



## NEC3 Engineering & Construction Contract

Between **ESKOM HOLDINGS SOC Limited**  
(Reg No. 2002/015527/30)

and

for **RUIGTEVALLEI-DREUNBERG OPGW INSTALLATION**

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**CONTRACT No.**

## Part C1: Agreements & Contract Data

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## C1.1 Form of Offer & Acceptance

### Offer

The Employer, identified in the Acceptance signature block, has solicited offers to enter into a contract for the procurement of: **RUIGTEVALLEI-DREUNBERG OPGW INSTALLATION**

The tenderer, identified in the Offer signature block, has examined the documents listed in the Tender Data and addenda thereto and by submitting this Offer has accepted the Conditions of Tender.

By the representative of the tenderer, deemed to be duly authorised, signing this part of this Form of Offer and Acceptance the tenderer offers to perform all of the obligations and liabilities of the *Contractor* under the contract including compliance with all its terms and conditions according to their true intent and meaning for an amount to be determined in accordance with the *conditions of contract* identified in the Contract Data.

|          |                                                                      |  |
|----------|----------------------------------------------------------------------|--|
| Option B | The offered total of the Prices exclusive of VAT is                  |  |
|          | Value Added Tax @ 15% is                                             |  |
|          | The offered total of the amount due inclusive of VAT is <sup>1</sup> |  |
|          | (Excluding VAT).                                                     |  |

This Offer may be accepted by the Employer by signing the Acceptance part of this Form of Offer and Acceptance and returning one copy of this document including the Schedule of Deviations (if any) to the tenderer before the end of the period of validity stated in the Tender Data, or other period as agreed, whereupon the tenderer becomes the party named as the *Contractor* in the *conditions of contract* identified in the Contract Data.

Signature(s)

Name(s)

Capacity

**For the  
tenderer:**

Name &  
signature of  
witness

Date

Tenderer's CIDB registration number (if applicable)

<sup>1</sup> This total is required by the *Employer* for budgeting purposes only. Actual amounts due will be assessed in terms of the *conditions of contract*.

## Acceptance

By signing this part of this Form of Offer and Acceptance, the Employer identified below accepts the tenderer's Offer. In consideration thereof, the Employer shall pay the Contractor the amount due in accordance with the *conditions of contract* identified in the Contract Data. Acceptance of the tenderer's Offer shall form an agreement between the Employer and the tenderer upon the terms and conditions contained in this agreement and in the contract that is the subject of this agreement.

The terms of the contract, are contained in:

|         |                                                                                  |
|---------|----------------------------------------------------------------------------------|
| Part C1 | Agreements and Contract Data, (which includes this Form of Offer and Acceptance) |
| Part C2 | Pricing Data                                                                     |
| Part C3 | Scope of Work: Works Information                                                 |
| Part C4 | Site Information                                                                 |

and drawings and documents (or parts thereof), which may be incorporated by reference into the above listed Parts.

Deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Returnable Schedules as well as any changes to the terms of the Offer agreed by the tenderer and the Employer during this process of offer and acceptance, are contained in the Schedule of Deviations attached to and forming part of this Form of Offer and Acceptance. No amendments to or deviations from said documents are valid unless contained in this Schedule.

The tenderer shall within two weeks of receiving a completed copy of this agreement, including the Schedule of Deviations (if any), contact the Employer's agent (whose details are given in the Contract Data) to arrange the delivery of any securities, bonds, guarantees, proof of insurance and any other documentation to be provided in terms of the *conditions of contract* identified in the Contract Data at, or just after, the date this agreement comes into effect. Failure to fulfil any of these obligations in accordance with those terms shall constitute a repudiation of this agreement.

Notwithstanding anything contained herein, this agreement comes into effect on the date when the tenderer receives one fully completed original copy signed between them of this document, including the Schedule of Deviations (if any).

Unless the tenderer (now *Contractor*) within five working days of the date of such receipt notifies the Employer in writing of any reason why he cannot accept the contents of this agreement, this agreement shall constitute a binding contract between the Parties.

Signature(s)

Name(s)

Capacity

**Senior Manager, Asset Creation  
Cape Coastal Cluster**

**for the  
Employer**

**ESKOM HOLDINGS SOC LIMITED,  
Sunnilaws Office Park, Beacon Bay  
EAST LONDON, 5205**

Name &  
signature of  
witness

Date

Note: If a tenderer wishes to submit alternative tenders, use another copy of this Form of Offer and Acceptance.

## Schedule of Deviations to be completed by the *Employer* prior to contract award

Note:

1. This part of the Offer & Acceptance would not be required if the contract has been developed by negotiation between the Parties and is not the result of a process of competitive tendering.
2. The extent of deviations from the tender documents issued by the Employer prior to the tender closing date is limited to those permitted in terms of the Conditions of Tender.
3. A tenderer's covering letter must not be included in the final contract document. Should any matter in such letter, which constitutes a deviation as aforesaid be the subject of agreement reached during the process of Offer and Acceptance, the outcome of such agreement shall be recorded here and the final draft of the contract documents shall be revised to incorporate the effect of it.

| No. | Subject | Details |
|-----|---------|---------|
| 1   |         |         |
| 2   |         |         |
| 3   |         |         |
| 4   |         |         |
| 5   |         |         |
| 6   |         |         |
| 7   |         |         |

By the duly authorised representatives signing this Schedule of Deviations below, the Employer and the tenderer agree to and accept this Schedule of Deviations as the only deviations from and amendments to the documents listed in the Tender Data and any addenda thereto listed in the Tender Schedules, as well as any confirmation, clarification or changes to the terms of the Offer agreed by the tenderer and the Employer during this process of Offer and Acceptance.

It is expressly agreed that no other matter whether in writing, oral communication or implied during the period between the issue of the tender documents and the receipt by the tenderer of a completed signed copy of this Form shall have any meaning or effect in the contract between the parties arising from this Agreement.

### For the tenderer:

### For the Employer

Signature

Name

Capacity

On behalf  
of

Name &  
signature  
of witness

Date

Senior Manager, Asset Creation  
Cape Coastal Cluster

ESKOM HOLDINGS SOC LIMITED,  
Sunnilaws Office Park, Beacon Bay  
EAST LONDON, 5205

## C1.2 ECC3 Contract Data

### Part one - Data provided by the *Employer*

| Clause | Statement                                                                              | Data                                                                                                                                             |
|--------|----------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| 1      | <b>General</b>                                                                         |                                                                                                                                                  |
|        | The <i>conditions of contract</i> are the core clauses and the clauses for main Option |                                                                                                                                                  |
|        | dispute resolution Option                                                              | <b>B:</b> Priced contract with bill of quantities                                                                                                |
|        | and secondary Options                                                                  | <b>W1:</b> Dispute resolution procedure                                                                                                          |
|        |                                                                                        | <b>X2:</b> Changes in the law                                                                                                                    |
|        |                                                                                        | <b>X5:</b> Sectional Completion                                                                                                                  |
|        |                                                                                        | <b>X7:</b> Delay damages                                                                                                                         |
|        |                                                                                        | <b>X16:</b> Retention                                                                                                                            |
|        |                                                                                        | <b>X18:</b> Limitation of liability                                                                                                              |
|        |                                                                                        | <b>Z:</b> <i>Additional conditions of contract</i>                                                                                               |
|        | of the NEC3 Engineering and Construction Contract, April 2013 (ECC3)                   |                                                                                                                                                  |
| 10.1   | The <i>Employer</i> is (Name):                                                         | Eskom Holdings SOC Ltd (reg no: 2002/015527/30), a state owned company incorporated in terms of the company laws of the Republic of South Africa |
|        | Address                                                                                | Registered office at Megawatt Park, Maxwell Drive, Sandton, Johannesburg                                                                         |
| 10.1   | The <i>Project Manager</i> is: (Name)                                                  | <b>Khululwa Maqokolo</b>                                                                                                                         |
|        | Address                                                                                | <b>ESKOM HOLDINGS SOC LIMITED,<br/>Sunilaws Office Park, Beacon Bay<br/>EAST LONDON, 5205</b>                                                    |
|        | Tel                                                                                    | <b>043- 703 2744</b>                                                                                                                             |
|        | Fax                                                                                    | <b>086 538 7582</b>                                                                                                                              |
|        | e-mail                                                                                 | <b>maqokokl@eskom.co.za</b>                                                                                                                      |
| 10.1   | The <i>Supervisor</i> is: (Name)                                                       | <b>Mlulami Quma</b>                                                                                                                              |
|        | Address                                                                                | <b>ESKOM HOLDINGS SOC LIMITED,<br/>Sunilaws Office Park, Beacon Bay<br/>EAST LONDON, 5205</b>                                                    |
|        | Tel No.                                                                                | <b>+27 43 605 2459</b>                                                                                                                           |

Fax No.

e-mail

qumamr@eskom.co.za

|          |                                                                                              |                                                                                                                                                                                            |                          |
|----------|----------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| 11.2(13) | The <i>works</i> are                                                                         | <b>OPGW Installation</b>                                                                                                                                                                   |                          |
| 11.2(14) | The following matters will be included in the Risk Register                                  | <b>Part 5 – Annexures – Risks identified part of the Risk Assessment as per the Safety Health &amp; Environment Specification document and FDP Document.</b>                               |                          |
| 11.2(15) | The <i>boundaries of the site</i> are                                                        | <b>Within the line servitude</b>                                                                                                                                                           |                          |
| 11.2(16) | The Site Information is in                                                                   | <b>Part 4: Site Information</b>                                                                                                                                                            |                          |
| 11.2(19) | The Works Information is in                                                                  | <b>Part 3: Scope of Work and all documents and drawings to which it makes reference.</b>                                                                                                   |                          |
| 12.2     | The <i>law of the contract</i> is the law of                                                 | <b>the Republic of South Africa</b>                                                                                                                                                        |                          |
| 13.1     | The <i>language of this contract</i> is                                                      | <b>English</b>                                                                                                                                                                             |                          |
| 13.3     | The <i>period for reply</i> is                                                               | <b>7 working days</b>                                                                                                                                                                      |                          |
| <b>2</b> | <b>The Contractor's main responsibilities</b>                                                | Data required by this section of the core clauses is provided by the <i>Contractor</i> in Part 2 and terms in italics used in this section are identified elsewhere in this Contract Data. |                          |
| <b>3</b> | <b>Time</b>                                                                                  |                                                                                                                                                                                            |                          |
| 11.2(3)  | The <i>completion date</i> for the whole of the <i>works</i> is                              | <b>31 March 2027</b>                                                                                                                                                                       |                          |
| 11.2(9)  | The <i>key dates</i> and the <i>conditions</i> to be met are:                                | <b>Condition to be met</b>                                                                                                                                                                 | <b>key date</b>          |
|          |                                                                                              | <b>1</b>   <b>Material inspection</b>                                                                                                                                                      | <b>12 October 2026</b>   |
| 30.1     | The <i>access dates</i> are:                                                                 | <b>Part of the Site</b>                                                                                                                                                                    | <b>Date</b>              |
|          |                                                                                              | <b>1</b>   <b>Site handover</b>                                                                                                                                                            | <b>21 September 2026</b> |
| 31.1     | The <i>Contractor</i> is to submit a first programme for acceptance within                   | <b>two weeks of the Contract Date.</b>                                                                                                                                                     |                          |
| 31.2     | The <i>starting date</i> is                                                                  | <b>21 September 2026</b>                                                                                                                                                                   |                          |
| 32.2     | The <i>Contractor</i> submits revised programmes at intervals no longer than                 | <b>4 weeks.</b>                                                                                                                                                                            |                          |
| 35.1     | The <i>Employer</i> is not willing to take over the <i>works</i> before the Completion Date. |                                                                                                                                                                                            |                          |

#### 4 Testing and Defects

42.2 The *defects date* is **52 weeks after Completion of the whole of the works.**

43.2 The *defect correction period* is **2 weeks**

except that the *defect correction period* for **n/a**

and the *defect correction period* for **n/a**

#### 5 Payment

50.1 The *assessment interval* is **Period agreed upon by Project Manager and Contractor from the Starting Date.**

51.1 The *currency of this contract* is the **South African Rand.**

51.2 The period within which payments are made is **Either 14 (fourteen) days or 30 (thirty) days depending on the Contractor's BBBEE status at the date of payment.**

51.4 The *interest rate* is **the publicly quoted prime rate of interest (calculated on a 365 day year) charged from time to time by the Standard Bank of South Africa Limited (as certified, in the event of any dispute, by any manager of such bank, whose appointment it shall not be necessary to prove) for amounts due in Rands and**

**(ii) the LIBOR rate applicable at the time for amounts due in other currencies. LIBOR is the 6 month London Interbank Offered Rate quoted under the caption "Money Rates" in The Wall Street Journal for the applicable currency or if no rate is quoted for the currency in question then the rate for United States Dollars, and if no such rate appears in The Wall Street Journal then the rate as quoted by the Reuters Monitor Money Rates Service (or such service as may replace the Reuters Monitor Money Rates Service) on the due date for the payment in question, adjusted *mutatis mutandis* every 6 months thereafter and as certified, in the event of any dispute, by any manager employed in the foreign exchange department of The Standard Bank of South Africa Limited, whose appointment it shall not be necessary to prove.**

#### 6 Compensation events

60.1(13) The place where weather is to be recorded is: **At the established Site Camp/working area**

The *weather measurements* to be recorded for each calendar month are, **the cumulative rainfall (mm)**

**the number of days with rainfall more than 10 mm**

**the number of days with minimum air**



|           |                                                                                                                             |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                            |
|-----------|-----------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|           |                                                                                                                             | <p>temperature less than 0 degrees Celsius</p> <p>the number of days with snow lying at 09:00 hours South African Time</p> <p>and these measurements: are recorded within a calendar month</p> <p>The <i>weather measurements</i> are supplied by</p> <p>The <i>weather data</i> are the records of past <i>weather measurements</i> for each calendar month which were recorded at:</p> <p>and which are available from:</p> | <p>The contractor using actual weather readings from the established site</p> <p>The nearest weather station of the South African Weather Service to the site</p> <p>the South African Weather Bureau and included in Annexure A to this Contract Data provided by the <i>Employer</i></p> |
| 60.1(13)  | Assumed values for the ten year return <i>weather data</i> for each <i>weather measurement</i> for each calendar month are: | <p><b>As stated in Annexure A to this Contract Data provided by the <i>Employer</i>.</b></p> <p>Note: If this arrangement is used, delete the rows above for 60.1(13) and delete this note.</p>                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                            |
| <b>7</b>  | <b>Title</b>                                                                                                                | <p>There is no reference to Contract Data in this section of the core clauses and terms in italics used in this section are identified elsewhere in this Contract Data.</p>                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                            |
| <b>8</b>  | <b>Risks and insurance</b>                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                            |
| 80.1      | These are additional <i>Employer's</i> risks                                                                                | 1. As per NEC3 ECC clause 80.1                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                            |
| <b>9</b>  | <b>Termination</b>                                                                                                          | <p>As per the terms and conditions of the NEC3 Engineering and Construction Contract, April 2013 (ECC3)</p>                                                                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                            |
| <b>10</b> | <b>Data for main Option clause</b>                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                            |
| <b>B</b>  | <b>Priced contract with bill of quantities</b>                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                            |
| 60.6      | The <i>method of measurement</i> is                                                                                         | As stated in Part C2.1, Pricing Assumptions.                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                                                                                                                                                                                            |
| <b>11</b> | <b>Data for Option W1</b>                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                            |
| W1.1      | The <i>Adjudicator</i> is                                                                                                   | <p>the person selected from the ICE-SA Division (or its successor body) of the South African Institution of Civil Engineering Panel of Adjudicators by the Party intending to refer a dispute to him. (see <a href="http://www.ice-sa.org.za">www.ice-sa.org.za</a>). If the Parties do not agree on an Adjudicator the Adjudicator will be appointed by the Arbitration Foundation of Southern Africa (AFSA).</p>            |                                                                                                                                                                                                                                                                                            |
|           | Address                                                                                                                     | TO BE APPOINTED WHEN DISPUTE ARISE                                                                                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                            |
|           | Tel No.                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                            |

Fax No.

e-mail

W1.2(3) The *Adjudicator nominating body* is: **the Chairman of ICE-SA a joint Division of the South African Institution of Civil Engineering and the London Institution of Civil Engineers. (See [www.ice-sa.org.za](http://www.ice-sa.org.za) ) or its successor body.**

W1.4(2) The *tribunal* is: **arbitration.**

W1.4(5) The *arbitration procedure* is **the latest edition of Rules for the Conduct of Arbitrations published by The Association of Arbitrators (Southern Africa) or its successor body.**

The place where arbitration is to be held is **[•] South Africa**

The person or organisation who will choose an arbitrator

- if the Parties cannot agree a choice or
- if the arbitration procedure does not state who selects an arbitrator, is **the Chairman for the time being or his nominee of the Association of Arbitrators (Southern Africa) or its successor body.**

## 12 Data for secondary Option clauses

X2 **Changes in the law** **As per the terms and conditions of the NEC3 Engineering and Construction Contract, April 2013 (ECC3)**

### X5 Sectional Completion

X5.1 The *completion date* for each *section* of the *works* is:

| Section                                                      | Teams  | Start Date        | Completion Date   | Duration |
|--------------------------------------------------------------|--------|-------------------|-------------------|----------|
| Health and safety file approval                              |        | 21 September 2026 | 25 September 2026 | 1 week   |
| Site Establishment                                           |        | 28 October 2026   | 02 October 2026   | 1 week   |
| OPGW stringing - Ruigtevallei substation to Structure 117    | Team 1 | 04 October 2026   | 04 November 2026  | 1 month  |
| OPGW stringing Structure 117 to Structure 210                | Team 2 | 04 October 2026   | 18 December 2026  | 2 months |
| OPGW stringing - Structure 210 to Structure 302              | Team 3 | 04 October 2026   | 18 December 2026  | 2 months |
| OPGW stringing - Structure 302 to Dreunberg substation       | Team 4 | 04 October 2026   | 04 November 2026  | 1 month  |
| Splicing - Ruigtevallei substation to Structure 117          | Team 5 | 04 October 2026   | 04 November 2026  | 1 month  |
| Splicing - Structure 302 to Dreunberg substation             | Team 6 | 04 October 2026   | 04 November 2026  | 1 month  |
| Splicing - Structure 117 to Structure 210                    | Team 5 | 05 November 2026  | 18 December 2026  | 1 month  |
| Splicing - Structure 210 to Structure 302                    | Team 6 | 05 November 2026  | 18 December 2026  | 1 month  |
| OPGW stringing - Ruigtevallei substation gantry to the panel | Team 1 | 05 November 2026  | 18 December 2026  | 1 Month  |
| OPGW stringing - Dreunberg                                   | Team 4 | 05 November       | 18 December       | 1 Month  |

|                                                        |               |                  |                  |         |
|--------------------------------------------------------|---------------|------------------|------------------|---------|
| substation gantry to the panel                         |               | 2026             | 2026             |         |
| Splicing - Ruigtevallei substation gantry to the panel | Team 5        | 04 January 2027  | 05 February 2027 | 1 Month |
| Splicing - Dreunberg substation gantry to the panel    | Team 6        | 04 January 2027  | 05 February 2027 | 1 Month |
| Defects fixing                                         | Various Teams | 04 January 2027  | 05 February 2027 | 1 Month |
| OPGW testing                                           | Various Teams | 08 February 2027 | 12 February 2027 | 1 Week  |
| Commissioning/Energise                                 |               | 15 February 2027 | 19 February 2027 | 1 Week  |

**X5 & X7 Sectional Completion and delay damages used together**

X7.1 Delay damages for late Completion of the  
X5.1 sections of the works are:

| Section                                                      | Teams         | Start Date        | Completion Date   | Duration | Amount per day          |
|--------------------------------------------------------------|---------------|-------------------|-------------------|----------|-------------------------|
| Health and safety file approval                              |               | 21 September 2026 | 25 September 2026 | 1 week   | 0.05% of contract value |
| Site Establishment                                           |               | 28 October 2026   | 02 October 2026   | 1 week   | 0.05% of contract value |
| OPGW stringing - Ruigtevallei substation to Structure 117    | Team 1        | 04 October 2026   | 04 November 2026  | 1 month  | 0.05% of contract value |
| OPGW stringing Structure 117 to Structure 210                | Team 2        | 04 October 2026   | 18 December 2026  | 2 months | 0.05% of contract value |
| OPGW stringing - Structure 210 to Structure 302              | Team 3        | 04 October 2026   | 18 December 2026  | 2 months | 0.05% of contract value |
| OPGW stringing - Structure 302 to Dreunberg substation       | Team 4        | 04 October 2026   | 04 November 2026  | 1 month  | 0.05% of contract value |
| Splicing - Ruigtevallei substation to Structure 117          | Team 5        | 04 October 2026   | 04 November 2026  | 1 month  | 0.05% of contract value |
| Splicing - Structure 302 to Dreunberg substation             | Team 6        | 04 October 2026   | 04 November 2026  | 1 month  | 0.05% of contract value |
| Splicing - Structure 117 to Structure 210                    | Team 5        | 05 November 2026  | 18 December 2026  | 1 month  | 0.05% of contract value |
| Splicing - Structure 210 to Structure 302                    | Team 6        | 05 November 2026  | 18 December 2026  | 1 month  | 0.05% of contract value |
| OPGW stringing - Ruigtevallei substation gantry to the panel | Team 1        | 05 November 2026  | 18 December 2026  | 1 Month  | 0.05% of contract value |
| OPGW stringing - Dreunberg substation gantry to the panel    | Team 4        | 05 November 2026  | 18 December 2026  | 1 Month  | 0.05% of contract value |
| Splicing - Ruigtevallei substation gantry to the panel       | Team 5        | 04 January 2027   | 05 February 2027  | 1 Month  | 0.05% of contract value |
| Splicing - Dreunberg substation gantry to the panel          | Team 6        | 04 January 2027   | 05 February 2027  | 1 Month  | 0.05% of contract value |
| Defects fixing                                               | Various Teams | 04 January 2027   | 05 February 2027  | 1 Month  | 0.05% of contract value |
| OPGW testing                                                 | Various Teams | 08 February 2027  | 12 February 2027  | 1 Week   | 0.05% of contract value |
| Commissioning/Energise                                       |               | 15 February 2027  | 19 February 2027  | 1 Week   | 0.05% of contract value |

Remainder of the works

**0.1% of Contract Value per day.**

|            |                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|            | The total delay damages payable by the <i>Contractor</i> does not exceed:                                                                                                     | Up to a limit not exceeding 10% of Contract Value                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <b>X16</b> | <b>Retention (not used with Option F)</b>                                                                                                                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| X16.1      | The <i>retention free amount</i> is                                                                                                                                           | n/a                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|            | The <i>retention percentage</i> is                                                                                                                                            | 10%                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>X18</b> | <b>Limitation of liability</b>                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| X18.1      | The <i>Contractor's</i> liability to the <i>Employer</i> for indirect or consequential loss is limited to:                                                                    | R0.0 (zero Rand)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| X18.2      | For any one event, the <i>Contractor's</i> liability to the <i>Employer</i> for loss of or damage to the <i>Employer's</i> property is limited to:                            | the amount of the deductibles relevant to the event                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| X18.3      | The <i>Contractor's</i> liability for Defects due to his design which are not listed on the Defects Certificate is limited to                                                 | <p>The greater of</p> <ul style="list-style-type: none"> <li>the total of the Prices at the Contract Date and</li> <li>the amounts excluded and unrecoverable from the <i>Employer's</i> assets policy for correcting the Defect (other than the resulting physical damage which is not excluded) plus the applicable deductible as at contract date.</li> </ul>                                                                                                                                                                                                                                                                                                                                        |
| X18.4      | The <i>Contractor's</i> total liability to the <i>Employer</i> for all matters arising under or in connection with this contract, other than excluded matters, is limited to: | <p>the total of the Prices other than for the additional excluded matters.</p> <p>The <i>Contractor's</i> total liability for the additional excluded matters is not limited.</p> <p>The additional excluded matters are amounts for which the <i>Contractor</i> is liable under this contract for</p> <ul style="list-style-type: none"> <li>Defects due to his design which arise before the Defects Certificate is issued,</li> <li>Defects due to manufacture and fabrication outside the Site,</li> <li>loss of or damage to property (other than the works, Plant and Materials),</li> <li>death of or injury to a person and</li> <li>infringement of an intellectual property right.</li> </ul> |
| X18.5      | The <i>end of liability date</i> is                                                                                                                                           | <p>(i) seven years after the <i>defects date</i> for latent Defects and</p> <p>(ii) the date on which the liability in question prescribes in accordance with the Prescription Act No. 68 of 1969 (as amended or in terms of any replacement legislation) for any other matter.</p> <p>A latent Defect is a Defect which would not have been discovered on reasonable inspection by the <i>Employer</i> or the <i>Supervisor</i> before the <i>defects date</i>, without requiring any inspection not ordinarily carried out by the <i>Employer</i> or the</p>                                                                                                                                          |

**Supervisor during that period.**

**If the *Employer* or the *Supervisor* do undertake any inspection over and above the reasonable inspection, this does not place a greater responsibility on the *Employer* or the *Supervisor* to have discovered the Defect.**

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**Z The Additional conditions of contract are**

**Z1 to Z15 always apply.**

---

**Z1 Cession delegation and assignment**

- Z1.1 The *Contractor* does not cede, delegate or assign any of its rights or obligations to any person without the written consent of the *Employer*.
- Z1.2 Notwithstanding the above, the *Employer* may on written notice to the *Contractor* cede and delegate its rights and obligations under this contract to any of its subsidiaries or any of its present divisions or operations which may be converted into separate legal entities as a result of the restructuring of the Electricity Supply Industry.

**Z2 Joint ventures**

- Z2.1 If the *Contractor* constitutes a joint venture, consortium or other unincorporated grouping of two or more persons or organisations then these persons or organisations are deemed to be jointly and severally liable to the *Employer* for the performance of this contract.
- Z2.2 Unless already notified to the *Employer*, the persons or organisations notify the *Project Manager* within two weeks of the Contract Date of the key person who has the authority to bind the *Contractor* on their behalf.
- Z2.3 The *Contractor* does not alter the composition of the joint venture, consortium or other unincorporated grouping of two or more persons without the consent of the *Employer* having been given to the *Contractor* in writing.

**Z3 Change of Broad Based Black Economic Empowerment (B-BBEE) status**

- Z3.1 Where a change in the *Contractor's* legal status, ownership or any other change to his business composition or business dealings results in a change to the *Contractor's* B-BBEE status, the *Contractor* notifies the *Employer* within seven days of the change.
- Z3.2 The *Contractor* is required to submit an updated verification certificate and necessary supporting documentation confirming the change in his B-BBEE status to the *Project Manager* within thirty days of the notification or as otherwise instructed by the *Project Manager*.
- Z3.3 Where, as a result, the *Contractor's* B-BBEE status has decreased since the Contract Date the *Employer* may either re-negotiate this contract or alternatively, terminate the *Contractor's* obligation to Provide the Works.
- Z3.4 Failure by the *Contractor* to notify the *Employer* of a change in its B-BBEE status may constitute a reason for termination. If the *Employer* terminates in terms of this clause, the procedures on termination are P1, P2 and P3 as stated in clause 92, and the amount due is A1 and A3 as stated in clause 93.

**Z4 Confidentiality**

- Z4.1 The *Contractor* does not disclose or make any information arising from or in connection with this

contract available to Others. This undertaking does not, however, apply to information which at the time of disclosure or thereafter, without default on the part of the *Contractor*, enters the public domain or to information which was already in the possession of the *Contractor* at the time of disclosure (evidenced by written records in existence at that time). Should the *Contractor* disclose information to Others in terms of clause 25.1, the *Contractor* ensures that the provisions of this clause are complied with by the recipient.

- Z4.2 If the *Contractor* is uncertain about whether any such information is confidential, it is to be regarded as such until notified otherwise by the *Project Manager*.
- Z4.3 In the event that the *Contractor* is, at any time, required by law to disclose any such information which is required to be kept confidential, the *Contractor*, to the extent permitted by law prior to disclosure, notifies the *Employer* so that an appropriate protection order and/or any other action can be taken if possible, prior to any disclosure. In the event that such protective order is not, or cannot, be obtained, then the *Contractor* may disclose that portion of the information which it is required to be disclosed by law and uses reasonable efforts to obtain assurances that confidential treatment will be afforded to the information so disclosed.
- Z4.4 The taking of images (whether photographs, video footage or otherwise) of the *works* or any portion thereof, in the course of Providing the Works and after Completion, requires the prior written consent of the *Project Manager*. All rights in and to all such images vests exclusively in the *Employer*.
- Z4.5 The *Contractor* ensures that all his subcontractors abide by the undertakings in this clause.

**Z5 Waiver and estoppel: Add to core clause 12.3:**

- Z5.1 Any extension, concession, waiver or relaxation of any action stated in this contract by the Parties, the *Project Manager*, the *Supervisor*, or the *Adjudicator* does not constitute a waiver of rights, and does not give rise to an estoppel unless the Parties agree otherwise and confirm such agreement in writing.

**Z6 Health, safety and the environment: Add to core clause 27.4**

- Z6.1 The *Contractor* undertakes to take all reasonable precautions to maintain the health and safety of persons in and about the execution of the *works*. Without limitation the *Contractor*:
- accepts that the *Employer* may appoint him as the "Principal Contractor" (as defined and provided for under the Construction Regulations 2014 (promulgated under the Occupational Health & Safety Act 85 of 1993) ("the Construction Regulations") for the Site;
  - warrants that the total of the Prices as at the Contract Date includes a sufficient amount for proper compliance with the Construction Regulations, all applicable health & safety laws and regulations and the health and safety rules, guidelines and procedures provided for in this contract and generally for the proper maintenance of health & safety in and about the execution of *works*; and
  - undertakes, in and about the execution of the *works*, to comply with the Construction Regulations and with all applicable health & safety laws and regulations and rules, guidelines and procedures otherwise provided for under this contract and ensures that his Subcontractors, employees and others under the *Contractor's* direction and control, likewise observe and comply with the foregoing.
- Z6.2 The *Contractor*, in and about the execution of the *works*, complies with all applicable environmental laws and regulations and rules, guidelines and procedures otherwise provided for under this contract and ensures that his Subcontractors, employees and others under the *Contractor's* direction and control, likewise observe and comply with the foregoing.

**Z7 Provision of a Tax Invoice and interest. Add to core clause 51**

- Z7.1 Within one week of receiving a payment certificate from the *Project Manager* in terms of core clause 51.1, the *Contractor* provides the *Employer* with a tax invoice in accordance with the *Employer's* procedures stated in the Works Information, showing the amount due for payment equal to that stated in the payment certificate.
- Z7.2 If the *Contractor* does not provide a tax invoice in the form and by the time required by this contract, the time by when the *Employer* is to make a payment is extended by a period equal in time to the delayed submission of the correct tax invoice. Interest due by the *Employer* in terms of core clause 51.2 is then calculated from the delayed date by when payment is to be made.
- Z7.3 The *Contractor* (if registered in South Africa in terms of the companies Act) is required to comply with the requirements of the Value Added Tax Act, no 89 of 1991 (as amended) and to include the *Employer's* VAT number 4740101508 on each invoice he submits for payment.

**Z8 Notifying compensation events**

- Z8.1 Delete from the last sentence in core clause 61.3, "unless the *Project Manager* should have notified the event to the *Contractor* but did not".

**Z9 Employer's limitation of liability**

- Z9.1 The *Employer's* liability to the *Contractor* for the *Contractor's* indirect or consequential loss is limited to R0.00 (zero Rand)
- Z9.2 The *Contractor's* entitlement under the indemnity in 83.1 is provided for in 60.1(14) and the *Employer's* liability under the indemnity is limited.

**Z10 Termination: Add to core clause 91.1, at the second main bullet point, fourth sub-bullet point, after the words "against it":**

- Z10.1 or had a business rescue order granted against it.

**Z11 Addition to secondary Option X7 Delay damages (if applicable in this contract)**

- Z11.1 If the amount due for the *Contractor's* payment of delay damages reaches the limits stated in this Contract Data for Option X7 or Options X5 and X7 used together, the *Employer* may terminate the *Contractor's* obligation to Provide the Works using the same procedures and payment on termination as those applied for reasons R1 to R15 or R18 stated in the Termination Table.

**Z12 Ethics**

For the purposes of this Z-clause, the following definitions apply:

- Affected Party** means, as the context requires, any party, irrespective of whether it is the *Contractor* or a third party, such party's employees, agents, or Subcontractors or Subcontractor's employees, or any one or more of all of these parties' relatives or friends,
- Coercive Action** means to harm or threaten to harm, directly or indirectly, an Affected Party or the property of an Affected Party, or to otherwise influence or attempt to influence an Affected Party to act unlawfully or illegally,
- Collusive Action** means where two or more parties co-operate to achieve an unlawful or illegal purpose, including to influence an Affected Party to act unlawfully or illegally,



- Committing Party** means, as the context requires, the *Contractor*, or any member thereof in the case of a joint venture, or its employees, agents, or Subcontractor or the Subcontractor's employees,
- Corrupt Action** means the offering, giving, taking, or soliciting, directly or indirectly, of a good or service to unlawfully or illegally influence the actions of an Affected Party,
- Fraudulent Action** means any unlawfully or illegally intentional act or omission that misleads, or attempts to mislead, an Affected Party, in order to obtain a financial or other benefit or to avoid an obligation or incurring an obligation,
- Obstructive Action** means a Committing Party unlawfully or illegally destroying, falsifying, altering or concealing information or making false statements to materially impede an investigation into allegations of Prohibited Action, and
- Prohibited Action** means any one or more of a Coercive Action, Collusive Action Corrupt Action, Fraudulent Action or Obstructive Action.

- Z12.1 A Committing Party may not take any Prohibited Action during the course of the procurement of this contract or in execution thereof.
- Z12.2 The *Employer* may terminate the *Contractor's* obligation to Provide the Services if a Committing Party has taken such Prohibited Action and the *Contractor* did not take timely and appropriate action to prevent or remedy the situation, without limiting any other rights or remedies the *Employer* has. It is not required that the Committing Party had to have been found guilty, in court or in any other similar process, of such Prohibited Action before the *Employer* can terminate the *Contractor's* obligation to Provide the Services for this reason.
- Z12.3 If the *Employer* terminates the *Contractor's* obligation to Provide the Services for this reason, the amounts due on termination are those intended in core clauses 92.1 and 92.2.
- Z12.4 A Committing Party co-operates fully with any investigation pursuant to alleged Prohibited Action. Where the *Employer* does not have a contractual bond with the Committing Party, the *Contractor* ensures that the Committing Party co-operates fully with an investigation.

### Z13 Insurance

#### Z 13.1 Replace core clause 84 with the following:

#### Insurance cover 84

- 84.1** When requested by a Party, the other Party provides certificates from his insurer or broker stating that the insurances required by this contract are in force.
- 84.2** The *Contractor* provides the insurances stated in the Insurance Table A.
- 84.3** The insurances provide cover for events which are at the *Contractor's* risk from the *starting date* until the earlier of Completion and the date of the termination certificate.

#### INSURANCE TABLE A

| Insurance against                                   | Minimum amount of cover or minimum limit of indemnity                     |
|-----------------------------------------------------|---------------------------------------------------------------------------|
| Loss of or damage to the works, Plant and Materials | The replacement cost where not covered by the <i>Employer's</i> insurance |



|                                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                                                                                                                                                   | The <i>Employer's</i> policy deductible, as at Contract Date, where covered by the <i>Employer's</i> insurance                                                                                                                                                                                                                                                                                                                                              |
| Loss of or damage to Equipment                                                                                                                                                                                                                                    | The replacement cost                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Liability for loss of or damage to property (except the <i>works</i> , Plant and Materials and Equipment) and liability for bodily injury to or death of a person (not an employee of the <i>Contractor</i> ) caused by activity in connection with this contract | <p><b><u>Loss of or damage to property</u></b><br/> <u><i>Employer's</i> property</u><br/> The replacement cost where not covered by the <i>Employer's</i> insurance</p> <p>The <i>Employer's</i> policy deductible, as at Contract Date, where covered by the <i>Employer's</i> insurance</p> <p><u>Other property</u><br/> The replacement cost</p> <p><b><u>Bodily injury to or death of a person</u></b><br/> The amount required by applicable law</p> |
| Liability for death of or bodily injury to employees of the <i>Contractor</i> arising out of and in the course of their employment in connection with this contract                                                                                               | The amount required by the applicable law                                                                                                                                                                                                                                                                                                                                                                                                                   |

**Z 13.2**

**Replace core clause 87 with the following:**

The *Employer* provides the insurances stated in the Insurance Table B.

**INSURANCE TABLE B**

| <b>Insurance against or name of policy</b>        | <b>Minimum amount of cover or minimum of indemnity</b> |
|---------------------------------------------------|--------------------------------------------------------|
| Assets All Risk                                   | Per the insurance policy document                      |
| Contract Works insurance                          | Per the insurance policy document                      |
| Environmental Liability                           | Per the insurance policy document                      |
| General and Public Liability                      | Per the insurance policy document                      |
| Transportation (Marine)                           | Per the insurance policy document                      |
| Motor Fleet and Mobile Plant                      | Per the insurance policy document                      |
| Terrorism                                         | Per the insurance policy document                      |
| Cyber Liability                                   | Per the insurance policy document                      |
| Nuclear Material Damage and Business Interruption | Per the insurance policy document                      |
| Nuclear Material Damage Terrorism                 | Per the insurance policy document                      |

**Z14 Nuclear Liability**

- Z14.1 The *Employer* is the operator of the Koeberg Nuclear Power Station (KNPS), a nuclear installation, as designated by the National Nuclear Regulator of the Republic of South Africa, and is the holder of a nuclear licence in respect of the KNPS.
- Z14.2 The *Employer* is solely responsible for and indemnifies the *Contractor* or any other person against any and all liabilities which the *Contractor* or any person may incur arising out of or resulting from nuclear damage, as defined in Act 47 of 1999, save to the extent that any liabilities are incurred due to the unlawful intent of the *Contractor* or any other person or the presence of the *Contractor* or that person or any property of the *Contractor* or such person at or in the KNPS or on the KNPS site, without the permission of the *Employer* or of a person acting on behalf of the *Employer*.
- Z14.3 Subject to clause Z14.4 below, the *Employer* waives all rights of recourse, arising from the aforesaid, save to the extent that any claims arise or liability is incurred due or attributable to the unlawful intent of the *Contractor* or any other person, or the presence of the *Contractor* or that person or any property of the *Contractor* or such person at or in the KNPS or on the KNPS site, without the permission of the *Employer* or of a person acting on behalf of the *Employer*.
- Z14.4 The *Employer* does not waive its rights provided for in section 30 (7) of Act 47 of 1999, or any replacement section dealing with the same subject matter.
- Z14.5 The protection afforded by the provisions hereof shall be in effect until the KNPS is decommissioned.

## **Z15 Asbestos**

For the purposes of this Z-clause, the following definitions apply:

|                              |                                                                                                                                                                                                                                                                                                              |
|------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>AAIA</b>                  | means approved asbestos inspection authority.                                                                                                                                                                                                                                                                |
| <b>ACM</b>                   | means asbestos containing materials.                                                                                                                                                                                                                                                                         |
| <b>AL</b>                    | means action level, i.e. a level of 50% of the OEL, i.e. 0.1 regulated asbestos fibres per ml of air measured over a 4 hour period. The value at which proactive actions is required in order to control asbestos exposure to prevent exceeding the OEL.                                                     |
| <b>Ambient Air</b>           | means breathable air in area of work with specific reference to breathing zone, which is defined to be a virtual area within a radius of approximately 30cm from the nose inlet.                                                                                                                             |
| <b>Compliance Monitoring</b> | means compliance sampling used to assess whether or not the personal exposure of workers to regulated asbestos fibres is in compliance with the Standard's requirements for safe processing, handling, storing, disposal and phase-out of asbestos and asbestos containing material, equipment and articles. |
| <b>OEL</b>                   | means occupational exposure limit.                                                                                                                                                                                                                                                                           |
| <b>Parallel Measurements</b> | means measurements performed in parallel, yet separately, to existing measurements to verify validity of results.                                                                                                                                                                                            |
| <b>Safe Levels</b>           | means airborne asbestos exposure levels conforming to the Standard's requirements for safe processing, handling, storing, disposal and phase-out of asbestos and asbestos containing material, equipment and articles.                                                                                       |
| <b>Standard</b>              | means the <i>Employer's</i> Asbestos Standard 32-303: Requirements for Safe Processing, Handling, Storing, Disposal and Phase-out of Asbestos and Asbestos Containing Material, Equipment and Articles.                                                                                                      |

**SANAS** means the South African National Accreditation System.

**TWA** means the average exposure, within a given workplace, to airborne asbestos fibres, normalised to the baseline of a 4 hour continuous period, also applicable to short term exposures, i.e. 10-minute TWA.

- Z15.1 The *Employer* ensures that the Ambient Air in the area where the *Contractor* will Provide the Services conforms to the acceptable prescribed South African standard for asbestos, as per the regulations published in GNR 155 of 10 February 2002, under the Occupational Health and Safety Act, 1993 (Act 85 of 1993) ("Asbestos Regulations"). The OEL for asbestos is 0.2 regulated asbestos fibres per millilitre of air as a 4-hour TWA, averaged over any continuous period of four hours, and the short term exposure limit of 0.6 regulated asbestos fibres per millilitre of air as a 10-minute TWA, averaged over any 10 minutes, measured in accordance with HSG248 and monitored according to HSG173 and OEESM.
- Z15.2 Upon written request by the *Contractor*, the *Employer* certifies that these conditions prevail. All measurements and reporting are effected by an independent, competent, and certified occupational hygiene inspection body, i.e. a SANAS accredited and Department of Employment and Labour approved AAIA. The *Contractor* may perform Parallel Measurements and related control measures at the *Contractor's* expense. For the purposes of compliance the results generated from Parallel Measurements are evaluated only against South African statutory limits as detailed in clause Z15.1. Control measures conform to the requirements stipulated in the AAIA-approved asbestos work plan.
- Z15.3 The *Employer* manages asbestos and ACM according to the Standard.
- Z15.4 In the event that any asbestos is identified while Providing the Services, a risk assessment is conducted and if so required, with reference to possible exposure to an airborne concentration of above the AL for asbestos, immediate control measures are implemented and relevant air monitoring conducted in order to declare the area safe.
- Z15.5 The *Contractor's* personnel are entitled to stop working and leave the contaminated area forthwith until such time that the area of concern is declared safe by either Compliance Monitoring or an AAIA approved control measure intervention, for example, per the emergency asbestos work plan, if applicable.
- Z15.6 The *Contractor* continues to Provide the Services, without additional control measures presented, on presentation of Safe Levels. The contractually agreed dates to Provide the Services, including the Completion Date, are adjusted accordingly. The contractually agreed dates are extended by the notification periods required by regulations 3 and 21 of the Asbestos Regulations, 2001.
- Z15.7 Any removal and disposal of asbestos, asbestos containing materials and waste, is done by a registered asbestos contractor, instructed by the *Employer* at the *Employer's* expense, and conducted in line with South African legislation.

## Annexure A: One-in-ten-year-return *weather data* obtained from SA Weather Bureau for [weather station]

If any one of these *weather measurements* recorded within a calendar month, before the Completion Date for the whole of the *works* and at the place stated in this Contract Data is shown to be more adverse than the amount stated below then the *Contractor* may notify a compensation event.

|  <b>South African Weather Service</b>                                                                                                                      |                               |                    |                                       |                  |                                                     |            |             |             |               |          |                               |                                  |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------|--------------------|---------------------------------------|------------------|-----------------------------------------------------|------------|-------------|-------------|---------------|----------|-------------------------------|----------------------------------|
| <b>RAINFALL ANALYSIS FOR:</b> 0175578A0 <b>ALIWAL-NORTH</b> <b>Lat:-30.841</b> <b>Lon:25.875</b> <b>Height:134</b> <b>Height:1347 m</b><br><b>DATA REQUEST ED 1995 to 2015</b>                                                              |                               |                    |                                       |                  |                                                     |            |             |             |               |          |                               |                                  |
| <b>Data for the Average Calculation is not used if:</b><br>There are more than five consecutive days of accumulation<br>The data for certain days in the month is not available<br>The accumulation period occurred at the end of the month |                               |                    |                                       |                  |                                                     |            |             |             |               |          |                               |                                  |
| <b>Data for the Frequency calculation is not used if:</b><br>The data for certain days in the month is not available<br>The accumulation period occurred at the end of the month                                                            |                               |                    |                                       |                  |                                                     |            |             |             |               |          |                               |                                  |
| Month                                                                                                                                                                                                                                       | Average Monthly Rainfall (mm) | Standard Deviation | Average Number of Rain Days per Month | Number of Months | Average Number of Rain Days in the Specified Range: |            |             |             |               |          | Maximum 24-hour Rainfall (mm) | Date of Maximum 24-hour Rainfall |
|                                                                                                                                                                                                                                             |                               |                    |                                       |                  | 1 - 5 mm                                            | 5.1 - 10mm | 10.1 - 20mm | 20.1 - 50mm | 50.1 - 100 mm | > 100 mm |                               |                                  |
| JAN                                                                                                                                                                                                                                         | 81.4                          | 52.7               | 10.5                                  | 19.0             | 4.5                                                 | 1.5        | 2.2         | 0.8         | 0.1           | 0.0      | 51.0                          | 2005/01/18                       |
| FEB                                                                                                                                                                                                                                         | 72.1                          | 45.5               | 11.2                                  | 20.0             | 4.0                                                 | 1.8        | 1.7         | 0.8         | 0.1           | 0.0      | 77.0                          | 2005/02/20                       |
| MAR                                                                                                                                                                                                                                         | 89.5                          | 41.7               | 11.5                                  | 19.0             | 3.8                                                 | 2.3        | 1.8         | 0.8         | 0.1           | 0.0      | 64.5                          | 1995/03/08                       |
| APR                                                                                                                                                                                                                                         | 45.5                          | 28.6               | 7.0                                   | 19.0             | 2.5                                                 | 1.2        | 1.1         | 0.5         | 0.0           | 0.0      | 38.0                          | 1997/04/12                       |
| MAY                                                                                                                                                                                                                                         | 17.5                          | 15.8               | 2.7                                   | 15.0             | 1.2                                                 | 0.5        | 0.5         | 0.1         | 0.0           | 0.0      | 30.0                          | 2008/05/05                       |
| JUN                                                                                                                                                                                                                                         | 12.7                          | 10.4               | 2.5                                   | 19.0             | 1.2                                                 | 0.8        | 0.2         | 0.1         | 0.0           | 0.0      | 22.0                          | 2005/06/21                       |
| JUL                                                                                                                                                                                                                                         | 7.4                           | 9.2                | 2.2                                   | 19.0             | 1.2                                                 | 0.1        | 0.0         | 0.2         | 0.0           | 0.0      | 29.2                          | 2005/07/31                       |
| AUG                                                                                                                                                                                                                                         | 21.8                          | 36.4               | 2.8                                   | 14.0             | 1.5                                                 | 0.4        | 0.5         | 0.2         | 0.0           | 0.0      | 35.2                          | 2002/08/17                       |
| SEP                                                                                                                                                                                                                                         | 22.8                          | 22.5               | 2.8                                   | 15.0             | 1.2                                                 | 0.5        | 0.8         | 0.1         | 0.0           | 0.0      | 47.0                          | 2000/09/15                       |
| OCT                                                                                                                                                                                                                                         | 55.8                          | 52.7               | 7.2                                   | 17.0             | 2.5                                                 | 1.8        | 0.8         | 0.0         | 0.1           | 0.0      | 61.0                          | 1991/10/29                       |
| NOV                                                                                                                                                                                                                                         | 75.5                          | 53.5               | 8.0                                   | 21.0             | 2.1                                                 | 1.1        | 1.5         | 1.0         | 0.1           | 0.0      | 64.2                          | 2005/11/01                       |
| DEC                                                                                                                                                                                                                                         | 52.2                          | 42.8               | 8.2                                   | 19.0             | 2.8                                                 | 1.5        | 1.2         | 0.2         | 0.1           | 0.0      | 55.7                          | 1995/12/17                       |
| YR                                                                                                                                                                                                                                          | 550.6                         |                    | 82.0                                  |                  | 28.8                                                | 13.7       | 12.6        | 5.7         | 0.5           | 0.0      |                               |                                  |

Only the difference between the more adverse recorded weather and the equivalent measurement given above is taken into account in assessing a compensation event.

## C1.2 Contract Data

### Part two - Data provided by the *Contractor*

| Clause   | Statement                                                                                                                                                                                    | Data                                                                                         |
|----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------|
| 10.1     | The <i>Contractor</i> is (Name):<br>Address<br>Tel No.<br>Fax No.                                                                                                                            |                                                                                              |
| 11.2(8)  | The <i>direct fee percentage</i> is<br>The <i>subcontracted fee percentage</i> is                                                                                                            | ...%<br>...%                                                                                 |
| 11.2(18) | The <i>working areas</i> are the Site and                                                                                                                                                    |                                                                                              |
| 24.1     | The <i>Contractor's</i> key persons are:<br>1 Name:<br>Job:<br>Responsibilities:<br>Qualifications:<br>Experience:<br>2 Name:<br>Job:<br>Responsibilities:<br>Qualifications:<br>Experience: | CV's (and further key persons data including CVs) are appended to Tender Schedule entitled . |
| 11.2(3)  | The <i>completion date</i> for the whole of the <i>works</i> is                                                                                                                              | 31 March 2027                                                                                |
| 11.2(14) | The following matters will be included in the Risk Register                                                                                                                                  |                                                                                              |
| 11.2(19) | The Works Information for the <i>Contractor's</i> design is in:                                                                                                                              |                                                                                              |
| 31.1     | The programme identified in the Contract Data is                                                                                                                                             |                                                                                              |

|            |                                                                                                                                                                                                                                                        |                                                                                                                                                                         |                  |             |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------|-------------|
| B          | Priced contract with bill of quantities                                                                                                                                                                                                                |                                                                                                                                                                         |                  |             |
| 11.2(21)   | The <i>bill of quantities</i> is in                                                                                                                                                                                                                    | <b>C2.1 The Bill of Quantities</b><br><br>excluding vat                                                                                                                 |                  |             |
| 11.2(31)   | The tendered total of the Prices is                                                                                                                                                                                                                    |                                                                                                                                                                         |                  |             |
|            | <b>Data for Schedules of Cost Components</b>                                                                                                                                                                                                           | <i>Note “SCC” means Schedule of Cost Components starting on page 60, and “SSCC” means Shorter Schedule of Cost Components starting on page 63 of ECC3 (April 2013).</i> |                  |             |
| B          | Priced contract with bill of quantities                                                                                                                                                                                                                | <b>Data for the Shorter Schedule of Cost Components</b>                                                                                                                 |                  |             |
| 41 in SSCC | The percentage for people overheads is:                                                                                                                                                                                                                | ...% (Only applicable for compensation events)                                                                                                                          |                  |             |
| 21 in SSCC | The published list of Equipment is the last edition of the list published by<br><br>The percentage for adjustment for Equipment in the published list is                                                                                               | Minus            %                                                                                                                                                      |                  |             |
| 22 in SSCC | The rates of other Equipment are:                                                                                                                                                                                                                      | Equipment                                                                                                                                                               | Size or capacity | Rate        |
| 61 in SSCC | The hourly rates for Defined Cost of design outside the Working Areas are<br><br>Note: Hourly rates are estimated ‘cost to company of the employee’ and not selling rates.<br><br>Please insert another schedule if foreign resources may also be used | Category of employee                                                                                                                                                    |                  | Hourly rate |
| 62 in SSCC | The percentage for design overheads is                                                                                                                                                                                                                 | %                                                                                                                                                                       |                  |             |
| 63 in SSCC | The categories of design employees whose travelling expenses to and from the Working Areas are included in Defined Cost are:                                                                                                                           |                                                                                                                                                                         |                  |             |

## PART 2: PRICING DATA

### ECC3 Option B

| Document reference | Title                         | No of pages |
|--------------------|-------------------------------|-------------|
| C2.1               | Pricing assumptions: Option B | [03]        |
| C2.2               | The <i>bill of quantities</i> | [00]        |

## C2.1 Pricing assumptions: Option B

### 1. How work is priced and assessed for payment

Clause 11 in NEC3 Engineering and Construction Contract (ECC3) Option B states:

|                                     |      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Identified and defined terms</b> | 11   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|                                     | 11.2 | (21) The Bill of Quantities is the <i>bill of quantities</i> as changed in accordance with this contract to accommodate implemented compensation events and for accepted quotations for acceleration.                                                                                                                                                                                                                                                                                                |
|                                     |      | (28) The Price for Work Done to Date is the total of <ul style="list-style-type: none"><li>• the quantity of the work which the <i>Contractor</i> has completed for each item in the Bill of Quantities multiplied by the rate and</li><li>• a proportion of each lump sum which is the proportion of the work covered by the item which the <i>Contractor</i> has completed.</li></ul> Completed work is work without Defects which would either delay or be covered by immediately following work. |
|                                     |      | (31) The Prices are the lump sums and the amounts obtained by multiplying the rates by the quantities for the items in the Bill of Quantities.                                                                                                                                                                                                                                                                                                                                                       |

This confirms that Option B is a re-measurement contract and the bill comprises only items measured using quantities and rates or stated as lump sums. Value related items are not used. Time related items are items measured using rates where the rate is a unit of time.

### 2. Function of the Bill of Quantities

Clause 55.1 in Option B states, "Information in the Bill of Quantities is not Works Information or Site Information". This confirms that specifications and descriptions of the work or any constraints on how it is to be done are not included in the Bill, but in the Works Information. This is further confirmed by Clause 20.1 which states, "The *Contractor* Provides the Works in accordance with the Works Information". Hence the *Contractor* does **not** Provide the Works in accordance with the Bill of Quantities. The Bill of Quantities is only a pricing document.

### 3. Guidance before pricing and measuring

Employers preparing tenders or contract documents, and tendering contractors are advised to consult the sections dealing with the bill of quantities in the NEC3 Engineering and Construction Contract Guidance Notes before preparing the *bill of quantities* or before entering rates and lump sums into the *bill*.

There is no general provision in Option B for payment for materials on Site before incorporation into the *works*. If secondary Option X14 Advanced payment has not been used then the tendering contractor may obtain the same effect by inserting appropriate items in the method related charges where the *method of measurement* allows, or alternatively making allowance in the rates of the *bill of quantities* for the financing of Plant and Materials until they are incorporated in the *works*.

When compensation events arise, the default position is that the Bill of Quantities is not used to calculate the cost effect of the event. Defined Cost and the resulting Fee is used and Defined Cost includes all components of cost which the *Contractor* is likely to incur, including so called P & G items. Rates and lump sums from the Bill of Quantities, or from any other source, may be used instead of Defined Cost and the Fee only if the *Contractor* and *Project Manager* agree. If they are unable to agree, then Defined Cost



plus Fee is used.

The NEC approach to the P & G bill assumes use will be made of method related charges for Equipment applied to Providing the Works based on durations shown in the Accepted Programme, fixed charges for the use of Equipment that is required throughout the construction phase, time related charges for people working in a supervisory capacity for the period required, and lump sum charges for other facilities or services not directly related to performing work items typically included in other parts of the bill. The P & G section of the bill is not used for the assessment of compensation events.

## 4. Measurement and payment

### 4.1. Symbols

The units of measurement described in the Bill of Quantities are metric units abbreviated as follows:

| Abbreviation         | Unit                  |
|----------------------|-----------------------|
| %                    | percent               |
| h                    | hour                  |
| ha                   | hectare               |
| kg                   | kilogram              |
| kl                   | kilolitre             |
| km                   | kilometre             |
| km-pass              | kilometre-pass        |
| kPa                  | kilopascal            |
| kW                   | kilowatt              |
| l                    | litre                 |
| m                    | metre                 |
| mm                   | millimetre            |
| m <sup>2</sup>       | square metre          |
| m <sup>2</sup> -pass | square metre pass     |
| m <sup>3</sup>       | cubic metre           |
| m <sup>3</sup> -km   | cubic metre-kilometre |
| MN                   | meganewton            |
| MN.m                 | meganewton-metre      |
| MPa                  | megapascal            |
| No.                  | number                |
| sum                  | Lump sum              |
| t                    | tonne (1000kg)        |

### 4.2. General assumptions

- 4.2.1. Unless otherwise stated, items are measured net in accordance with the drawings, and no allowance has been made in the quantities for waste.
- 4.2.2. The Prices and rates stated for each item in the Bill of Quantities shall be treated as being fully inclusive of all work, risks, liabilities, obligations, overheads, profit and everything necessary as incurred or required by the *Contractor* in carrying out or providing that item.
- 4.2.3. An item against which no Price is entered will be treated as covered by other Prices or rates in the *bill of quantities*.
- 4.2.4. The quantities contained in the Bill of Quantities may not be final and do not necessarily represent the actual amount of work to be done. The quantities of work assessed and certified

for payment by the *Project Manager* at each assessment date will be used for determining payments due.

- 4.2.5. The short descriptions of the items of payment given in the *bill of quantities* are only for the purposes of identifying the items. Detail regarding the extent of the work entailed under each item is provided in the Works Information.
- 4.2.6. A **5 %** handling fee is applicable to all material purchased by the contractor
- 4.2.7. The contractor's offer for supply rates shall be approved by the relevant Quantity Surveyor. These will be fixed for the duration of the *Contract*.

#### **4.3. Departures from the *method of measurement***

4.3.1.

#### **4.4. Amplification of or assumptions about measurement items**

The following is provided to assist in the interpretation of descriptions given in the *method of measurement*. In the event of any ambiguity or inconsistency between the statements in the *method of measurement* and this section, the interpretation given in this section shall be used.

4.4.1.

## C2.2 the *bill of quantities*

**Bill of Quantities: Ruigtevallei\_Dreunberg Substation 132kV Line BOQ**

|                        |                                                                                             |                  |  |  |     |
|------------------------|---------------------------------------------------------------------------------------------|------------------|--|--|-----|
| <b>Site Activities</b> |                                                                                             |                  |  |  |     |
| <b>A</b>               | <b>Fixed Charged Items</b>                                                                  | Start date       |  |  | R - |
| <b>B</b>               | <b>Time Related items (Will be paid as % of work done to date)</b>                          | Completion Date  |  |  | R - |
|                        |                                                                                             | Certificate Date |  |  |     |
| <b>C</b>               | Activity Stage 12: Safe handling & stringing; b) Regulating, clamping and jointing of OPGW. |                  |  |  | R - |
|                        |                                                                                             |                  |  |  |     |
|                        |                                                                                             |                  |  |  |     |
|                        |                                                                                             |                  |  |  |     |
|                        |                                                                                             |                  |  |  |     |
| <b>Total</b>           |                                                                                             |                  |  |  | R - |

| CODE | STANDARD ACTIVITY | UNIT | QTY | RATE | TENDER PRICE |
|------|-------------------|------|-----|------|--------------|
|------|-------------------|------|-----|------|--------------|

|                      |                                                                                                                                                                                                        |       |    |  |     |
|----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------|----|--|-----|
| <b>A</b>             | <b>FIXED CHARGE ITEMS</b>                                                                                                                                                                              |       |    |  |     |
| <b>A.1.1</b>         | Contractual requirements i.e., insurance's, statutory contributions, etc.                                                                                                                              | sum   | 1  |  | R - |
| <b>A.1.2</b>         | Site Establishment - including, offices, telephone and fax, lighting, fencing, toilet facilities, water, etc.                                                                                          |       |    |  |     |
| A.1.2.1              | Office complete as per works information                                                                                                                                                               | sum   | 1  |  | R - |
| A.1.2.2              | Staff Accommodation                                                                                                                                                                                    | sum   | 1  |  | R - |
| A.1.2.3              | Stores                                                                                                                                                                                                 | sum   | 1  |  | R - |
| A.1.2.4              | Water, Sanitation and Electricity                                                                                                                                                                      | sum   | 1  |  | R - |
| A.1.2.5              | Communication 24 hours access to a computer for e-mail communication is required and cellphone for verbal communication.                                                                               | sum   | 1  |  | R - |
| A.1.2.6              | Removal of site establishment on completed of the contract                                                                                                                                             | sum   | 1  |  | R - |
| A.1.2.7              | Construction of land owner access road ( Allowed 1km, 6m wide Gravel Road)                                                                                                                             | sum   | 1  |  | R - |
| A.1.2.8              | Transport line material from Aliwal North CNC and Riebeeck S/S to site camp                                                                                                                            | sum   | 1  |  | R - |
|                      | <b>Sub-contract allowance (provisional amount)</b>                                                                                                                                                     |       |    |  |     |
|                      | *Chemical toilet                                                                                                                                                                                       | month | 4  |  | R - |
|                      | *TLB                                                                                                                                                                                                   | month | 4  |  | R - |
|                      | *Community Liaison Officer                                                                                                                                                                             | month | 4  |  | R - |
|                      | *Project Steering committee transport costs                                                                                                                                                            | month | 4  |  | R - |
| <b>1.3</b>           | <b>Materials Management</b>                                                                                                                                                                            |       |    |  |     |
|                      | Allow for the receipt and handling of "free issue" materials from Eskom Stores, including the maintenance of a record keeping system to track the issue of materials for incorporation into the Works. | sum   | 1  |  | R - |
| <b>1.4</b>           | <b>Sample Line and Sample Board</b>                                                                                                                                                                    |       |    |  |     |
|                      | Provision of Sample board comprising all components to be used on the line;                                                                                                                            | sum   | 1  |  | R - |
| <b>1.5</b>           | <b>Construction Name Board</b>                                                                                                                                                                         |       |    |  |     |
|                      | The Contractor shall fabricate, erect and maintain one project sign board bearing the name of the project, the name and logo of Eskom, the Consulting Engineer and the Contractor.                     | sum   | 1  |  | R - |
| <b>1.6</b>           | <b>Compliance with OHS&amp;Act and Construction Regulations</b>                                                                                                                                        |       | 1  |  | R - |
|                      | Provision for compliance to new safety regulations, OH&S Act                                                                                                                                           | sum   | 1  |  | R - |
|                      | *Legal and contractual compliance                                                                                                                                                                      | sum   | 1  |  | R - |
|                      | *Personal Protective Equipment                                                                                                                                                                         | sum   | 1  |  | R - |
|                      | *Fall arrest systems/Ladders/Climbing Irons                                                                                                                                                            | sum   | 1  |  | R - |
| <b>1.7</b>           | <b>Provision for compliance to Construction Regulations</b>                                                                                                                                            | sum   | 1  |  | R - |
| <b>Sub Total 'A'</b> |                                                                                                                                                                                                        |       |    |  | R - |
| <b>B</b>             | <b>TIME RELATED ITEMS</b>                                                                                                                                                                              |       |    |  |     |
| <b>B.1</b>           | <b>Outages</b>                                                                                                                                                                                         |       |    |  |     |
|                      | Contractors must allow for outages being done of weekends.                                                                                                                                             |       |    |  |     |
| B.1.1                | Provide detailed breakdown of outage scope complete with time allocations to be handed to the Project Co-ordinator at the outage planning meeting prior to the outage - [minimum of 48 hours]          | ea    | 1  |  | R - |
| B.2.1                | Contractors must allow for the preparation of a detailed programme reflecting the outage dates.                                                                                                        | ea    | 1  |  | R - |
| <b>B.3</b>           | <b>Site Establishment</b>                                                                                                                                                                              |       |    |  |     |
| B.3.1                | Office complete as per works information                                                                                                                                                               | wks   | 16 |  | R - |
| B.3.2                | Staff Accommodation                                                                                                                                                                                    | wks   | 16 |  | R - |
| B.3.3                | Stores                                                                                                                                                                                                 | wks   | 16 |  | R - |
| B.3.4                | Water, Sanitation and Electricity                                                                                                                                                                      | wks   | 16 |  | R - |
| B.3.5                | Communication                                                                                                                                                                                          | wks   | 16 |  | R - |
| B.4                  | Supervision Provision of authorised staff with HV regs to be on site at all times                                                                                                                      | wks   | 16 |  | R - |
| B.5                  | Site Security as per works information                                                                                                                                                                 | wks   | 16 |  | R - |
| B.6                  | Plant and Equipment                                                                                                                                                                                    | wks   | 16 |  | R - |
| B.7                  | Cost for Health and Safety measures                                                                                                                                                                    | wks   | 16 |  | R - |
| B.8                  | Other time related charges (specify hereunder): Transportation                                                                                                                                         | wks   | 16 |  | R - |
| <b>Sub Total 'B'</b> |                                                                                                                                                                                                        |       |    |  | R - |

| Activity Stages : ± 50km Ruigtevallei Dreunberg Substation 132kV Line OPGW                  |                                                                                                                                                                                                                |      |                | RATE PRICE     |            | TOTAL PRICE                  |   |
|---------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------|----------------|------------|------------------------------|---|
| ITEM                                                                                        | STANDARD ACTIVITY                                                                                                                                                                                              | UNIT | QTY (A)        | Material (B)   | Labour (C) | Tender costs (D)<br>=A*(B+C) |   |
| Activity Stage 12: Safe handling & stringing; b) Regulating, clamping and jointing of OPGW. |                                                                                                                                                                                                                |      |                |                |            |                              |   |
| 12.1                                                                                        | 12kA OPGW Assemblies (15mm OPGW)                                                                                                                                                                               |      |                |                |            |                              |   |
| 12.1.1                                                                                      | a) Non insulated strain assembly (15mm OPGW)                                                                                                                                                                   | ea   | 8              |                |            | R                            | - |
|                                                                                             | b) Non insulated strain assembly (15mm OPGW)                                                                                                                                                                   | ea   | 24             | Not Applicable |            | R                            | - |
|                                                                                             | d) Non insulated strain assembly dome closure (15mm OPGW)                                                                                                                                                      | ea   | 3              |                |            | R                            | - |
|                                                                                             | e) Non insulated strain assembly dome closure (15mm OPGW)                                                                                                                                                      | ea   | 7              | Not Applicable |            | R                            | - |
|                                                                                             | g) Non insulated suspension assembly (15mm OPGW)                                                                                                                                                               | ea   | 31             |                |            | R                            | - |
|                                                                                             | h) Non insulated suspension assembly (15mm OPGW)                                                                                                                                                               | ea   | 40             | Not Applicable |            | R                            | - |
|                                                                                             | j) Earth bond 2 lugs 1m sq(15mm OPGW)                                                                                                                                                                          | ea   | 58             |                |            | R                            | - |
|                                                                                             | k) Earth bond 2 lugs 1m sq(15mm OPGW)                                                                                                                                                                          | ea   | 42             | Not Applicable |            | R                            | - |
|                                                                                             | l) Multi response dampers- spiral (15mm OPGW)                                                                                                                                                                  | ea   | 108            |                |            | R                            | - |
|                                                                                             | m) Multi response dampers- spiral (15mm OPGW)                                                                                                                                                                  | ea   | 106            | Not Applicable |            | R                            | - |
|                                                                                             | n) Non-insulated down lead clamps (15mm OPGW - Monopole)                                                                                                                                                       | ea   | 16             |                |            | R                            | - |
|                                                                                             | o) Non-insulated down lead clamps (15mm OPGW - Gantry)                                                                                                                                                         | ea   | 8              | Not Applicable |            | R                            | - |
|                                                                                             | p) OPGW slack brackets non-insulated                                                                                                                                                                           | ea   | 3              |                |            | R                            | - |
| q) OPGW slack brackets non-insulated                                                        | ea                                                                                                                                                                                                             | 4    | Not Applicable |                | R          | -                            |   |
|                                                                                             |                                                                                                                                                                                                                |      | Sub-total      | 12.1.1         |            | R                            | - |
| 12.2                                                                                        | 5kA OPGW Assemblies (11.4mm OPGW)                                                                                                                                                                              |      |                |                |            |                              |   |
| 12.2.1                                                                                      | a) Non insulated strain assembly (11.4mm OPGW)                                                                                                                                                                 | ea   | 78             | Not Applicable |            | R                            | - |
|                                                                                             | b) Non insulated strain assembly dome closure (11.4mm OPGW)                                                                                                                                                    | ea   | 12             |                |            | R                            | - |
|                                                                                             | c) Non insulated strain assembly dome closure (11.4mm OPGW)                                                                                                                                                    | ea   | 4              | Not Applicable |            | R                            | - |
|                                                                                             | d) Non insulated suspension assembly (11.4mm OPGW)                                                                                                                                                             | ea   | 147            |                |            | R                            | - |
|                                                                                             | e) Non insulated suspension assembly (11.4mm OPGW)                                                                                                                                                             | ea   | 12             | Not Applicable |            | R                            | - |
|                                                                                             | f) Earth bond 2 lugs 1m sq (11.4mm OPGW)                                                                                                                                                                       | ea   | 197            |                |            | R                            | - |
|                                                                                             | g) Earth bond 2 lugs 1m sq (11.4mm OPGW)                                                                                                                                                                       | ea   | 25             | Not Applicable |            | R                            | - |
|                                                                                             | h) Multi response dampers- spiral (11.4mm OPGW)                                                                                                                                                                | ea   | 496            |                |            | R                            | - |
|                                                                                             | i) Multi response dampers- spiral (11.4mm OPGW)                                                                                                                                                                | ea   | 40             | Not Applicable |            | R                            | - |
|                                                                                             | j) Non-insulated down lead clamps (11.4mm OPGW - Monopole)                                                                                                                                                     | ea   | 56             |                |            | R                            | - |
|                                                                                             | k) Non-insulated down lead clamps (11.4mm OPGW - Monopole)                                                                                                                                                     | ea   | 4              |                |            | R                            | - |
|                                                                                             | l) Non-insulated down lead clamps (11.4mm OPGW - Gantry)                                                                                                                                                       | ea   | 4              | Not Applicable |            | R                            | - |
|                                                                                             | m) OPGW slack brackets non-insulated                                                                                                                                                                           | ea   | 14             |                |            | R                            | - |
| n) OPGW slack brackets non-insulated                                                        | ea                                                                                                                                                                                                             | 2    | Not Applicable |                | R          | -                            |   |
|                                                                                             |                                                                                                                                                                                                                |      | Sub-total      | 12.2.1         |            | R                            | - |
| 12.3                                                                                        | Safe handling, transport to drum sites and complete stringing, regulating clamping of OPGW:                                                                                                                    |      |                |                |            |                              |   |
| 12.3.1                                                                                      | a) 12kA 24 Core OPGW                                                                                                                                                                                           | km   | 36538          | Not Applicable |            | R                            | - |
|                                                                                             | b) 5kA 24 Core OPGW                                                                                                                                                                                            | km   | 53572          | Not Applicable |            | R                            | - |
|                                                                                             | c) Trenching - excavate, backfill and compaction in pickable ground in substation HV yard                                                                                                                      | m    | 10             | R              | -          | R                            | - |
|                                                                                             | d) Trenching - excavate, backfill and compaction in pickable ground in substation HV yard                                                                                                                      | m    | 10             | R              | -          | R                            | - |
|                                                                                             | e) Supply & Install of Unarmoured Duct Cable 24 Fibre                                                                                                                                                          | m    | 250            |                |            | R                            | - |
|                                                                                             | f) Supply & Install of Unarmoured Duct Cable 24 Fibre                                                                                                                                                          | m    | 250            | Not Applicable |            | R                            | - |
|                                                                                             | g) Orange sprag tubing with mounting clamps/ straps/ brackets, to protect fibre cable in control rooms at Substations.                                                                                         | m    | 250            |                |            | R                            | - |
|                                                                                             | h) Orange sprag tubing with mounting clamps/ straps/ brackets, to protect fibre cable in control rooms at Substations.                                                                                         | m    | 250            | Not Applicable |            | R                            | - |
|                                                                                             | i) 40mm OD HDPE tubing (grade 6 and better) or Optex ducting and install in existing cable trench                                                                                                              | m    | 250            |                |            | R                            | - |
|                                                                                             | j) 40mm OD HDPE tubing (grade 6 and better) or Optex ducting and install in existing cable trench                                                                                                              | m    | 250            | Not Applicable |            | R                            | - |
|                                                                                             | k) 50mm OD stainless steel pipe at the gantries, approx. 2.5m in length, (1.5m above ground and 0.5m below ground to 110mm PVC pipe), to protect the HDPE tubing when exposed. Pipe to be sealed at both ends. | ea   | 2              |                |            | R                            | - |
|                                                                                             | l) Supply 90degree bends at Substation Gantries                                                                                                                                                                | ea   | 10             |                |            | R                            | - |
|                                                                                             | m) Supply and installation of Sarel Box                                                                                                                                                                        | ea   | 1              |                |            | R                            | - |
|                                                                                             | n) Supply and installation of Sarel Box                                                                                                                                                                        | ea   | 1              | Not Applicable |            | R                            | - |
|                                                                                             | o) Midcouplers, SC/APC                                                                                                                                                                                         | ea   | 2              |                |            | R                            | - |
|                                                                                             | p) Patch leads, SC/APC 3m                                                                                                                                                                                      | ea   | 2              |                |            | R                            | - |
|                                                                                             | q) Splicing                                                                                                                                                                                                    | ea   | 17             |                |            | R                            | - |
|                                                                                             | r) Splicing                                                                                                                                                                                                    | ea   | 5              | Not Applicable |            | R                            | - |
|                                                                                             | s) Redruming of OPGW drums                                                                                                                                                                                     | ea   | 3              | Not Applicable |            | R                            | - |
|                                                                                             | t) ODTR Testing                                                                                                                                                                                                | ea   | 36             |                |            | R                            | - |
|                                                                                             | u) Splicing protector                                                                                                                                                                                          | ea   | 370            |                |            | R                            | - |
|                                                                                             | v) 24 Way patch panel                                                                                                                                                                                          | ea   | 2              |                |            | R                            | - |
|                                                                                             | x) Insulate OPGW on existing structures for structure footing resistance test                                                                                                                                  | str  | 55             |                |            | R                            | - |
|                                                                                             | y) Insulate OPGW on existing structures for structure footing resistance test                                                                                                                                  | str  | 26             | Not Applicable |            | R                            | - |
|                                                                                             |                                                                                                                                                                                                                |      | Sub-total      | 12.3.1         |            | R                            | - |
| TOTAL Activity Stage 12 CARRIED FORWARD TO SUMMARY                                          |                                                                                                                                                                                                                |      |                |                |            | R                            | - |

**Ruigtevallei\_Dreunberg Substation 132kV Line BOM \_ Eskom Supplied Material**

| OPGW assembly |         |                                                          |     |        |
|---------------|---------|----------------------------------------------------------|-----|--------|
|               |         |                                                          |     |        |
| Buy Out       | Buy Out | Non insulated strain assembly (15mm OPGW)                | PLP | ea 8   |
| Buy Out       | Buy Out | Non insulated strain assembly dome closure (15mm OPGW)   | PLP | ea 3   |
| Buy Out       | Buy Out | Non insulated suspension assembly (15mm OPGW)            | PLP | ea 31  |
| Buy Out       | Buy Out | Earth bond 2 lugs 1m sq(15mm OPGW)                       | PLP | ea 58  |
| Buy Out       | Buy Out | Multi response dampers- spiral (15mm OPGW)               | PLP | ea 108 |
| Buy Out       | Buy Out | Non-insulated down lead clamps (15mm OPGW - Monopole)    | PLP | ea 16  |
| Buy Out       | Buy Out | OPGW slack brackets non-insulated                        | PLP | ea 3   |
| Buy Out       | Buy Out | Non insulated strain assembly dome closure (11.4mm OPGW) | PLP | ea 12  |
| Buy Out       | Buy Out | Non insulated suspension assembly (11.4mm OPGW)          | PLP | ea 147 |
| Buy Out       | Buy Out | Earth bond 2 lugs 1m sq (11.4mm OPGW)                    | PLP | ea 197 |
| Buy Out       | Buy Out | Multi response dampers- spiral (11.4mm OPGW)             | PLP | ea 496 |
| Buy Out       | Buy Out | Non-insulated down lead clamps (11.4mm OPGW - Monopole)  | PLP | ea 56  |
| Buy Out       | Buy Out | Non-insulated down lead clamps (11.4mm OPGW - Monopole)  | PLP | ea 4   |
| Buy Out       | Buy Out | OPGW slack brackets non-insulated                        | PLP | ea 14  |

| Name              | Designation    | Signature | Date |
|-------------------|----------------|-----------|------|
| Project Designer: | Sifiso Mayeza  |           |      |
| NED Manager:      | Ralph Reddy    |           |      |
| Project Manager:  | Khush Maqokolo |           |      |

# Ruigtevallei\_Dreunberg Substation 132kV Line BOM \_ Contractor Supplied Material

| OPGW assembly |         |                                                                |     |    |     |
|---------------|---------|----------------------------------------------------------------|-----|----|-----|
|               |         |                                                                |     |    |     |
| Buy Out       | Buy Out | Supply & Install of Unarmoured Duct Cable 24 Fibre             | PLP | ea | 250 |
| Buy Out       | Buy Out | 50mm OD stainless steel pipe at the gantries, approx. 2.5m in  | PLP | ea | 2   |
| Buy Out       | Buy Out | Supply 90degree bends at Substation Gantries                   | PLP | ea | 10  |
| Buy Out       | Buy Out | Patch leads, SC/APC 3m                                         | PLP | ea | 2   |
| Buy Out       | Buy Out | Supply & Install of Unarmoured Duct Cable 24 Fibre             | PLP | ea | 250 |
| Buy Out       | Buy Out | Orange sprag tubing with mounting clamps/ straps/ brackets, to | PLP | ea | 250 |
| Buy Out       | Buy Out | 40mm OD HDPE tubing (grade 6 and better) or Optex ducting      | PLP | ea | 1   |
| Buy Out       | Buy Out | Supply and installation of Sarel Box                           | PLP | ea | 2   |
| Buy Out       | Buy Out | Midcouplers, SC/APC                                            | PLP | ea | 17  |
| Buy Out       | Buy Out | Splicing                                                       | PLP | ea | 370 |
| Buy Out       | Buy Out | Splicing protector                                             | PLP | ea | 2   |
| Buy Out       | Buy Out | 24 Way patch panel                                             | PLP | ea | 2   |

|  |               |
|--|---------------|
|  | INSTALLED     |
|  | NOT INSTALLED |

| DRUM # | OPGW SPECIFICATION      | LENGTH | FROM      | TO  |
|--------|-------------------------|--------|-----------|-----|
| 1      | 24F - 12kA GREASED OPGW | 2520   | RUT-DRN 1 | 12  |
| 2      |                         | 3114   | 12        | 24  |
| 3      |                         | 4165   | 24        | 41  |
| 4      |                         | 4549   | 41        | 59  |
| 5      |                         | 4780   | 59        | 80  |
| 6      |                         | 4597   | 80        | 98  |
| 7      |                         | 4796   | 98        | 117 |
| 8      |                         | 4516   | 117       | 135 |
| 9      |                         | 3502   | 135       | 150 |
| 10     | 24F - 5kA GREASED OPGW  | 4099   | 150       | 167 |
| 11     |                         | 3889   | 167       | 182 |
| 12     |                         | 3587   | 182       | 196 |
| 13     |                         | 3126   | 196       | 210 |
| 14     |                         | 2511   | 210       | 219 |
| 15     |                         | 3501   | 219       | 232 |
| 16     |                         | 2793   | 232       | 244 |
| 17     |                         | 2388   | 244       | 254 |
| 18     |                         | 3389   | 254       | 268 |
| 19     |                         | 4303   | 268       | 285 |
| 20     |                         | 4561   | 285       | 302 |
| 21     |                         | 3988   | 302       | 319 |
| 22     |                         | 3108   | 319       | 331 |
| 23     |                         | 2988   | 331       | 342 |
| 24     |                         | 2855   | 342       | 353 |
| 25     |                         | 2485   | 353       | 367 |
| TOTAL  |                         | 90111  |           | m   |

|                         |       |   |          |
|-------------------------|-------|---|----------|
| 24F - 12kA GREASED OPGW | 36538 | m | 5 Drums  |
| 24F - 5kA GREASED OPGW  | 53572 | m | 14 Drums |



| Fault Current (kA)            | Installation Comments | Tower No.  | Tower Type                                         | Diagram   | Span Length [m] | Splice point (Drums) | Drum Length [m] | Tower & Splice information | Remark         |
|-------------------------------|-----------------------|------------|----------------------------------------------------|-----------|-----------------|----------------------|-----------------|----------------------------|----------------|
| Conductor installed with OPGW |                       | RUT-DRN-1  | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   | RUT-DRN-1 | 153             | 1                    |                 | TENS Splice                | OPGW INSTALLED |
|                               |                       | RUT-DRN-2  | 7645 series                                        |           | 166             |                      |                 | TENS                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-3  | 7645 series                                        |           | 196             |                      |                 | TENS                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-4  | S/Pole Intermediate Suspension                     |           | 128             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-5  | 7645 0 series                                      |           | 144             |                      |                 | TENS                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-6  | 7645 series                                        |           | 256             |                      |                 | TENS                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-7  | S/Pole Intermediate Suspension                     |           | 269             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-8  | S/Pole Intermediate Suspension                     |           | 258             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-9  | S/Pole Intermediate Suspension                     |           | 227             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-10 | S/Pole Intermediate Suspension                     |           | 261             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-11 | S/Pole Intermediate Suspension                     |           | 222             |                      | 2520            | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-12 | 7645 0 series                                      |           | 239             |                      |                 | TENS Splice                | OPGW INSTALLED |
|                               |                       | RUT-DRN-13 | S/Pole Intermediate Suspension                     |           | 172             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-14 | S/Pole Intermediate Suspension                     |           | 261             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-15 | S/Pole Intermediate Suspension                     |           | 225             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-16 | S/Pole Intermediate Suspension                     |           | 254             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-17 | S/Pole Intermediate Suspension                     |           | 239             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-18 | S/Pole Intermediate Suspension                     |           | 242             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-19 | S/Pole Intermediate Suspension                     |           | 257             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-20 | S/Pole Intermediate Suspension                     |           | 255             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-21 | S/Pole Intermediate Suspension                     |           | 248             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-22 | S/Pole Intermediate Suspension                     |           | 253             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-23 | S/Pole Intermediate Suspension                     |           | 232             |                      | 3114            | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-24 | 7645 0 series                                      |           | 236             |                      |                 | TENS Splice                | OPGW INSTALLED |
|                               |                       | RUT-DRN-25 | S/Pole Intermediate Suspension                     |           | 236             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-26 | S/Pole Intermediate Suspension                     |           | 238             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-27 | S/Pole Intermediate Suspension                     |           | 239             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-28 | S/Pole Intermediate Suspension                     |           | 239             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-29 | S/Pole Intermediate Suspension                     |           | 239             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-30 | S/Pole Intermediate Suspension                     |           | 232             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-31 | S/Pole Intermediate Suspension                     |           | 238             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-32 | S/Pole Intermediate Suspension                     |           | 241             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-33 | S/Pole Intermediate Suspension                     |           | 231             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-34 | S/Pole Intermediate Suspension                     |           | 240             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-35 | S/Pole Intermediate Suspension                     |           | 212             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-36 | S/Pole Intermediate Suspension                     |           | 205             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-37 | S/Pole Intermediate Suspension                     |           | 210             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-38 | kc 7645 0 series                                   |           | 289             |                      |                 | TENS                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-39 | S/Pole Intermediate Suspension                     |           | 246             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-40 | 7615 - S/Pole Stayed Medium Angle Strain (30°-60°) |           | 161             |                      | 4165            | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-41 | 7615 - S/Pole Stayed Medium Angle Strain (30°-60°) |           | 234             |                      |                 | TENS Splice                | OPGW INSTALLED |
|                               |                       | RUT-DRN-42 | S/Pole Intermediate Suspension                     |           | 235             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-43 | S/Pole Intermediate Suspension                     |           | 231             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-44 | S/Pole Intermediate Suspension                     |           | 251             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-45 | S/Pole Intermediate Suspension                     |           | 245             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-46 | S/Pole Intermediate Suspension                     |           | 248             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-47 | S/Pole Intermediate Suspension                     |           | 237             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-48 | S/Pole Intermediate Suspension                     |           | 253             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-49 | S/Pole Intermediate Suspension                     |           | 251             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-50 | S/Pole Intermediate Suspension                     |           | 245             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-51 | S/Pole Intermediate Suspension                     |           | 234             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-52 | S/Pole Intermediate Suspension                     |           | 240             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-53 | S/Pole Intermediate Suspension                     |           | 248             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-54 | S/Pole Intermediate Suspension                     |           | 253             |                      |                 | SUSP                       | OPGW INSTALLED |
|                               |                       | RUT-DRN-55 | S/Pole Intermediate Suspension                     |           | 200             |                      |                 | SUSP                       | OPGW INSTALLED |

|                     |             |                                                      |  |   |     |      |  |             |                |
|---------------------|-------------|------------------------------------------------------|--|---|-----|------|--|-------------|----------------|
|                     | RUT-DRN-56  | S/Pole Intermediate Suspension                       |  |   | 217 |      |  | SUSP        | OPGW INSTALLED |
|                     | RUT-DRN-57  | S/Pole Intermediate Suspension                       |  |   | 218 |      |  | SUSP        | OPGW INSTALLED |
|                     | RUT-DRN-58  | S/Pole Intermediate Suspension                       |  |   | 263 | 4549 |  | SUSP        | OPGW INSTALLED |
|                     | RUT-DRN-59  | 7615 - S/Pole Stayed Medium Angle Strain (30° - 60°) |  | 1 | 245 |      |  | TENS Splice | OPGW INSTALLED |
| Structure installed | RUT-DRN-60  | S/Pole Intermediate Suspension                       |  |   | 236 |      |  | SUSP        |                |
|                     | RUT-DRN-61  | S/Pole Intermediate Suspension                       |  |   | 237 |      |  | SUSP        |                |
|                     | RUT-DRN-62  | S/Pole Intermediate Suspension                       |  |   | 245 |      |  | SUSP        |                |
|                     | RUT-DRN-63  | S/Pole Intermediate Suspension                       |  |   | 240 |      |  | SUSP        |                |
|                     | RUT-DRN-64  | S/Pole Intermediate Suspension                       |  |   | 244 |      |  | SUSP        |                |
|                     | RUT-DRN-65  | S/Pole Intermediate Suspension                       |  |   | 234 |      |  | SUSP        |                |
|                     | RUT-DRN-66  | S/Pole Intermediate Suspension                       |  |   | 254 |      |  | SUSP        |                |
|                     | RUT-DRN-67  | S/Pole Intermediate Suspension                       |  |   | 207 |      |  | SUSP        |                |
|                     | RUT-DRN-68  | kc 7645 0 series                                     |  |   | 204 |      |  | TENS        |                |
|                     | RUT-DRN-69  | S/Pole Intermediate Suspension                       |  |   | 206 |      |  | SUSP        |                |
|                     | RUT-DRN-70  | S/Pole Intermediate Suspension                       |  |   | 233 |      |  | SUSP        |                |
|                     | RUT-DRN-71  | S/Pole Intermediate Suspension                       |  |   | 161 |      |  | SUSP        |                |
|                     | RUT-DRN-72  | S/Pole Intermediate Suspension                       |  |   | 230 |      |  | SUSP        |                |
|                     | RUT-DRN-73  | S/Pole Intermediate Suspension                       |  |   | 230 |      |  | SUSP        |                |
|                     | RUT-DRN-74  | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)     |  |   | 143 |      |  | TENS        |                |
|                     | RUT-DRN-75  | S/Pole Intermediate Suspension                       |  |   | 201 |      |  | SUSP        |                |
| Bases               | RUT-DRN-76  | S/Pole Intermediate Suspension                       |  |   | 263 |      |  | SUSP        |                |
|                     | RUT-DRN-77  | S/Pole Intermediate Suspension                       |  |   | 260 |      |  | SUSP        |                |
|                     | RUT-DRN-78  | kc 7645 0 series                                     |  |   | 160 |      |  | TENS        |                |
|                     | RUT-DRN-79  | S/Pole Intermediate Suspension                       |  |   | 183 | 4780 |  | SUSP        |                |
|                     | RUT-DRN-80  | kc 7645 0 series                                     |  | 1 | 163 |      |  | TENS Splice |                |
|                     | RUT-DRN-81  | S/Pole Intermediate Suspension                       |  |   | 244 |      |  | SUSP        |                |
|                     | RUT-DRN-82  | S/Pole Intermediate Suspension                       |  |   | 249 |      |  | SUSP        |                |
|                     | RUT-DRN-83  | S/Pole Intermediate Suspension                       |  |   | 179 |      |  | SUSP        |                |
|                     | RUT-DRN-84  | S/Pole Intermediate Suspension                       |  |   | 215 |      |  | SUSP        |                |
|                     | RUT-DRN-85  | S/Pole Intermediate Suspension                       |  |   | 242 |      |  | SUSP        |                |
|                     | RUT-DRN-86  | S/Pole Intermediate Suspension                       |  |   | 239 |      |  | SUSP        |                |
|                     | RUT-DRN-87  | 7615 - S/Pole Stayed Medium Angle Strain (30°-60°)   |  |   | 242 |      |  | TENS        |                |
|                     | RUT-DRN-88  | S/Pole Intermediate Suspension                       |  |   | 231 |      |  | SUSP        |                |
|                     | RUT-DRN-89  | S/Pole Intermediate Suspension                       |  |   | 279 |      |  | SLSP        |                |
|                     | RUT-DRN-90  | 7645 0 series                                        |  |   | 211 |      |  | TENS        |                |
|                     | RUT-DRN-91  | S/Pole Intermediate Suspension                       |  |   | 259 |      |  | SUSP        |                |
| Nothing installed   | RUT-DRN-92  | S/Pole Intermediate Suspension                       |  |   | 310 |      |  | SUSP        |                |
|                     | RUT-DRN-93  | S/Pole Intermediate Suspension                       |  |   | 258 |      |  | SLSP        |                |
|                     | RUT-DRN-94  | 7645 0 series                                        |  |   | 401 |      |  | TENS        |                |
|                     | RUT-DRN-95  | 7645 0 series                                        |  |   | 232 |      |  | TENS        |                |
|                     | RUT-DRN-96  | S/Pole Intermediate Suspension                       |  |   | 204 |      |  | SUSP        |                |
|                     | RUT-DRN-97  | S/Pole Intermediate Suspension                       |  |   | 200 | 4597 |  | SUSP        |                |
|                     | RUT-DRN-98  | 7615 - S/Pole Stayed Medium Angle Strain (30°-60°)   |  | 1 | 240 |      |  | TENS Splice |                |
|                     | RUT-DRN-99  | S/Pole Intermediate Suspension                       |  |   | 185 |      |  | SUSP        |                |
|                     | RUT-DRN-100 | S/Pole Intermediate Suspension                       |  |   | 276 |      |  | SUSP        |                |
|                     | RUT-DRN-101 | S/Pole Intermediate Suspension                       |  |   | 249 |      |  | SUSP        |                |
|                     | RUT-DRN-102 | S/Pole Intermediate Suspension                       |  |   | 241 |      |  | SUSP        |                |
|                     | RUT-DRN-103 | S/Pole Intermediate Suspension                       |  |   | 244 |      |  | SUSP        |                |
|                     | RUT-DRN-104 | S/Pole Intermediate Suspension                       |  |   | 250 |      |  | SUSP        |                |
|                     | RUT-DRN-105 | S/Pole Intermediate Suspension                       |  |   | 264 |      |  | SUSP        |                |
|                     | RUT-DRN-106 | S/Pole Intermediate Suspension                       |  |   | 323 |      |  | SLSP        |                |
|                     | RUT-DRN-107 | 7645 0 series                                        |  |   | 282 |      |  | TENS        |                |
|                     | RUT-DRN-108 | S/Pole Intermediate Suspension                       |  |   | 211 |      |  | SUSP        |                |
|                     | RUT-DRN-109 | S/Pole Intermediate Suspension                       |  |   | 236 |      |  | SUSP        |                |
|                     | RUT-DRN-110 | S/Pole Intermediate Suspension                       |  |   | 215 |      |  | SLSP        |                |
|                     | RUT-DRN-111 | S/Pole Intermediate Suspension                       |  |   | 207 |      |  | SUSP        |                |
|                     | RUT-DRN-112 | S/Pole Intermediate Suspension                       |  |   | 195 |      |  | SUSP        |                |
|                     | RUT-DRN-113 | S/Pole Intermediate Suspension                       |  |   | 236 |      |  | SUSP        |                |
|                     | RUT-DRN-114 | S/Pole Intermediate Suspension                       |  |   | 253 |      |  | SLSP        |                |
|                     | RUT-DRN-115 | S/Pole Intermediate Suspension                       |  |   | 270 |      |  | SUSP        |                |
|                     | RUT-DRN-116 | S/Pole Intermediate Suspension                       |  |   | 210 | 4796 |  | SUSP        |                |
|                     | RUT-DRN-117 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)     |  | 1 | 209 |      |  | TENS Splice |                |
|                     | RUT-DRN-118 | S/Pole Intermediate Suspension                       |  |   | 251 |      |  | SUSP        |                |
|                     | RUT-DRN-119 | S/Pole Intermediate Suspension                       |  |   | 242 |      |  | SUSP        |                |
|                     | RUT-DRN-120 | S/Pole Intermediate Suspension                       |  |   | 262 |      |  | SUSP        |                |

|                                           |             |                                                    |  |   |  |     |      |  |  |             |
|-------------------------------------------|-------------|----------------------------------------------------|--|---|--|-----|------|--|--|-------------|
| Structure only with no insulator and OPGW | RUT-DRN-121 | S/Pole Intermediate Suspension                     |  |   |  | 240 |      |  |  | SUSP        |
|                                           | RUT-DRN-122 | S/Pole Intermediate Suspension                     |  |   |  | 237 |      |  |  | SUSP        |
|                                           | RUT-DRN-123 | S/Pole Intermediate Suspension                     |  |   |  | 249 |      |  |  | SUSP        |
|                                           | RUT-DRN-124 | S/Pole Intermediate Suspension                     |  |   |  | 246 |      |  |  | SUSP        |
|                                           | RUT-DRN-125 | S/Pole Intermediate Suspension                     |  |   |  | 247 |      |  |  | SUSP        |
|                                           | RUT-DRN-126 | S/Pole Intermediate Suspension                     |  |   |  | 246 |      |  |  | SUSP        |
|                                           | RUT-DRN-127 | S/Pole Intermediate Suspension                     |  |   |  | 247 |      |  |  | SUSP        |
|                                           | RUT-DRN-128 | S/Pole Intermediate Suspension                     |  |   |  | 254 |      |  |  | SUSP        |
|                                           | RUT-DRN-129 | S/Pole Intermediate Suspension                     |  |   |  | 249 |      |  |  | SUSP        |
|                                           | RUT-DRN-130 | S/Pole Intermediate Suspension                     |  |   |  | 254 |      |  |  | SUSP        |
|                                           | RUT-DRN-131 | S/Pole Intermediate Suspension                     |  |   |  | 187 |      |  |  | SUSP        |
|                                           | RUT-DRN-132 | S/Pole Intermediate Suspension                     |  |   |  | 241 |      |  |  | SUSP        |
|                                           | RUT-DRN-133 | S/Pole Intermediate Suspension                     |  |   |  | 161 |      |  |  | SUSP        |
|                                           | RUT-DRN-134 | S/Pole Intermediate Suspension                     |  |   |  | 228 | 4516 |  |  | SUSP        |
|                                           | RUT-DRN-135 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  | 1 |  | 265 |      |  |  | TENS Splice |
| Base Only                                 | RUT-DRN-136 | S/Pole Intermediate Suspension                     |  |   |  | 164 |      |  |  | SUSP        |
|                                           | RUT-DRN-137 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  |   |  | 426 |      |  |  | TENS        |
|                                           | RUT-DRN-138 | 7645 series                                        |  |   |  | 244 |      |  |  | TENS        |
|                                           | RUT-DRN-139 | S/Pole Intermediate Suspension                     |  |   |  | 207 |      |  |  | SUSP        |
|                                           | RUT-DRN-140 | S/Pole Intermediate Suspension                     |  |   |  | 203 |      |  |  | SUSP        |
|                                           | RUT-DRN-141 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  |   |  | 215 |      |  |  | TENS        |
|                                           | RUT-DRN-142 | S/Pole Intermediate Suspension                     |  |   |  | 189 |      |  |  | SUSP        |
|                                           | RUT-DRN-143 | S/Pole Intermediate Suspension                     |  |   |  | 235 |      |  |  | SUSP        |
|                                           | RUT-DRN-144 | S/Pole Intermediate Suspension                     |  |   |  | 204 |      |  |  | SUSP        |
|                                           | RUT-DRN-145 | 7615 - S/Pole Stayed Medium Angle Strain (30°-60°) |  |   |  | 148 |      |  |  | TENS        |
|                                           | RUT-DRN-146 | S/Pole Intermediate Suspension                     |  |   |  | 177 |      |  |  | SUSP        |
|                                           | RUT-DRN-147 | 7615 - S/Pole Stayed Medium Angle Strain (30°-60°) |  |   |  | 92  |      |  |  | TENS        |
|                                           | RUT-DRN-148 | S/Pole Intermediate Suspension                     |  |   |  | 128 |      |  |  | SUSP        |
|                                           | RUT-DRN-149 | 7618                                               |  |   |  | 321 | 3502 |  |  | TENS        |
|                                           | RUT-DRN-150 | 7645 0 series                                      |  | 1 |  | 285 |      |  |  | TENS Splice |
| Nothing installed                         | RUT-DRN-151 | S/Pole Intermediate Suspension                     |  |   |  | 239 |      |  |  | SUSP        |
|                                           | RUT-DRN-152 | S/Pole Intermediate Suspension                     |  |   |  | 233 |      |  |  | SUSP        |
|                                           | RUT-DRN-153 | S/Pole Intermediate Suspension                     |  |   |  | 250 |      |  |  | SUSP        |
|                                           | RUT-DRN-154 | S/Pole Intermediate Suspension                     |  |   |  | 216 |      |  |  | SUSP        |
|                                           | RUT-DRN-155 | S/Pole Intermediate Suspension                     |  |   |  | 235 |      |  |  | SUSP        |
|                                           | RUT-DRN-156 | 7615 - S/Pole Stayed Medium Angle Strain (30°-60°) |  |   |  | 173 |      |  |  | TENS        |
|                                           | RUT-DRN-157 | S/Pole Intermediate Suspension                     |  |   |  | 247 |      |  |  | SUSP        |
|                                           | RUT-DRN-158 | S/Pole Intermediate Suspension                     |  |   |  | 250 |      |  |  | SUSP        |
|                                           | RUT-DRN-159 | S/Pole Intermediate Suspension                     |  |   |  | 250 |      |  |  | SUSP        |
|                                           | RUT-DRN-160 | S/Pole Intermediate Suspension                     |  |   |  | 251 |      |  |  | SUSP        |
|                                           | RUT-DRN-161 | S/Pole Intermediate Suspension                     |  |   |  | 240 |      |  |  | SUSP        |
|                                           | RUT-DRN-162 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  |   |  | 258 |      |  |  | TENS        |
|                                           | RUT-DRN-163 | S/Pole Intermediate Suspension                     |  |   |  | 282 |      |  |  | SUSP        |
|                                           | RUT-DRN-164 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  |   |  | 231 |      |  |  | TENS        |
|                                           | RUT-DRN-165 | S/Pole Intermediate Suspension                     |  |   |  | 239 |      |  |  | SUSP        |
| Structure only with no insulator          | RUT-DRN-166 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  |   |  | 221 | 4099 |  |  | TENS        |
|                                           | RUT-DRN-167 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  | 1 |  | 246 |      |  |  | TENS Splice |
|                                           | RUT-DRN-168 | S/Pole Intermediate Suspension                     |  |   |  | 267 |      |  |  | SUSP        |
|                                           | RUT-DRN-169 | S/Pole Intermediate Suspension                     |  |   |  | 253 |      |  |  | SUSP        |
|                                           | RUT-DRN-170 | S/Pole Intermediate Suspension                     |  |   |  | 246 |      |  |  | SUSP        |
|                                           | RUT-DRN-171 | S/Pole Intermediate Suspension                     |  |   |  | 262 |      |  |  | SUSP        |
|                                           | RUT-DRN-172 | S/Pole Intermediate Suspension                     |  |   |  | 284 |      |  |  | SUSP        |
|                                           | RUT-DRN-173 | kc 7645 0 series                                   |  |   |  | 162 |      |  |  | TENS        |
|                                           | RUT-DRN-174 | S/Pole Intermediate Suspension                     |  |   |  | 250 |      |  |  | SUSP        |
|                                           | RUT-DRN-175 | S/Pole Intermediate Suspension                     |  |   |  | 243 |      |  |  | SUSP        |
|                                           | RUT-DRN-176 | S/Pole Intermediate Suspension                     |  |   |  | 243 |      |  |  | SUSP        |
|                                           | RUT-DRN-177 | S/Pole Intermediate Suspension                     |  |   |  | 227 |      |  |  | SUSP        |
|                                           | RUT-DRN-178 | S/Pole Intermediate Suspension                     |  |   |  | 226 |      |  |  | SUSP        |
|                                           | RUT-DRN-179 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  |   |  | 294 |      |  |  | TENS        |
|                                           | RUT-DRN-180 | S/Pole Intermediate Suspension                     |  |   |  | 171 |      |  |  | SUSP        |
| Structure only with no insulator          | RUT-DRN-181 | S/Pole Intermediate Suspension                     |  |   |  | 267 | 3889 |  |  | SUSP        |
|                                           | RUT-DRN-182 | 7645 0 series                                      |  | 1 |  | 248 |      |  |  | TENS Splice |
|                                           | RUT-DRN-183 | S/Pole Intermediate Suspension                     |  |   |  | 169 |      |  |  | SUSP        |
|                                           | RUT-DRN-184 | S/Pole Intermediate Suspension                     |  |   |  | 231 |      |  |  | SUSP        |
|                                           | RUT-DRN-185 | S/Pole Intermediate Suspension                     |  |   |  | 254 |      |  |  | SUSP        |

|  |             |                                                    |  |   |     |  |      |  |             |
|--|-------------|----------------------------------------------------|--|---|-----|--|------|--|-------------|
|  | RUT-DRN-186 | S/Pole Intermediate Suspension                     |  |   | 255 |  |      |  | SUSP        |
|  | RUT-DRN-187 | S/Pole Intermediate Suspension                     |  |   | 249 |  |      |  | SUSP        |
|  | RUT-DRN-188 | S/Pole Intermediate Suspension                     |  |   | 214 |  |      |  | SUSP        |
|  | RUT-DRN-189 | S/Pole Intermediate Suspension                     |  |   | 243 |  |      |  | SUSP        |
|  | RUT-DRN-190 | S/Pole Intermediate Suspension                     |  |   | 214 |  |      |  | SUSP        |
|  | RUT-DRN-191 | S/Pole Intermediate Suspension                     |  |   | 254 |  |      |  | SUSP        |
|  | RUT-DRN-192 | S/Pole Intermediate Suspension                     |  |   | 250 |  |      |  | SUSP        |
|  | RUT-DRN-193 | S/Pole Intermediate Suspension                     |  |   | 261 |  |      |  | SUSP        |
|  | RUT-DRN-194 | S/Pole Intermediate Suspension                     |  |   | 249 |  |      |  | SUSP        |
|  | RUT-DRN-195 | S/Pole Intermediate Suspension                     |  |   | 253 |  | 3587 |  | SUSP        |
|  | RUT-DRN-196 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  | 1 | 243 |  |      |  | TENS Splice |
|  | RUT-DRN-197 | S/Pole Intermediate Suspension                     |  |   | 230 |  |      |  | SUSP        |
|  | RUT-DRN-198 | S/Pole Intermediate Suspension                     |  |   | 214 |  |      |  | SUSP        |
|  | RUT-DRN-199 | kc 7645 0 series                                   |  |   | 145 |  |      |  | TENS        |
|  | RUT-DRN-200 | S/Pole Intermediate Suspension                     |  |   | 209 |  |      |  | SUSP        |
|  | RUT-DRN-201 | S/Pole Intermediate Suspension                     |  |   | 191 |  |      |  | SUSP        |
|  | RUT-DRN-202 | S/Pole Intermediate Suspension                     |  |   | 233 |  |      |  | SUSP        |
|  | RUT-DRN-203 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  |   | 242 |  |      |  | TENS        |
|  | RUT-DRN-204 | S/Pole Intermediate Suspension                     |  |   | 214 |  |      |  | SUSP        |
|  | RUT-DRN-205 | S/Pole Intermediate Suspension                     |  |   | 220 |  |      |  | SUSP        |
|  | RUT-DRN-206 | S/Pole Intermediate Suspension                     |  |   | 214 |  |      |  | SUSP        |
|  | RUT-DRN-207 | S/Pole Intermediate Suspension                     |  |   | 222 |  |      |  | SUSP        |
|  | RUT-DRN-208 | 7645 series                                        |  |   | 168 |  |      |  | TENS        |
|  | RUT-DRN-209 | S/Pole Intermediate Suspension                     |  |   | 156 |  | 3126 |  | SUSP        |
|  | RUT-DRN-210 | 7615 - S/Pole Stayed Medium Angle Strain (30°-60°) |  | 1 | 225 |  |      |  | TENS Splice |
|  | RUT-DRN-211 | S/Pole Intermediate Suspension                     |  |   | 256 |  |      |  | SUSP        |
|  | RUT-DRN-212 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  |   | 257 |  |      |  | TENS        |
|  | RUT-DRN-213 | S/Pole Intermediate Suspension                     |  |   | 274 |  |      |  | SUSP        |
|  | RUT-DRN-214 | S/Pole Intermediate Suspension                     |  |   | 225 |  |      |  | SUSP        |
|  | RUT-DRN-215 | S/Pole Intermediate Suspension                     |  |   | 248 |  |      |  | SUSP        |
|  | RUT-DRN-216 | S/Pole Intermediate Suspension                     |  |   | 247 |  |      |  | SUSP        |
|  | RUT-DRN-217 | S/Pole Intermediate Suspension                     |  |   | 269 |  |      |  | SUSP        |
|  | RUT-DRN-218 | S/Pole Intermediate Suspension                     |  |   | 261 |  | 2511 |  | SUSP        |
|  | RUT-DRN-219 | 7645 0 series                                      |  | 1 | 249 |  |      |  | TENS Splice |
|  | RUT-DRN-220 | S/Pole Intermediate Suspension                     |  |   | 267 |  |      |  | SUSP        |
|  | RUT-DRN-221 | S/Pole Intermediate Suspension                     |  |   | 259 |  |      |  | SUSP        |
|  | RUT-DRN-222 | S/Pole Intermediate Suspension                     |  |   | 259 |  |      |  | SUSP        |
|  | RUT-DRN-223 | S/Pole Intermediate Suspension                     |  |   | 261 |  |      |  | SUSP        |
|  | RUT-DRN-224 | S/Pole Intermediate Suspension                     |  |   | 238 |  |      |  | SUSP        |
|  | RUT-DRN-225 | S/Pole Intermediate Suspension                     |  |   | 253 |  |      |  | SUSP        |
|  | RUT-DRN-226 | S/Pole Intermediate Suspension                     |  |   | 263 |  |      |  | SUSP        |
|  | RUT-DRN-227 | S/Pole Intermediate Suspension                     |  |   | 265 |  |      |  | SUSP        |
|  | RUT-DRN-228 | S/Pole Intermediate Suspension                     |  |   | 243 |  |      |  | SUSP        |
|  | RUT-DRN-229 | S/Pole Intermediate Suspension                     |  |   | 214 |  |      |  | SUSP        |
|  | RUT-DRN-230 | S/Pole Intermediate Suspension                     |  |   | 230 |  |      |  | SUSP        |
|  | RUT-DRN-231 | S/Pole Intermediate Suspension                     |  |   | 239 |  | 3501 |  | SUSP        |
|  | RUT-DRN-232 | kc 7645 0 series                                   |  | 1 | 261 |  |      |  | TENS Splice |
|  | RUT-DRN-233 | S/Pole Intermediate Suspension                     |  |   | 176 |  |      |  | SUSP        |
|  | RUT-DRN-234 | S/Pole Intermediate Suspension                     |  |   | 144 |  |      |  | SUSP        |
|  | RUT-DRN-235 | 7615 - S/Pole Stayed Medium Angle Strain (30°-60°) |  |   | 320 |  |      |  | TENS        |
|  | RUT-DRN-236 | 7615 - S/Pole Stayed Medium Angle Strain (30°-60°) |  |   | 217 |  |      |  | TENS        |
|  | RUT-DRN-237 | kc 7645 0 series                                   |  |   | 235 |  |      |  | TENS        |
|  | RUT-DRN-238 | 7615 - S/Pole Stayed Medium Angle Strain (30°-60°) |  |   | 185 |  |      |  | TENS        |
|  | RUT-DRN-239 | D7649 Suspension steel pole 22m                    |  |   | 203 |  |      |  | SUSP        |
|  | RUT-DRN-240 | S/Pole Intermediate Suspension                     |  |   | 225 |  |      |  | SUSP        |
|  | RUT-DRN-241 | S/Pole Intermediate Suspension                     |  |   | 241 |  |      |  | SUSP        |
|  | RUT-DRN-242 | S/Pole Intermediate Suspension                     |  |   | 230 |  |      |  | SUSP        |
|  | RUT-DRN-243 | S/Pole Intermediate Suspension                     |  |   | 193 |  | 2793 |  | SUSP        |
|  | RUT-DRN-244 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  | 1 | 162 |  |      |  | SUSP        |
|  | RUT-DRN-245 | S/Pole Intermediate Suspension                     |  |   | 166 |  |      |  | SUSP        |
|  | RUT-DRN-246 | S/Pole Intermediate Suspension                     |  |   | 252 |  |      |  | SUSP        |
|  | RUT-DRN-247 | S/Pole Intermediate Suspension                     |  |   | 250 |  |      |  | SUSP        |
|  | RUT-DRN-248 | S/Pole Intermediate Suspension                     |  |   | 231 |  |      |  | SUSP        |
|  | RUT-DRN-249 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  |   | 239 |  |      |  | TENS        |
|  | RUT-DRN-250 | S/Pole Intermediate Suspension                     |  |   | 249 |  |      |  | SUSP        |

Nothing installed

|             |                                                    |  |  |   |     |  |      |  |             |  |
|-------------|----------------------------------------------------|--|--|---|-----|--|------|--|-------------|--|
| RUT-DRN-251 | S/Pole Intermediate Suspension                     |  |  |   | 222 |  |      |  | SUSP        |  |
| RUT-DRN-252 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  |  |   | 155 |  |      |  | TENS        |  |
| RUT-DRN-253 | S/Pole Intermediate Suspension                     |  |  |   | 230 |  | 2388 |  | SUSP        |  |
| RUT-DRN-254 | ke 7645 0 series                                   |  |  | I | 232 |  |      |  | TENS Splice |  |
| RUT-DRN-255 | S/Pole Intermediate Suspension                     |  |  |   | 253 |  |      |  | SUSP        |  |
| RUT-DRN-256 | S/Pole Intermediate Suspension                     |  |  |   | 243 |  |      |  | SUSP        |  |
| RUT-DRN-257 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  |  |   | 208 |  |      |  | TENS        |  |
| RUT-DRN-258 | S/Pole Intermediate Suspension                     |  |  |   | 204 |  |      |  | SUSP        |  |
| RUT-DRN-259 | S/Pole Intermediate Suspension                     |  |  |   | 216 |  |      |  | SUSP        |  |
| RUT-DRN-260 | S/Pole Intermediate Suspension                     |  |  |   | 241 |  |      |  | SUSP        |  |
| RUT-DRN-261 | S/Pole Intermediate Suspension                     |  |  |   | 233 |  |      |  | SUSP        |  |
| RUT-DRN-262 | S/Pole Intermediate Suspension                     |  |  |   | 225 |  |      |  | SUSP        |  |
| RUT-DRN-263 | S/Pole Intermediate Suspension                     |  |  |   | 254 |  |      |  | SUSP        |  |
| RUT-DRN-264 | S/Pole Intermediate Suspension                     |  |  |   | 256 |  |      |  | SUSP        |  |
| RUT-DRN-265 | S/Pole Intermediate Suspension                     |  |  |   | 261 |  |      |  | SUSP        |  |
| RUT-DRN-266 | S/Pole Intermediate Suspension                     |  |  |   | 170 |  |      |  | SUSP        |  |
| RUT-DRN-267 | S/Pole Intermediate Suspension                     |  |  |   | 152 |  | 3389 |  | SUSP        |  |
| RUT-DRN-268 | 7615 - S/Pole Stayed Medium Angle Strain (30°-60°) |  |  | I | 240 |  |      |  | TENS Splice |  |
| RUT-DRN-269 | S/Pole Intermediate Suspension                     |  |  |   | 259 |  |      |  | SUSP        |  |
| RUT-DRN-270 | S/Pole Intermediate Suspension                     |  |  |   | 251 |  |      |  | SUSP        |  |
| RUT-DRN-271 | S/Pole Intermediate Suspension                     |  |  |   | 262 |  |      |  | SUSP        |  |
| RUT-DRN-272 | S/Pole Intermediate Suspension                     |  |  |   | 252 |  |      |  | SUSP        |  |
| RUT-DRN-273 | S/Pole Intermediate Suspension                     |  |  |   | 254 |  |      |  | SUSP        |  |
| RUT-DRN-274 | S/Pole Intermediate Suspension                     |  |  |   | 245 |  |      |  | SUSP        |  |
| RUT-DRN-275 | 7615 - S/Pole Stayed Small Angle Strain (0°)       |  |  |   | 208 |  |      |  | TENS        |  |
| RUT-DRN-276 | S/Pole Intermediate Suspension                     |  |  |   | 271 |  |      |  | SUSP        |  |
| RUT-DRN-277 | S/Pole Intermediate Suspension                     |  |  |   | 234 |  |      |  | SUSP        |  |
| RUT-DRN-278 | S/Pole Intermediate Suspension                     |  |  |   | 229 |  |      |  | SUSP        |  |
| RUT-DRN-279 | S/Pole Intermediate Suspension                     |  |  |   | 257 |  |      |  | SUSP        |  |
| RUT-DRN-280 | S/Pole Intermediate Suspension                     |  |  |   | 248 |  |      |  | SUSP        |  |
| RUT-DRN-281 | S/Pole Intermediate Suspension                     |  |  |   | 222 |  |      |  | SUSP        |  |
| RUT-DRN-282 | S/Pole Intermediate Suspension                     |  |  |   | 225 |  |      |  | SUSP        |  |
| RUT-DRN-283 | S/Pole Intermediate Suspension                     |  |  |   | 203 |  |      |  | SUSP        |  |
| RUT-DRN-284 | S/Pole Intermediate Suspension                     |  |  |   | 203 |  | 4303 |  | SUSP        |  |
| RUT-DRN-285 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  |  | I | 238 |  |      |  | TENS Splice |  |
| RUT-DRN-286 | S/Pole Intermediate Suspension                     |  |  |   | 247 |  |      |  | SUSP        |  |
| RUT-DRN-287 | S/Pole Intermediate Suspension                     |  |  |   | 235 |  |      |  | SUSP        |  |
| RUT-DRN-288 | S/Pole Intermediate Suspension                     |  |  |   | 244 |  |      |  | SUSP        |  |
| RUT-DRN-289 | S/Pole Intermediate Suspension                     |  |  |   | 256 |  |      |  | SUSP        |  |
| RUT-DRN-290 | S/Pole Intermediate Suspension                     |  |  |   | 258 |  |      |  | SUSP        |  |
| RUT-DRN-291 | S/Pole Intermediate Suspension                     |  |  |   | 256 |  |      |  | SUSP        |  |
| RUT-DRN-292 | S/Pole Intermediate Suspension                     |  |  |   | 265 |  |      |  | SUSP        |  |
| RUT-DRN-293 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  |  |   | 256 |  |      |  | TENS        |  |
| RUT-DRN-294 | S/Pole Intermediate Suspension                     |  |  |   | 257 |  |      |  | SUSP        |  |
| RUT-DRN-295 | S/Pole Intermediate Suspension                     |  |  |   | 277 |  |      |  | SUSP        |  |
| RUT-DRN-296 | S/Pole Intermediate Suspension                     |  |  |   | 252 |  |      |  | SUSP        |  |
| RUT-DRN-297 | S/Pole Intermediate Suspension                     |  |  |   | 226 |  |      |  | SUSP        |  |
| RUT-DRN-298 | S/Pole Intermediate Suspension                     |  |  |   | 217 |  |      |  | SUSP        |  |
| RUT-DRN-299 | S/Pole Intermediate Suspension                     |  |  |   | 270 |  |      |  | SUSP        |  |
| RUT-DRN-300 | S/Pole Intermediate Suspension                     |  |  |   | 263 |  |      |  | SUSP        |  |
| RUT-DRN-301 | S/Pole Intermediate Suspension                     |  |  |   | 229 |  | 4561 |  | SUSP        |  |
| RUT-DRN-302 | ke 7645 0 series                                   |  |  | I | 312 |  |      |  | TENS Splice |  |
| RUT-DRN-303 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  |  |   | 220 |  |      |  | TENS        |  |
| RUT-DRN-304 | S/Pole Intermediate Suspension                     |  |  |   | 226 |  |      |  | SUSP        |  |
| RUT-DRN-305 | S/Pole Intermediate Suspension                     |  |  |   | 184 |  |      |  | SUSP        |  |
| RUT-DRN-306 | S/Pole Intermediate Suspension                     |  |  |   | 245 |  |      |  | SUSP        |  |
| RUT-DRN-307 | S/Pole Intermediate Suspension                     |  |  |   | 133 |  |      |  | SUSP        |  |
| RUT-DRN-308 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  |  |   | 223 |  |      |  | TENS        |  |
| RUT-DRN-309 | S/Pole Intermediate Suspension                     |  |  |   | 254 |  |      |  | SUSP        |  |
| RUT-DRN-310 | S/Pole Intermediate Suspension                     |  |  |   | 194 |  |      |  | SUSP        |  |
| RUT-DRN-311 | S/Pole Intermediate Suspension                     |  |  |   | 220 |  |      |  | SUSP        |  |
| RUT-DRN-312 | S/Pole Intermediate Suspension                     |  |  |   | 236 |  |      |  | SUSP        |  |
| RUT-DRN-313 | S/Pole Intermediate Suspension                     |  |  |   | 227 |  |      |  | SUSP        |  |
| RUT-DRN-314 | S/Pole Intermediate Suspension                     |  |  |   | 254 |  |      |  | SUSP        |  |
| RUT-DRN-315 | 7615 - S/Pole Stayed Small Angle Strain (5°-30°)   |  |  |   | 196 |  |      |  | TENS        |  |

Conductor installed with  
No OPGW

Structure only installed



| <b>Name</b> | <b>Number</b> | <b>Latitude</b> | <b>Longitude</b> |
|-------------|---------------|-----------------|------------------|
| RUT-DRN     | 1             | 30°38'27.38"S   | 25°30'10.47"E    |
| RUT-DRN     | 2             | 30°38'28.52"S   | 25°30'7.66"E     |
| RUT-DRN     | 3             | 30°38'33.60"S   | 25°30'9.77"E     |
| RUT-DRN     | 4             | 30°38'32.19"S   | 25°30'16.93"E    |
| RUT-DRN     | 5             | 30°38'31.27"S   | 25°30'21.63"E    |
| RUT-DRN     | 6             | 30°38'30.23"S   | 25°30'26.91"E    |
| RUT-DRN     | 7             | 30°38'37.70"S   | 25°30'31.09"E    |
| RUT-DRN     | 8             | 30°38'45.55"S   | 25°30'35.50"E    |
| RUT-DRN     | 9             | 30°38'53.10"S   | 25°30'39.73"E    |
| RUT-DRN     | 10            | 30°38'59.75"S   | 25°30'43.46"E    |
| RUT-DRN     | 11            | 30°39'7.38"S    | 25°30'47.74"E    |
| RUT-DRN     | 12            | 30°39'13.86"S   | 25°30'51.38"E    |
| RUT-DRN     | 13            | 30°39'20.85"S   | 25°30'55.30"E    |
| RUT-DRN     | 14            | 30°39'25.89"S   | 25°30'58.13"E    |
| RUT-DRN     | 15            | 30°39'33.51"S   | 25°31'2.41"E     |
| RUT-DRN     | 16            | 30°39'40.09"S   | 25°31'6.10"E     |
| RUT-DRN     | 17            | 30°39'47.51"S   | 25°31'10.26"E    |
| RUT-DRN     | 18            | 30°39'54.49"S   | 25°31'14.18"E    |
| RUT-DRN     | 19            | 30°40'1.57"S    | 25°31'18.15"E    |
| RUT-DRN     | 20            | 30°40'9.08"S    | 25°31'22.37"E    |
| RUT-DRN     | 21            | 30°40'16.52"S   | 25°31'26.54"E    |
| RUT-DRN     | 22            | 30°40'23.77"S   | 25°31'30.61"E    |
| RUT-DRN     | 23            | 30°40'31.17"S   | 25°31'34.76"E    |
| RUT-DRN     | 24            | 30°40'37.93"S   | 25°31'38.56"E    |
| RUT-DRN     | 25            | 30°40'44.84"S   | 25°31'42.44"E    |
| RUT-DRN     | 26            | 30°40'51.73"S   | 25°31'46.31"E    |
| RUT-DRN     | 27            | 30°40'58.67"S   | 25°31'50.20"E    |
| RUT-DRN     | 28            | 30°41'5.65"S    | 25°31'54.12"E    |
| RUT-DRN     | 29            | 30°41'12.62"S   | 25°31'58.03"E    |
| RUT-DRN     | 30            | 30°41'19.59"S   | 25°32'1.95"E     |
| RUT-DRN     | 31            | 30°41'26.37"S   | 25°32'5.76"E     |
| RUT-DRN     | 32            | 30°41'33.32"S   | 25°32'9.66"E     |
| RUT-DRN     | 33            | 30°41'40.35"S   | 25°32'13.61"E    |
| RUT-DRN     | 34            | 30°41'47.09"S   | 25°32'17.39"E    |
| RUT-DRN     | 35            | 30°41'54.10"S   | 25°32'21.33"E    |
| RUT-DRN     | 36            | 30°42'0.29"S    | 25°32'24.81"E    |
| RUT-DRN     | 37            | 30°42'6.28"S    | 25°32'28.17"E    |
| RUT-DRN     | 38            | 30°42'12.43"S   | 25°32'31.62"E    |
| RUT-DRN     | 39            | 30°42'20.88"S   | 25°32'36.37"E    |
| RUT-DRN     | 40            | 30°42'28.06"S   | 25°32'40.41"E    |
| RUT-DRN     | 41            | 30°42'33.08"S   | 25°32'38.67"E    |
| RUT-DRN     | 42            | 30°42'39.87"S   | 25°32'42.58"E    |
| RUT-DRN     | 43            | 30°42'46.71"S   | 25°32'46.52"E    |
| RUT-DRN     | 44            | 30°42'53.41"S   | 25°32'50.39"E    |
| RUT-DRN     | 45            | 30°43'0.70"S    | 25°32'54.59"E    |
| RUT-DRN     | 46            | 30°43'7.82"S    | 25°32'58.69"E    |
| RUT-DRN     | 47            | 30°43'15.03"S   | 25°33'2.85"E     |
| RUT-DRN     | 48            | 30°43'21.92"S   | 25°33'6.83"E     |

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|---------|----|---------------|---------------|
| RUT-DRN | 49 | 30°43'29.28"S | 25°33'11.07"E |
| RUT-DRN | 50 | 30°43'36.59"S | 25°33'15.29"E |
| RUT-DRN | 51 | 30°43'43.70"S | 25°33'19.39"E |
| RUT-DRN | 52 | 30°43'50.52"S | 25°33'23.32"E |
| RUT-DRN | 53 | 30°43'57.50"S | 25°33'27.35"E |
| RUT-DRN | 54 | 30°44'4.71"S  | 25°33'31.51"E |
| RUT-DRN | 55 | 30°44'12.06"S | 25°33'35.75"E |
| RUT-DRN | 56 | 30°44'17.87"S | 25°33'39.10"E |
| RUT-DRN | 57 | 30°44'24.18"S | 25°33'42.75"E |
| RUT-DRN | 58 | 30°44'30.53"S | 25°33'46.41"E |
| RUT-DRN | 59 | 30°44'38.16"S | 25°33'50.81"E |
| RUT-DRN | 60 | 30°44'39.71"S | 25°33'59.86"E |
| RUT-DRN | 61 | 30°44'41.20"S | 25°34'8.55"E  |
| RUT-DRN | 62 | 30°44'42.70"S | 25°34'17.30"E |
| RUT-DRN | 63 | 30°44'44.26"S | 25°34'26.35"E |
| RUT-DRN | 64 | 30°44'45.78"S | 25°34'35.21"E |
| RUT-DRN | 65 | 30°44'47.32"S | 25°34'44.20"E |
| RUT-DRN | 66 | 30°44'48.80"S | 25°34'52.84"E |
| RUT-DRN | 67 | 30°44'50.41"S | 25°35'2.22"E  |
| RUT-DRN | 68 | 30°44'51.71"S | 25°35'9.84"E  |
| RUT-DRN | 69 | 30°44'53.01"S | 25°35'17.37"E |
| RUT-DRN | 70 | 30°44'54.31"S | 25°35'24.96"E |
| RUT-DRN | 71 | 30°44'55.78"S | 25°35'33.57"E |
| RUT-DRN | 72 | 30°44'56.80"S | 25°35'39.49"E |
| RUT-DRN | 73 | 30°44'58.25"S | 25°35'47.96"E |
| RUT-DRN | 74 | 30°44'59.70"S | 25°35'56.44"E |
| RUT-DRN | 75 | 30°44'58.92"S | 25°36'1.74"E  |
| RUT-DRN | 76 | 30°44'57.83"S | 25°36'9.18"E  |
| RUT-DRN | 77 | 30°44'56.40"S | 25°36'18.91"E |
| RUT-DRN | 78 | 30°44'54.98"S | 25°36'28.55"E |
| RUT-DRN | 79 | 30°44'54.11"S | 25°36'34.49"E |
| RUT-DRN | 80 | 30°44'53.11"S | 25°36'41.27"E |
| RUT-DRN | 81 | 30°44'52.22"S | 25°36'47.31"E |
| RUT-DRN | 82 | 30°44'50.89"S | 25°36'56.34"E |
| RUT-DRN | 83 | 30°44'49.54"S | 25°37'5.55"E  |
| RUT-DRN | 84 | 30°44'48.56"S | 25°37'12.20"E |
| RUT-DRN | 85 | 30°44'47.39"S | 25°37'20.18"E |
| RUT-DRN | 86 | 30°44'46.07"S | 25°37'29.14"E |
| RUT-DRN | 87 | 30°44'44.77"S | 25°37'37.99"E |
| RUT-DRN | 88 | 30°44'49.55"S | 25°37'45.22"E |
| RUT-DRN | 89 | 30°44'54.11"S | 25°37'52.12"E |
| RUT-DRN | 90 | 30°44'59.63"S | 25°38'0.45"E  |
| RUT-DRN | 91 | 30°45'3.79"S  | 25°38'6.74"E  |
| RUT-DRN | 92 | 30°45'8.90"S  | 25°38'14.46"E |
| RUT-DRN | 93 | 30°45'15.01"S | 25°38'23.70"E |
| RUT-DRN | 94 | 30°45'20.11"S | 25°38'31.40"E |
| RUT-DRN | 95 | 30°45'28.02"S | 25°38'43.36"E |
| RUT-DRN | 96 | 30°45'32.60"S | 25°38'50.29"E |
| RUT-DRN | 97 | 30°45'36.63"S | 25°38'56.38"E |



|         |     |               |               |
|---------|-----|---------------|---------------|
| RUT-DRN | 98  | 30°45'40.58"S | 25°39'2.35"E  |
| RUT-DRN | 99  | 30°45'40.43"S | 25°39'11.38"E |
| RUT-DRN | 100 | 30°45'40.32"S | 25°39'18.32"E |
| RUT-DRN | 101 | 30°45'40.15"S | 25°39'28.71"E |
| RUT-DRN | 102 | 30°45'40.00"S | 25°39'38.07"E |
| RUT-DRN | 103 | 30°45'39.85"S | 25°39'47.12"E |
| RUT-DRN | 104 | 30°45'39.70"S | 25°39'56.28"E |
| RUT-DRN | 105 | 30°45'39.54"S | 25°40'5.69"E  |
| RUT-DRN | 106 | 30°45'39.38"S | 25°40'15.61"E |
| RUT-DRN | 107 | 30°45'39.18"S | 25°40'27.75"E |
| RUT-DRN | 108 | 30°45'39.00"S | 25°40'38.34"E |
| RUT-DRN | 109 | 30°45'38.87"S | 25°40'46.26"E |
| RUT-DRN | 110 | 30°45'38.72"S | 25°40'55.13"E |
| RUT-DRN | 111 | 30°45'38.59"S | 25°41'3.23"E  |
| RUT-DRN | 112 | 30°45'38.46"S | 25°41'11.02"E |
| RUT-DRN | 113 | 30°45'38.34"S | 25°41'18.33"E |
| RUT-DRN | 114 | 30°45'38.19"S | 25°41'27.21"E |
| RUT-DRN | 115 | 30°45'38.03"S | 25°41'36.71"E |
| RUT-DRN | 116 | 30°45'37.86"S | 25°41'46.88"E |
| RUT-DRN | 117 | 30°45'37.73"S | 25°41'54.78"E |
| RUT-DRN | 118 | 30°45'40.93"S | 25°42'1.70"E  |
| RUT-DRN | 119 | 30°45'44.78"S | 25°42'10.00"E |
| RUT-DRN | 120 | 30°45'48.48"S | 25°42'18.01"E |
| RUT-DRN | 121 | 30°45'52.49"S | 25°42'26.68"E |
| RUT-DRN | 122 | 30°45'56.18"S | 25°42'34.64"E |
| RUT-DRN | 123 | 30°45'59.82"S | 25°42'42.51"E |
| RUT-DRN | 124 | 30°46'3.64"S  | 25°42'50.78"E |
| RUT-DRN | 125 | 30°46'7.42"S  | 25°42'58.95"E |
| RUT-DRN | 126 | 30°46'11.21"S | 25°43'7.14"E  |
| RUT-DRN | 127 | 30°46'14.97"S | 25°43'15.28"E |
| RUT-DRN | 128 | 30°46'18.76"S | 25°43'23.47"E |
| RUT-DRN | 129 | 30°46'22.65"S | 25°43'31.89"E |
| RUT-DRN | 130 | 30°46'26.47"S | 25°43'40.15"E |
| RUT-DRN | 131 | 30°46'30.37"S | 25°43'48.57"E |
| RUT-DRN | 132 | 30°46'33.23"S | 25°43'54.78"E |
| RUT-DRN | 133 | 30°46'36.92"S | 25°44'2.76"E  |
| RUT-DRN | 134 | 30°46'39.40"S | 25°44'8.11"E  |
| RUT-DRN | 135 | 30°46'42.90"S | 25°44'15.67"E |
| RUT-DRN | 136 | 30°46'45.88"S | 25°44'24.77"E |
| RUT-DRN | 137 | 30°46'47.84"S | 25°44'30.76"E |
| RUT-DRN | 138 | 30°46'57.62"S | 25°44'42.09"E |
| RUT-DRN | 139 | 30°47'5.26"S  | 25°44'39.67"E |
| RUT-DRN | 140 | 30°47'11.75"S | 25°44'37.61"E |
| RUT-DRN | 141 | 30°47'18.10"S | 25°44'35.60"E |
| RUT-DRN | 142 | 30°47'24.68"S | 25°44'32.87"E |
| RUT-DRN | 143 | 30°47'30.45"S | 25°44'30.47"E |
| RUT-DRN | 144 | 30°47'37.64"S | 25°44'27.48"E |
| RUT-DRN | 145 | 30°47'43.87"S | 25°44'24.89"E |
| RUT-DRN | 146 | 30°47'48.63"S | 25°44'25.75"E |

|         |     |               |               |
|---------|-----|---------------|---------------|
| RUT-DRN | 147 | 30°47'54.31"S | 25°44'26.78"E |
| RUT-DRN | 148 | 30°47'55.57"S | 25°44'29.90"E |
| RUT-DRN | 149 | 30°47'57.34"S | 25°44'34.25"E |
| RUT-DRN | 150 | 30°48'1.78"S  | 25°44'45.15"E |
| RUT-DRN | 151 | 30°48'5.72"S  | 25°44'54.85"E |
| RUT-DRN | 152 | 30°48'9.02"S  | 25°45'2.97"E  |
| RUT-DRN | 153 | 30°48'12.24"S | 25°45'10.89"E |
| RUT-DRN | 154 | 30°48'15.70"S | 25°45'19.39"E |
| RUT-DRN | 155 | 30°48'18.68"S | 25°45'26.73"E |
| RUT-DRN | 156 | 30°48'21.94"S | 25°45'34.73"E |
| RUT-DRN | 157 | 30°48'19.25"S | 25°45'40.45"E |
| RUT-DRN | 158 | 30°48'15.42"S | 25°45'48.60"E |
| RUT-DRN | 159 | 30°48'11.54"S | 25°45'56.86"E |
| RUT-DRN | 160 | 30°48'7.66"S  | 25°46'5.12"E  |
| RUT-DRN | 161 | 30°48'3.76"S  | 25°46'13.41"E |
| RUT-DRN | 162 | 30°48'0.04"S  | 25°46'21.33"E |
| RUT-DRN | 163 | 30°47'57.23"S | 25°46'30.48"E |
| RUT-DRN | 164 | 30°47'54.16"S | 25°46'40.47"E |
| RUT-DRN | 165 | 30°47'52.92"S | 25°46'49.05"E |
| RUT-DRN | 166 | 30°47'51.64"S | 25°46'57.93"E |
| RUT-DRN | 167 | 30°47'53.36"S | 25°47'6.00"E  |
| RUT-DRN | 168 | 30°47'54.58"S | 25°47'15.16"E |
| RUT-DRN | 169 | 30°47'55.90"S | 25°47'25.07"E |
| RUT-DRN | 170 | 30°47'57.16"S | 25°47'34.47"E |
| RUT-DRN | 171 | 30°47'58.38"S | 25°47'43.62"E |
| RUT-DRN | 172 | 30°47'59.68"S | 25°47'53.37"E |
| RUT-DRN | 173 | 30°48'1.09"S  | 25°48'3.94"E  |
| RUT-DRN | 174 | 30°48'1.90"S  | 25°48'9.95"E  |
| RUT-DRN | 175 | 30°48'3.14"S  | 25°48'19.24"E |
| RUT-DRN | 176 | 30°48'4.34"S  | 25°48'28.28"E |
| RUT-DRN | 177 | 30°48'5.55"S  | 25°48'37.32"E |
| RUT-DRN | 178 | 30°48'6.67"S  | 25°48'45.75"E |
| RUT-DRN | 179 | 30°48'7.79"S  | 25°48'54.14"E |
| RUT-DRN | 180 | 30°48'6.85"S  | 25°49'5.16"E  |
| RUT-DRN | 181 | 30°48'6.30"S  | 25°49'11.57"E |
| RUT-DRN | 182 | 30°48'5.45"S  | 25°49'21.55"E |
| RUT-DRN | 183 | 30°48'4.66"S  | 25°49'30.82"E |
| RUT-DRN | 184 | 30°48'4.12"S  | 25°49'37.14"E |
| RUT-DRN | 185 | 30°48'3.38"S  | 25°49'45.80"E |
| RUT-DRN | 186 | 30°48'2.56"S  | 25°49'55.31"E |
| RUT-DRN | 187 | 30°48'1.75"S  | 25°50'4.84"E  |
| RUT-DRN | 188 | 30°48'0.95"S  | 25°50'14.16"E |
| RUT-DRN | 189 | 30°48'0.26"S  | 25°50'22.16"E |
| RUT-DRN | 190 | 30°47'59.48"S | 25°50'31.26"E |
| RUT-DRN | 191 | 30°47'58.80"S | 25°50'39.29"E |
| RUT-DRN | 192 | 30°47'57.98"S | 25°50'48.79"E |
| RUT-DRN | 193 | 30°47'57.18"S | 25°50'58.14"E |
| RUT-DRN | 194 | 30°47'56.34"S | 25°51'7.91"E  |
| RUT-DRN | 195 | 30°47'55.54"S | 25°51'17.24"E |

|         |     |               |               |
|---------|-----|---------------|---------------|
| RUT-DRN | 196 | 30°47'54.73"S | 25°51'26.70"E |
| RUT-DRN | 197 | 30°47'58.94"S | 25°51'34.43"E |
| RUT-DRN | 198 | 30°48'2.92"S  | 25°51'41.75"E |
| RUT-DRN | 199 | 30°48'6.63"S  | 25°51'48.56"E |
| RUT-DRN | 200 | 30°48'9.14"S  | 25°51'53.17"E |
| RUT-DRN | 201 | 30°48'12.76"S | 25°51'59.82"E |
| RUT-DRN | 202 | 30°48'16.08"S | 25°52'5.91"E  |
| RUT-DRN | 203 | 30°48'20.12"S | 25°52'13.33"E |
| RUT-DRN | 204 | 30°48'20.85"S | 25°52'22.41"E |
| RUT-DRN | 205 | 30°48'21.50"S | 25°52'30.42"E |
| RUT-DRN | 206 | 30°48'22.17"S | 25°52'38.65"E |
| RUT-DRN | 207 | 30°48'22.82"S | 25°52'46.67"E |
| RUT-DRN | 208 | 30°48'23.49"S | 25°52'54.98"E |
| RUT-DRN | 209 | 30°48'18.90"S | 25°52'58.35"E |
| RUT-DRN | 210 | 30°48'14.62"S | 25°53'1.49"E  |
| RUT-DRN | 211 | 30°48'14.83"S | 25°53'9.95"E  |
| RUT-DRN | 212 | 30°48'15.07"S | 25°53'19.57"E |
| RUT-DRN | 213 | 30°48'16.22"S | 25°53'29.15"E |
| RUT-DRN | 214 | 30°48'17.44"S | 25°53'39.37"E |
| RUT-DRN | 215 | 30°48'18.44"S | 25°53'47.76"E |
| RUT-DRN | 216 | 30°48'19.55"S | 25°53'56.99"E |
| RUT-DRN | 217 | 30°48'20.64"S | 25°54'6.18"E  |
| RUT-DRN | 218 | 30°48'21.84"S | 25°54'16.21"E |
| RUT-DRN | 219 | 30°48'23.00"S | 25°54'25.92"E |
| RUT-DRN | 220 | 30°48'24.14"S | 25°54'35.19"E |
| RUT-DRN | 221 | 30°48'25.36"S | 25°54'45.14"E |
| RUT-DRN | 222 | 30°48'26.54"S | 25°54'54.78"E |
| RUT-DRN | 223 | 30°48'27.72"S | 25°55'4.42"E  |
| RUT-DRN | 224 | 30°48'28.91"S | 25°55'14.15"E |
| RUT-DRN | 225 | 30°48'29.99"S | 25°55'23.00"E |
| RUT-DRN | 226 | 30°48'31.15"S | 25°55'32.44"E |
| RUT-DRN | 227 | 30°48'32.34"S | 25°55'42.22"E |
| RUT-DRN | 228 | 30°48'33.55"S | 25°55'52.10"E |
| RUT-DRN | 229 | 30°48'34.66"S | 25°56'1.17"E  |
| RUT-DRN | 230 | 30°48'35.64"S | 25°56'9.14"E  |
| RUT-DRN | 231 | 30°48'36.68"S | 25°56'17.70"E |
| RUT-DRN | 232 | 30°48'37.77"S | 25°56'26.58"E |
| RUT-DRN | 233 | 30°48'38.96"S | 25°56'36.31"E |
| RUT-DRN | 234 | 30°48'39.76"S | 25°56'42.88"E |
| RUT-DRN | 235 | 30°48'40.42"S | 25°56'48.26"E |
| RUT-DRN | 236 | 30°48'49.13"S | 25°56'54.81"E |
| RUT-DRN | 237 | 30°48'49.68"S | 25°57'2.93"E  |
| RUT-DRN | 238 | 30°48'50.28"S | 25°57'11.76"E |
| RUT-DRN | 239 | 30°48'54.99"S | 25°57'16.09"E |
| RUT-DRN | 240 | 30°49'0.16"S  | 25°57'20.84"E |
| RUT-DRN | 241 | 30°49'5.88"S  | 25°57'26.10"E |
| RUT-DRN | 242 | 30°49'12.02"S | 25°57'31.74"E |
| RUT-DRN | 243 | 30°49'17.87"S | 25°57'37.13"E |
| RUT-DRN | 244 | 30°49'22.77"S | 25°57'41.63"E |

|         |     |               |               |
|---------|-----|---------------|---------------|
| RUT-DRN | 245 | 30°49'27.18"S | 25°57'44.97"E |
| RUT-DRN | 246 | 30°49'31.70"S | 25°57'48.39"E |
| RUT-DRN | 247 | 30°49'38.55"S | 25°57'53.58"E |
| RUT-DRN | 248 | 30°49'45.34"S | 25°57'58.72"E |
| RUT-DRN | 249 | 30°49'51.62"S | 25°58'3.48"E  |
| RUT-DRN | 250 | 30°49'54.11"S | 25°58'11.99"E |
| RUT-DRN | 251 | 30°49'56.71"S | 25°58'20.88"E |
| RUT-DRN | 252 | 30°49'59.02"S | 25°58'28.78"E |
| RUT-DRN | 253 | 30°50'2.79"S  | 25°58'32.64"E |
| RUT-DRN | 254 | 30°50'8.38"S  | 25°58'38.37"E |
| RUT-DRN | 255 | 30°50'14.02"S | 25°58'44.16"E |
| RUT-DRN | 256 | 30°50'20.18"S | 25°58'50.47"E |
| RUT-DRN | 257 | 30°50'26.10"S | 25°58'56.53"E |
| RUT-DRN | 258 | 30°50'28.81"S | 25°59'3.71"E  |
| RUT-DRN | 259 | 30°50'31.47"S | 25°59'10.74"E |
| RUT-DRN | 260 | 30°50'34.27"S | 25°59'18.18"E |
| RUT-DRN | 261 | 30°50'37.41"S | 25°59'26.50"E |
| RUT-DRN | 262 | 30°50'40.45"S | 25°59'34.54"E |
| RUT-DRN | 263 | 30°50'43.38"S | 25°59'42.31"E |
| RUT-DRN | 264 | 30°50'46.68"S | 25°59'51.06"E |
| RUT-DRN | 265 | 30°50'50.01"S | 25°59'59.89"E |
| RUT-DRN | 266 | 30°50'53.41"S | 26° 0'8.89"E  |
| RUT-DRN | 267 | 30°50'55.62"S | 26° 0'14.75"E |
| RUT-DRN | 268 | 30°50'57.60"S | 26° 0'20.00"E |
| RUT-DRN | 269 | 30°50'59.51"S | 26° 0'28.75"E |
| RUT-DRN | 270 | 30°51'1.58"S  | 26° 0'38.21"E |
| RUT-DRN | 271 | 30°51'3.58"S  | 26° 0'47.36"E |
| RUT-DRN | 272 | 30°51'5.67"S  | 26° 0'56.91"E |
| RUT-DRN | 273 | 30°51'7.68"S  | 26° 1'6.10"E  |
| RUT-DRN | 274 | 30°51'9.70"S  | 26° 1'15.37"E |
| RUT-DRN | 275 | 30°51'11.66"S | 26° 1'24.32"E |
| RUT-DRN | 276 | 30°51'13.46"S | 26° 1'31.86"E |
| RUT-DRN | 277 | 30°51'15.80"S | 26° 1'41.71"E |
| RUT-DRN | 278 | 30°51'17.82"S | 26° 1'50.19"E |
| RUT-DRN | 279 | 30°51'19.80"S | 26° 1'58.51"E |
| RUT-DRN | 280 | 30°51'22.02"S | 26° 2'7.84"E  |
| RUT-DRN | 281 | 30°51'24.16"S | 26° 2'16.84"E |
| RUT-DRN | 282 | 30°51'26.08"S | 26° 2'24.91"E |
| RUT-DRN | 283 | 30°51'28.02"S | 26° 2'33.07"E |
| RUT-DRN | 284 | 30°51'29.78"S | 26° 2'40.45"E |
| RUT-DRN | 285 | 30°51'31.53"S | 26° 2'47.82"E |
| RUT-DRN | 286 | 30°51'35.58"S | 26° 2'55.47"E |
| RUT-DRN | 287 | 30°51'39.78"S | 26° 3'3.41"E  |
| RUT-DRN | 288 | 30°51'43.78"S | 26° 3'10.96"E |
| RUT-DRN | 289 | 30°51'47.92"S | 26° 3'18.80"E |
| RUT-DRN | 290 | 30°51'52.27"S | 26° 3'27.02"E |
| RUT-DRN | 291 | 30°51'56.65"S | 26° 3'35.30"E |
| RUT-DRN | 292 | 30°52'0.99"S  | 26° 3'43.50"E |
| RUT-DRN | 293 | 30°52'5.48"S  | 26° 3'52.00"E |

|         |     |               |               |
|---------|-----|---------------|---------------|
| RUT-DRN | 294 | 30°52'6.18"S  | 26° 4'1.60"E  |
| RUT-DRN | 295 | 30°52'6.87"S  | 26° 4'11.23"E |
| RUT-DRN | 296 | 30°52'7.62"S  | 26° 4'21.61"E |
| RUT-DRN | 297 | 30°52'8.30"S  | 26° 4'31.08"E |
| RUT-DRN | 298 | 30°52'8.91"S  | 26° 4'39.57"E |
| RUT-DRN | 299 | 30°52'9.50"S  | 26° 4'47.72"E |
| RUT-DRN | 300 | 30°52'10.23"S | 26° 4'57.87"E |
| RUT-DRN | 301 | 30°52'10.94"S | 26° 5'7.74"E  |
| RUT-DRN | 302 | 30°52'11.55"S | 26° 5'16.34"E |
| RUT-DRN | 303 | 30°52'12.40"S | 26° 5'28.06"E |
| RUT-DRN | 304 | 30°52'14.91"S | 26° 5'35.79"E |
| RUT-DRN | 305 | 30°52'17.50"S | 26° 5'43.77"E |
| RUT-DRN | 306 | 30°52'19.61"S | 26° 5'50.26"E |
| RUT-DRN | 307 | 30°52'22.41"S | 26° 5'58.88"E |
| RUT-DRN | 308 | 30°52'23.94"S | 26° 6'3.57"E  |
| RUT-DRN | 309 | 30°52'24.41"S | 26° 6'11.93"E |
| RUT-DRN | 310 | 30°52'24.94"S | 26° 6'21.45"E |
| RUT-DRN | 311 | 30°52'25.35"S | 26° 6'28.72"E |
| RUT-DRN | 312 | 30°52'25.82"S | 26° 6'37.00"E |
| RUT-DRN | 313 | 30°52'26.32"S | 26° 6'45.88"E |
| RUT-DRN | 314 | 30°52'26.80"S | 26° 6'54.40"E |
| RUT-DRN | 315 | 30°52'27.34"S | 26° 7'3.94"E  |
| RUT-DRN | 316 | 30°52'25.24"S | 26° 7'10.90"E |
| RUT-DRN | 317 | 30°52'22.91"S | 26° 7'18.65"E |
| RUT-DRN | 318 | 30°52'20.36"S | 26° 7'27.11"E |
| RUT-DRN | 319 | 30°52'20.67"S | 26° 7'37.41"E |
| RUT-DRN | 320 | 30°52'20.83"S | 26° 7'42.45"E |
| RUT-DRN | 321 | 30°52'16.40"S | 26° 7'54.06"E |
| RUT-DRN | 322 | 30°52'13.73"S | 26° 8'1.05"E  |
| RUT-DRN | 323 | 30°52'10.89"S | 26° 8'8.50"E  |
| RUT-DRN | 324 | 30°52'7.84"S  | 26° 8'16.48"E |
| RUT-DRN | 325 | 30°52'4.31"S  | 26° 8'25.73"E |
| RUT-DRN | 326 | 30°52'1.91"S  | 26° 8'32.01"E |
| RUT-DRN | 327 | 30°51'58.69"S | 26° 8'40.45"E |
| RUT-DRN | 328 | 30°51'55.20"S | 26° 8'49.58"E |
| RUT-DRN | 329 | 30°51'51.81"S | 26° 8'58.48"E |
| RUT-DRN | 330 | 30°51'49.01"S | 26° 9'5.81"E  |
| RUT-DRN | 331 | 30°51'45.21"S | 26° 9'15.75"E |
| RUT-DRN | 332 | 30°51'42.77"S | 26° 9'25.25"E |
| RUT-DRN | 333 | 30°51'40.39"S | 26° 9'34.51"E |
| RUT-DRN | 334 | 30°51'38.71"S | 26° 9'41.02"E |
| RUT-DRN | 335 | 30°51'36.12"S | 26° 9'51.10"E |
| RUT-DRN | 336 | 30°51'33.91"S | 26° 9'59.68"E |
| RUT-DRN | 337 | 30°51'31.46"S | 26°10'9.21"E  |
| RUT-DRN | 338 | 30°51'29.16"S | 26°10'18.17"E |
| RUT-DRN | 339 | 30°51'26.83"S | 26°10'27.22"E |
| RUT-DRN | 340 | 30°51'24.53"S | 26°10'36.16"E |
| RUT-DRN | 341 | 30°51'21.89"S | 26°10'46.41"E |
| RUT-DRN | 342 | 30°51'19.65"S | 26°10'55.11"E |

|         |     |               |               |
|---------|-----|---------------|---------------|
| RUT-DRN | 343 | 30°51'17.49"S | 26°11'3.50"E  |
| RUT-DRN | 344 | 30°51'15.31"S | 26°11'11.95"E |
| RUT-DRN | 345 | 30°51'13.08"S | 26°11'20.63"E |
| RUT-DRN | 346 | 30°51'11.14"S | 26°11'28.17"E |
| RUT-DRN | 347 | 30°51'9.16"S  | 26°11'35.86"E |
| RUT-DRN | 348 | 30°51'6.84"S  | 26°11'44.85"E |
| RUT-DRN | 349 | 30°51'4.54"S  | 26°11'53.77"E |
| RUT-DRN | 350 | 30°51'2.22"S  | 26°12'2.78"E  |
| RUT-DRN | 351 | 30°50'59.79"S | 26°12'12.23"E |
| RUT-DRN | 352 | 30°50'57.59"S | 26°12'20.75"E |
| RUT-DRN | 353 | 30°50'55.41"S | 26°12'29.24"E |
| RUT-DRN | 354 | 30°50'47.49"S | 26°12'29.88"E |
| RUT-DRN | 355 | 30°50'39.97"S | 26°12'30.49"E |
| RUT-DRN | 356 | 30°50'33.40"S | 26°12'31.03"E |
| RUT-DRN | 357 | 30°50'25.87"S | 26°12'31.64"E |
| RUT-DRN | 358 | 30°50'20.97"S | 26°12'31.95"E |
| RUT-DRN | 359 | 30°50'18.51"S | 26°12'28.46"E |
| RUT-DRN | 360 | 30°50'11.05"S | 26°12'28.56"E |
| RUT-DRN | 361 | 30°50'3.63"S  | 26°12'33.37"E |
| RUT-DRN | 362 | 30°49'56.79"S | 26°12'33.89"E |
| RUT-DRN | 363 | 30°49'50.22"S | 26°12'34.38"E |
| RUT-DRN | 364 | 30°49'44.40"S | 26°12'34.82"E |
| RUT-DRN | 365 | 30°49'43.98"S | 26°12'38.91"E |
| RUT-DRN | 366 | 30°49'43.78"S | 26°12'40.92"E |
| RUT-DRN | 367 | 30°49'45.50"S | 26°12'41.27"E |

## PART 3: SCOPE OF WORK

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|                    | Total number of pages               | [37]        |

## C3.1: EMPLOYER'S WORKS INFORMATION

### Contents

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## 1 Description of the works

### 1.1 Executive overview

The contractor is required to complete the portion of the optical ground wire on the line from structure RUT-DRN 59 – 344, including testing the already installed OPGW cable.  
The Ruigtevallei - Dreunberg 132kV Line will be constructed with monopole structures, Chickadee conductor and fully fitted with OPGW system

### ***Employer's objectives and purpose of the works***

See Final design package (FDP) attached

### 1.2 Interpretation and terminology

#### 1.3.1 Abbreviations

The following abbreviations are used in this Works Information:

| Abbreviation | Meaning given to the abbreviation         |
|--------------|-------------------------------------------|
| AFC          | Approved for construction                 |
| OBL          | Outside battery limits                    |
| PM           | Project Manager                           |
| CPE          | Contract Project Engineer                 |
| CPM          | Contract Project Manager                  |
| EMP          | Environmental Management Program          |
| PE           | Project Engineer                          |
| PES          | Project Engineer Specialist               |
| FDP          | Final Design Package                      |
| T&Q          | Technology and Quality Department - Eskom |

### 1.3.2 Acceptance of Eskom SHEQ Policies and Procedures

The attached documents form part of this legal binding contract, the **Contractor** confirms that he has familiarized himself with all the embedded documents from 1 to 25 as indicated

| No          | UNIQUE IDENTIFIER                                 | REVISION | DOCUMENT TITLE                                                                                                                                                                                                                                                                                  |
|-------------|---------------------------------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1           | 32 - 727                                          | LATEST   | <b>SAFETY, HEALTH, ENVIRONMENT AND QUALITY (SHEQ) POLICY 32-727</b><br><br>Safety, Health, Environment and Qua                                                                                                |
| 5           | ESKOM LIFE SAVING RULES                           | LATEST   | <b>ESKOM LIFE SAVING RULES 240-62196227</b><br> <br>Eskom life-saving rules.pdf      Life saving rules (2)Acknowledgement. |
| 6           | CONSTRUCTION REG 4                                | LATEST   | <b>NOTIFICATION OF CONSTRUCTION WORK TO DEPARTMENT OF LABOUR</b><br><br>Notification of construction work (2).                                                                                                |
| 7           | CONSTRUCTION REG 4 & 5                            | LATEST   | <b>APPOINTMENT LETTERS FOR CLIENT REPRESENTATIVE, PRINCIPAL CONTRACTOR &amp; CONTRACTOR</b><br><br>Principal Contractor appointment.docx                                                                     |
| 8 & 9       | OHS ACT                                           | LATEST   | <b>WRITTEN AGREEMENT ON OHS ACT SECTION 37(2) &amp; STANDARD CLAUSE</b><br><br>Section 37 (2) Agreement (2).docx                                                                                            |
| 10, 11 & 12 | 34 - 1063                                         | LATEST   | <b>EXPANDED PUBLIC WORKS REPORT 34-1063.</b>                                                                                                                                                                                                                                                    |
| 13          | <u>DST 34-961</u>                                 | LATEST   | <b>LEGAL APPOINTMENTS AND AUTHORIZATIONS</b>                                                                                                                                                                                                                                                    |
| 14          | TPC 41-55                                         | LATEST   | <b>TRANSPORTING PERSONS ON BACK OF VEHICLES</b><br><br>Vehicle and Driver Safety Management.p                                                                                                               |
| 15          | LTIR                                              | LATEST   | <b>LOST TIME INJURY REPORT</b>                                                                                                                                                                                                                                                                  |
| 16          | 1. Contractor Performance Evaluation              | LATEST   |                                                                                                                                                                                                                                                                                                 |
| 17          | SHE Requirements for the Eskom Commercial Process | LATEST   | <br>SHE Requirements for the Eskom Comm                                                                                                                                                                     |

|    |                                                                                       |        |                                                                                                                                   |
|----|---------------------------------------------------------------------------------------|--------|-----------------------------------------------------------------------------------------------------------------------------------|
| 18 | <b>2. Supplier Contract Quality Requirements</b>                                      | LATEST |                                                                                                                                   |
| 19 | <b>3. Work at Heights Procedure</b>                                                   | LATEST | <br>Work at Height<br>Standard.pdf              |
| 20 | <b>4. Contract Specification for Vegetation Management Services on Eskom Networks</b> | LATEST | <br>DST_240-52456757<br>vegetation.pdf          |
|    | <b>5. Environmental Incident Management Procedure 240-133087117</b>                   |        | <br>Environmental<br>Incident Management        |
|    | <b>6. Eskom Wildlife Interaction and Management Standard</b><br><b>7. 32-829</b>      |        | <br>Wildlife Interaction<br>and Management Stai |
|    | <b>8. Eskom Waste Standard 32-245</b>                                                 |        | <br>Eskom Waste<br>Management 32-245.           |

## 2 Management and start up.

### 2.1 Management meetings

Regular meetings of a general and Legal nature shall be convened and chaired by the *Project Manager/Project co-ordinator or representative so delegated by Eskom Holdings SOC Limited. As part of the contractor's responsibility with an objective of minimizing the adverse effects of risks and surprises for both Parties, meetings shall be held at reasonable times as defined OHS act as follows:*

| Title and purpose                       | Approximate time & interval | Location | Attendance by                              |
|-----------------------------------------|-----------------------------|----------|--------------------------------------------|
| Kick-Off Meetings                       |                             | On site  | e.g. PM, Contractor, Supervisor, and _____ |
| Risk register and compensation events   | Weekly on at                |          |                                            |
| Overall contract progress and feedback  | Monthly on ____ at          |          | e.g. Employer, Contractor, Supervisor, and |
| Technical Site Meetings                 |                             |          |                                            |
| Health, Safety & Environmental Meetings |                             |          |                                            |
| Community based Meetings                |                             |          |                                            |

Meetings of a specialist nature may be convened as specified elsewhere in this Works Information or if not so specified by persons and at times and locations to suit the Parties, the nature and the progress of the works. Records of these meetings shall be submitted to the *Project Manager* by the person convening the meeting within five days of the meeting.

All meetings shall be recorded using minutes or a register prepared and circulated by the person who convened the meeting. Such minutes or register shall not be used for the purpose of confirming actions or instructions under the contract as these shall be done separately by the person identified in the *conditions of contract* to carry out such actions or instructions.

### 2.2 Documentation control

All contractual Documentation must have relevant contract number and Purchase Order Number as reference as per Eskom Holdings SOC Limited Standards (List). Contractual communications will be in the form of properly compiled letters, letters attached to emails, emails, NEC template and urgent contractor meetings can be in the form of sms and as outlined on core clause 13 of the NEC3 ECC.

The use of sms's, emails does not override the use of applicable and relevant NEC3 ECC standard templates, forms and Eskom Holdings SOC Limited procedures.

**Note: It is the contractor responsibility to acquire and familiarize themselves with the NEC3 ECC.**

## 2.3 Health and safety risk management

In addition to the requirements of the laws governing health and safety, Eskom may have some additional requirements particular to the *works* and the Working Areas for this contract. The text below provides for these being attached as an Annexure to this Works Information. PLEASE ALSO READ CORE CLAUSE 27.4 TOGETHER WITH Z7 IN THE ADDITIONAL CONDITIONS OF CONTRACT TO MAKE SURE THAT WHATEVER IS INCLUDED IN THE ANNEXURE FOLLOWS ON FROM THOSE CLAUSES.

The Cluster Safety Risk Manager or his representative having jurisdiction over the *works* must provide the relevant safety, health and environmental (SHE) criteria for incorporation into this Works Information. The SHE specification / scope must be signed off by the Cluster Safety Risk Manager or his representative confirming that the applicable safety criteria have been taken into account.

The Buyer must refer the tender to the Cluster Safety Risk Manager or his representative in order to evaluate against enquiry-specific safety criteria.

The Cluster Safety Risk Managers who will be responsible for the allocation of resources to assist P&SCM with the above processes are as follows:

- Dx CCC B/E Nosipho Manyonga
- Dx CCC SHEQ-Lindelwa Ngcaba
- Dx CCC Contractors Vuyiseka Ngamlana
- Dx CCC Contractors Nathen Felkers

The *Contractor* shall comply with the health and safety requirements contained in Annexure 32-136 to this Works Information.

The contractor SHE files should be submitted and approved within 5 working days. The contractor is given **one opportunity** to correct, and re-submit within seven 7 days.

The Contractors Project SHEQ File is to be updated on a continuous basis. The Contractor is to ensure that all relevant documentation and authorisations are contained in the file pertaining to the project. Upon completion of the project, the Contractor is to convert all documentation contained in the SHEQ file into electronic format and save it as a PDF File. The file name should contain the name of the Contractor and the project. The file should then be saved onto a disk or removal storage device and handed over to the *Project Manager* upon completion of the project.

## 2.4 Environmental constraints and management

The *Contractor* shall comply with the environmental criteria and constraints contained in the FDP and attached in Annexure B to this Works Information and consist of the following documentation to comply with:

- Environmental Legal Compliance for Eskom Distribution Projects with DESD's signed
- 240-DX-048T Standard for Environmental Screening of Distribution Activities applicable to Eskom Dx Cluster
- 240-715553 Distribution generic EMP for Operations Maintenance Standard
- 240-DX-038T Generic Environmental Management Programme for Distribution Activities
- 240-DX-049T Standard for Environmental Impact Assessment of Distribution Activities
- DPC\_34-926 doc incorporating Water use issues draft 1(3) (Repaired) draft 0A.

## Notes and Requirements for Environmental Compliance

- Contractors must be aware of environmental specifications in contracts and comply with them;
- Contractors building new lines and substations and performing maintenance on existing infrastructure to attend environmental law course.
- Legal contraventions involving contractors to be communicated to all other contractors to avoid recurrence;
- Contractors to follow and comply with EMPr's provided.
- Contractors are to use the following Standard **240-52456757 Contract Specification for Vegetation Management Services on Eskom Networks** when doing bush clearing.
- Contractors building new assets or maintaining existing assets to always have a copy of the EMPr, EA and any other permits (tree, water, heritage, CCA) and also monitoring/inspections reports available on site where such documents exist;
- Contractors assisting with self-build projects for third parties to attend the DESD training awareness.
- Contractors assisting with self-build projects for third parties to ensure that the relevant documentation including the DESD is handed over to and acknowledged and supported by the Land Development and Environment section. Such contractors take
- liability for the completion of the DESD;
- All environmental incidents to be brought under the attention of the Eskom Holdings SOC Limited representative within 24 hours as per Environmental Incident Management Procedure 240-133087117 ;
- Contractors must demand/request a copy of the completed DESD for their projects);
- Read and understand the DESD, EMPr and other permits;
- (K) Ensure all relevant staff are aware of the conditions of the DESD, EMPr and other permits;
- Review DESD and EMP before tendering;
- Environmental Authorizations are only issued for specific projects that triggers Listed activities as stipulated in NEMA regulations .

## 2.5 Quality assurance requirements

### Quality Control

- An approved Quality Control Programme is to be implemented in conjunction with, and to the approval of, the *Project Manager*.
- The Quality Control Document for per construction stage is to be used and signed off by the relevant people indicated in the document.
- The following Quality Control stages to be documented:
  1. Geotechnical investigation & report for each pole foundation.
  2. DCP tests & soil nominations for each stay foundation.
  3. Steel inspection on steel poles at delivery
  4. Structure dressing & installation Quality control check sheets
  5. Stay pull tests per stay
  6. Earth resistance (pole foot) tests per structure
  7. Sag & tension records during stringing of conductors and shield wire
  8. Recording of full tension joints



## Quality Engineering

- All construction and installation methods are to comply with the *Power Delivery Engineering* standard requirements as contained in the National and Provincial Standards on the Distribution Technology websites.
- The Contractor shall comply with the Project Specifications included in the FDP document. Any changes proposed during the construction phase shall notify the Project Manager who will follow the Project Change Request approval process.
- Eskom Holdings SOC Limited's representative must be notified at least 30 days prior to the commissioning.
- Eskom Holdings SOC Limited's representative must be allowed access to the site at any time during the construction to carry out an inspection of the works.
- Before the start of the construction stage, the Contractor will confirm with the Clerk of Works which activities are identified as Holding Points/milestone and which activities he would like to be photographed as proof for compliancy if not present. A Holding Point is an activity for which arrangements have to be made for the Clerk of Works to be present and to witness the work procedure.
- Each stage, once completed by the contractor, will be signed off by both the Contractor and Clerk of Works. The Clerk of Works will indicate whether the activity was:
  - Witnessed (W) - present during this activity
  - Verify (V) - not present but confirm compliancy.
- Once all the activities have been completed, the Quality Control Programme shall be presented to the Project Manager to sign off the Handover Certificate of each stage.

## 2.6 Programming constraints

The contractor shall submit his construction program in terms of the conditions of contract. This program shall be submitted according to Part one – Data provided by the *Employer* (Time).

Any programme, which is going to be used to assess delay and disruption during the course of a project, must be prepared in a manner, which most accurately and clearly expresses the intention of the Contractor.

The programme prepared at the beginning of the project should therefore be:

1. Realistic and capable of achievement;
2. Based on available information; with
3. Assumptions clearly defined; and
4. Supported by a method statement identifying the contractor's construction logic.

This Programme may include but not limited to the activities stated below:

- Site Establishment
- Bush clearing
- Survey
- Foundations
- Pole layout
- Dressing of structures
- Planting poles & stays
- Stringing of conductors
- Stringing of shieldwire
- Outage Program & Requirements
- Commissioning

Every activity on the programme will be clearly linked to a **labour** resources and **equipment** required to perform the specific activity.

**Weather delays** based on the rainfall data supplied under Part 2 (C1.2 Annexure A), must be included in the programme. Only weather delays over and above the specified number of rain days will qualify for evaluation as delays.

**Completion and hand-over dates** for formal inspection by the site supervisor must be indicated.

**Project expenditure (cash flow projection)** on a monthly basis for the entire duration of the contract must be indicated.

The Contract Program will be on display in the *Contractors Site Offices* and will be updated weekly.

In addition to the maintaining of this programme, the Contractor will report progress to the Project Manager on a weekly basis.

Should any deviations to the program be found, the *Contractor* shall submit a revised program to the *Project Manager* within one week.

The *Project Manager* retains the right to alter the Accepted Program should circumstances on *site* necessitate such a change.

The following Statutory non-working days are included within the contract period:

- All Public Holidays for the duration of the contract.
- The programme must clearly indicate the working days for the entire construction period or alternatively all the non-working days within the construction period.

## 2.7 Contractor's management, supervision and key people

The *Contractor* shall also provide a detailed organization chart showing the personnel to be employed for the *works*, along with Training certificates of all key personnel. Contractors to submit proof to Eskom that their Contracts manager or delegated employee representative has NEC ECC training. A full definition of ONE team shall form part of the organization chart per project and identity number shall form part of this document.

## 2.8 Invoicing and payment

Within one week of receiving a payment certificate from the *Project Manager* in terms of core clause 51.1, the *Contractor* provides the *Employer* with a tax invoice showing the amount due for payment equal to that stated in the *Project Manager's* payment certificate. Email Invoice to shared services:

The *Contractor* shall address the tax invoice to Eskom Holdings SOC Ltd and include on each invoice the following information:

- Name and address of the *Contractor* and the *Project Manager*;
- The contract number and title;
- *Contractor's* VAT registration number;
- The *Employer's* VAT registration number 4740101508;
- Description of service provided for each item invoiced based on the Price List;
- Total amount invoiced excluding VAT, the VAT and the invoiced amount including VAT;
- (add other as required)

**Note:** All material purchased by the contractor will be paid once they have been installed (subjected to project managers discretion). The risk of paying the material prematurely delivered to site will remain with the contractor.

Financial records are to be kept by the Contractor on any additional items not included in the original Scope of Works/Activity List.

An **EPWP (Expanded Public Works Programme)** reports must accompany each invoice as part of the approval and acceptance process of the monthly assessment and reporting stage.

On a monthly basis, the *Contractor* must report the number of employees working on the projects. Manhours report must be provided on the 1st day of the following month to the respective Eskom Project Manager, cc Contract administrator Xoliswa Quluba, e-mail address is QulubaX@eskom.co.za

|                                                                                                                                                                                                                                                                                                                     |          |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|
| <b>General Information</b>                                                                                                                                                                                                                                                                                          | <b>X</b> |
| - No Pro-forma Invoice                                                                                                                                                                                                                                                                                              |          |
| - Check Vendor number against the Address and name on Tax invoice                                                                                                                                                                                                                                                   |          |
| - Insert the Vendor number on Tax invoice (Top right hand corner)                                                                                                                                                                                                                                                   |          |
| - Bank details must be on the invoice or on a attach sheet, but it does not require a bank stamp just a letter)                                                                                                                                                                                                     |          |
| - Check banking details on invoice against SAP system. If more than one banking account check bank account against banking details on invoice. If banking details not on invoice, write the bank code next to the vendor account (bank code 0002)                                                                   |          |
| - Check Vendor VAT number against the vendor master. (FK03) If VAT number not on master records, prepare a list and forward to Vendor Management to check and update the vendor master records                                                                                                                      |          |
| - No fax copies of Tax invoices allowed                                                                                                                                                                                                                                                                             |          |
| - No copies of Tax invoices allowed unless originally printed by the Vendor if a photocopy tax invoice, it must be an original "certified copy" (i.e. not a copy of a "certified copy" invoice) from the vendor and check in system if not previously be paid. Put stamp "not previously paid" on invoice and sign. |          |
| - Ensure that date received stamp is clear on invoice                                                                                                                                                                                                                                                               |          |
| - Stamp all Invoices with the Vat stamp, complete and sign (only when VAT is applicable)                                                                                                                                                                                                                            |          |
| - The stamp should not be stamped over any written information                                                                                                                                                                                                                                                      |          |
| - When scanning invoice, check the quality before linking in SAP (inboxes)                                                                                                                                                                                                                                          |          |
|                                                                                                                                                                                                                                                                                                                     |          |
| <b>With Reference Invoices</b>                                                                                                                                                                                                                                                                                      | <b>X</b> |
| - Goods receipt must be done (payment with reference)                                                                                                                                                                                                                                                               |          |
| - Ensure that the SAP purchase order number is clear and correct on the invoice                                                                                                                                                                                                                                     |          |
| - GR number to be written on the Invoices                                                                                                                                                                                                                                                                           |          |
| - If multiple lines on invoice write the line number of the order against the line to ensure that the processors match the correct lines (to ensure that 191100 is matched correctly)                                                                                                                               |          |

## 2.9 Insurance provided by the *Employer*

The insurance provided by the *Employer*, is addressed under the **contract data by the *Employer* under Z13.2** Insurances "Insurance provided by the *Employer*". In this case Format Dx is applicable for this contract.

## 2.10 Contract change management

For any compensation event relating to changes to scope and additions to scope which were not part of the original scope, such changes shall be treated under compensation event core clause section 6 of the NEC3. The contractor shall notify the Project Manager of any changes to Site Personnel within 5 (Five) working day. Only resources listed on the approved safety file should be allowed on the construction site. Should there be a need for replacement of resources or adding more teams, the safety file must be updated to reflect such amendment. The allocated safety officer shall re-evaluate the health and safety file for approval. Additional resources may only be allowed access to construction sites after the amended file has been approved

## 2.11 Provision of bonds and guarantees

N/A

## **2.12 Records of Defined Cost, payments & assessments of compensation events to be kept by the *Contractor***

## **2.13 Training workshops and technology transfer**

Technological requirements and standards that are applicable at this stage of contract establishment may change and contractors are required to comply with latest standards. In the event that this results in a cost implication, this will be dealt with according to section 6 of the NEC/ECC Contract.

Contractor shall comply with all SD&L requirements relating to training, workshops and any technology transfer obligations.

### **3 Engineering and the *Contractor's* design**

The contractor shall execute the works as per the Employer's Final Design Package (FDP)/ Detailed Design Package (DDP).

#### **3.1 *Employer's* design**

The Employer will supply Contractor with a final design document compiled by the Project Engineer detailing the scope of work to be executed on the project as well as Project Drawings.

#### **3.2 Parts of the *works* which the *Contractor* is to design**

Even when the contract is a traditional 'construction only' contract, the *Contractor* is probably still required to carry out workshop details from overall drawings provided by the *Employer* and to design temporary works.

#### **3.3 Procedure for submission and acceptance of *Contractor's* design**

This procedure may also include a design stage activity matrix or requirements for co-operation with Others on a multi party project. State requirements for drawings to be prepared by the *Contractor*.

#### **3.4 Other requirements of the *Contractor's* design**

N/a

#### **3.5 Use of *Contractor's* design**

N/a

#### **3.6 Design of Equipment**

N/a

#### **3.7 Equipment required to be included in the *works***

The Contractor shall propose at the start of the project and Project Manager/ Engineer to approve.

### **3.8 As-built drawings, operating manuals and maintenance schedules**

The Contractor completes as-built drawings and as-built schedule of quantities per transformer zone handed over as completed. The Contractor submits these as-built drawings and as-built schedule of quantities as part of the hand-over documentation in line with the completion dates indicated on the approved construction programme.

Should there be conflict between the specification and drawings, then documentation shall be considered in the order of priority set out below:

- Tender Correspondence/Minutes/Site Instructions
- Approved Sample Line
- Works Information & Final Design Package
- Drawings
- Power Delivery Engineering Standard
- Should the Contractor note any inconsistency between the specification and drawings he shall notify the Project Manager and obtain clarification or instructions prior to collecting and installing materials and plant for the work.

## 4 Procurement

### 4.1 People

#### 4.1.1 Minimum requirements of people employed on the Site

Extended Public Works Programme (EPWP) shall be applicable on all projects. The EPWP report template is included as supporting documentation and forms part of this Contract.

To be compiled by the Contractor:

- Base indicators to be collated on all EPWP projects (Table 1)

**Table 1: Base indicators to be collected on all EPWP projects**

| B1 Number | Project level Indicator to be used in monitoring system                 | Comments                                                                                                                                     |
|-----------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| 1         | Number of people ("Different warm bodies") employed on relevant project | Will be assumed to be equivalent to number of job opportunities created. Will measure the number of people to benefit directly from the EPWP |
| 2         | Person-days of employment created                                       | Total number of person days created will be divided by 230 to convert to person years of employment created                                  |
| 3         | Minimum wage rate                                                       | Since local public bodies may set the wage rate as part of the EPWP to wage rate on a particular project will need to be reported            |
| 4         | Number of training days provided                                        | Since all workers are entitled to training it is important to ensure that actual training is delivered                                       |
| 5         | Overall spending on the project                                         | Will give an indication of how much is actually spent on EPWP projects                                                                       |
| 6         | Demographics of workers on EPWP Projects                                | The percentages of women, youth and disabled to be reported on.                                                                              |

- KPI to be used for the EPWP (Table 2)

**Table 2: KPI's to be used for the EPWP**

| KPI | KPI                                                   | Method for calculation                                                                                                   | Comment                                                                                 |
|-----|-------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|
| 1   | <b>Number of Job opportunities created</b>            | Assumed to be equal to number of warm bodies employed per project                                                        | Will give an indication as to how many unemployed people benefit directly from the EPWP |
| 2   | <b>Person years of employment created</b>             | Divide the total number of person days of all projects by 230 (Agreed upon number of person days of employment per year) | Indicator that shows the equivalent number of full-time jobs created                    |
| 3   | <b>Number of training days provided</b>               | Total sum from all projects                                                                                              | Measure total amount of training provided                                               |
| 4   | <b>Overall spending on EPWP projects</b>              | Total sum from all projects                                                                                              | Measure total government spending on the EPWP                                           |
| 5   | <b>Demographics of workers on EPWP projects</b>       | Total sums of the project totals of women, youth and disabled employed                                                   | Measures the demographics of the people benefiting from the EPWP                        |
| 6   | <b>Average length of employment created</b>           | Divide person years of employment created (KPI 2) by number of job opportunities (KPI 1)                                 | Also allows comparison between sectors and types of projects                            |
| 7   | <b>Total income paid out to previously unemployed</b> | Multiply number of person-days (BI 2) by the minimum wage (BI 3)                                                         |                                                                                         |

|    |                                                        |                                                                                     |                                                                      |
|----|--------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------------------------------------------|
| 8  | <b>workers</b><br><b>Average income of EPWP worker</b> | Divide Total income (KPI 6) by Number of job opportunities (KPI1)                   |                                                                      |
| 9  | <b>Average duration of training provided</b>           | Divide total number of training days (KPI 3) by number of job opportunities (KPI 1) | Provides an indication of the level of skills build in the programme |
| 10 | <b>Percentage of spending paid out to EPWP workers</b> | Divide total income paid out (KPI 6) by Overall spending on EPWP (KPI 4)            | Measure the labour intensity of the EPWP                             |

#### 4.1.2 BBBEE and preferencing scheme

The "PREFERENCE POINTS CLAIM FORM IN TERMS OF THE PREFERENTIAL PROCUREMENT REGULATIONS" is applicable as described under the "Invitation to Tender" section.

#### 4.1.3 Supplier Development and Localisation

A commitment from a supplier to implement skills development and/or the promotion of localised content applicable to the scope of work shall be provided at tender stage. Regular reporting on a 2 monthly basis must be done and handed to the project manager and SDL&I functionary to report on progress of compliance to the commitments agreed upon at contract stage. This report must be handed over to the Project Manager and SDL&I functionary on a 2 monthly basis when submitting the assessment claim for payment



## 4.2 Subcontracting

### 4.2.1 Preferred subcontractors

### 4.2.2 Subcontract documentation, and assessment of subcontract tenders

The use of the NEC3 - ECSC is required.

### 4.2.3 Limitations on subcontracting

The *Employer* may require that the *Contractor* must subcontract certain specialised work, or that the *Contractor* shall not subcontract more than a specified proportion of the whole of the contract.

(unless otherwise agreed) of the Works may be sub-contracted subject to *Project Managers* approval.

### 4.2.4 Attendance on subcontractors

The *Contractor* is responsible for performing on the provided scope of work as if he had not subcontracted. The appointed *Contractor* will also be liable to the *Subcontractors'* employees, as he legally and liable to this contract.

The *Contractor* is liable for ensuring that materials are fit for purpose and free of defects.

The *Contractor* is liable for ensuring that all materials and workmanship fulfil the specifications, instructions and design.

Any appointment of a subcontractor by the *Contractor* is to be approved by the *Project Manager*.

The *Sub Contractor* must be CIDB registered. A maximum of 25% of the Works may be sub-contracted subject to Project Managers approval.

#### **4.2.5 SECURITY OFFICER'S ON-SITE EQUIPMENT REQUIREMENTS**

##### **SERVICE INFORMATION**

Description of the service

The Provision of the supply of security services Eskom Eastern Cape Operating Unit.

- 24 Hour Physical Guarding Service.
- The Service required is PSIRA D Grade trained, registered and competent Security Guards on site in the form of two (2) guards during day shift and two (2) guards during night shift pending on the size of the site as well as the scope of work at the specific site.
- Monday to Sunday (incl. Public Holidays) to conduct physical security on site.
- Physical guarding duties) Visibility) Access control Duties) Patrol / Inspection Duties) Prelim Investigation and

##### **SECURITY SERVICES**

##### **ACCESS CONTROL**

Control and management of movement of employees, visitors and Security Service Providers by ensuring that only authorized persons are allowed on site and to that only authorized equipment and material enters or is removed from site.

Access control will include amongst others the following activities:

- Recording of visitors details electronically or manually (as per site specifics)
- Application of the visitor confirmation process
- Declaration, recording and movement control of equipment and material
- Screening of persons and articles/parcels through the use of electronic equipment
- Conduct Alcohol screening/testing (training and device will be provided by Eskom)
- Safety inductions of visitors and Security Service Providers
- Searching or vehicles and persons for presence of prohibited items such as weapons, explosives or items or any devices that can be used in the commission of a criminal act.

##### **STATIC GUARDING**

The provision of unarmed guarding services in the Eastern Cape Operating Unit.

Static guarding will include among others the following activities:

- Monitoring specific locations, areas, installations to identify and prevent access of unauthorized persons, material and equipment
- Attend to and intercept suspicious activities
- Prevent illegal activities

- Prevent occurrences that may endanger Eskom employees, its Security Service Providers and visitors
  - Prevent criminal activities
  - Prevent incidents that may interrupt Eskom's normal business
  - Supervision of static guards will be required by no fewer than 2 visits per shift per site by two supervisors at all times
  - The deployment of ad-hoc security guards within an agreed time with the Eskom security supervisor (not longer than 3 hours of request)
  - The submission of a monthly report to Eskom
- Static guarding sites must be equipped with a panic button system linked to a 24/7 operational control room. To provide response service to a static guarded site.

## **SECURITY SERVICES**

The Security supplier is expected to do an environment scanning within which security services are to be rendered in order to identify potential threats and risks and develop appropriate mitigation strategies to address the threats and risks. The implementation of such strategies shall be done in consultation with Eskom.

## **SECURITY PATROL**

- Execution of crime prevention patrols at the critical network infrastructure and hotspot areas including any other specified sites within regional boundaries.
- Visiting and patrolling of Eskom sites at irregular intervals and not in a specific sequence, to detect the presence of unauthorized person, suspicious activities or occurrences that may endanger personnel or critical network infrastructure.
- Prevention of unauthorized removal of Eskom assets from Eskom sites and network infrastructure.
- Eskom reserves the right to change the reporting base within the boundaries of the allocated geographical area.
- The Eskom Service manager or his/her delegate reserves the right to re-direct crime prevention activities in his/her area of responsibility.
- No deviations from the operational plan without the authorization of the Eskom Service manager or his/her delegate will be permitted.
- The service provider must be a legally constituted entity allowed to provide security services.
- All personnel employed by the service provider must have been trained at a PSIRA accredited training institution and proof must be available on request.
- Salaries must be in accordance with the Wage Determination Act.

## **SECURITY OFFICERS (PSIRA Grade)**

- All Security officers must be registered with PSIRA at the required grade.
- Security officers must be in possession of their PSIRA and company I.D card at all times.
- Security officers will be expected to sign a declaration of Secrecy, before commencements of their duties in terms of this contract.
- All Security officers must be subjected to a criminal screening process prior to the commencement of the contract and a copy of the results must be placed in their personnel files.
- Security officers should not have been convicted of any criminal offence and should disclose all pending criminal prosecutions against them. Non-disclosure of such will result in the officers' automatic removal from Eskom site or duties.

- Security officers should be able to read and write and express themselves well in English.
- Security officers may be required to undergo polygraph testing as and when required.
- Security officers will not be allowed to access IT networks registries, communication networks or any sensitive/zoned areas even when responding to alarms.
- Security officers should be trained on the Standard Operating Procedures (SOPs) relevant for their site of deployment and/or be made available for training by Eskom at no additional costs on any process or procedure necessary for them to do their duties. Proof of training must be kept on file and availed to Eskom on request.
- No security officers are to be deployed in terms of this contract, before undergoing necessary Eskom SAFETY induction, training and assessments. Eskom reserves the right to remove such Officers that have not complied with this requirement from their sites or duties as per this contract at the cost to the Security Service Provider.

### **SUPERVISION (GRADE B)**

A Dedicated supervisor may be required in specified areas. A minimum PSIRA Grade B supervisor must supervise deployed guards. The supervisors must ensure that guards deployed at rural/ remote sites or areas with transport challenges are provided with their company transport to assist them to reach the sites. Smaller and remote sites will require a roaming Supervisor as per the regional requirements. The posting of guards is required to be done by the Supervisor at all sites (the practice of "self-posting" is not ruled out but must be monitored closely). All equipment must be tested and documented in the OB and deviations corrected during each and every shift change.

### **TRAINING**

All Security personnel deployed in terms of this contract must be trained in accordance with the various applicable legislative requirements such as Private Security Industry Regulatory Authority (PSIRA),

### **WORKING TIMES /SHIFTS**

- Working times shall be as determined by PSIRA – 48 hours per week and 45 hours per week days for shift workers.
- The security service is required 24 hours a day on a two shift cycle i.e. 06:00 to 18:00 and 18:00 to 06:00.
- A signed off reviewed list of Security officers deployed in terms of this contract must be provided on monthly basis, within 5 days prior to the commencement of the new month.
- The Security Service provider is responsible to ensure that every shift complement is correct as per Eskom's requirement before commencement of a shift.
- The Security Officers will be expected to do a pre-job / daily risk assessment and safety talks before commencement of every shift.

### **COMMUNICATION**

The Security service provider must ensure suitable continuous communication between operational control room and their deployed staff. Supplier shall provide either one or more of the following mediums of communications as per user requirements: base radios, hand-held radios, satellite radio,

company contracted cell phones (programmed with all the necessary contact details as per Eskom list) and/or push to talk system (PTT).

## **CONTINGENCY PLANS**

- The service provider must have contingency plans in place for among others the following:
- Own Strike/Labour unrest amongst own staff.
- Shortage of Manpower due to e.g. absenteeism, sick leave annual leave.
- Equipment Failure e.g. Vehicle breakdown and Communication system.

## **INCIDENT REPORTING AND INVESTIGATION**

- All incidents and response to incidents must be handled according to the relevant Standard Operating Procedure (SOP) and/or work instructions for each site.
- All incidents and response must be immediately (within 15 minutes) reported to the Eskom.
- The SAPS must be contacted immediately only for criminal incidents or suspected ongoing criminal activities.
- Weekly status reports are to be supplied by the service provider.
- The Security Service Provider is to ensure that all involved personnel are available for relevant court proceedings, incident investigations and assist Eskom and the SAPS in their investigations as and when required.
- All incidents (including incidents in terms of the Occupational Health and Safety Act), should be reported within 24 hours and a preliminary investigation report provided within 24 hours as well as a final Incident investigation report within Seven (7) days.

## **SECURITY REGISTERS**

- The Security Service provider will be required to provide with the Occurrence books, Visitors and After-hours register where necessary.
- Occurrence book to be correctly completed by Security officers and supervisors listing all occurrences and visits on site.
- Visitors register to be completed daily and filed on site for future reference and pages must be numbered.
- Security Service Provider must ensure that quality registers are provided. Register must remain bonded, with no loose and damaged pages.
- Accurate records of all occurrences are to be kept for a minimum of 12 months (Max 5 years) post the occurrence and should be made readily available to Eskom at any time. The OB's must be handed to Eskom once the contract term is completed or the contract is terminated.

## DOCUMENTATION

The following documentation is to be supplied by the security service provider at least four (4) weeks before a Task order can be issued and commencement of the contract.

- List of all potential security officers intended to be deployed on Eskom sites in terms of this contract.
- Certified ID copies and PSIRA certificates of all security officers.
- Certified copies of firearm competency certificates of the security officers.
- Certified copies of the company and Directors PSIRA registrations certificates.
- Criminal check records as proof that the Security officers have not been convicted of any criminal offence.
- A list of all vehicles and maintenance records for vehicles to be used as per this contract and in a specific region/area.
- Driver risk profiles must be submitted for every driver as per this Security Service Provider.
- Emergency Preparedness procedure with relevant contact details.
- Standard operating procedures per site to include the following but not limited to and should be approved by Eskom representative before application:
  - wearing of uniform standard
  - Communication procedure
  - Firearm handling procedure
  - Shift changes
  - Emergency Preparedness and Response process

## SAFETY REQUIREMENTS

- All vehicles utilized to transport staff, must be fitted with SABS approved seatbelts and in accordance with Eskom's safety standards.
- The Service provider is responsible to ensure that the security officers deployed at Ad-hoc sites have access to a shelter, water and sanitation.
- All Security officers should receive a safety induction before they can be deployed on Eskom sites.
- All Security Service providers to prevent further reoccurrences at any of the Eskom site, as per allocated timeframes, shall implement safety recommendations following an incident.
- Open fires, the use of bar heaters and hotplates as heaters at Eskom sites, is totally prohibited.
- Security officers should observe the provisions of the Criminal procedure Act and all relevant legislation regarding the use of minimum force. Security officers should at all-time use minimum force sufficient to bring the situation under control and such force shall cease as soon as the situation is brought under control. No deliberate assault on suspects will be condoned.

## **OPERATIONAL EQUIPMENT REQUIREMENTS**

- A list of equipment shall be fully specified as per sites requirements in the bill of quantities (BOQ). Eskom will provide specifications for mobile guard houses and facilities.
- Service providers must supply this on an “as and when” required basis.
- The specification will be determined per the task order. All vehicles must be equipped with a local global positioning system or any other vehicle tracking device or system.

## **MANPOWER REQUIREMENTS**

Manpower will be required on an as and when required basis. A task order stipulating the required number of security guards/officers will be provided on a monthly basis.

- No work is to commence before a task order with a SAP order number has been supplied to the Security Service Provider by Eskom and such task order by be duly signed off by both parties.
- No task order will be issued until Eskom is satisfied that all applicable training, legislative and stipulated requirements have been met.

## **SALARIES AND PAYMENTS**

Security Service Provider shall pay security guards/officers at least the minimum wage specified in the Sectorial Determination, of the Private Security Sector, South Africa. Register all security guards with the Department of Labour: UIF, COID and provident fund.

Eskom reserves the right to request proof of the above registrations on a monthly basis or as and when required. A PSIRA listing of all guards employed by the Security Service Provider and letter of good standing shall be provided on a monthly basis or as and when required.

## **UNIFORMS**

- The Security Service Provider must comply with legislative requirement (PSIRA Regulation 13). Uniform items must be kept in clean, neat and good condition at all times.
- Uniform must be functional in terms of the environment where security staff are deployed.
- Bullet proof vests shall be worn as part of uniform by all security officers. Only Eskom shall indicate exclusions to this rule for certain sites or posts as per the site risk assessments; if applicable.
- For obvious hygiene and safety reasons, each Security officer must be issued with his/her own bullet proof vest.

## **SCHEDULE OF DEFICIENCY AND PENALTIES:**

### **DEFIENCIENCY PENALTY**

- Security officer (SO) or dog not posted on duty as agreed upon. (Short posting) One shift cost deduction (per SO)
- SO intoxicated/ or under the influence of liquor or drugs. Permanent removal of SO from Eskom contract duties. Plus the cost of the entire shift.
- Refusal by SO to comply with lawful instruction. Permanent removal of SO from Eskom contract duties.
- Sleeping on duty. One shift cost deduction (entire shift)
- Desertion of post by SO One shift cost deduction (entire shift)

- Negligent by SO in the performance of their duties Permanent removal of SO from Eskom contract duties.
- SO late for duty (tantamount to short posting) One shift cost deduction (per SO)
- SO without a functional torch or spot light One shift cost deduction (entire shift)
- SO or site without a functional radio or PTT One shift cost deduction (entire shift)
- No functional panic button on site only for applicable sites One shift cost deduction (entire shift)
- SO not wearing bullet proof vest. Vests worn without plates and wearing of non-level 3 bullet proof vests will be deemed as no bullet proof vest was worn. One shift cost deduction (entire shift)
- Non submission of vehicle tracking reports Non payments of the total services (i.e. the cost for the SOs, vehicle and dog for the entire month)
- Non submission of site inspections reports by Crime prevention and response team. Non payments of the total services (i.e. the cost for the SOs, vehicle and dog for the entire month)
- Late reporting of patrol teams at designated reporting site. Total shift cost deduction (i.e. the cost for the SOs, vehicle and dog)
- SO not wearing proper uniform items or uniform is worn out. One shift cost deduction
- SO not in possession of a baton or hand-cuffs One shift cost deduction (entire shift)
- Unavailability of patrol teams on call out. Total shift cost deduction (i.e. the cost for the SOs, vehicle and dog)

**THE COMPANY MUST AGREE TO THE FOLLOWING:**

- Reliability checks by relevant National intelligence structures.
- Security screening of the companies Owners/CEO'S/Directors/Partners.
- Security Screening of Security Officials who will be working on the sub station
- Signing of declaration of secrecy by security officials
- Adherence to all internal Security policies and procedures of ESKOM
- Contract security officers must not be allowed to access IT networks registries, communication networks or any other sensitive/zoned sites
- Security officers must always present an acceptable image and appearances
- Agree on references checks
- The use of Polygraph Testing on guards if so required at the cost of the service provider.



### 4.3 Plant and Materials

#### 4.3.1 Quality

The *Contractor* shall control his activities and processes in accordance with Eskom's Quality Requirements for Procurement of Assets, Goods & Services, QM-58 and ISO-9001.

All materials shall be new and of the best quality and shall conform to the requirements of the Eskom Buyers Guide (Eskom Distribution Standard Part 9). With regards to the material supply chain, the approved materials manufacturer and marking requirements shall be set out on a schedule and approved before construction.

#### 4.3.2 Plant & Materials provided "free issue" by the *Employer*

The following Big five (5) materials will be supplied by Eskom ("Free issue"):

- 1) Transformers (Pole-mounted and other),
- 2) Poles,
- 3) Meters and Bases,
- 4) Conductors and Cables,
- 5) Airdac.

**Please note the contractor is accountable for all the material for the Project.**

***Materials supplied by Eskom, will be delivered to Contractor Site.***

The Delivery Driver and the Contractor shall sign the Goods Issue Document at delivery date as a declaration that;

- The quantities are correct as specified on the Good Issue Document
- The quality of material is acceptable
- Any discrepancies found shall be noted in the remarks column and co-signed by the Dispatch Controller and the Contractor

#### 4.3.3 *Contractor's* procurement of Plant and Materials

All material is to comply with the **latest** Eskom Approved Manufacturer's List as published in the Cape Coastal – Eastern Cape by the Eskom T&Q Department. Any non-standard material items are to be approved by Eskom Holdings Limited before use on the project. Acceptance sampling is to be carried out on receipt of material on site in order to inspect the outward condition of the material item.

In exceptional cases which require materials and/or techniques which are not contemplated in the various Distribution standards shall be approved by the nominated **Senior Engineer, Ralph Reddy, Phone No: 043-703 2294**. The written approval shall be submitted together with the tender.

The *Contractor* will be required to arrange a material sample inspection on site according to the requirements supplied by the PE. At this inspection materials will be recorded and approved per item by the PE, the Eskom PES and the T&Q Department. For any enquiries related to material inspection standards contact **Henry Jordaan No. 043 7035318**

#### 4.3.4 Spares and consumables

All hardware to be supplied by *Contractor* is to be as per Eskom Standards limited to Eskom's approval. All hardware and cost thereof shall be within the mandate that has been Eskom approved.

#### **4.4 Tests and inspections before delivery**

The *Contractor* will be required to arrange and supply the following:

**Material Sample Inspection:** - A sample of each material item is to be presented for an inspection by the Eskom T&Q Department. A 2 week notification period required.

#### **4.5 Marking Plant and Materials outside the Working Areas**

Where applicable. Subject to approval of the Clerk of Works.

#### **4.6 *Contractor's* Equipment (including temporary works).**

The *Contractor* is to provide the necessary equipment to complete the *Works* safely and by the *completion date*. (Refer to item 5.9)

#### **4.7 Cataloguing requirements by the *Contractor***

## 5 Construction

### 5.1 Temporary works, Site services & construction constraints

The contractor provides a secure and accessible area for the Site Camp, which includes secure storage facilities and areas, etc. The location of the site camp shall be determined in consultation with the *Project Manager*, local communities, and the relevant authorities.

The *Contractor* is to provide a 24 hour, 7 days a week, access and perimeter control unarmed security service from a reputable PSIRA registered security firm.

The *Contractor* when sourcing Security firms do as guided by information stated under **4.2 SUBCONTRACTING under 4.2.5 SECURITY OFFICER'S ON-SITE EQUIPMENT REQUIREMENTS**

On completion of the contract, the contractor removes the site camp and offices, and the area will be left in its original state to the satisfaction of the employer's representative and the Environmental Officer.

#### Site Establishment Costs

The *Contractor* shall take note that the total cost involved in establishing site services, facilities, and temporary works shall be incorporated in the Fixed and Time Related Preliminary & General costs part of the Bill of Quantity.

In situations where private roads must be used for construction purposes, the condition of the said roads shall be recorded (e.g. Photographed) prior to the use thereof and be agreed upon by the *Employer*, the *Landowner* and the *Contractor*. The *Contractor*, at all times at his expense, shall maintain all private roads used as access to the site of work by the *Contractor*. Upon completion of the work, the road shall be left in at least the condition it was prior to the commencement of the construction activities.

The Contractor should adhere to the Life Saving Rules at all times.

Due to the importance to save life's and apparatus of Eskom it is recommended that if a contractor abuse any Life Saving Rules, all work allocated to the contractor will immediately put on hold until final outcome with investigation. Safety is the combined responsibility of the team and therefore team leader or team **will** be punished together. There are five cardinal rules that may not be broken by the Team Leader and his/her team.

#### 5.1.1 Restrictions to access on Site, roads, walkways and barricades

Where possible, access along the power line must be established by utilizing existing tracks. Access roads shall only be constructed and maintained where necessary at watercourses, steep slopes or where boulders and rocks prohibit vehicular traffic. No access roads shall be constructed in and/or outside the power line servitude without the written instructions from the *Project Manager*.

#### 5.1.2 People restrictions on Site; hours of work, conduct and records

It is very important that the *Contractor* keeps records of his people on Site, including those of his Subcontractors which the *Project Manager* or *Supervisor* have access to at any time. These records will be needed when assessing compensation events.

### 5.1.3 Health and safety facilities on Site

The *Contractor* shall at all times adhere to the **Safety Health & Environmental Specification** attached in the Annexure of the contract document.

A Health & Safety Plan as well as the Health & Safety File as specified in the **Safety Health & Environmental Specification** must be kept on site and updated on a regular basis. Daily safety tailgate talks with task risk analysis shall be held and recorded to discuss the safety aspects and risks involved in the day's work to ensure safe operation throughout the contract period.

Health & Safety meetings shall be held at least once a month and records of minutes kept in the H&S file on site. The following items on the agenda to be discussed as a minimum requirement:

- Eskom Monthly Safety Theme – inform staff.
- Eskom Incident Case Studies and Recommendations
- OHS Act appointments – Updates, Validity, Expiry dates etc.
- PPE – issued and required.
- Safe Work procedures (Method Statements) – updates/changes
- Equipment – Inspection records updated
- Training requirements
- Staff Medicals
- Environmental issues

The *Contractor* shall not be **allowed to work on any “live” structures. All live structures are to be identified beforehand and shown to all the contractor’s staff – notification to be official recorded and kept in the SHE file on site.**

The *Contractor* shall not be **allowed to leave any excavation open** without supervision. If foundations cannot be planted on the same day of the excavation, holes are to be closed over the night period or full time security guard to be arranged.

Machinery that can encroach on the safe working clearances with regard to live lines and equipment, are not to be operated within nine metres of live reticulation lines, without the direct supervision of a qualified supervisor under the *Employer’s* HV Regulations and the OHS Act.

### Precautions against Damage

The *Contractor* shall take precautions for the protection of life and property on, or about, or in connection with the contract. The *Contractor* shall be held liable for any damage arising from negligence on the part of himself and his employees. The *Contractor* will ensure that excavations are done carefully as per the construction drawings. The damages occurring during any required excavations will be for the contractor's risk, and must therefore be repaired by the contractor.

Protection of the environment should at all times be adhered to.

### Customer & Client liaison

The contractor will ensure that all required outages be communicated to the *Project Manager* and that the necessary outage requests are tabled for approval at the Monthly Outage meetings of the applicable area.

### 5.1.4 Environmental controls, fauna & flora, dealing with objects of historical interest

The *Contractor* shall at all times adhere to the **Environmental Management Programme (EMP) and all referenced documents referred to in Section 2.4.**

No fences, gates or locks may be damaged to obtain access onto a line route. Arrangements must be made in advance to obtain permission for access.

Use of private roads must be arranged in advance. Any damage to private roads must be repaired at the contractor's expense and to the satisfaction of the landowner.

No fires may be lit on private property. If fires are lit on Eskom's property or in the construction camp, provision must be made that no accidental fires are started. No firewood may be collected in the veld.

No trees may be cut or removed without prior permission from the landowner. Permits shall be obtained for protected trees (protected trees shall be dealt with in special conditions)

#### **5.1.5 Title to materials from demolition and excavation**

The *Contractor* has no such title. All equipment and materials dismantled to be stored inside the *Contractor's* site camp. Disposal of this equipment and materials to be liaise with the **Asset Disposal Officer – Regeba Kamroodeen at 031 710 5674.**

#### **5.1.6 Cooperating with and obtaining acceptance of Others**

The *Contractor* is responsible to ensure that the landowners and/or local authority have been informed before any work is carried out on site. It is also the *Contractor's* responsibility to maintain a good relationship with the landowners and to ensure that the following procedures are in place:

- 1) Access arrangements to the property
- 2) Allowable construction times on the property to be agreed and documented

#### **5.1.7 Publicity and progress photographs**

Photographs can be captured to provide evidence with supporting documentation where applicable. These photographs shall have date and time stamps to be eligible for use.

#### **5.1.8 *Contractor's* Equipment**

The *Contractor* is to provide equipment necessary to complete the *Works* safely and by the *completion date*. An equipment asset register is to be kept on site record is to be kept on site.

#### **5.1.9 Equipment provided by the *Employer***

As stated on the Bill of Quantity

#### **5.1.10 Site services and facilities**

The *Contractor* shall provide on *Site* a minimum of one well illuminated, insulated and ventilated *site* office for utilisation by the *Employer / Project Manager* or their representatives. This *site* office shall have as a minimum the following:

- A Suitable water supply and sanitary facilities (chemical toilet).
- First aid facilities
- Telecommunication facilities (down loading of electronic communications and printing of it)
- Access to Eskom website to download latest information.
- 1 x Table, 10 x chairs required and a suitable office required to hold a site meeting.
- Site diary.

#### **5.1.11 Facilities provided by the *Contractor***

##### **Material Storage Area**

The *Contractor* shall provide a secure fenced-in yard for the whole of the contract period. Storage facilities must be of such a nature that all the *Contractors* materials, including free issue materials (Employers materials) are safe from theft, fire hazards and vandalism. Fire breaks around the storage area, and fire-fighting equipment must be in accordance with the OHS Act, and of sufficient capacity to ensure the security of stored materials.

#### **5.1.12 Existing premises, inspection of adjoining properties and checking work of Others**

To be negotiated and agreed with the approval of the community liaison officer where applicable.

#### **5.1.13 Survey control and setting out of the *works***

N/a

#### **5.1.14 Excavations and associated water control**

Keep excavations free from water.

#### **5.1.15 Underground services, other existing services, cable and pipe trenches and covers**

The *Contractor* shall be held liable for any damages caused during construction to existing services such as, underground water pipes, electrical cables, telecommunication cables, overhead lines, storm water pipes and existing roads.

It is the responsibility of the *Contractor* to contact the landowner and/or local authority to determine the position of such services to prevent any damages.

#### **5.1.16 Control of noise, dust, water and waste**

The *Contractor* shall within reason try and keep noise levels, dust and wastage to a minimum.

#### **5.1.17 Sequences of construction or installation**

As per the approved construction programme and in conjunction with the Quality Control Plan.

#### **5.1.18 Giving notice of work to be covered up**

The Project Manager/Clerk of Works shall always be notified.

#### **5.1.19 Hook ups to existing works**

As per approved FDP. All safety requirements shall be observed.

## 5.2 Completion, testing, commissioning and correction of Defects

### 5.2.1 Work to be done by the Completion Date

On or before the Completion Date the *Contractor* shall have done everything required to Provide the Works except for the work listed below which may be done after the Completion Date but in any case before the dates stated. The *Project Manager* cannot certify Completion until all the work except that listed below has been done and is also free of Defects which would have, in his opinion, prevented the *Employer* from using the *works* and Others from doing their work.

|  | Item of work                                                                                              | To be completed by                    |
|--|-----------------------------------------------------------------------------------------------------------|---------------------------------------|
|  | As built drawings of                                                                                      | Within _____ days after Completion    |
|  | Performance testing of the <i>works</i> in use as specified in paragraph _____ of this Works Information. | See performance testing requirements. |
|  |                                                                                                           |                                       |

The whole of the *Works* as described by the *Works Information* of this contract and in the Final Design package shall be completed on or before the *Completion Date*. Completion includes the completion and submission of hand-over documentation, as-built drawings, and completed defect lists. The *Contractor* pays delay damages for late completion in terms of the *Conditions of Contract*. Should the Contractor receive 3 non-conformances, preventative actions and corrective actions, Eskom reserves the right to terminate the contract.

### Outages & Commissioning

The contractor will prepare the scope of works required for the planned outage at each stage before the outage date. On the day of the outage, the required scope of work at this point is to be completed, checked and handed over to the CNC with the required handover documentation.

### 5.2.2 Use of the *works* before Completion has been certified

The *Contractor* will have to carry out the supervision of the installations, as per the instruction of the *Project Manager* then a *Sectional completion Certificate* shall be issued to the *Contractor*.

### 5.2.3 Materials facilities and samples for tests and inspections

From time to time random sample test and inspections may be requested, to ensure good quality of the goods being supplied

### 5.2.4 Commissioning

Commissioning is to be done before or after Completion depending on the Programme.

### 5.2.5 Start-up procedures required to put the *works* into operation

In order to put the *works* into operation the *Project Manager* may require the *Contractor* to either do this for him or be in attendance whilst he does it, depending on who is the responsible person.

#### **5.2.6 Take over procedures.**

Take-over is after or at the same time as Completion. The *Contractor* is to arrange an inspection before completion of the installation to inspect and identify any outstanding or any defects. The *Project Manager* may require the *Contractor* to provide assistance, on an as and when required basis.

#### **5.2.7 Access given by the *Employer* for correction of Defects**

After the *works* have been put into operation, the *Employer* may require the *Contractor* to undertake certain procedures before such access can be granted

#### **5.2.8 Performance tests after Completion**

The *Contractor* will perform all tests required to bring the asset to service.

#### **5.2.9 Training and technology transfer**

The *Employer* requires the *Contractor* to provide training on the use of the access control or any associated transfer of technology from him to the *Employer*.

#### **5.2.10 Operational maintenance after Completion**

The *Employer* may require the *Contractor* before the *defects date* to perform certain duties after Completion and take over which relate to maintenance of the *works*.



## **6 Plant and Materials standards and workmanship**

### **6.1 Investigation, survey and Site clearance**

Some contracts may require the *Contractor* to carry out further investigation of existing facilities or of the Site before commencing final design.

### **6.2 Building works**

N/a

### **6.3 Civil engineering and structural works**

N/a



## C3.2 *CONTRACTOR'S* WORKS INFORMATION

This section of the Works Information will always be contract specific depending on the nature of the *works*. It is most likely to be required for design and construct contracts where the tendering contractor will have proposed specifications and schedules for items of Plant and Materials and workmanship, which once accepted by the *Employer* prior to award of contract now become obligations of the *Contractor* per core clause 20.1.

Typical sub headings could be

- a) *Contractor's* design
- b) Plant and Materials specifications and schedules
- c) Other

This section could also be compiled as a separate file.

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## PART 4: SITE INFORMATION

| Document reference | Title                 | No of pages |
|--------------------|-----------------------|-------------|
| C4                 | This cover page       | [01]        |
|                    | Site Information      | [01]        |
|                    | Total number of pages | [02]        |

## PART 4: SITE INFORMATION

Core clause 11.2(16) states

“Site Information is information which

- describes the Site and its surroundings and
- is in the documents which the Contract Data states it is in.”

In Contract Data, reference has been made to this Part 4 of the contract for the location of Site Information.

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### 1. General description

Full details will be specified in the Final Design Package

### 2. Existing buildings, structures, and plant & machinery on the Site

Some of the existing infrastructure is indicated on layout drawings provided. Though it is the *Contractor's* responsibility, to familiarise himself with all existing infrastructure in and around the working place.

### 3. Subsoil information

All excavations and associated soil information are described under the Works information and Bill of Quantities. No geotechnical study or report provided.

### 4. Hidden services

In the event of a discrepancy between physical condition and the information on a drawing, the *Contractor* shall notify the *Project Manager* immediately if the physical condition found on *site* is such that the deviation from the drawing requires a change in the design of the *works*.

## **PART 5: ANNEXURES**

### **C5 Annexures**

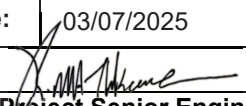
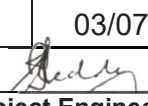
GENERAL SPECIFICATIONS

| NO  | REFERENCE NUMBER         | R E V. | TITLE                                                                                                                            | TYPE *SPEC/PF    | ATTACHED YES/NO |
|-----|--------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------|------------------|-----------------|
| A1  | PFMA 1 of 1999           |        | Public Finance Management Act                                                                                                    |                  | No              |
|     |                          |        |                                                                                                                                  |                  |                 |
| A2  | OHS Act. 85 of 1993      |        | <b><u>Integrated Risk Management - Safety</u></b><br>Occupational Health and Safety Act                                          | SPEC             | No              |
| A3  | COID 130 of 1993         |        | Compensation Health and Safety Act                                                                                               |                  |                 |
| A4  | SCSAMAAE4                | 0      | Safety Risk Management Process Manual                                                                                            | Manual           | No              |
| A5  | SCSPVABM9                | 0      | Co-Ordination of safety on capital projects                                                                                      | Procedure        | No              |
| A6  | SCSASAAW8                | 4      | Standards applicable for Contractors working in close proximity to live apparatus                                                | Standard         | No              |
| A7  | 32-136                   | 0      | Contractor Health and Safety Requirements                                                                                        | SPEC             | YES             |
| A8  | SCSPVACK0                | 0      | Identifying, analyzing, documenting and observing dangerous/hazardous tasks.                                                     | Procedure        | No              |
| A9  | SCSPVACU1                | 1      | Pres-Task Planning and Feedback process                                                                                          | Procedure        | No              |
| A10 | SCSPVABP6                | 1      | Procedure for refusal to work on the grounds of health, safety and environmental concerns.                                       | Procedure        | No              |
| A11 | 34-350                   | 0      | Reporting, recording, investigating, costing and follow-up of incident/accidents.                                                | Procedure        | No              |
| A12 | 34-332                   | 0      | First Aid Standard                                                                                                               | Standard         | No              |
| A13 | ESKPVAEY6                | 0      | Operating Regulations for High Voltage Systems                                                                                   | Procedure        | No              |
| A14 | 34-163                   | 1      | Portfolio of evidence for Authorisation                                                                                          | Guide            | No              |
| A15 | NWS 1494                 |        | Fire Prevention and Protection of Contractor's Premises on New Work Sites                                                        | SPEC             | No              |
|     |                          |        |                                                                                                                                  |                  |                 |
|     |                          |        | <b><u>Operational</u></b>                                                                                                        |                  |                 |
| A16 | ESKARAAG4                | 6      | Operating Regulations for High Voltage Systems                                                                                   | Procedure        | No              |
| A17 | SCSPVABN2                | 0      | Training, Testing and Authorization of persons for the operating and maintenance of the Power System                             | SPEC             | No              |
| A18 | SCSAMAAE5                | 1      | The training logbooks for Authorization of persons working on high voltage systems.                                              | SPEC             | No              |
| A19 | SCSAAAR0                 |        | GUIDE FOR THE STORAGE, TRANSPORT AND HANDLING OF COMPOSITE INSULATORS                                                            | Guide            | No              |
| A20 | ESKASAAU7                | 0      | Quality Requirements for the procurement of Assets, Goods and Services.                                                          | Standard         | No              |
| A21 | SCSAGAAW2                | 0      | Building line restrictions, servitudes widths, line separations and clearances from power lines                                  | Guide            | No              |
| A22 | DISPVABY3                | 0      | Procedure for handling Auditing and stacking of new wooden poles                                                                 | Procedure        | No.             |
| A23 | DISPVAB17                | 1      | Procedure for manual handling of rural line poles.                                                                               | Standard         | No              |
| A24 | ESKASABG3                | 1      | Standards for bush clearance and maintenance within overhead powerline servitudes                                                | Standard         | No              |
| A25 | SCSSCAAY5                | 2      | Specifications for phase conductor for distribution lines (See 4.6 Conductor markings)                                           | SPEC             | No              |
| A26 | DISADABQ9                |        | Access to farms                                                                                                                  | Guide            | No.             |
|     |                          |        |                                                                                                                                  |                  |                 |
|     |                          |        | <b><u>Contractor Site Requirements</u></b>                                                                                       |                  |                 |
| A27 | STR103/2006<br>10 TI-012 |        | Transporting person on back of vehicles<br>Prohibition of transportation of employees in crew cabs mounted on the back of trucks | Technical Instr. | No              |
| A28 | Work Instruction         |        | Expanded Public Works Report – Divisional Capital Programme & Manhour Report                                                     |                  | No              |
| A29 |                          |        | Eskom Distribution Standard including all Technical Bulletins issued till Tender Issue date                                      | SPEC             | No              |
| A30 |                          |        | Electrical Clearances and Safe Working Clearances                                                                                | SPEC             | No              |
| A31 |                          |        | Tax Declaration and Tax Clearance                                                                                                | SPEC             | No              |
| A32 |                          |        | Section 28 of the National Environmental Management Act 10 of 1998                                                               | SPEC             | No              |

|            |  |          |                                                                                                                      |             |            |
|------------|--|----------|----------------------------------------------------------------------------------------------------------------------|-------------|------------|
|            |  |          |                                                                                                                      |             |            |
|            |  |          | <b><u>Project Specific Documentation:</u></b>                                                                        |             |            |
| <b>A33</b> |  | <b>0</b> | <b>Final Design Package &amp; drawings – will be provided electronically at tender clarification meeting</b>         | <b>FDP</b>  | <b>Yes</b> |
| <b>A34</b> |  | <b>0</b> | <b>Environmental Documents:</b> <ul style="list-style-type: none"><li><b>ENVIRONMENTAL MANAGEMENT PLAN</b></li></ul> | <b>SPEC</b> | <b>Yes</b> |
| <b>A35</b> |  | <b>0</b> | <b>SHE SPECIFICATION FOR SUBSTATION PROJECTS</b>                                                                     | <b>SPEC</b> | <b>Yes</b> |

Eskom Holdings Limited's Standard and Specifications are available at [www.eskom.co.za](http://www.eskom.co.za) and all Procurement offices.



|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                               |                                                                                     |                                  |                                                                                       |              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|----------------------------------|---------------------------------------------------------------------------------------|--------------|
| <br><b>Eskom</b><br>Distribution<br><br>CAPE COASTAL<br>CLUSTER<br>NETWORK<br>ENGINEERING AND<br>DESIGN                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <b>TYPE B: SUB-TRANSMISSION HV LINE</b><br><b>FINAL DESIGN PACKAGE (OPGW)</b> |                                                                                     |                                  |                                                                                       |              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Project Title:                                                                | Ruigtevallei - Dreunberg 132kV Line                                                 | Rev.                             | 0                                                                                     |              |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Project No.                                                                   | C.DS01146                                                                           |                                  |                                                                                       |              |
| <b>1.1.1.1 PROJECT OVERVIEW</b><br><p>The section of the line between structure RUT-DRN 1 – 59 and RUT-DRN 344 – 367 has been partially constructed. The contractor is required to complete the portion of the optical ground wire on the line from structure RUT-DRN 59 – 344, including testing the already installed OPGW cable.</p> <p>The Ruigtevallei - Dreunberg 132kV Line will be constructed with monopole structures, Chickadee conductor and fully fitted with OPGW system.</p>                                                                                                                                                                                                                                                               |                                                                               |                                                                                     |                                  |                                                                                       |              |
| Compiled By                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                               | Checked By                                                                          |                                  | Approved by                                                                           |              |
| Name:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Blessing Sifiso Mayeza                                                        | Name:                                                                               | Kabelo Matlhakoane               | Name:                                                                                 | Ralph Reddy  |
| Tel:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 043 703 2172                                                                  | Tel:                                                                                | 043 703 2283                     | Tel:                                                                                  | 043 703 2294 |
| Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 03/07/2025                                                                    | Date:                                                                               | 03/07/2025                       | Date:                                                                                 | 03/07/2025   |
|                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                                                                               |  |                                  |  |              |
| Project Engineer                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                                                               | Project Senior Engineer                                                             |                                  | Project Engineering Manager                                                           |              |
| <b>Design Package Handing Over Certificate</b><br><p>Herewith all the applicable design documentation and drawings. The design package is a comprehensive document complete with; Scope of Works, Technical Specifications, Bill of Material, and other relevant documentation. The Design Package provides the Capital Program Office with sufficient information to successfully implement this project.</p> <p>Signing of the Design Package Handover Certificate will confirm the completion of the Design Phase of the project and the receipt of the complete design outputs as requested. Further we trust that this design package will be formally handed over to each discipline. (Please note that no additional copies will be provided).</p> |                                                                               |                                                                                     |                                  |                                                                                       |              |
| Handed Over from Network Engineering Design                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                               |                                                                                     | Received by Programme Management |                                                                                       |              |
| Name:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Ralph Reddy                                                                   |                                                                                     | Name:                            | Khush Maqokolo                                                                        |              |
| Tel:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | 043 703 2294                                                                  |                                                                                     | Tel:                             | 043 703 2744                                                                          |              |
| Date:                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |                                                                               |                                                                                     | Date:                            |                                                                                       |              |
| Project Engineering Manager                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                               |                                                                                     | Project Manager                  |                                                                                       |              |

|                                                                                   |                                            |
|-----------------------------------------------------------------------------------|--------------------------------------------|
|  | <b>Cape Coastal Cluster</b>                |
|                                                                                   | <b>Final Design Package (FDP)</b>          |
|                                                                                   | <b>Index Cover Sheet</b>                   |
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| <b>Job ID</b>                                                                     |                                            |
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## **Design Philosophy**

# **1. Design Philosophy**

## **1.1 Executive Summary/Motivation**

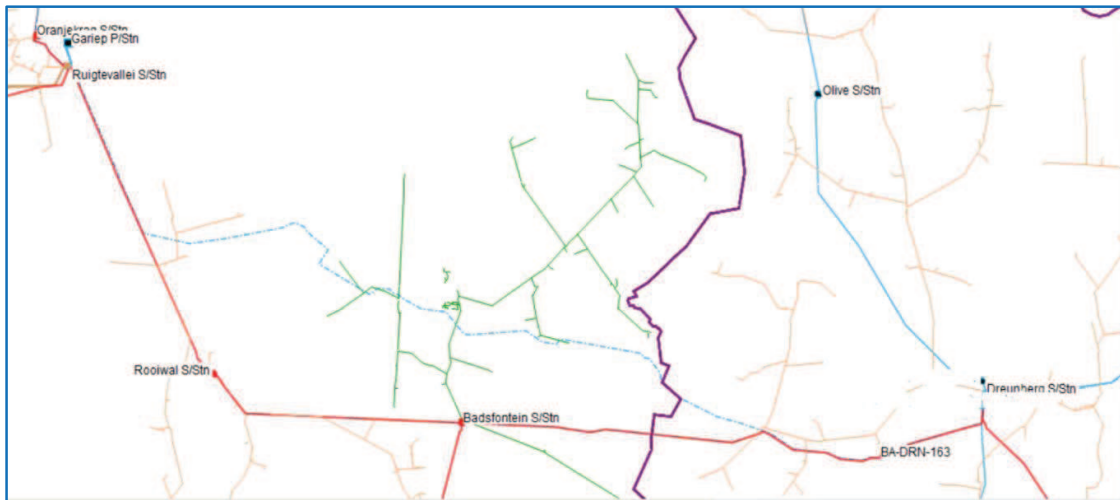
The Hydra 400/220kV trfrs are unfirm. The Hydra/Ruigtevallei 1 220kV line is performing poorly as it is constructed for 132kV operation. The Ruigtevallei/Valleydora 132kV line overloads during an outage on one of the Hydra/Ruigtevallei 220kV lines. The Ruigtevallei/Valleydora 132kV line also overloads during max generation at Gariep PS. There are high network losses on the Ruigtevallei/Valleydora 132kV line. Supply to Dreunberg s/s is non-firm (not meeting reliability criteria). The preferred solution is to build a 132kV line between Ruigtevallei and Dreunberg substations and downrate the Hydra/Ruigtevallei 1 220kV line to 132kV operation.

This document presents the design of the 132kV line between Ruigtevallei and Dreunberg substations. The section of the line between structure 1 – 59 and 344 – 367 has been built using Chickadee conductor, which covers  $\pm 35\text{km}$  of the line. It is required to build the remaining  $\pm 50\text{km}$  132kV line between Ruigtevallei and Dreunberg substations using Chickadee conductor fully fitted with OPGW system. The line will be constructed using monopole structures.

This project shall be carried out in full accordance with this Detailed Technical Specification, referred Eskom Specifications and the relevant drawings and documentation provided by Eskom. All work shall be carried out in strict accordance with TRMSCAAC 6: the standard for the construction of overhead powerlines SANS 1200 series of documents and Eskom Standards.

## 1.2 132kV Network Diagram

The 132kV Network Diagram is as given in Figure 1 below.



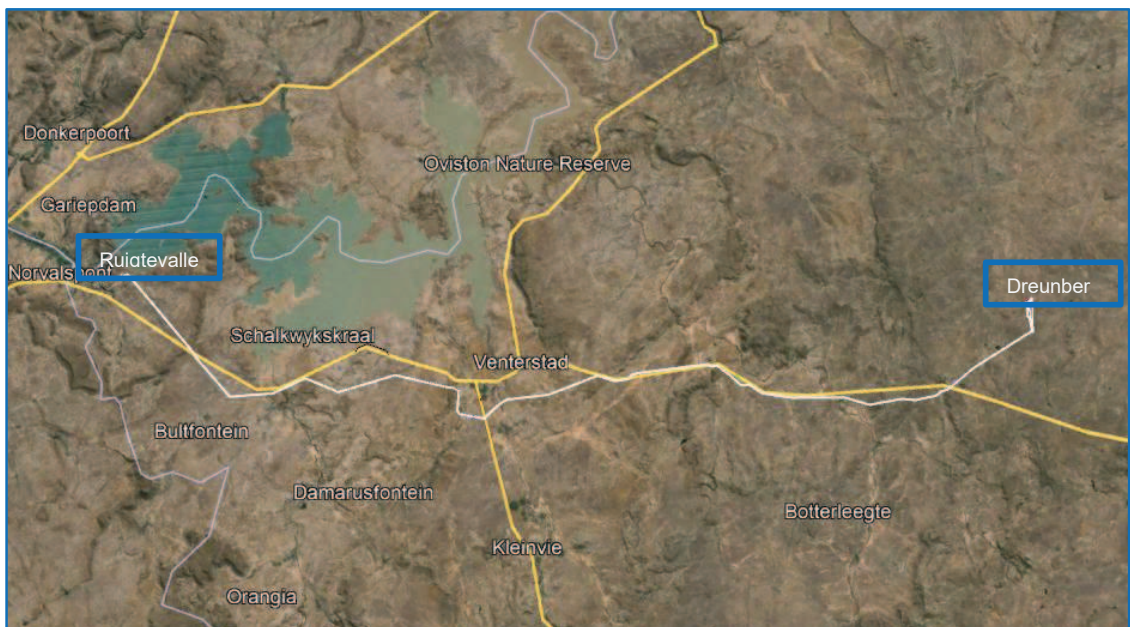
**Figure 1:** 132kV Network diagram

### Powerline Route

The shortest route was selected for the 132kV line rerouting while taking constructability, access, environmental impact and multiple 22kV lines into consideration.

The line runs in privately owned farms along Gariep, Venterstad and Kaffelskraal area.

The site is situated in a remote area with a few existing access tracks within the construction area to access the structures. **Figure 2** below shows the aerial view of the approved line route for the Ruigtevallei – Dreunberg 132kV line.



**Figure 2:** Approved line route for the line between Ruigtevallei and Dreunberg Substation

Access to work on the line is provided in terms of the “Deed of Servitude” or “Permission to Occupy” in respect of each property. However, the contractor shall visit and advise each property owner of the proposed activities prior to any work commencing. The contractor shall maintain an accurate record (nature and extent) of all damages to crops and other physical features. Where required, a schedule shall be compiled indicating the following details:

- Date of damage
- An accurate area of measurement of the damage
- The signature of the land owner/farm manager agreeing to the measurement of the damaged area

The above mentioned schedule of damages must be submitted to Project Management.

### 1.3 Scope of Works

The line is to be built from a combination of D-DT-7645 (Angle and Inline Strain), D-DT-7649 (Suspension) and D-DT-7618 (Terminal) monopole structures. The slack span from the terminal structures positioned outside the substation terminates on to the gantry located within the substation.

The contractor must **install, test and commission** the **OPGW system** on all parts (from Str. RUT – DRN – 1 to Str. RUT – DRN – 367) of the line, and seamlessly connect to each structure earthing system and substation Gantry. The contractor needs to collect hardware/structures, insulators and OPGW drums from Riebeek Substation (30°45'25.02"S, 27°8'1.187"E), ESKOM Colesberg CNC (30°42'59.86"S, 25°7'42.03"E) and ESKOM Colesberg Warehouse (30°43'10.29"S, 25° 7'56.24"E).

Install aviation spheres between:-

- Str. RUT-DRN-1 and RUT-DRN-11,
- Str. RUT-DRN-75 and RUT-DRN-80.

Install bird flight diverters between:-

- Str. RUT-DRN-11 and RUT-DRN-75,
- Str. RUT-DRN-80 and RUT-DRN-84,
- Str. RUT-DRN-94 and RUT-DRN-120,
- Str. RUT-DRN-135 and RUT-DRN-167,
- Str. RUT-DRN-172 and RUT-DRN-194,
- Str. RUT-DRN-230 and RUT-DRN-234,
- Str. RUT-DRN-237 and RUT-DRN-245;
- Str. RUT-DRN-252 and RUT-DRN-257,
- Str. RUT-DRN-261 and RUT-DRN-272,
- Str. RUT-DRN-277 and RUT-DRN-286,
- Str. RUT-DRN-302 and RUT-DRN-310,
- Str. RUT-DRN-314 and RUT-DRN-327,
- as well as between Str. RUT-DRN-331 and RUT-DRN-344, as per Eskom standard **240-93563150**.

## 1.4 Conductor

### 1.4.1 Ruigtevallei – Dreunberg 132kV Line

- i) The existing Ruigtevallei – Dreunberg 132kV line is built using “Chickadee” ACSR phase conductor.
- ii) The physical characteristics of Chickadee conductor are as follows:
  - Overall Diameter – 18.87 mm
  - UTS – 44.90 kN
  - Current carrying capacity @ 70° - 625 A

### 1.4.2 Ruigtevallei – Dreunberg 132kV Line

- iii) The 24 core optic fibre greased OPGW with a fault rating of 12kA (Str. RUT-DRN-1 & Str. RUT-DRN-150) and 5 kA (Str. RUT-DRN-150 & Str. RUT-DRN-367) shall be used as the shield wire.
- iv) The physical characteristics of 5kA OPGW are as follows:
  - Number of Fibres - 24
  - Number of tubes ~ active – 1
  - Cable – Weight - 444
  - Overall Diameter – 11.5 mm
- v) The physical characteristics of 12kA OPGW are as follows:
  - Number of Fibres - 24
  - Number of tubes ~ active – 1
  - Cable – Weight - 461
  - Overall Diameter – 15mm

## 1.5 Earthing

The earthing of the overhead line consists of the following:

- Structure earthing.
- OPGW earth wire/Shield wire; and
- Steel rope shield wires at closings spans and direct, underground copper connections to substation gantries.

The earthing of the overhead line is designed with reference to Eskom standard **240-75880946** Rev 2. OPGW terminations should be done as indicated on **240-46264031**.

The structure footing resistance must be measured for all structures and if any structures have more than 20 Ohms, the concerned structure shall be further earthed in strict accordance to Eskom's



earthing standard: **240-75880946**. The terminal shall be bonded to the main substation earthmat using a bonding strap.

Tests shall be undertaken prior to the installation of the shield wire/OPGW in accordance with Eskom standard **240-75880946** Rev 2. If the test results confirm the need for supplementary earth electrodes, then threepoint star (crow's foot), or counterpoise earth electrodes will be installed at the relevant structures. The earth electrode will be fabricated from annealed copper bars and be connected to the structure via the dedicated lug point. Straps and leads must be installed such that it is concealed, thus preventing theft.

## 1.6 Insulators

The regions is classified as very heavy pollution, hence insulators with 31 mm/kV creepage shall be used. Long rod 120kN insulators with 31mm/kV creepage distance to be used on strains and suspension structures. Suspension structures will also use Long rod insulators which must also be fitted with drop eyes and all associated hard wares as well as AGS units.

## 1.7 Fitting of Vibration Dampers and Bird Diverters

Vibration dampers are to be fitted in accordance with the referred specification **240-98155879**. Multi frequency Vibration Dampers are to be fitted to all phase conductors that is on all conductors. The earth wire or OPGW to be fitted with spiral vibration dampers; each damper to be installed exactly one hand width (across the knuckles = 10cm) from end of hardware and if more than a set dampers to be used the spacing must also be one hand width from each other. See on project Staking table for the number of dampers in this line in relation to the span length and damper types.

### SPIRAL

| MAX SPAN (m) | QTY | No. of Sets |
|--------------|-----|-------------|
| 250          | 2   | 1           |
| 500          | 4   | 2           |
| 751          | 6   | 3           |
| 752          | 8   | 4           |

### M/F - Dogbone

| Loop Length - 2.16m |     |             | Loop Length | Damper Placement |
|---------------------|-----|-------------|-------------|------------------|
| MAXSPAN (m)         | QTY | No. of Sets | Multiplier  | From Damper (m)  |
| 370                 | 2   | 1           | 0.7         | 0                |
| 550                 | 4   | 2           | 0.6         | 0                |
| 730                 | 6   | 3           | 0.9         | 0                |
| 1000                | 8   | 4           | 1.2         | 0                |
| 1250                | 10  | 5           | 1.5         | 0                |
| 1500                | 12  | 6           | 1.8         | 0                |

## 1.8 Structures

The powerline is designed using ESKOM approved self supporting monopole suspension structures (**D-DT-7649**), angle strain monopole structures (**D-DT-7645**) and triple pole structures (**D-ECOU-7618**) designed to suit the particular line deviation angle. Figure-3 shows a typical self supporting suspension monopole structure. Planted pole design is used for all intermediate structures. Figure-4 shows a typical angle strain monopole structure used in the design. Figure-5 shows a typical triple monopole structures used in the design. Table 1 below specifies the list of structures that will be used on the specified area to be worked in the Ruigtevallei – Dreunberg 132kV Line and the portion of the Dreunberg – Melkspruit 132kV Line.

**Table 1: Ruigtevallei – Dreunberg and Dreunberg - Melkspruit Substation 132kV Line structure list**

| Structure List                                    |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|---------------------------------------------------|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| PROJECT NAME: Ruigtevallei - Dreunberg 132kV Line |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Job ID                                            |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Gantry                                            |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Corresponding to Line Profile                     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Intermediates / Suspension                        |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Corresponding to Line Profile                     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Str Type                                          | Qty | Structure number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 7649                                              | 288 | 4,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21,22,23,25,26,27,28,29,30,31,32,33,34,35,36,37,39,42,43,44,45,46,47,48,49,50,51,52,53,54,55,56,57,58,60,61,62,63,64,65,66,67,69,70,71,72,73,75,76,77,79,81,82,83,84,85,86,88,89,91,92,93,96,97,99,100,101,102,103,104,105,106,108,109,110,111,112,113,114,115,116,118,119,120,121,122,123,124,125,126,127,128,129,130,131,132,133,134,136,139,140,142,143,144,146,148,151,152,153,154,155,157,158,159,160,161,163,165,168,169,170,171,172,174,175,176,177,178,180,181,183,184,185,186,187,188,189,190,191,192,193,194,195,197,198,200,201,202,204,205,206,207,209,211,213,214,215,216,217,218,220,221,222,223,224,225,226,227,228,229,230,231,233,234,239,240,241,242,243,245,246,247,248,250,251,253,255,256,258,259,260,261,262,263,264,265,266,267,269,270,271,272,273,274,276,277,278,279,280,281,282,283,284,286,287,288,289,290,291,292,294,295,296,297,298,299,300,301,304,305,306,307,309,310,311,312,313,314,316,317,322,323,324,325,326,327 |
| Total:                                            | 288 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Strains                                           |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Corresponding to Line Profile                     |     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Str Type                                          | Qty | Structure number                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| 7645                                              | 76  | 1,2,3,5,6,12,24,26,30,31,59,63,74,78,80,87,90,94,95,96,107,117,135,137,138,141,145,147,149,150,156,162,164,166,167,173,179,182,196,199,203,208,210,212,219,232,235,236,237,238,244,249,252,254,257,268,275,285,293,302,303,308,315,318,319,320,321,331,342,353,357,358,359,360,361,364                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| 7618                                              | 1   | RUT-DRN 366                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| 7818                                              | 2   | RUT-DRN RUT-DRN 365, RUT-DRN 367                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Total:                                            | 79  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Total Intermediate structures:                    |     | 288                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Total Strain structures:                          |     | 79                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| TOTAL STRUCTURES:                                 |     | 367                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|                                                   |     | Ratio                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|                                                   |     | 0.784741144                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|                                                   |     | 0.215258856                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |

### **1.8.1 Monopole suspension structure D-DT-7649.**



**Figure 3: Self supporting monopole suspension structures (D-DT-7649)**

Self-supporting monopoles will be used along the line.

### **1.8.2 Angle strain monopole structures D-DT-7645**

Strain monopole will be used as at angle.



**Figure 4 : Guyed monopole strain structure (D-DT-7645)**



**Figure-5 : Steel Trips monopole strain structure (D-DT-7618)**

NB: Prospective contractors should note for all poles for the Steel Trips monopole strain structures (**D-DT-7618**) required for the 132kV line should have an equal height (18m poles) with tie strap.

All structures used on this line belong to the Distribution Technology and Line Engineering Services (LES) and the designer has no design influence over them whatsoever and therefore takes no responsibility when the structure fails. However, all precautionary measures have been taken to ensure responsible design. The contractor must also adhere to proper construction principle. Important care must be exercised in terms of stay orientation and should the contractor be uncertain, he should request clarity from Network Engineering and Design.

## **1.9 Foundation**

The contractor will be accountable for nominating the correct soil and foundation types for the specific structures. On completion of the required soil nominations, the foundation drawings for the soil type shall be obtained from the Eskom Project Manager. The contractor shall compile a schedule indicating the specific foundation type for each tower and submitted to Eskom's Project Engineer for approval prior to any foundation work commencing.

The contractor shall appoint a Civil Engineer. A geotechnical survey specialist (preferably a Civil Engineer), should be consulted on all foundation matters, irrespective of what construction route has been taken. The Civil Engineer appointed shall take responsibility for all civil works or the contractor with this type of competence can provide this service. The civil engineer shall advise the Project Engineer and the contractor with respect to soil erosion and mitigation thereof. A geotechnical design report and

DCP results shall be compiled and submitted to Project Engineering once the studies have been conducted to form part of this document and it is the project manager's duty to ensure this happens.

### **1.10 Stays**

The permanent stays are stays which form a coherent part of the structure and must keep the structure upright for the entire life span of the line. Whereas the temporary stay is a typical stay used for temporary purposes during the stringing of the line. Typically the temporary stay will be used on the strain to give it a temporary support to ensure the pole will take the longitudinal load induced by conductor being tensioned (strung).

Where required, it is expected that such temporary stays will be connected directly opposite to the conductor being strung and it can either be two stays or one per phase conductor depending on the angle of deviation. The load balancing the temporary stay must take into account safety factors or else if foundations are used proper permanent stay foundation installation principles must be adhered to. The 120kN UTS stay cable shall always be used to avoid issues of incorrect load calculations and omission of a use of safety factor. Stay construction is to be done in accordance with **240-75883148**.

### **1.11 Execution Plan**

Contractor to submit Execution Plan to the Eskom Project Manager for approval in the form of method statements prior executing the construction activities.

### **1.12 Dismantling and Re-configuration Existing line**

Dismantle and remove the existing line from **Str. 2DRN-MLK 1A** upto gantry. Plant a new steel structure as per stacking table and terminate conductor, and shield wire. Dismantle bases near Str. **RUI-DRN 87**. Replace damaged bases for Str. **RUI-DRN 135 and RUI-DRN 136**.

All decommissioned material shall be collected and stacked at the site camp. The decommissioned material should be sorted and stored separately according to the different type of material removed from the line, e.g. glass insulator, silicone insulators, aluminium, steel, wood etc.

### **1.13 Construction Notes**

- The construction shall take place in accordance to the Eskom standard for construction of overhead power lines "TRMSCAAC6"
- Prior outage work must be prepared and carried out as such. Site establishment, site access work & access permission requests, land owner engagement, possible excavation and laying of foundations, assembling of steel poles etc. shall be done as much and as soon as possible to reduce and minimize outage time.

- Engagements with farmers and land owner should be done prior and in advance to avoid challenges that could put the project in jeopardy. Such areas shall be identified and pro-active action to be taken.
- Where the lines are crossing; all safety measures to be taken in carrying out the work (special reference shall be made to **Eskom Standard: Unique Identifier: 34-600**).

### Line crossings

There are thirteen (13) crossings of the existing 22kV Lines in that area. The crossing for these medium voltages crossing may require Goal-posts (H Poles) and netting in order to facilitate stringing if outages cannot be arranged. The line crossing will occur at the following sections of the line:

| Crossing | Description | Applicable line                | HV Towers                           | Special precautions                                              |
|----------|-------------|--------------------------------|-------------------------------------|------------------------------------------------------------------|
| MV Line  | 22kV Line   | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-69 & Str. RUT-DRN-70   | Suitable clearances has been allowed. Goal posts will be needed. |
| MV Line  | 22kV Line   | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-162 & Str. RUT-DRN-163 | Suitable clearances has been allowed. Goal posts will be needed. |
| MV Line  | 22kV Line   | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-131 & Str. RUT-DRN-132 | Suitable clearances has been allowed. Goal posts will be needed. |
| MV Line  | 22kV Line   | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-133 & Str. RUT-DRN-134 | Suitable clearances has been allowed. Goal posts will be needed. |
| MV Line  | 22kV Line   | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-156 & Str. RUT-DRN-157 | Suitable clearances has been allowed. Goal posts will be needed. |
| MV Line  | 22kV Line   | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-173 & Str. RUT-DRN-174 | Suitable clearances has been allowed. Goal posts will be needed. |
| MV Line  | 22kV Line   | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-209 & Str. RUT-DRN-210 | Suitable clearances has been allowed. Goal posts will be needed. |
| MV Line  | 22kV Line   | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-281 & Str. RUT-DRN-282 | Suitable clearances has been allowed. Goal posts will be needed. |
| MV Line  | 22kV Line   | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-296 & Str. RUT-DRN-297 | Suitable clearances has been allowed. Goal posts will be needed. |
| MV Line  | 22kV Line   | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-320 & Str. RUT-DRN-321 | Suitable clearances has been allowed. Goal posts will be needed. |
| MV Line  | 22kV Line   | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-364 & Str. RUT-DRN-365 | Suitable clearances has been allowed. Goal posts will be needed. |
| MV Line  | 22kV Line   | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-366 & Str. RUT-DRN-367 | Suitable clearances has been allowed. Goal posts will be needed. |
| MV Line  | 22kV Line   | Ruigtevallei – Dreunberg 132kV | Str. 2DRN-MLK-1A & Str. 2DRN-MLK-1  | Suitable clearances has been allowed. Goal posts will be needed. |

### Road and Telkom crossings

There are five (5) crossing on existing road and Telkom lines along the line route. The crossing for these roads and Telkom lines require Goal-posts (H Poles) in order to facilitate stringing. The line crossing will occur at the following sections of the line:

| Crossing             | Applicable line                | HV Towers                           | Special precautions        | Line clearance (m) |
|----------------------|--------------------------------|-------------------------------------|----------------------------|--------------------|
| Road and Telkom Line | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-40 & Str. RUT-DRN-41   | Goal posts will be needed. | 9.8                |
| Road and Telkom Line | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-156 & Str. RUT-DRN-157 | Goal posts will be needed. | 10.4               |
| Road and Telkom Line | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-208 & Str. RUT-DRN-209 | Goal posts will be needed. | 9.9                |
| Road and Telkom Line | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-235 & Str. RUT-DRN-236 | Goal posts will be needed. | 9.3                |
| Road and Telkom Line | Ruigtevallei – Dreunberg 132kV | Str. RUT-DRN-320 & Str. RUT-DRN-321 | Goal posts will be needed. | 8.1                |

### **Pole and Stay hole compaction**

Stay holes are dug away from the pole position as indicated on **D-DT-0350-3-1-13**. The pegged stay position marks where the stay rod comes out of the ground. A slot is cut in that side of the hole for the stay rod (the top end should stick out a distance of 300mm) and the stay plate is bedded against the undisturbed soil at the bottom of the hole. All backfilling of foundations should be done in accordance with 4.6 of TRMSCAAC 6. The material to be utilised for compacted backfill shall be moistened to optimum moisture content (OMC)  $\pm 10\%$ , and deposited in horizontal layers, having a thickness of not more than 300 mm before being compacted. In backfilling, the pad of the foundation shall be covered, first with a 200 mm layer of well-graded material containing no pieces larger than 20 mm, before any coarse material is deposited.

If the excavated soil has clay characteristics it cannot be compacted and must be replaced with suitable material. Any stones or rocks are to be removed and not used in the returned material. Cement has been included in the Bill of Quantities, where non-cohesive soils are encountered **240-75883148** should be consulted.

### **Conductor Stringing**

It is preferred that tension-stringing be used in order to avoid contact of the conductor with the ground. Alternative (possibly labour-intensive) methods may be used to achieve the same purpose. The conductors (which are greased) will be damaged if they are dragged along the ground during installation. Contamination with grit from the ground will cause eventual damage during the life of the conductor. The conductor is to be supported on pulleys during running out and tensioning.

### **Care and Handling of Insulators**

The general rule for all insulators is for them to be kept in their packaging until they are about to be installed. They should be transported in their packaging to the structure where they are to be installed and only then installed directly from their packaging.



Insulators must never be placed on bare ground; particularly for silicone rubber insulators as this will roughen, distort or tear the skirts. Ceramic insulators should never be laid on their sides on bare ground. If the insulators have been removed from their packaging they can be placed on a smooth surface (e.g. a clean board or thick blanket of some sort). The silicone insulators are light enough for a carrying rack (e.g. holding 6) can be made and used for transport to site.

Insulators of any kind must NEVER be placed loose on the back of a vehicle.

## **Steel**

Tower steel in storage shall be blocked off the ground with sufficient number of wooden blocks to prevent bending or warping off individual members. Steel members shall be handled with the use of nylon or fabric slings. Material shall not be dumped or dropped from truck, but be carefully unloaded and stacked. Contractor representative shall witness all material delivery to confirm quantity, handling and storage, this shall be achieved by liaising with the Project Manager for material delivery dates

## **Environmental considerations**

Land rehabilitation shall be done to cover all damages done on the ground surface due to construction work. All efforts of rehabilitation shall be exercised by the construction contractor where the aftermath of construction may exacerbate to soil erosion.

### ***1.13.1.1 General Outline of the Activities***

1. The centreline of the surveyed new power line route shall be pegged and pegs should be placed at each bend point.
2. An access plan is developed and agreed, rehabilitation measures agreed by the landowner, Eskom and the contractor. Access road will be established through recurring use (i.e. there will be no blading or scraping of new road).
3. The appointed surveyor shall set out the footing of pylons and report back to the contractor if anything odd is found and tower will be moved accordingly.
4. Soil types are checked to determine correct soil nomination for each foundation. On completion of the required soil nominations, a schedule indicating the specific foundation type for each tower is to be compiled and submitted to Eskom's Project Engineer for approval prior to any foundation work commencing.
5. The Contractor shall obtain all steel from Eskom approved suppliers. The steelwork delivered in sections to site are fitted together, assembled on ground and nuts punched. A non corrosive paint is placed on nuts. Cranes used for final assembly.
6. Cable drums are placed next to each other within the servitude stringing takes place in both directions from the drum stations. A pilot tractor will place the pilot cable on the ground which is then pulled up through the use of a pulley. To avoid damage, conductors are never to touch the ground.



7. The line is tensioned from each cable station to ensure minimum ground clearance heights are achieved as per the OSH Act 1993 and Eskom Standards and Specifications.
8. All outage requirements shall be approved by the Eskom Project Manager in consultation with the relevant Eskom Field Services personnel. The construction of the new line have been designed to minimise the length of the unavoidable required outage(s).

## **1.14 Line Labeling**

All work to be done in strict accordance with the specifications Section 3.3 of STANDARD FOR THE LABELLING OF ELECTRICAL EQUIPMENT WITHIN ESKOM WIRES NETWORKS **240-120804300**. The labels shall be manufactured to standard Eskom drawing as advised by the Eskom Project Manager.

### **1.14.1 Line designation labels**

1. 120mm wide x 1,0mm thick (Length of label will vary to suit relevant line description) "Line designation" labels shall be fitted vertically and below the lowest conductor attachment on the second structure from the terminal structure at each end of the line. The label shall face towards the substation.
2. The line number, line description and voltage information must be specified on the label;
3. Each label shall be properly strapped to the pole structure with 12mm x 1,7mm thick heavy-duty bandit strapping.

### **1.14.2 Structure identification labels**

1. 120mm x 1 220mm 1,0mm thick "Structure identification" labels shall be fitted vertically
2. Midway between the lowest conductor attachment and ground level on every structure on the line. The label shall face towards the substation first mentioned on the label code.
3. The line number, 3 coded abbreviation of the line description and the structure number information must be specified on the label;

Each label shall be strapped to the pole structure with 12mm x 1,7mm thick heavy-duty bandit strapping.

### **1.14.3 Line crossing labels**

1. 406 x 900mm x 1,0mm thick "Line crossing" labels shall be installed at all major line crossings.
2. The first, second and third structures away from intersection point in all four directions must be provided with line crossing labels.
3. The label must be installed at the top of the structure, below the earth wire attachment and facing away from the point of intersection, on the new line, and On the transverse face of the cross-arm, facing away from the point of intersection, on existing lattice steel towers.

4. Line crossing labels shall be supported by a 15mm x 15mm x 1,6mm aluminium square tube frame.
5. Each label shall be properly strapped to the pole structure with 12mm x 1,7mm thick heavy duty bandit strapping.

**LABEL SCHEDULE**

| STRUCTURE NO. | SUBSTATION<br>NAME | LINE DESIGNATION<br>LABEL | POLE DESIGNATION<br>LABEL |
|---------------|--------------------|---------------------------|---------------------------|
| RUT-DRN 1     | RUIGTEVALLEI       | RUI - DRN 132kV           | RUT-DRN 1                 |
| RUT-DRN 2     |                    | RUI - DRN 132kV           | RUT-DRN 2                 |
| RUT-DRN 3     |                    | RUI - DRN 132kV           | RUT-DRN 3                 |
| RUT-DRN 4     |                    | RUI - DRN 132kV           | RUT-DRN 4                 |
| RUT-DRN 5     |                    | RUI - DRN 132kV           | RUT-DRN 5                 |
| RUT-DRN 6     |                    | RUI - DRN 132kV           | RUT-DRN 6                 |
| RUT-DRN 7     |                    | RUI - DRN 132kV           | RUT-DRN 7                 |
| RUT-DRN 8     |                    | RUI - DRN 132kV           | RUT-DRN 8                 |
| RUT-DRN 9     |                    | RUI - DRN 132kV           | RUT-DRN 9                 |
| RUT-DRN 10    |                    | RUI - DRN 132kV           | RUT-DRN 10                |
| RUT-DRN 11    |                    | RUI - DRN 132kV           | RUT-DRN 11                |
| RUT-DRN 12    |                    | RUI - DRN 132kV           | RUT-DRN 12                |
| RUT-DRN 13    |                    | RUI - DRN 132kV           | RUT-DRN 13                |
| RUT-DRN 14    |                    | RUI - DRN 132kV           | RUT-DRN 14                |
| RUT-DRN 15    |                    | RUI - DRN 132kV           | RUT-DRN 15                |
| RUT-DRN 16    |                    | RUI - DRN 132kV           | RUT-DRN 16                |
| RUT-DRN 17    |                    | RUI - DRN 132kV           | RUT-DRN 17                |
| RUT-DRN 18    |                    | RUI - DRN 132kV           | RUT-DRN 18                |
| RUT-DRN 19    |                    | RUI - DRN 132kV           | RUT-DRN 19                |
| RUT-DRN 20    |                    | RUI - DRN 132kV           | RUT-DRN 20                |
| RUT-DRN 21    |                    | RUI - DRN 132kV           | RUT-DRN 21                |
| RUT-DRN 22    |                    | RUI - DRN 132kV           | RUT-DRN 22                |
| RUT-DRN 23    |                    | RUI - DRN 132kV           | RUT-DRN 23                |
| RUT-DRN 24    |                    | RUI - DRN 132kV           | RUT-DRN 24                |
| RUT-DRN 25    |                    | RUI - DRN 132kV           | RUT-DRN 25                |
| RUT-DRN 26    |                    | RUI - DRN 132kV           | RUT-DRN 26                |
| RUT-DRN 27    |                    | RUI - DRN 132kV           | RUT-DRN 27                |
| RUT-DRN 28    |                    | RUI - DRN 132kV           | RUT-DRN 28                |
| RUT-DRN 29    |                    | RUI - DRN 132kV           | RUT-DRN 29                |
| RUT-DRN 30    |                    | RUI - DRN 132kV           | RUT-DRN 30                |
| RUT-DRN 31    |                    | RUI - DRN 132kV           | RUT-DRN 31                |
| RUT-DRN 32    |                    | RUI - DRN 132kV           | RUT-DRN 32                |
| RUT-DRN 33    |                    | RUI - DRN 132kV           | RUT-DRN 33                |
| RUT-DRN 34    |                    | RUI - DRN 132kV           | RUT-DRN 34                |
| RUT-DRN 35    |                    | RUI - DRN 132kV           | RUT-DRN 35                |
| RUT-DRN 36    |                    | RUI - DRN 132kV           | RUT-DRN 36                |
| RUT-DRN 37    |                    | RUI - DRN 132kV           | RUT-DRN 37                |
| RUT-DRN 38    |                    | RUI - DRN 132kV           | RUT-DRN 38                |
| RUT-DRN 39    |                    | RUI - DRN 132kV           | RUT-DRN 39                |
| RUT-DRN 40    |                    | RUI - DRN 132kV           | RUT-DRN 40                |

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| RUT-DRN | 41 |  | RUI - DRN 132kV | RUT-DRN | 41 |
| RUT-DRN | 42 |  | RUI - DRN 132kV | RUT-DRN | 42 |
| RUT-DRN | 43 |  | RUI - DRN 132kV | RUT-DRN | 43 |
| RUT-DRN | 44 |  | RUI - DRN 132kV | RUT-DRN | 44 |
| RUT-DRN | 45 |  | RUI - DRN 132kV | RUT-DRN | 45 |
| RUT-DRN | 46 |  | RUI - DRN 132kV | RUT-DRN | 46 |
| RUT-DRN | 47 |  | RUI - DRN 132kV | RUT-DRN | 47 |
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| RUT-DRN | 52 |  | RUI - DRN 132kV | RUT-DRN | 52 |
| RUT-DRN | 53 |  | RUI - DRN 132kV | RUT-DRN | 53 |
| RUT-DRN | 54 |  | RUI - DRN 132kV | RUT-DRN | 54 |
| RUT-DRN | 55 |  | RUI - DRN 132kV | RUT-DRN | 55 |
| RUT-DRN | 56 |  | RUI - DRN 132kV | RUT-DRN | 56 |
| RUT-DRN | 57 |  | RUI - DRN 132kV | RUT-DRN | 57 |
| RUT-DRN | 58 |  | RUI - DRN 132kV | RUT-DRN | 58 |
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| RUT-DRN | 60 |  | RUI - DRN 132kV | RUT-DRN | 60 |
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| RUT-DRN | 65 |  | RUI - DRN 132kV | RUT-DRN | 65 |
| RUT-DRN | 66 |  | RUI - DRN 132kV | RUT-DRN | 66 |
| RUT-DRN | 67 |  | RUI - DRN 132kV | RUT-DRN | 67 |
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| RUT-DRN | 72 |  | RUI - DRN 132kV | RUT-DRN | 72 |
| RUT-DRN | 73 |  | RUI - DRN 132kV | RUT-DRN | 73 |
| RUT-DRN | 74 |  | RUI - DRN 132kV | RUT-DRN | 74 |
| RUT-DRN | 75 |  | RUI - DRN 132kV | RUT-DRN | 75 |
| RUT-DRN | 76 |  | RUI - DRN 132kV | RUT-DRN | 76 |
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| RUT-DRN | 79 |  | RUI - DRN 132kV | RUT-DRN | 79 |
| RUT-DRN | 80 |  | RUI - DRN 132kV | RUT-DRN | 80 |

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| RUT-DRN 124 |  | RUI - DRN 132kV | RUT-DRN 124 |
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| RUT-DRN 152 |  | RUI - DRN 132kV | RUT-DRN 152 |
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| RUT-DRN 159 |  | RUI - DRN 132kV | RUT-DRN 159 |
| RUT-DRN 160 |  | RUI - DRN 132kV | RUT-DRN 160 |

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| RUT-DRN | 161 |  | RUI - DRN 132kV | RUT-DRN | 161 |
| RUT-DRN | 162 |  | RUI - DRN 132kV | RUT-DRN | 162 |
| RUT-DRN | 163 |  | RUI - DRN 132kV | RUT-DRN | 163 |
| RUT-DRN | 164 |  | RUI - DRN 132kV | RUT-DRN | 164 |
| RUT-DRN | 165 |  | RUI - DRN 132kV | RUT-DRN | 165 |
| RUT-DRN | 166 |  | RUI - DRN 132kV | RUT-DRN | 166 |
| RUT-DRN | 167 |  | RUI - DRN 132kV | RUT-DRN | 167 |
| RUT-DRN | 168 |  | RUI - DRN 132kV | RUT-DRN | 168 |
| RUT-DRN | 169 |  | RUI - DRN 132kV | RUT-DRN | 169 |
| RUT-DRN | 170 |  | RUI - DRN 132kV | RUT-DRN | 170 |
| RUT-DRN | 171 |  | RUI - DRN 132kV | RUT-DRN | 171 |
| RUT-DRN | 172 |  | RUI - DRN 132kV | RUT-DRN | 172 |
| RUT-DRN | 173 |  | RUI - DRN 132kV | RUT-DRN | 173 |
| RUT-DRN | 174 |  | RUI - DRN 132kV | RUT-DRN | 174 |
| RUT-DRN | 175 |  | RUI - DRN 132kV | RUT-DRN | 175 |
| RUT-DRN | 176 |  | RUI - DRN 132kV | RUT-DRN | 176 |
| RUT-DRN | 177 |  | RUI - DRN 132kV | RUT-DRN | 177 |
| RUT-DRN | 178 |  | RUI - DRN 132kV | RUT-DRN | 178 |
| RUT-DRN | 179 |  | RUI - DRN 132kV | RUT-DRN | 179 |
| RUT-DRN | 180 |  | RUI - DRN 132kV | RUT-DRN | 180 |
| RUT-DRN | 181 |  | RUI - DRN 132kV | RUT-DRN | 181 |
| RUT-DRN | 182 |  | RUI - DRN 132kV | RUT-DRN | 182 |
| RUT-DRN | 183 |  | RUI - DRN 132kV | RUT-DRN | 183 |
| RUT-DRN | 184 |  | RUI - DRN 132kV | RUT-DRN | 184 |
| RUT-DRN | 185 |  | RUI - DRN 132kV | RUT-DRN | 185 |
| RUT-DRN | 186 |  | RUI - DRN 132kV | RUT-DRN | 186 |
| RUT-DRN | 187 |  | RUI - DRN 132kV | RUT-DRN | 187 |
| RUT-DRN | 188 |  | RUI - DRN 132kV | RUT-DRN | 188 |
| RUT-DRN | 189 |  | RUI - DRN 132kV | RUT-DRN | 189 |
| RUT-DRN | 190 |  | RUI - DRN 132kV | RUT-DRN | 190 |
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| RUT-DRN | 200 |  | RUI - DRN 132kV | RUT-DRN | 200 |

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| RUT-DRN | 236 |  | RUI - DRN 132kV | RUT-DRN | 236 |
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| RUT-DRN | 239 |  | RUI - DRN 132kV | RUT-DRN | 239 |
| RUT-DRN | 240 |  | RUI - DRN 132kV | RUT-DRN | 240 |



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| RUT-DRN | 257 |  | RUI - DRN 132kV | RUT-DRN | 257 |
| RUT-DRN | 258 |  | RUI - DRN 132kV | RUT-DRN | 258 |
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| RUT-DRN | 276 |  | RUI - DRN 132kV | RUT-DRN | 276 |
| RUT-DRN | 277 |  | RUI - DRN 132kV | RUT-DRN | 277 |
| RUT-DRN | 278 |  | RUI - DRN 132kV | RUT-DRN | 278 |
| RUT-DRN | 279 |  | RUI - DRN 132kV | RUT-DRN | 279 |
| RUT-DRN | 280 |  | RUI - DRN 132kV | RUT-DRN | 280 |

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| RUT-DRN | 325 |  | RUI - DRN 132kV | RUT-DRN | 325 |

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| RUT-DRN    | 364 |           | RUI - DRN 132kV  | RUT-DRN    | 364 |
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| RUT-DRN    | 366 |           | RUI - DRN 132kV  | RUT-DRN    | 366 |
| RUT-DRN    | 367 | DREUNBERG | RUI - DRN 132kV  | RUT-DRN    | 367 |
|            |     |           |                  |            |     |
| 1DRN - MLK | 1   | DREUNBERG | 1DRN - MLK 132kV | 1DRN - MLK | 1   |
| 1DRN - MLK | 1A  |           | 1DRN - MLK 132kV | 1DRN - MLK | 1A  |

## **2. Templated Profile**

### **3. Stringing Charts**

#### **4.       Staking Table**

## **5.      Vibration Dampers**

## **6. Bill of Materials (BOM) & Bill of Quantity (BOQ)**



## **7.        Structure Drawing & Structure Foundations**

## **8. Hardware Assembly Drawings**

## **9. Buyers Guide Specifications**

## **10. Construction Checklist**

## **11. Safety & Environmental Specification**

## **12. Appendix A : Environmental approval**

