TENDER NO.KP1/9AA-2/OT/51-NM/15-16 FOR REROUTING OF UEB 132KV DOUBLE CIRCUIT TRANSMISSION LINE AT CENTRAL RIFT AND RECONSTRUCTION OF SECTIONS OF 132KV SINGLE CIRCUIT TRANSMISSION LINES IN WEST KENYA

ALL TENDERERS ARE ADVISED TO READ CAREFULLY THIS TENDER DOCUMENT IN ITS ENTIRETY BEFORE MAKING ANY BID

(E-PROCUREMENT TENDER OPENING SYSTEM)

(ENSURE TO READ THE APPENDIX TO INSTRUCTIONS TO TENDERERS)

MARCH 2016

THE KENYA POWER & LIGHTING COMPANY LIMITED
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KOLOBOT ROAD, PARKLANDS,
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ABBREVIATIONS AND ACRONYMS

BDS	Bid Data Sheet
BQ	Bills of Quantities
CBK	Central Bank of Kenya
CC	Conditions of Contract
DDP	Delivery Duty Paid
ERC	Energy Regulatory Commission
GoK	Government of Kenya
ICPAK	Institute of Certified Public Accountants of Kenya
JV	Joint Venture
KPLC	The Kenya Power & Lighting Company Limited
KShs. / KES	Kenya Shillings
PM	Project Manager
PPDA 2005	Public Procurement and Disposal Act, 2005
PPOA	Public Procurement and Oversight Authority
VAT	Value Added Tax

SECTION I - INVITATION TO TENDER

DATE: 8.03.2016

TENDER NO: KP1/9AA-2/OT/51-NM/5-16 FOR REROUTING OF UEB 132KV DOUBLE CIRCUIT TRANSMISSION LINE AT CENTRAL RIFT AND RECONSTRUCTION OF SECTIONS OF 132KV SINGLE CIRCUIT TRANSMISSION LINES IN WEST KENYA.

1.1 The Kenya Power & Lighting Company Ltd (KPLC) invites bids from eligible Tenderers for **Rerouting of UEB 132kV Double Circuit Transmission Line at Central Rift and Reconstruction of Sections of 132kV Single Circuit Transmission Lines in West Kenya.** Interested eligible Tenderers may obtain further information from the **General Manager, Supply Chain,** he Kenya Power & Lighting Company Ltd at Stima Plaza, 3rd Floor, Kolobot Road, P.O. Box 30099 – 00100 Nairobi, Kenya.

1.2 **Obtaining tender documents.**

1.2.1 Tender documents detailing the requirements may be viewed at KPLC E-Procurement Web Portal found on the KPLC website (www.kplc.co.ke) beginning on **9th March 2016.**

1.3 Completed Tenders are to be enclosed in plain sealed envelopes marked; **KP1/9AA-2/OT/51-NM/15-16 FOR REROUTING OF UEB 132KV DOUBLE CIRCUIT TRANSMISSION LINE AT CENTRAL RIFT AND RECONSTRUCTION OF SECTIONS OF 132KV SINGLE CIRCUIT TRANSMISSION LINES IN WEST KENYA.** addressed and deposited in the Company Secretary's Office located at KPLC premises, Stima Plaza, 7th Floor, Kolobot Road, Nairobi, Kenya so as to be received on or before **Thursday, 31st March, 2016 at 10.00am.**

1.4 Prices quoted should be net inclusive of all taxes and delivery costs to the required site (where applicable) and must be in Kenya Shillings or a freely convertible currency in Kenya and shall remain valid for One Hundred and Twenty (120) days from the closing date of the tender.

1.5 Tenders will be opened promptly thereafter in the presence of the Tenderer's or their representatives who choose to attend in **KPLC Auditorium at Stima Plaza, Kolobot Road, Parklands, Nairobi.**

1.6 There will be a series of **mandatory** pre-bid/site visit meetings to be held at the different sites on **16th, 17th and 18th March 2016 as per schedule in ITT**

SECTION II - TENDER SUBMISSION CHECKLIST

A. Tender Submission Format

This order and arrangement shall be considered as the Tender Submission Format, Non-Financial. Tenderers shall tick against each item indicating that they have provided it.

No.	Item	Tick Where Provided
1	Tender Security – Bank Guarantee or Letters of Credit (issued by Banks Licensed by the Central Bank of Kenya)	
2	Declaration Form	
3	Duly completed Tender Form	
4	Confidential Business Questionnaire (CBQ)	
5	Duly completed Qualification Information Form and the required attachments	
6	Proposed Work Plan (Work method & schedule)	
7	Duly completed sample Site Visit Form	
8	Copy of Contractor's Certificate of Incorporation	
9	Certificate of Confirmation of Directors and Shareholding (C.R. 12) or equivalent (for foreign tenderers)	
10	Copy of Subcontractor's Certificate of Incorporation	
11	Copy of Contractor's Certificate of Registration for the relevant category from the National Construction Authority	
12	Copy of Valid Tax Compliance Certificate	
13	Copy of PIN certificate	
14	Copy of Subcontractors' Certificate of Registration for the relevant category the National Construction Authority	
15	Copy of the subcontractors' Valid Tax Compliance Certificates	
16	Copy of the subcontractors 'PIN certificate	
17	Type Test Certificates and their Reports and or Test Certificates and their Reports	
18	Copy of accreditation certificate for the testing laboratory as per ISO/ IEC 17025,	
19	Valid and current ISO 9001 Certificates or for locally manufactured or produced goods, valid Diamond Mark of Quality Certificate or Standardization Mark Certificates from the Kenya Bureau of Standards (KEBS).	

20	Catalogues and or Brochures and or Manufacturer's drawings	
21	Duly completed Schedule of Guaranteed Technical Particulars	
20	Manufacturer's Authorisation and warranty	
21	Names with full contact as well as physical addresses of previous customers of similar works and reference letters from at least three (3) of the customers	
22	Names with full contact as well as physical addresses of previous customers of similar goods and reference letters from at least four (4) of the customers	
23	Statement on Deviations	
24	For foreign tenderers, provide proof that Forty percent (40%) of the works are from citizen contractors	
25	Valid copy of certificate of confirmation of directorship and shareholding issued and signed by registrar of companies or registrar of business names (for local tenderers).-NOT APPLICABLE	
26	Price Schedule and/or Bill of Quantities	
27	Audited Financial Statements. The audited financial statements required must be those that are reported within eighteen (18) calendar months of the date of the tender document. *(For companies or firms that are registered or incorporated within the last one calendar year of the Date of the Tender Document, they should submit certified copies of bank statements covering a period of at least six months prior to the date of the tender document. The copies should be certified by the Bank issuing the statements. The certification should be original).*	
28	Any other document or item required by the tender document. (The Tenderer shall specify such other documents or items it has submitted)	

***NOTES TO TENDERERS**

1. Valid Tax Compliance Certificate shall be one issued by the relevant tax authorities and valid for at least up to the tender closing date. All Kenyan registered Tenderers must provide a valid Tax Compliance Certificate.

2. Foreign Tenderers must provide equivalent documents from their country of origin as regards Tax Compliance Certificate OR statements certifying that the equivalent documentation is not issued in the Tenderer's country of origin. The Statement(s) that equivalent documentation is not issued by the Tenderer's country should be original and issued by the Tax authorities in the Tenderer's country of origin.

3. Valid Registration Certificate shall be one issued by the relevant body including the National Construction Authority (NCA).

TABLE OF PARAGRAPHS ON INSTRUCTIONS TO TENDERERS

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SECTION III - INSTRUCTIONS TO TENDERERS (ITT)

3.1 Definitions

In this tender, unless the context or express provision otherwise requires: -

a) *Any reference to any Act shall include any statutory extension, amendment, modification, re-amendment or replacement of such Act and any rule, regulation or order made there-under.*

b) *"Date of Tender Document" shall begin with the first day and end on the last day of the month appearing on the cover page of the Tender Document.*

c) *"Day" means calendar day and "month" means calendar month.*

d) *"KEBS" wherever appearing means the Kenya Bureau of Standards or its successor(s) and assign(s) where the context so admits.*

e) *"KENAS" wherever appearing means the Kenya National Accreditation Service or its successor(s) and assign(s) where the context so admits*

f) *"NCA" wherever appearing means the National Construction Authority or its successor(s) and assign(s) where the context so admits*

g) *"PPOA" wherever appearing means The Public Procurement Oversight Authority or its successor(s) and assign(s) where the context so admits.*

h) *Reference to "the tender" or the "Tender Document" includes its appendices and documents mentioned hereunder and any reference to this tender or to any other document includes a reference to the other document as varied supplemented and/or replaced in any manner from time to time.*

i) *"The Procuring Entity" means The Kenya Power and Lighting Company Limited or its successor(s) and assign(s) where the context so admits (hereinafter abbreviated as KPLC).*

j) *"The Tenderer" means the person(s) submitting its Tender for the performance of Works in response to the Invitation to Tender. This may include a business name, joint venture, private or public company, government owned institution or any combination of one or more of them.*

k) *Where there are two or more persons included in the expression the "Tenderer", any act or default or omission by the Tenderer shall be deemed to be an act, default or omission by any one or more of such persons.*

l) *Words importing the masculine gender only, include the feminine gender or (as the case may be) the neutral gender.*

m) *Words importing the singular number only include the plural number and vice-versa and where there are two or more persons included in the expression the "Tenderer" the covenants, agreements and obligations expressed to be made or performed by the Tenderer shall be deemed to be made or performed by such persons jointly and severally.*

n) *"Works" means the construction, repair, renovation or demolition of*

buildings, roads or other structures and includes the design, supply, installation, testing and commissioning of equipment and materials, site preparation and other incidental services where applicable.

m) Citizen contractors-a firm shall be qualified as a citizen contractor if its owners and shareholders are Kenyan citizens

n) Local contractors- a firm shall be qualified as a local contractor if it is registered in Kenya.

3.2 Eligible Tenderers

3.2.1 This Invitation to Tender is open to all Tenderers eligible as described in the Bid Data Sheet. A manufacturer can quote directly OR authorize only ONE Agent or only ONE Supplier to quote products from their factory. Besides the manufacturer's bid OR authorized agent/suppliers bid, no other bid shall be considered from the same manufacturer. Successful Tenderers shall perform the Works in accordance with this tender and the ensuing contract.

3.2.2 Agreements between undertaking to directly or indirectly fix purchase or selling prices or any other trading conditions are prohibited. Where this is discovered, the undertakings involved will not be eligible for award and all undertakings involved shall be disqualified.

3.2.3 The classification of eligibility shall be in accordance with that maintained by Kenya's NCA or its successor responsible for the classification of contractors.

3.2.4 Government or government owned institutions in Kenya may participate only if they are legally and financially autonomous, if they operate under commercial law, are registered by the relevant registration board or authorities and if they are not a dependant agency of the Government.

3.2.5 All Tenderers shall comply with all relevant licensing and/or registration requirements with the appropriate statutory bodies in Kenya such as the NCA, the ERC, the National Treasury, the County Treasury or any other relevant authority.

3.2.6 Tenderers shall provide such evidence of their continued eligibility satisfactory to KPLC as KPLC may reasonably request.

3.2.7 Tenderers (including all members of a joint venture and subcontractors) shall provide a statement that they are not associated, or have not been associated in the past, directly or indirectly, with the Consultant or any other entity that has prepared the design, specifications, and other documents for this project or being proposed as Project Manager for this Contract. A firm that has been engaged by the Employer to provide consulting services for the preparation or supervision of the Works, and any of its affiliates, shall not be eligible to tender

3.2.8 For purposes of this paragraph the Tenderer shall submit with its Tender, a valid copy of certificate of Confirmation of Directorships and Shareholding issued **and signed** by either the Registrar of Companies or Registrar of Business Names. This certificate

must not be more than three (3) months old from the Date of the Tender Document. KPLC reserves the right to subject the certificate to authentication.

3.3 Ineligible Tenderers

3.3.1 Notwithstanding any other provisions of this tender, the following are not eligible to participate in the tender:-

a) KPLC's employees, its Board or any of its committee members.
b) Any Cabinet Secretary of the Government of the Republic of Kenya (GoK)
c) Any public servant of GoK.
d) Any member of a Board or Committee or any department of GoK.
e) Any person appointed to any position by the President of Kenya.
f) Any person appointed to any position by any Cabinet Secretary of GoK.

3.3.2 For the purposes of this paragraph, any relative i.e. spouse(s) and child(ren) of any person mentioned in sub-paragraph 3.3.1 is also ineligible to participate in the tender. In addition, a Cabinet Secretary shall include the President, Deputy-President or the Attorney General of GoK.

3.3.3 Tenderers shall provide the qualification information statement that the Tenderer (including all members of a joint venture and subcontractors) is not associated, or have been associated in the past, directly or indirectly, with a firm or any of its affiliates which have been engaged by KPLC to provide consulting services for the preparation of the design, specifications, and other documents to be used for the procurement of the goods under this Invitation to Tender.

3.2.4 Tenderers shall not be under declarations as prescribed at Section XIII

3.2.5 Tenderers who are not under these declarations shall complete the Declaration Form strictly in the form and content as prescribed at Section XIII.

3.2.6 Those that are under the Declaration as prescribed at Section XIII whether currently or in the past shall not complete the Form. They will submit a suitable Form giving details, the nature and present status of their circumstances.

3.4 Declarations of Eligibility

3.4.1 Tenderers shall not be under declarations of ineligibility for corrupt, fraudulent practices and are not amongst persons mentioned in sub-paragraphs 3.3.1 and 3.3.2 above.

3.4.2 Tenderers who are not under these declarations shall complete the Declaration Form strictly in the form and content as prescribed at Section XIII.

3.4.3 Those that are under the Declaration for corrupt and fraudulent practices whether currently or in the past shall not complete the Form. They will submit a suitable Form giving details, the nature and present status of their circumstances.

3.5 Joint Venture

3.5.1 Tenders submitted by a joint venture (JV) of two or more firms (consortium), as partners shall comply with the following requirements: -

a) The Tender Form and in case of a successful tender, the Contract Agreement Form, shall be signed so as to be legally binding on all partners of the joint venture.

b) One of the partners shall be nominated and authorized as being lead contractor. The authorization shall be evidenced by submitting a Power of Attorney signed by legally authorized signatories of all the partners/directors.

c) The Power of Attorney which shall accompany the tender, shall be granted by the authorized signatories of all the partners as follows:-

(i.) for local and citizen contractors, before a Commissioner of Oaths or a Notary Public or Magistrate of the Kenyan Judiciary.

(ii.) for a foreign bidder, before a Notary Public, or the equivalent of a Notary Public, and in this regard the bidder shall provide satisfactory proof of such equivalence.

d) The lead contractor shall be authorized to incur liability and receive instructions for and on behalf of any and all the partners of the joint venture and the entire execution of the contract including payment shall be done exclusively with the lead contractor.

3.5.2 All partners of the joint venture shall be liable jointly and severally for the execution of the contract in accordance with the contract terms, and a relevant statement to this effect shall be included in the authorization mentioned in paragraph 3.5.1 (b) above as well as in the Form of Tender and the Contract Agreement Form (in case of the accepted tender).

3.5.3 The JV must be in either of the following forms –

a) A registered JV agreement. The registration may either be :-

(i.) At the Ministry of Lands/National Land Commission or,

(ii.) At the Office of the Attorney General, or

(iii.) NCA

b) A Letter of Intent to enter into a joint venture including a draft JV Agreement indicating at least the part of the Works to be executed by the respective partners.

a) The JV agreement should be signed by at least two directors from each company or firm that is a party to the JV

b) The JV agreement must be under the company or firm seal

c) The Letter of Intent should be signed by at least one director from each company or firm that is a party to the intended joint venture

3.5.4 A copy of the agreement entered into, or Letter of Intent by the joint venture partners shall be submitted with the tender.

3.6 Time for Completion of Works

The successful Tenderer will be expected to complete the Works by the required completion period as specified in the BDS.

3.7 Source of Funding

KPLC has set aside funds during the present financial year. It is intended that part of the proceeds of funds will be applied to cover the eligible payments under the ensuing contract for these Works.

3.8 Conflict of Interest

3.8.1 A Tenderer *(including all members of a joint venture and subcontractors)* shall not have a conflict of interest. A Tenderer found to have a conflict of interest shall be disqualified. A Tenderer may be considered to have a conflict of interest with one or more parties in this tendering process if they:-

a) are associated or have been associated in the past directly or indirectly with employees or agents of KPLC or a member of the Board or committee of KPLC

b) are associated or have been associated in the past directly or indirectly with a firm or company or any of their affiliates which have been engaged by KPLC to provide consulting services for the preparation of the design, specifications, and other documents to be used for the execution, completion and maintenance of the Works under this Invitation to Tender

c) have controlling shareholders in common

d) receive or have received any direct or indirect subsidy from any of them

e) have a relationship with each other, either directly or through common third parties, that puts them in a position to have access to information about, or influence on the tender of another Tenderer, or influence the decisions of KPLC regarding this tendering process

f) submit more than one Tender in this tendering process.

3.8.2 A Tenderer will be considered to have a conflict of interest if they participated as a consultant in the preparation of the design or technical specification of the Works and related services that are the subject of this Tender.

3.9 One Tender per Tenderer

3.9.1 A firm or company shall submit only one Tender in the same tendering process, either individually or as a partner in a joint venture.

3.9.2 No firm or company can be a sub-contractor while submitting a Tender individually or as a partner in a joint venture in the same tendering process.

3.9.3 A company or firm, if acting in the capacity of sub-contractor in any Tender may participate in more than one Tender but only in that capacity.

3.9.4 A Tenderer who submits or participates in more than one tender *(other than as a sub-contractor or in cases of alternatives that have been permitted or requested)* will cause all tenders in which the Tenderer has participated to be disqualified.

3.10 Site Visit and Pre-Bid Meeting

3.10.1 The Tenderer, at the Tenderer's own responsibility and risk is advised to visit and examine the site of Works and its surrounding and obtain all information that may be necessary for preparing the tender and entering into a contract for the Works. The cost of visiting the site shall be at the Tenderer's own expense.

3.10.2 KPLC may conduct a site visit and pre-bid meeting. The purpose of the pre-bid meeting shall be to clarify issues and answer any questions that may be raised at that stage.

3.10.3 The Tenderer's designated representative is invited to attend a site visit and prr-bid meeting which if convened will take place at the venue and time stipulated in the BDS.

3.10.4 The Tenderer is requested as far as possible to submit any questions in writing or be electronic means to reach KPLC before the pre-bid meeting.

3.10.5 Minutes of the pre-bid meeting including the text of the questions raised and the responses given together with any response prepared after the pre-bid meeting will be transmitted within the time stated in the BDS to all purchasers of the Tender Document.

3.10.6 Non-attendance during the site visit or the pre-bid meeting will not be a cause of disqualification of the Tender unless specified to the contrary in the BDS.

3.11 Cost of Tendering

3.11.1 The Tenderer shall bear all costs associated with the preparation and submission of its Tender. KPLC will in no case be responsible or liable for those costs, regardless of the conduct or outcome of the tendering process.

3.11.2 The price to be charged for the Tender Document shall be as indicated in the Invitation to Tender but in any case not exceeding KSh 1,000/=.

3.12 Contents of the Tender Document

3.12.1 The Tender Document comprises the documents listed below and Addendum (where applicable) issued in accordance with paragraph 3.14 of these Instructions to Tenderers: -

a) Invitation to Tender
b) Tender Submission Checklist
c) Instructions to Tenderers
d) Bid Data Sheet
e) Schedule of Requirements
f) Bill of Quantities
g) Summary of Evaluation Process/Evaluation Criteria
h) General Conditions of Contract
i) Special Conditions of Contract s
j) Technical Specifications

k) Drawings
l) Tender Form
m) Confidential Business Questionnaire Form
n) Manufacturer's Authorization Form
o) Manufacturer's Warranty
p) Tender Security Forms
q) Declaration Form
r) Contract Agreement Form
s) Performance Security Forms

3.12.2 The Tenderer is expected to examine all instructions, forms, provisions, terms and specifications in the Tender Document. Failure to furnish all information required by the Tender Document or to submit a tender not substantially responsive to the Tender Document in every respect will be at the Tenderer's risk and may result in the rejection of its Tender.

3.12.3 All recipients of the documents for the proposed Contract for the purpose of submitting a tender (whether they submit a tender or not) shall treat the details of the documents as "Private and Confidential".

3.13 Clarification of Documents

A prospective Tenderer requiring any clarification of the Tender Document may notify the Supply Chain Manager (Procurement) in writing or by post at KPLC's address indicated in the Invitation to Tender. KPLC will respond in writing to any request for clarification of the Tender documents, which it receives not later than seven (7) days prior to the deadline for the submission of Tenders, prescribed by KPLC.

Written copies of KPLC's response *(including an explanation of the query but without identifying the source of inquiry)* will be sent to all prospective Tenderers that have duly received the Tender Document.

3.14 Amendment of Documents

3.14.1 At any time prior to the deadline for submission of Tenders, KPLC, for any reason, whether at its own initiative or in response to a clarification requested by a prospective Tenderer, may modify the tender documents by amendment.

3.14.2 All prospective Tenderers that have received the tender documents will be notified of the amendment(s) *(hereinafter referred to or otherwise known as addendum)* in writing and will be binding on them.

3.14.3 In order to allow prospective Tenderers reasonable time in which to take the amendment into account in preparing their Tenders, KPLC, at its discretion, may extend the deadline for the submission of Tenders.

3.15 Language of Tender

The Tender prepared by the Tenderer, as well as all correspondence and documents relating to the tender, exchanged between the Tenderer and KPLC, shall be written in English language, provided that any printed literature furnished by the Tenderer may be written in another language provided that they are accompanied by an accurate English translation of the relevant passages in which case, for purposes of interpretation of the Tender, the English translation shall govern. The English translation shall be on the Tenderer's letterhead and shall be signed by the duly authorized signatory signing the Tender and stamped with the Tenderer's stamp.

3.16 Documents Comprising the Tender

The Tender prepared and submitted by the Tenderers shall include but not be limited to all the following components: -

a) Declaration Form, Tender Form and Priced Bill of Quantities (BQ) duly completed

b) Documentary evidence that the Works and any ancillary services thereto to be performed by the Tenderer conform to the tender documents

c) Technical Proposal in sufficient detail to demonstrate the adequacy of the Tenderer's proposal to meet the Works requirements and the completion time. Those details should include the following:-

- *(i.) a statement of work methods i.e. Methodology*
- *(ii.) major items of equipment proposed to carry out the Contract*
- *(iii) an undertaking that the items in c (ii) will be available for the execution of the Contract.*

d) Tender Security furnished in accordance with the Tender requirements

e) Power of Attorney authorizing the signatory of the Tender to commit the Tenderer in accordance with the Tender requirements.

f) A detailed list of previous clients as prescribed in the BDS for similar Works on tender and their contact addresses including e-mail shall be submitted with the Tender for the purpose of reference, or for evaluation

g) Statement of Deviations, if any, from the tender requirements on a separate sheet of paper clearly indicating –

- *(i.) the specific tender document requirement*
- *(ii.) the deviation proposed by the Tenderer*
- *(iii.) the technical specifications of the deviation*
- *(iv.) the design, if any, of the deviation*
- *(v.) justification or reason for the deviation*
- *(vi.) the Tenderer's cost of that deviation and the Tenderer's estimate of the cost of complying with KPLC's requirement without the deviation.*

h) In case of a tender submitted by a joint venture, either of the following –

(i.) the registered joint venture agreement, or,

(ii.) a Letter of Intent to enter into a joint venture including a draft JV agreement indicating at least the part of the Works to be executed by the respective partners.

j) Any information or other materials required to be completed and submitted by Tenderers as specified in the Tender Document

3.17 Tender Forms

The Tenderer shall complete and sign the Tender Form and all other documents furnished in the Tender Document, indicating the Works to be performed, a brief description of the Works, quantities, and prices amongst other information required.

3.18 Tender Rates and Prices

3.18.1 The Tenderer shall indicate on the Price Schedule and/or Bill of Quantities, the unit rates and prices (where applicable) and total tender price of the Works it proposes to perform under the contract.

3.18.2 The Tenderer shall fill in rates and prices for all items of the Works described in the Price Schedule and/or BQs. Items for which no rates or price is entered by the Tenderer will not be paid for by KPLC when executed and shall be deemed covered by other rates and prices in the Price Schedule and/or BQs.

3.18.3 Prices and rates indicated on the Price Schedule and/or BQs shall be inclusive of all costs for the Works including insurances, duties, levies, Value Added Tax (V.A.T), Withholding Tax and other taxes payable and delivery to the premises of KPLC (where applicable) or other specified site(s). No other basis shall be accepted for evaluation, award or otherwise.

3.18.4 Price Schedule and/or BQ rates and prices to be submitted (quoted) by the Tenderer shall remain fixed for the contract duration.

3.18.5 For the avoidance of doubt, Tenderers shall quote on Delivered Duty Paid *(DDP)* basis. No other basis shall be accepted for evaluation, award or otherwise.

3.18.6 A price that is derived by a disclosed incorporation or usage of an internationally accepted standard formula shall be acceptable within the meaning of this paragraph.

3.19 Tender Currencies

3.19.1 For Works that the Tenderer will provide from within or outside Kenya, the prices shall be quoted in Kenya Shillings, or in another freely convertible currency in Kenya. The currency quoted must be indicated clearly on the Price Schedule and/or BQs.

3.19.2 The exchange rate to be used for currency conversion for evaluation purposes shall be the Central Bank of Kenya selling rate ruling on the Tender closing date. *(Please visit the Central Bank of Kenya website).*

3.20 Tenderer's Eligibility and Qualifications

3.20.1 Pursuant to paragraph 3.16, the Tenderer shall furnish, as part of its Tender, documents establishing the Tenderer's eligibility to tender and its qualifications to execute, complete and maintain the Works in the contract if its Tender is accepted.

3.20.2 The documentary evidence of the Tenderer's qualifications to perform the contract if its Tender is accepted shall be established to KPLC's satisfaction –

a) that, in the case of a Tenderer offering to supply goods under the contract which the Tenderer did not manufacture or otherwise produce, the Tenderer has been duly authorized by the goods' manufacturer or producer to supply the goods. The authorization shall strictly be in the form and content as prescribed in the Manufacturer's Authorization Form in the Tender Document.

b) that the Tenderer has the financial capability necessary to perform the contract. The Tenderer shall be required to provide -

(i.) Audited Financial Statements (Audited Accounts) that are reported within eighteen (18) calendar months of the date of the tender document. The Statements must be stamped and signed by the Auditors who must be currently registered by ICPAK.

(ii.) For companies or firms that are registered or incorporated within the last one calendar year of the Date of the Tender Document, they should submit certified copies of bank statements covering a period of at least six (6) months prior to the Date of the Tender Document. The copies should be certified by the Bank issuing the statements. The certification should be original.

(iv.) A valid and current Tax Compliance Certificate (TCC) issued by KRA. The Tenderer is strongly advised to confirm the authenticity of the TCC with KRA's Compliance Department to avoid rejection of its Tender.

(iv.) evidence of adequacy of working capital for this Contract eg. access to line(s) of credit and availability of other financial resources

c) that the Tenderer has the technical and/or production capability necessary to perform the contract.

d) that, in the case of a Tenderer not doing business within Kenya, the Tenderer is or will be (if awarded the contract) represented by an agent in Kenya equipped and able to carry out the Tenderer's maintenance, repair, spare parts and stocking obligations prescribed in the Conditions of Contract and or in the Technical Specifications.

e) that the Tenderer has the technical and management capability necessary to perform the contract. These are as per the Qualification Information Form which includes:-

(i.) documents showing qualifications and experience of key site management and technical personnel proposed for the Contract.

(ii.) employment records including contracts of employment for all key personnel

(v.) The Tenderer's undertaking that the key site management and technical personnel will be available for the contract

(vi.) List and evidence of ownership/lease of contractor's equipment proposed for carrying out the Works

f) that the Tenderer is duly classified and currently registered by NCA, ERC, the National Treasury, the County Treasury or any other relevant authorised body as capable of performing the Works under the contract. The Tenderer will furnish KPLC with a copy of the registration certificate and copy of renewal receipt. KPLC reserves the right to subject the certificate and receipt to authentication.

g) information regarding any litigation or arbitration current or during the last five (5) years, in which the Tenderer is involved, the parties concerned and disputed amount; and

h) detailed proposals for subcontracting components of the Works amounting to more than twenty percent (20%) of the Contract Price.

3.20.3 Tenderers with a record of unsatisfactory or default in performance obligations in any contract shall not be considered for evaluation or award. For the avoidance of doubt, this shall include any Tenderer with unresolved case(s) in its obligations for more than two (2) months in any contract.

3.21 Eligibility and Conformity of Works to Tender Documents

3.21.1 The Tenderer shall furnish, as part of its tender, documents establishing the eligibility and conformity to the Tender Document of all the Works that the Tenderer proposes to perform under the contract.

3.21.2 The documentary evidence of the eligibility of the goods shall consist of a statement in the Price Schedule of the country of origin of the goods and services offered which shall be confirmed by a certificate of origin issued at the time of shipment.

3.21.3 The documentary evidence of conformity of the Works to the Tender Document may be in the form of literature, drawings, and data, and shall (where applicable) consist of: -

a) a detailed description of the essential technical and performance characteristics of the Works whether in brochures, catalogues, drawings or otherwise,

b) a list giving full particulars, including available source and current prices of spare parts, special tools and other incidental apparatus necessary for the proper and continuing performance of the Works for a minimum period of six (6) months following usage of the Works after the official handing over to KPLC, and,

c) Duly completed Schedule of Guaranteed Technical Particulars (GTP) as per Tender Specifications demonstrating substantial responsiveness of the goods

and service to those specifications and, if any, a statement of deviations and exceptions to the provisions of the Technical Specifications.

d) duly completed Price Schedule and/or BQs' in compliance with KPLC's schedule of requirements and/or BQs requirements or, a Statement of Deviations and exceptions to the provisions of KPLC's schedule of requirements and/or BQs' requirements.

For (a), (b) and (c) above, the literature, drawings and data shall be those from the Manufacturer.

3.21.4 For purposes of the documentary and other evidence to be furnished pursuant to sub-paragraphs 3.21.1, 3.21.2 and paragraph 3.22, the Tenderer shall note that standards for workmanship, material, and equipment, designated by KPLC in its schedule of requirements and/or BQs' are intended to be descriptive only and not restrictive. The Tenderer may adopt higher standards in its Tender, provided that it demonstrates to KPLC's satisfaction that the substitutions ensure substantial equivalence to those designated in the BQs'.

3.22 Demonstration(s), Inspection(s) and Test(s)

3.22.1 Where required, all Tenderers shall demonstrate ability of performance of the required Works in conformity with the schedule of requirements and/or Bills of Quantities.

3.22.2 KPLC or its representative(s) shall have the right to inspect/ test the Tenderer's capacity, equipment, premises, and to confirm their conformity to the tender requirements. This shall include the quality management system. KPLC's representative(s) retained for these purposes shall provide appropriate identification at the time of such inspection/ test.

3.22.3 The bidder shall meet the cost of demonstration, inspection and test while KPLC shall meet the cost of air travel to the nearest airport and accommodation of its nominated officers inspecting and witnessing tests. Where conducted on the premises of the Tenderer(s), all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors at no charge to KPLC. In all cases, the equipment used for tests must be validly calibrated by the national standards body and a copy (ies) of the calibration certificate(s) must be submitted with the test report(s).

3.22.4 Demonstration and/or Inspection and/or Test Report(s) shall be completed upon conclusion of the demonstration/ inspection/ tests. This Report will be considered at time of evaluation and or award.

3.23 Warranty

3.23.1 Where required in the Tender, all Tenderers must also provide a Warranty that warrants that any part of the Works that comprises any equipment, the equipment to be provided under the contract are new, unused and or are of the most recent or

current specification and incorporate all recent improvements in design and materials unless provided otherwise in the Tender.

3.23.2 The Warranty shall also warrant that the equipment in the Tenderer's bid have no defect arising from manufacture, materials or workmanship or from any act or omission of the Tenderer that may develop under normal use or application of the equipment under the conditions obtaining in Kenya.

3.23.3 The Warranty will remain valid for a minimum of twelve (12) months after the equipment, or any part thereof as the case may be, have been commissioned as indicated in the contract.

3.24 Tender Security

3.24.1 The Tenderer shall furnish, as part of its Tender, a tender security for the amount specified in the BDS.

3.24.2 The tender security shall be either one or a combination of the following:-

a) an original Bank Guarantee from a commercial bank licensed by the Central Bank of Kenya (CBK) that is strictly in the form and content as prescribed in the Tender Security Form (Bank Guarantee) in the Tender Document. The bank must be located in Kenya.

b) For local bidders, Standby Letters of Credit (LC). All costs, expenses and charges levied by all banks party to the LC shall be prepaid by the Tenderer. The LC must contain all the mandatory conditions of payment to KPLC as prescribed in the Tender Security (Letters of Credit) provided in the Tender Document.

c) For foreign bidders, Standby Letters of Credit (LC) confirmed by a bank in Kenya. All costs, expenses and charges levied by all banks party to the LC including confirmation charges shall be prepaid by the Tenderer. The LC must contain all the mandatory conditions of payment to KPLC as prescribed in the Tender Security (Letters of Credit) provided in the Tender Document.

d) An original Guarantee by a deposit taking Microfinance Institution, Sacco Society, Youth Enterprise Development Fund or the Women Enterprise Fund, that is strictly in the form and content as prescribed in the Tender Security Form

3.24.3 The Tender Security is required to protect KPLC against the risk of the Tenderer's conduct which would warrant the security's forfeiture pursuant to paragraph 3.24.10.

3.24.4 The Tender Security shall be denominated in Kenya Shillings or in another freely convertible currency, and shall be issued by a commercial bank located in Kenya and licensed by the Central Bank of Kenya. The bank or institution must be located in Kenya.

3.24.5 The Tender Security shall be valid for thirty (30) days beyond the validity of the tender.

3.24.6 KPLC shall seek authentication of the Tender Security from the issuing bank. It is the responsibility of the Tenderer to sensitise its issuing bank/institution on the need to respond directly and expeditiously to queries from KPLC. The period for response shall not exceed five (5) days from the date of KPLC's query. Should there be no conclusive response by the bank/institution within this period, such Tenderer's Tender Security may be deemed as invalid and the bid rejected.

3.24.7 Any Tender not secured in accordance with this paragraph will be rejected by KPLC as non-responsive, pursuant to paragraph 3.35.

3.24.8 The unsuccessful Tenderer's Tender Security will be released as promptly as possible, in any of the following circumstances: -

a) the procurement proceedings are terminated
b) KPLC determines that none of the submitted Tenders is responsive
c) a contract for the procurement is entered into
d) the Tenderer does not qualify for Financial Evaluation in accordance with paragraph 3.31.

3.24.9 The successful Tenderer's Tender Security will be released upon the successful Tenderer's signing the contract, pursuant to paragraph 3.32 and furnishing an authentic Performance Security, pursuant to paragraph 3.37.

3.24.10 The Tender Security shall be forfeited –

a) if the Tenderer withdraws its Tender after the deadline for submitting Tenders but before the expiry of the period during which the Tenders must remain valid
b) if the Tenderer rejects a correction of an arithmetic error
c) if the Tenderer fails to enter into a written contract in accordance with paragraph 3.48
d) if the successful Tenderer fails to furnish the performance security in accordance with paragraph 3.49
e) if the Tenderer fails to extend the validity of the tender security where KPLC has extended the tender validity period in accordance with paragraph 3.25.

3.24.11 In cases of a JV bid, without prejudice to the provisions relating to a JV, the Tender Security may be in the name of any or all parties to the JV and the above provisions on Tender Security shall apply.

3.25 Validity of Tenders

3.25.1 Tenders shall remain valid for one hundred and twenty (120) days after the date of tender opening as specified in the Invitation to Tender or as otherwise may be prescribed by KPLC, pursuant to paragraph 3.30. A Tender that is valid for a shorter period shall be rejected by KPLC as non-responsive.

3.25.2 In exceptional circumstances, KPLC may extend the Tender validity period. The extension shall be made in writing. The tender security provided under paragraph 3.24 shall also be extended. A Tenderer shall not be required nor permitted to modify its tender during the extended period.

3.26 Alternative Offers

Only main offers shall be considered, as alternative offers are not acceptable.

3.27 Number of Sets of and Tender Format

3.27.1 The Tenderer shall prepare three complete sets of its Tender, identifying and clearly marking the **"**ORIGINAL TENDER", "COPY 1 OF TENDER", and "COPY 2 OF TENDER" as appropriate. Each set shall be properly bound. The copies shall be a replica of the Original. Each copy will be deemed to contain the same information as the Original.

3.27.2 The Tender shall be bound and divided clearly in descending order as listed in the Tender Submission Checklist. The divisions are for clear identification and marking of the respective documents or information that are serially numbered in the Checklist.

3.27.3 The order and arrangement as indicated in the Tender Submission Checklist will be considered as the Tender Formats.

3.27.4 Any Tender not prepared and signed in accordance with this paragraph, in particular sub-paragraphs 3.20.1, 3.20.2 and 3.20.3 shall be rejected by KPLC as non-responsive, pursuant to paragraph 3.28.

3.28 Preparation and Signing of the Tender

3.28.1 The Original and all copies of the Tender shall be typed or written in indelible ink. They shall be signed by the Tenderer or a person or persons duly authorized to bind the Tenderer to the contract.

3.28.2 The authorization shall be indicated by a written Power of Attorney granted by the Tenderer to the authorized person before any of the following persons:-

a) For local Tenderers, a Commissioner of Oaths or a Notary Public or a Magistrate of the Kenyan Judiciary.

b) For foreign Tenderers, a Notary Public in the country of the Tenderer.

In either case above, the Power of Attorney shall accompany the Tender.

3.28.3 All pages of the Tender, including un-amended printed literature, shall be initialled by the person or persons signing the Tender and serially numbered.

3.28.4 The Tender shall have no interlineations, erasures, or overwriting except as necessary to correct errors made by the Tenderer, in which case such corrections shall be initialled by the person or persons signing the Tender.

3.28.5 KPLC will assume no responsibility whatsoever for the Tenderer's failure to comply with or observe the entire contents of this paragraph 3.21.

3.28.6 Any Tender not prepared and signed in accordance with this paragraph may be rejected by KPLC as non-responsive, pursuant to paragraph 3.28.

3.29 Sealing and Outer Marking of Tenders

3.29.1 The Tenderer shall seal the Original and each Copy of the Tender in separate envelopes or packages, duly marking the envelopes or packages as "ORIGINAL", "COPY 1 OF TENDER" and "COPY 2 OF TENDER". The envelopes or packages shall then be sealed in outer envelopes or packages.

3.29.2 The inner and outer envelopes or packages shall -

a) be addressed to KPLC at the address given in the Invitation to Tender,

*b) bear the tender number and name as per the Invitation to Tender and the words, **"DO NOT OPEN BEFORE** as specified in the Invitation to Tender.*

3.29.3 All inner envelopes or packages shall also indicate the name and full physical, telephone, e-mail, facsimile and postal contacts of the Tenderer to enable the Tender to be returned unopened in circumstances necessitating such return including where Tenders are received late, procurement proceedings are terminated before tenders are opened.

3.29.4 If the envelopes or packages are not sealed and marked as required by this paragraph, KPLC will assume no responsibility whatsoever for the Tender's misplacement or premature opening. A tender opened prematurely for this cause will be rejected by KPLC and promptly returned to the Tenderer.

3.30 Deadline for Submission of Tenders

3.30.1 Tenders must be received by KPLC by the time and at the place specified in the Invitation to Tender.

3.30.2 KPLC may, at its discretion, extend this deadline for submission of Tenders by amending the tender documents in accordance with paragraph 3.7, in which case all rights and obligations of KPLC and the Tenderer previously subject to the initial deadline, will therefore be subject to the deadline as extended.

3.31 Modification and Withdrawal of Tenders

3.31.1 The Tenderer may modify or withdraw its Tender after it has submitted it, provided that written notice of the modification, including substitution or withdrawal of the Tender is received by KPLC prior to the deadline prescribed for submission of tenders.

3.31.2 The Tenderer's modification or withdrawal notice shall be prepared, sealed, marked, and dispatched in accordance with the provisions of paragraphs 3.20, 3.21 and 3.22. A withdrawal notice may also be sent by facsimile, electronic mail, cable or telex but followed by an original signed confirmation copy, postmarked not later than the deadline for submission of Tenders.

3.31.3 No Tender may be modified after the deadline for submission of Tenders.

3.31.4 No Tender may be withdrawn in the interval between the deadline for submission of tenders and the expiration of the period during which the Tender must remain valid. Any withdrawal of a Tender during this interval shall result in forfeiture of the Tenderer's Tender Security.

3.32 Opening of Tenders

3.32.1 KPLC shall open all Tenders promptly after the tender closing date and time, at the location specified in the Invitation to Tender or as may otherwise be indicated.

3.32.2 The Tenderer's names, tender modifications or withdrawals, the presence or absence of requisite Tender Security, the number of sets of tender documents duly received and such other details as KPLC, at its discretion, may consider appropriate, will be announced at the opening.

3.32.3 At the Tender opening, tender prices, discounts, and such other details as KPLC, at its discretion, may consider appropriate will be read out.

3.32.4 The Tenderers or their representatives may attend the opening and those present shall sign a register evidencing their attendance.

3.33 Process to be Confidential

3.33.1 After the opening of tenders, information relating to the examination, clarification, evaluation and comparisons of tenders and recommendations arising there-from shall not be disclosed to a Tenderer or other person(s) not officially concerned with such process until conclusion of that process.

3.33.2 Any effort by a Tenderer to influence KPLC or any of its staff members in the process of examination, evaluation and comparison of tenders and information or decisions concerning award of Contract may result in the rejection of the Tenderer's tender.

3.34 Clarification of Tenders and Contacting KPLC

3.34.1 To assist in the examination, evaluation and comparison of Tenders KPLC may, at its discretion, ask the Tenderer for a clarification of its Tender. The request for clarification and the response shall be in writing, and no change in the prices or substance of the Tender shall be sought, offered, or permitted.

3.34.2 The Tenderer is required to provide timely clarification or substantiation of the information that is essential for effective evaluation of its qualifications. It is the responsibility of the Tenderer to provide in writing the clarification or substantiation which should reach KPLC within five (5) days from the date of KPLC's query. Such writing may include by electronic mail, facsimile or postal mail. Should there be no conclusive response within this period, it shall result in the Tenderer's disqualification.

3.34.3 Save as is provided in this paragraph and paragraph 3.26 above, no Tenderer shall contact KPLC on any matter related to its Tender, from the time of the tender opening to the time the contract is awarded.

3.34.4 Any effort by a Tenderer to influence KPLC in its decisions on tender evaluation, tender comparison, tender recommendation(s) or contract award may result in the rejection of the Tenderer's Tender.

3.35 Preliminary Tender Evaluation

3.35.1 Prior to the detailed Technical and Financial evaluation, KPLC will determine the substantial responsiveness of each Tender. For purposes of this tender, a substantially responsive Tender is one that conforms to the requirements of Preliminary Evaluation. KPLC's determination of a Tender's responsiveness is to be based on the contents of the Tender itself without recourse to extrinsic evidence.

3.35.2 KPLC will examine the Tenders to determine whether they conform to the Preliminary Evaluation Criteria set out in Section VI Evaluation Criteria.

3.35.3 Notwithstanding the contents of the foregoing sub-paragraphs, if a Tender is not substantially responsive, it will be rejected at the earliest stage of evaluation by KPLC and cannot subsequently be made responsive by the Tenderer by correction of any non–conformity.

3.36 Minor Deviations, Errors or Oversights

3.36.1 KPLC may waive any minor deviation in a Tender that does not materially depart from the requirements of the goods and or services set out in the Tender Document.

3.36.2 Such minor deviation -

3.29.2.1 shall be quantified to the extent possible,

3.29.2.2 shall be taken into account in the evaluation process, and,

3.29.2.3 shall be applied uniformly and consistently to all qualified Tenders duly received by KPLC.

3.36.3 KPLC may waive errors and oversights that can be corrected without affecting the substance of the Tender.

3.37 Technical Evaluation and Comparison of Tenders

3.37.1 KPLC will further evaluate and compare the Tenders that have been determined to be substantially responsive, in compliance to the Schedule of Requirements and/or BQs set out in the Tender Document and as per the prescribed Evaluation Criteria.

3.37.2 The Implementation Plan is a critical aspect of the Tender. KPLC requires that the Works shall be performed at the time specified in the BDS. KPLC's evaluation of a tender will also take into account the Work Plan proposed in the Tender.

3.38 Financial Evaluation

3.38.1 The financial evaluation and comparison shall be as set out in the Summary of Evaluation Process. The comparison shall include:-

a) the rates and prices [which must be inclusive of insurances, duties, levies, Value Added Tax (V.A.T), Withholding Tax and other taxes payable (where

applicable) and delivery to the premises of KPLC (where applicable) or other specified site(s)]

b) Confirming if there are any deviations in the Payment Schedule from what is specified in the Special Conditions of Contract

3.38.2 Where other currencies are used, KPLC will convert those currencies to the same currency using the selling exchange rate ruling on the date of tender closing provided by the Central Bank of Kenya.

3.38.3 Arithmetical errors will be rectified on the following basis - if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail, and the total price shall be corrected. If there is a discrepancy between words and figures, the amount in words will prevail.

3.38.4 The Tenderer will be notified of the correction of the arithmetical error(s). If the Tenderer does not accept the correction of the error(s), its Tender will be rejected, and its Tender Security forfeited.

3.39 Preferences

3.39.1 Where applicable, in the evaluation of tenders, exclusive preference shall be given to citizens of Kenya where -

3.39.1.1 the funding is one hundred percent (100%) from the Government of Kenya or a Kenyan body, and,

3.39.1.2 the amount of the tender as evaluated is below;

3.39.1.2.1 Ksh. 1 Billion in respect of roads works, construction materials and others used in transmission and conduction of electricity of which the material is made in Kenya.

3.39.1.2.2 Ksh. 500 Million in respect of other works

3.39.1.2.3 Ksh. 100 Million in respect of goods.

3.39.1.2.4 Ksh. 50 Million in respect of services.

3.39.2 For purposes of this paragraph the Tenderer shall submit with its Tender, a valid copy of certificate of Confirmation of Directorships and Shareholding issued **and signed** by either the Registrar of Companies or Registrar of Business Names. This certificate must not be more than three (3) months old from the Date of the Tender Document. Kenya Power reserves the right to subject the certificate to authentication.

3.40 Debarment of a Tenderer

A Tenderer who gives false information in the Tender about its qualification or who refuses to enter into a contract after notification of contract award shall be considered for debarment from participating in future public procurement.

3.41 Confirmation of Qualification for Award

3.41.1 KPLC may confirm to its satisfaction whether the Tenderer that is selected as having submitted the lowest evaluated responsive tender is qualified to perform the contract satisfactorily.

3.41.2 The confirmation will take into account the Tenderer's financial, technical, and performance capabilities. It will be based upon an examination of the documentary evidence of the Tenderer's qualifications submitted by the Tenderer, pursuant to paragraph 3.20 as well as confirmation of such other information as KPLC deems necessary and appropriate. This may include factory, office and other facilities inspection and audits.

3.41.3 An affirmative confirmation will be a prerequisite for award of the contract to the Tenderer. A negative confirmation will result in rejection of the Tenderer's Tender, in which event KPLC will proceed to the next lowest evaluated responsive tender to make a similar confirmation of that Tenderer's capabilities to perform satisfactorily.

3.42 Award of Contract

3.42.1 KPLC will award the contract to the successful Tenderer who will have the highest bid score as per evaluation criterea

3.43 Termination of Procurement Proceedings

3.43.1 KPLC may at any time terminate procurement proceedings before contract

award and shall not be liable to any person for the termination.

3.43.2 KPLC shall give prompt notice of the termination to the Tenderers, and, on request from any Tenderer, give its reasons for termination within fourteen (14) days of such request.

3.44 Notification of Award

3.44.1 Prior to the expiration of the period of tender validity, KPLC shall notify the successful Tenderer in writing that its Tender has been accepted.

3.44.2 The notification of award shall not constitute the formation of the contract until one is finally signed by both parties.

3.44.3 Simultaneously, and without prejudice to the contents of paragraph 3.34, on issuance of Notification of Award to the successful Tenderer, KPLC shall notify each unsuccessful Tenderer.

3.44.4 A notification of the tender outcome does not reduce the validity period for any tender security whether the Tenderer is successful or not, except where such tender security is officially released to the Bank/institution and/or the Tenderer and such Bank/institution discharged of all its obligations by KPLC prior to the expiry of its stated validity period.

3.45 Clarifications with the Successful Tenderer (s)

3.45.1 Clarifications may be undertaken with the successful Tenderer(s) relating to any or all of the following areas:-

a) A minor alteration to the technical details of the Schedule of requirements and/or BQ's

b) Reduction of quantities for budgetary reasons where the reduction is in excess of any provided for in the Tender Document
c) A minor amendment to the SCC.
d) Finalising payment arrangements
e) Mobilisation arrangements e.g. operational details
f) Agreed final delivery or Work Plan to accommodate any changes required by KPLC.
g) Methodology and Staffing
h) Clarifying details that were not apparent or could not be finalized at the time of tendering

3.45.2 Clarifications shall not change the substance of the Tender.

3.46 Signing of Contract

3.46.1 At the same time as KPLC notifies the successful Tenderer that its Tender has been accepted, KPLC will send the Tenderer the Contract Agreement provided in the Tender Document together with any other necessary documents incorporating all agreements between the Parties.

3.46.2 Within seven (7) days of the date of notification of award, the successful Tenderer shall only sign the Contract Form and all the documents specified in that Form and return them to KPLC within that period of seven (7) days.

3.46.3 KPLC shall sign and date the Contract in the period between not earlier than seven (7) days from the date of notification of contract award and not later than thirty (30) days after expiry of tender validity. Further, KPLC shall not sign the contract until and unless the authentic performance security is received in accordance with paragraph 3.47.

3.46.4 Failure of the successful Tenderer to sign the Contract, the award shall be annulled and its tender security forfeited in which event KPLC shall notify the next lowest evaluated Tenderer that its Tender has been accepted.

3.46.5 Paragraph 3.34 together with the provisions of this paragraph 3.42 will apply with necessary modifications with respect to the Tenderer notified under sub-paragraph 3.46.4.

3.47 Performance Security

3.47.1 Within fourteen (14) days of the date of notification of award from KPLC, the successful Tenderer shall furnish KPLC with a Performance Security. The Performance Security shall be denominated in Kenya Shillings and shall be valid shall be until a date sixty (60) days beyond the date of issue of the Certificate of Completion.

3.47.2 The Performance Security shall be either one or a combination of the following:

a) An original Bank Guarantee from a commercial bank licensed by the Central Bank of Kenya that is strictly in the form and content as prescribed in the

Performance Security Form (Bank Guarantee) in the Tender Document. The bank issuing the Bank Guarantee must be located in Kenya.

b) For Local bidders, Standby Letters of Credit (LC). All costs, expenses and charges levied by all banks party to the LC shall be prepaid by the Tenderer. The LC must contain all the mandatory conditions of payment to KPLC as prescribed in the Tender Security (Letters of Credit) provided in the Tender Document.

c) For Foreign bidders, Standby Letters of Credit (LC) confirmed by a bank in Kenya. All costs, expenses and charges levied by all banks party to the LC including confirmation charges shall be prepaid by the Tenderer. The LC must contain all the mandatory conditions of payment to KPLC as prescribed in the Tender Security (Letters of Credit) provided in the Tender Document.

3.47.3 The successful Tenderer shall furnish a Performance Security being the sum of ten percent (10%) of the contract price.

3.47.4 KPLC shall seek authentication of the Performance Security from the issuing bank. It is the responsibility of the successful Tenderer to sensitise its issuing bank on the need to respond directly and expeditiously to queries from KPLC. The period for response shall not exceed three (3) days from the date of KPLC's query. Should there be no conclusive response by the Bank within this period, such successful Tenderer's Performance Security may be deemed as invalid.

3.47.5 Failure of the successful Tenderer to furnish an authentic Performance Security, the award shall be annulled and the Tender Security forfeited, in which event KPLC may notify the next lowest evaluated Tenderer that its Tender has been accepted.

3.47.6 Paragraph 3.44, 3.45, 3.46 together with the provisions of this paragraph 3.47 will apply with necessary modifications, and as far as circumstances permit, with respect to the Tenderer notified under sub-paragraph 3.47.5

3.48 Corrupt or Fraudulent Practices

3.48.1 KPLC requires that Tenderers observe the highest standard of ethics during the procurement process and execution of contracts. When used in the present Regulations, the following terms are defined as follows: -

a) *"Corrupt practice" means the offering, giving, receiving or soliciting of any thing of value to influence the action of public official in the procurement process or in contract execution;*

b) *"Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to the detriment of KPLC, and includes collusive practice among Tenderers (prior to or after Tender submission) designed to establish tender prices at artificial non-competitive levels and to deprive KPLC of the benefits of free and open competition.*

3.48.2 KPLC will reject a proposal for award if it determines that the Tenderer recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question.

3.48.3 Further, a Tenderer who is found to have indulged in corrupt or fraudulent practices risks being debarred from participating in public procurement in Kenya.

3.41 Monopolies and Restrictive Trade Practices

3.49.1 Agreements between undertakings, decisions by associations of undertakings, decisions by undertakings or concerted practices by undertakings which have as their object or effect the prevention, distortion or lessening of competition in trade in the goods tendered for are prohibited.

3.49.2 An agreement or a concerted practice of the nature prohibited above shall be deemed to exist between two or more undertakings if-

a. Any one of the undertakings owns a significant interest in the other or has at least one director or one substantial shareholder in common; or
b. Any combination of the undertakings engages in any of the below practices;
    i. Directly or indirectly fixing purchase or selling prices or any other trading conditions, and/or
    ii. Collusive tendering.

SECTION IV - BID DATA SHEET (Appendix to Instructions to Tenderers)

The following information regarding the particulars of the tender shall complement and or amend the provisions of the Instructions to Tenderers *hereinafter abbreviated as ITT*. Wherever there is a conflict between the provisions of the ITT and the Bid Data Sheet, the provisions of the BDS shall prevail over those of the ITT.

No.	ITT Reference Clause	Particulars of Appendix
1.	**3.2.1 Eligible Tenderers**	*Local and Foreign Tenderers are eligible*
2.	**3.6 Time for Completion of works**	*Within six months from date of award*
3.	**3.10.3 Sample Site Visit** **Pre-Bid Meeting**	*There shall be a mandatory sample site visit on site and a prebid briefing as follows;* • *Site 1 UEB Line Lake Nakuru.* ***16th March 2016****; Meeting at* ***Lanet 132kV Substation*** *11.00 a.m.* • *Site 2 Towers 9, 10 and 12 (Mumias) –* ***17th March 2016****; Musaga-Mumias Transmission Line. Meeting at* ***Mumias 132kV Substation*** *at 10.00 a.m.* • *Site 3 Tower 113 (Rabuor) –* ***18th March 2016****; Sondu-Kisumu Transmission Line. Meeting at* ***Rabuor*** *Crossing at 9.00 a.m.* • *Site 4 Tower 245 (Nyando) –* ***18th March 2016****; Muhoroni-Kisumu Transmission Line. Meeting at* ***Awasi*** *at 2.00 p.m.* • *Bidders who had visited the sites in the previous tender need not to attend but will be required to provide the stamped site visit form.*
4.	**3.16(f) – List of Previous Customers**	*The Tenderer shall submit at least three (3) names with full contact including telephone, email and physical addresses of previous clients of similar Works and letters from the previous clients confirming satisfactory completion of the contracts and on schedule.*
5.	**3.20.e Documents of evidence of eligibility and qualification**	*Bidders shall be required to provide details and testimonials of their staff as contained in the evaluation criteria.*
6.	**3.21.3 (a) Catalogues, Brochures, Manufacturer's/**	*Bidders are required to provide.*

	Principal's Drawings	
7	**3.22.4 Demonstration and/or Inspection and/or Test Report(s)**	*Tests and Factory inspections shall apply as per tender before installation and commissioning tests thereafter on completion*
8.	**3.23.3 Warranty/Warranty Period**	*The period shall be Two (2yrs) from the date of the commissioning.*
9.	**3.24.1 Tender Security**	*Tender security shall be KShs. 1,200,000 (One million and two hundred thousand shillings)* ***However the Original Tender Security in an envelope clearly labelled with the tender number & name, shall be deposited in the Tender Security Box on 3rd Floor Supply Chain Reception on or before the opening date and time.***
10	**3.25 Validity of Tenders**	*Tender validity shall be 120 days from the date of the tender as per the Invitation to Tender and Tender Form*
11	**3.27 Number of Sets of and Tender Format**	There will be only one document submitted on the e-procurement portal.
12	**3.28 Preparation and Signing of the Tender**	There will be only one document submitted on the e-procurement portal. ***Bidders shall ensure that they upload all the required documents into the portal.***
13	**3.29 Sealing and Outer Marking of Tenders**	For purposes of this tender, this is not applicable as the tender is being submitted electronically ***However the Original Tender Security in a clearly labelled envelope shall be deposited in the Tender Security Box on 3rd Floor Supply Chain Reception on or before the opening date and time.***
14	**3.42 Award of contract**	*Shall be for supply, installation and commissioning as one whole contract to the lowest evaluated bidder*
15	**3.48 Performance Security**	*Performance Security shall be 10% of the contract sum.)*

SECTION VII - SUMMARY OF EVALUATION PROCESS

Evaluation of duly submitted tenders will be conducted along the following three main stages: -

7.1 Part I - Preliminary Evaluation Criteria Under Clause 3.35 of the ITT. These are mandatory requirements. This shall include confirmation of the following: -

7.1.1 S*ubmission of Tender Security - Checking its validity, whether it is Original; whether it is sufficiency and whether it is issued as required in the tender document; whether it is strictly in the format required in accordance with the sample Tender Security Form(s).*

7.1.2 Submission of Declaration Form(s) duly completed and signed.

7.1.3 Submission and considering Tender Form duly completed and signed.

7.1.4 Submission and considering the following:-

7.1.4.1 For Local Tenderers and subcontractors

a) Company or Firm's Registration Certificate

b) PIN Certificate.

c) Valid Tax Compliance Certificate.

d) Names with full contact as well as physical addresses of previous customers of similar goods and reference letters from at least four (4) previous customers.

7.1.4.2 For Foreign Tenderers and subcontractors

a) Company or Firm's Registration Certificate

b) PIN Certificate or its equivalent in the country of bidder or a statement from the tax authorities in the Tenderer's country of origin indicating that such certificate or its equivalent is not issued.

c) Valid Tax Compliance Certificate or its equivalent in the country of bidder or a statement from the tax authorities in the Tenderer's country of origin indicating that such certificate or its equivalent is not issued.

d) Names with full contact as well as physical addresses of previous customers of similar works and reference letters from at least four (3) previous customers.

7.1.5 That the Tender is valid for the period required.

7.1.6 Sample Site visit signed and stamped form by authorized staff.

7.1.7 Submission of the following documents from the subcontracted firms:-

a). Company registration certificate

b). Valid certificate of registration of the subcontracted firms by NCA 4 and above or the relevant registration body as indicated in the tender.

b). Registration with ERC class A1

7.1.8 Submission and considering the Confidential Business Questionnaire:-

a) Is fully filled.

b) That details correspond to the related information in the bid.

c) That the Tenderer is not ineligible as per paragraph 3.3 of the ITT.

7.1.10 Submission and considering the Certificate of Confirmation of Directors and Shareholding if any one of the undertakings owns a significant interest in the other or has at least one director or one substantial shareholder in common as per paragraph 3.3 and 3.41of the ITT.

7.1.11 Submission and considering the Implementation Plan

7.1.12 Record of unsatisfactory or default in performance obligations in any contract shall be considered. This shall include any Tenderer with unresolved case(s) in its performance obligations for more than two (2) months in any contract.

7.1.14 Notwithstanding the above, considering any outstanding works where applicable and the capacity indicated by the tenderer.

Tenderers will proceed to the Technical Stage only if they qualify in compliance with Part 1 above, Preliminary Evaluation under clause 7.

7.2 Part II - Technical Evaluation under clause 3.41 of the ITT. It will include the following stages: -

Part II (a) – <u>These are mandatory requirements</u>

Evaluation of the following Technical information against Tender Requirements and Specifications:-

7.2.1 Evaluation of the following technical information against Tender Requirements and Specifications:-

7.2.1.1 For goods manufactured outside Kenya, applicable relevant valid ISO 9001 certification

7.2.1.2 For goods manufactured in Kenya - valid KEBS Diamond Mark of Quality Certificate or KEBS Standardisation Mark Certificate.

7.2.1.3 Type Test Certificates and their Reports or Test Certificates and their Reports from the designated bodies for full compliance with Tender Specifications

7.2.1.4 The accreditation certificate for the testing laboratory to ISO/ IEC 17025.

7.2.1.5 Manufacturer's Authorization

7.2.1.6 As contained in the following documents –

a) Manufacturer's Warranty
b) Catalogues and or Brochures and or Manufacturer's drawings
c) Schedule of Guaranteed Technical Particulars as per Technical Specifications.

7.2.2 Detailed Technical Evaluation

The Schedule of Mandatory Guaranteed Technical Particulars (GTP) shall be evaluated against Tender Specifications to confirm compliance of the goods and services to the specifications and evaluation of any deviations and exceptions declared by the Tenderer.

Tenderers will proceed to the next evaluation stage if they qualify in compliance with Parts II (a) above.

Part II (b) - Technical Evaluation under clause 3.20 of the ITT. It will include the following stages: The following will be scored.

7.2.2.1 Clear uploaded documents as per Tender Format i.e.

a) Clarity of information
c) Proper labeling of contents
d) Proper referencing of contents
e) Relevance of all attached documents in conformity with the requested information in Tender document

7.2.2.2 Experience

Accomplishments: (previous & current projects) Details of building projects undertaken successfully within the last 5 years each worth Ksh. 200Million Experience in the construction of transmission lines. Details of projects undertaken successfully within the last 5 years with evidenced of 3 by letters of reference from clients, certificates of occupation and completion certificates for the respective projects. (For a project to qualify it must be at least 70%

complete. For Projects that are not completed, letters of reference from respective Architects and Clients must be provided).

7.2.2.3 Professional Qualification

Qualified Technical staff in the company relevant to the power infrastructure industry who will actively be involved in the proposed project. Provide employment/appointment letters, contracts of the key personnel including length of service and termination date, CV, Academic and professional certificates and evidence of registration with relevant professional bodies and Telephone contacts.

i) Project management team comprising of team leader, registered engineers in civil, electrical and mechanical categories

ii) Works supervisors with a bias in lattice towers erection, transmission line overhead works, civil foundation works

iii) Skilled workers, artisans, craftsmen

iv) Safety officer-competence to receive KPLC permits and also trained in occupation safety, first aid etc. with over 5 years in active site supervision

v) Tenderers undertaking - The Tenderer's undertaking that the key site management and technical personnel will be available for the contract.

7.2.2.4 The bidder shall submit a contract methodology describing a full and comprehensive work plan for the implementation of this particular project (as part of the requirements of technical proposal in section IV). This shall include method statements but not limited to

- Engineering Design of 132 kV transmission line
- Installation, erection and commissioning of 132 kV line
- Quality control including subcontractor selection
- Safety compliance
- Proposed gant chart
- Site Restoration Erosion Mitigation, Foundation Protection

7.2.2.5 Proposed execution timeline for project

7.2.2.6 Tools and equipment to be used in the service.

i. Transmission line construction tools

ii. Tension and stringing tools

iii. Civil construction tools

Provide documentary evidence of ability to lease or hire relevant equipment not owned by the company. Give a description of their application and

performance to demonstrate technical capacity and an undertaking that the tools and equipment will be available for the execution of the contract.

7.2.2.7 Mitigation

Pricing justification and methodology-include the estimation method i.e. unit cost, approach justification based on world steel prices, freight charges etc. and comparatives with other projects undertaken by firm.

6.3 Part III – Financial Evaluation Criteria Under Paragraph 3.31 of the ITT. These are mandatory requirements.

6.3.1 This will include the following: -

a) *Confirmation of the authenticity of the submitted Tender Security.*

b) *Confirmation of and considering Price Schedule duly completed and signed.*

c) *Checking that the Tenderer has quoted prices based on all costs including duties and taxes*

*d)** *Checking submission of audited financial statements required which must be those that are reported within fifteen (15) calendar months of the date of the tender document.*

e) *Conducting a financial comparison, including conversion of tender currencies into one common currency,*

f) *Correction of arithmetical errors,*

g) *Taking into account the cost of any deviation(s) from the tender requirements,*

i) *Considering information submitted in the Confidential Business Questionnaire against other information in the bid including:-*

a) *Declared maximum value of business*

b) *Shareholding and citizenship for preferences where applicable.*

6.3.2 Confirming the following: -

6.3.2.1 that the contractor execution and completion Schedule meets KPLC's requirements.

6.3.2.2 that the contractor offered Terms of Payment meets KPLC's requirements.

<u>*NOTES</u>: -

1. For purposes of evaluation, the exchange rate to be used for currency conversion shall be the selling exchange rate ruling on the date of tender closing provided by the Central Bank of Kenya. (Visit the Central Bank of Kenya website).

2. Total tender value means the Tenderer's total tender price inclusive of Value Added Tax (V.A.T) for the services it offers to provide.

3. For companies or firms that are registered or incorporated within the last one calendar year of the Date of the Tender Document, they should submit certified copies of bank

statements covering a period of at least six months prior to the date of the tender document. The copies should be certified by the Bank issuing the statements. The certification should be original.

4. The spot balance of 20% required will be that which is seen in the certified bank statements at least in any day of the month of the Date of the Tender Document.

TABLE OF CLAUSES ON GENERAL CONDITIONS OF CONTRACT

SECTION VIII – GENERAL CONDITIONS OF CONTRACT

The General Conditions of Contract *hereinafter referred abbreviated as the GCC* shall form part of the Conditions of Contract in accordance with the law and KPLC's guidelines, practices, procedures and working circumstances. The provisions in the GCC will apply unless an alternative solution or amendment is made under other parts of the Contract including the Special Conditions of Contract.

8.1 Definitions

In this contract, the following terms shall be interpreted as follows: -

a) ***"Day"*** *means calendar day and "month" means calendar month.*

b) ***"Dayworks"*** *are work inputs subject to payment on a time basis for labour and the associated materials and plant.*

c) ***"Certificate of Acceptance"*** *means the certificate issued by KPLC to the Contractor confirming that the Works have been completed as per the terms of the Contract.*

d) ***"The Contract"*** *means the agreement entered into between KPLC and the Contractor, as recorded in the Contract Form signed by the parties, including all attachments and appendices thereto and all documents incorporated by reference therein.*

e) ***"The Contract Price"*** *means the price payable to the Contractor under the contract for the full and proper performance of its contractual obligations.*

f) ***"A Defect"*** *is any part of the Works not completed in accordance with the Contract.*

g) ***"The Defects Liability Certificate"*** *is the certificate issued by the Project Manager upon correction of defects by the Contractor.*

h) ***"The Defects Liability Period"*** *is the period specified in the Special Conditions of Contract when the Contractor is to remedy any defects in the Works.*

i) ***"The Goods"*** *includes all of the equipment, machinery, and or other materials, which the Contractor is required to supply to KPLC under the contract and install and commission under the contract as the case may be.*

j) ***"Party"*** *means KPLC or the Contractor or both as the context so requires.*

k) ***"Project Manager"*** *is the employee of KPLC responsible for supervising the execution of the Works and administering the Contract.*

l) ***"Site"*** *is the area where the Works under this Contract are to be carried out as specified in the Contract.*

m) ***"The Contractor"*** *means the individual or firm supplying the goods and undertaking the Works under this Contract as the case may be or his/ her/ its permitted heir(s), personal representative(s), successor(s) or permitted assign(s) where the context so admits. For the avoidance of doubt this shall mean the successful Tenderer(s) pursuant to the tender.*

n) ***"Works"*** *means the construction, repair, renovation or demolition of buildings, roads or other structures and includes the design, supply, installation, testing and commissioning of equipment and materials, site preparation and other incidental services where applicable.*

o) *Wherever used in the contract, "delivery" shall be complete or be deemed to be complete, unless the circumstances indicate otherwise, when the goods have been inspected and tested in accordance with the Contract and where KPLC does not signify its approval to the Contractor, but retains the goods without giving notice of rejection, on the expiration of thirty (30) days from date of documented receipt by the duly authorized representative of KPLC, of the goods, at KPLC stores or other indicated site.*

8.2 Application

These General Conditions shall apply to the extent that provisions of other parts of the contract do not supersede them.

8.3 Country of Origin

8.3.1 For purposes of this clause, "Origin" means the place where the goods were mined, grown, or produced.

8.3.2 The origin of Goods and Services is distinct from the nationality of the Contractor.

8.4 Standards

The Goods supplied under this contract shall conform to the standards mentioned in the Technical Specifications.

8.5 Use of Contract Documents and Information

8.5.1 The Contractor shall not, without KPLC's prior written consent, disclose the contract, or any provision thereof or any specification, plan, drawing, pattern, sample, or information furnished by or on behalf of KPLC in connection therewith, to any person other than a person employed by the Contractor in the performance of the contract.

8.5.2 The Contractor shall not, without KPLC's prior written consent, make use of any document or information enumerated in clause 7.5.1 above.

8.5.3 Any document, other than the contract itself, enumerated in clause 7.5.1 shall remain the property of KPLC and shall be returned (including all copies) to KPLC on completion of the Contractor's performance under the contract if so required by KPLC.

8.6 Patent Rights

The Contractor shall indemnify KPLC against all third party claims of infringement of patent, trademark, or industrial design rights arising from use of the goods of any part thereof in KPLC's country.

8.7 Performance Security

8.7.1 Within fourteen (14) days of the date of the notification of contract award, the Contractor shall furnish to KPLC the Performance Security which shall be either one or a combination of the following:-

a) an original Bank Guarantee that is strictly in the form and content as prescribed in the Performance Security Form (Bank Guarantee) in the Tender Document.

b) Confirmed Standby Letters of Credit (LC). All costs, expenses and charges levied by all banks party to the LC including confirmation charges shall be prepaid by the successful Tenderer. Certain mandatory conditions of the LC shall be as prescribed in the Performance Security Form (LC) in the Tender Document.

8.7.2 The Performance Security shall be issued by a commercial bank licensed by the Central Bank of Kenya. The bank must be located in Kenya.

8.7.3 The Performance Security shall be the sum of ten percent (10%) of the contract price. It shall be in the currency of the contract price.

8.7.4 Failure of the Contractor to furnish the Performance Security, the award shall be annulled and the Tender Security forfeited, in which event KPLC may notify the next lowest evaluated Tenderer that its Tender has been accepted.

8.7.5 The proceeds of the Performance Security shall be payable to KPLC as compensation for any loss resulting from the Contractor's failure to comply with its obligations in accordance with the contract without KPLC being required to demonstrate the loss it has suffered.

8.7.6 The Performance Security shall be valid for a minimum of sixty (60) days after satisfactory delivery for both Foreign and Local Contractors.

8.7.7 KPLC shall seek authentication of the Performance Security from the issuing bank. It is the responsibility of the Contractor to sensitize its issuing bank on the need to respond directly and expeditiously to queries from KPLC. The period for response shall not exceed five (5) days from the date of KPLC's query. Should there be no

conclusive response by the Bank within this period, such Contractor's Performance Security may be deemed as invalid and the Contract nullified, unless information to the contrary is received by KPLC two (2) days before the expiry of the Contractor's Tender Security.

8.7.8 Subject to the provisions of this contract, the Performance Security will be discharged by KPLC and returned to the Contractor not earlier than thirty (30) days following the date of completion of the Contractor's obligations under the contract, including any warranty obligations, under the contract.

8.8 Approval before Manufacture

8.8.1 All technical details and design drawings for the items to be supplied shall be submitted by the Contractor to KPLC for approval before manufacture.

8.8.2 Should the Contractor fail to observe this condition of approval before manufacture, KPLC may decline to accept the goods, or the Contractor shall either replace them or make alterations necessary, but in any case, KPLC shall incur no liability howsoever.

8.9 Inspection and Tests

8.9.1 KPLC or its representative shall have the right to inspect and/or to test the goods to confirm their conformity to the contract specifications. KPLC shall notify the Contractor in writing in a timely manner, of the identity of any representative(s) retained for these purposes.

8.9.2 Prior to the manufacture or production of the goods on order, KPLC reserves the right to inspect the manufacturing or production facility and the quality management system. The manufacturer or producer shall meet the cost of routine inspection while KPLC shall meet the cost of air travel to the nearest airport and accommodation of two of its nominated officers inspecting and witnessing tests.

8.9.3 It is the responsibility of the Contractor to confirm if this right is to be exercised. Such visit and or inspection shall in no way prejudice KPLC's rights and privileges.

8.9.4 Upon completion of manufacturing or production process, KPLC reserves the right to send two of its nominated officers to inspect the goods on order at the place of manufacture where inspection and acceptance tests as per tender specifications shall be carried out in their presence. Tests shall be done in accordance with the test standard(s) given in the Technical Specification of the goods on order.

8.9.5 The manufacturer or producer shall meet the cost of tests as per tender specifications while KPLC shall meet the cost of air travel to the nearest airport and accommodation of its two nominated officers inspecting and witnessing the tests.

8.9.6 The inspections and tests may be conducted on the premises of the Contractor or its subcontractor(s), at point of production, manufacture, delivery and or at the goods' final destination. If conducted on the premises of the Contractor or its subcontractor(s), all reasonable facilities and assistance, including access to drawings and production data, shall be furnished to the inspectors at no charge to KPLC. In all cases, the equipment used for tests must be validly calibrated by the national

standards body and a copy (ies) of the calibration certificate(s) must be submitted with the test report(s).

8.9.7 Complete test report(s) for all the goods as per Tender Specifications shall be submitted to KPLC for approval before packaging and shipment. No material or goods shall be shipped or delivered without written approval from KPLC.

8.9.8 Should any inspected or tested goods fail to conform to the specifications, KPLC shall reject the goods, and the Contractor shall either replace the rejected goods or make alterations necessary to meet specification requirements free of cost to KPLC. The period for replacement or alterations together with delivery to KPLC shall be fourteen (14) days or as may otherwise be specified in the notice of rejection.

8.9.9 The Contractor shall collect the rejected goods within fourteen (14) days from the date of notification of rejection. If the rejected goods are not collected within this period, the goods will be disposed of by KPLC guided by the Disposal of Uncollected Goods Act, Chapter 38 of the Laws of Kenya.

8.9.10 Notwithstanding any previous inspection(s) and test(s) KPLC shall inspect and may test the goods upon arrival at the indicated site. Where KPLC inspects and rejects the goods after the goods arrival, KPLC shall claim from the Contractor the full cost of the goods including delivery charges to KPLC Stores or other indicated site and other incidental costs incurred in relation thereof.

8.9.11 KPLC's right to inspect, test and where necessary, reject the goods after their arrival shall in no way be limited or waived by reason of the goods having previously been inspected, tested and passed by KPLC or its representative(s) prior to the goods delivery.

8.9.12 For the avoidance of doubt, any acknowledgement by KPLC on the Contractor's or sub-contractor's document shall not be conclusive proof or evidence of satisfactory delivery without duly authorized approval by KPLC.

8.9.13 Nothing in clause 7.9 shall in any way release the Contractor from any warranty or other obligations under this Contract.

8.10 Pre–Shipment Verification of Conformity (PVoC)

8.10.1 All Contractors of imported goods and or products must obtain a Certificate of Conformity issued by an authorized KEBS appointed partner prior to shipment.

8.10.2 The Certificate is a mandatory customs clearance document in Kenya. KEBS has appointed, Global Inspections South Africa (Pty) Ltd, (GSIA), China Certification and Inspection (Group) Company Ltd (CCIC), Agency Societe Generale de Surveillance S.A. (SGS) and INTERTEK, to perform the PVoC programme on their behalf depending on the country of supply origin. The cost of pre-shipment verification shall be borne by the Contractor.

8.11 Consignment

8.11.1 The terms shall be strictly on Delivered and Duty Paid (DDP) basis.

8.11.2 The Consignee shall be the supplier or supplier's agent whose responsibilities shall include payment of all Customs taxes, duties and levies, clearance of the goods, and delivery to KPLC stores. For avoidance of doubt, this includes Value Added Tax (VAT), Railway Development Levy (RDL) and Import Duties.

8.12 Packaging and Labelling

8.12.1 The Contractor shall provide such packaging of the goods as is required to prevent their damage or deterioration during transit to their final destination, as indicated in the contract.

8.12.2 The method of packaging, labeling and marking shall comply strictly with such special requirements as shall be specified and attached to the Tender and particular Order.

8.12.3 The labelling, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the contract.

8.12.4 The goods shall be packed in good condition suitable for sea/air/road/rail dispatch. Hazard in transit to the final destination shall include rough handling and storage in tropical conditions.

8.12.5 The Contractor shall enclose a packing list in each package and all documents relating to the Order shall show the Stores Code Number detailed against the items.

8.12.6 The labeling on each package shall include the following;

(i) General description of the item(s)

(ii) KPLC Order No……

(iii) Cautionary notes and handling instructions

(iv) Package number

8.13 Delivery and Documents for Foreign Goods

8.13.1 Delivery and or shipment of the goods shall be made by the Contractor to the place and in accordance with the terms specified by KPLC in its Schedule of Requirements.

8.13.2 For imported goods, upon shipment, the Contractor shall notify KPLC and the insurance company, by papermail or facsimile the full details of the shipment including Order number, description of goods, quantity, the vessel, the airway bill number and the date, port of discharge. The Contractor shall courier, one copy to KPLC and another to the insurance company, a set of the following documents: -

a) The Contractor's invoice showing the goods description, quantity, unit price, total amount

b) Non-negotiable airway bill or bill of lading

c) Packing list identifying contents of each package

d) Insurance certificate, where applicable

e) Manufacturer's and or Contractor's credit number, Type Test and or Test Reports and their respective Certificates and KPLC's Official Order number shall be quoted on the shipping documents

f) Approved drawings, brochures, catalogues and technical details

g) Inspection Certificate issued by the nominated inspection agency, as per Clause 7.10 PVoC, and the Contractor's inspection report

h) Summary of Acceptance Test reports signed and approved by KPLC for the items offered, and,

i) Certificate of Origin of the goods.

8.13.3 It is the responsibility of the Contractor to ensure shipping documents are received by KPLC at least one (1) week before the vessel docks or lands.

8.13.4 Any goods or products supplied without timely delivery or submission of the above mentioned shipping documents will not be released to importers until their quality is determined and will be held at the Contractor's expense.

8.13.5 Any late submission of shipping documents shall be treated as part of non-performance on the part of the Contractor and the Procurement Entity shall be entitled to call up the Performance Security. In addition KPLC shall upon demand, be entitled to receive any other amounts in excess including demurrage costs.

8.14 Delivery and Documents for Domestic Goods

8.14.1 Delivery of the goods shall be made by the Contractor to the place and in accordance with the terms specified by KPLC in its Schedule of Requirements.

8.14.2 The Contractor shall notify KPLC of the full details of the delivered goods by delivering together with the goods a full set of the following documents:-

a) Copies of the Contractor's invoice showing the goods description, quantity, unit price and total price

b) Delivery note

c) Manufacturer's and or Contractor's warranty certificate

d) Packing list identifying contents of each package

8.14.3 It is the responsibility of the Contractor to ensure that the delivery documents are received by KPLC at the designated delivery point at the time of delivery.

8.14.4 Any late or non-submission of the delivery documents shall be treated as part of non-performance on the part of the Contractor and KPLC shall be entitled to call up the Performance Security.

8.15 Transportation

8.15.1 Where the Contractor is required under the contract to deliver the goods FOB, transport of the goods, upto and including the point of putting the goods on board the vessel at the specified port of loading shall be arranged and paid for by the Contractor, and the cost thereof shall be included in the contract price.

8.15.2 Where the Contractor is required under the contract to deliver the goods CFR to Kenya, transport of the goods to the port of discharge or such other point in Kenya as shall be specified in the contract shall be arranged and paid for by the Contractor, and the cost thereof shall be included in the contract price.

8.15.3 Where the Contractor is required under the contract to deliver the goods CFR, no further restriction shall be placed on the choice of the shipping line and or airline.

8.15.4 Where the Contractor is required to effect the delivery under any other terms, for example by post or to another address in the source country, the Contractor shall be required to meet all transport expenses until delivery.

8.15.5 In all the above cases, transportation of the goods after delivery shall be the responsibility of KPLC.

8.16 Liability and Insurance

7.15.1 The goods supplied under the contract shall be fully insured by the Contractor against loss or damage incidental to manufacture, production or acquisition, transportation, storage and delivery in the manner specified in this Contract (Delivery Duty Paid terms.

8.16.2 The Contractor shall be responsible for and keep in force current appropriate insurance covers for its property and persons engaged in the performance of Works under the contract.

8.16.2 The Contractor shall (except in respect to losses, injuries or damage resulting from any act or neglect of KPLC) indemnify and keep indemnified KPLC against all losses and claims for injuries or damage to any person or property whatsoever which may arise out of or in consequence of the contract and against all claims, demands, proceedings, damages, costs, charges, and expenses whatsoever in respect thereof or in relation thereto.

8.17 Payment

8.17.1 Payments shall be made promptly by KPLC and shall not be less than thirty (30) days from delivery and submission of invoice together with other required and related documents or as otherwise prescribed in the contract.

8.17.2 Payment shall primarily be through KPLC's cheque or Real Time Gross Settlement (RTGS) or telegraphic transfer. Where applicable, a copy of a valid Performance Security, stamped, certified as authentic by KPLC, shall form part of the documents to be presented to KPLC before any payment is made. The terms shall be strictly on Delivered and Duty Paid (DDP) basis.

8.17.3 Contractors who request for a Letter of Credit *(hereinafter abbreviated as LC)* –

a) Shall meet all the LC costs. Indicative costs levied by the banks include opening charges (0.25% per quarter), confirmation charges (0.25% flat), settlement (0.25% flat), acceptance charges (0.25% flat) and any amendment charges.

b) Any extension and or amendment charges and any other costs that may result from the Contractor's delays, requests, mistakes or occasioned howsoever by the Contractor shall be to the Beneficiary's account.

c) The maximum number of extensions and amendments shall be limited to two (2).

d) Should the Contractor require a confirmed LC, then all confirmation and any other related charges levied by both the Contractor's and KPLC's bank shall be to the Beneficiary's account.

e) The LC shall be opened only for the specific Order within the validity period of the contract.

f) LCs shall be partial for partial performance or full for whole performance as per the contract.

g) The Contractor shall be required to submit a proforma invoice for each lot for use in the placement of order and opening of the LC. The proforma invoice shall be on total DDP basis.

h) A copy of the Performance Security, stamped and certified as authentic by KPLC, whose expiry date should not be less than sixty (60) days from the LC expiry date, shall form part of the documents to be presented to the Bank before any payment is effected.

8.17.4 KPLC shall have the sole discretion to accept or decline any Contractor's payment request through Letters of Credit without giving any reason for such decline.

8.18 Interest

7.18.1 Interest payment by KPLC is inapplicable in the contract.

8.19 Prices

8.19.1 Subject to clause 7.18.2 herein-below, prices charged by the Contractor for goods delivered and services performed under the contract shall, be fixed for the period of the contract with no variations.

8.19.2 A price that is derived by a pre-disclosed incorporation or usage of an internationally accepted standard formula shall not be deemed to be a price variation within the meaning of this clause.

8.20 Variation of Contract

KPLC and the Contractor may vary the contract only in accordance with the following: -

a) the quantity variation for goods shall not exceed ten percent (10%) of the original contract quantity.

b) the quantity variation for works does not exceed fifteen per cent of the original quantity.

b) the quantity variation must be executed within the period of the contract.

8.21 Assignment

8.21.1 The Contractor shall not assign in whole or in part its obligations to perform under this contract, except with KPLC's prior written consent.

8.22 Subcontracts

8.22.1 The Contractor shall notify KPLC in writing of all subcontracts awards under this contract if not already specified in the tender. Such notification, in the original tender or obligation under the Contract shall not relieve the Contractor from any liability or obligation under the Contract.

8.22.2 In the event that an award is given and the Contract is sub contracted, the responsibility and onus over the contract shall rest on the Contractor who was awarded.

8.23 Project Manager

8.23.1 KPLC shall appoint a Project Manager who shall be an employee of KPLC and who will be responsible for supervising the execution of the Works. The names and contacts of the person appointed as the Project Manager shall be communicated to the Contractor once such appointment is made.

8.23.2 Except where otherwise specifically stated, the Project Manager will decide contractual matters between KPLC and the Contractor.

8.23.3 The Project Manager may delegate any of his duties and responsibilities to another KPLC employee and thereafter notify the Contractor of the person to whom such duties are delegated.

8.24 Works

7.24.1 The Contractor shall perform the Works in accordance with the specifications set out in the Contract.

8.25 Safety at Work Sites

8.25.1 The Contractor shall be responsible for the safety of all activities on the sites where Works are performed.

8.26. Discoveries

8.26.1 Anything of historical or other interest or of significant value unexpectedly discovered on site where the Works are being carried out shall be the property of KPLC. The Contractor shall notify the Project Manager of such discoveries and carry out the Project Manager's instructions for dealing with them.

8.27 Access to Site (s)

7.27.1 The Contractor shall allow the Project Manager and any other person authorised by the Project Manager, access to the site (s) where Works are carried out and to any place where work in connection with the contract is being carried out or is intended to be carried out.

8.28 Instructions

8.28.1 The Contractor shall carry out all instructions of the Project Manager which are in accordance with the Contract.

8.29 Dayworks

8.29.1 If applicable, the Dayworks rates in the Contractor's tender shall be used for small additional amounts of work only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.

8.29.2 All work to be paid for as Dayworks shall be recorded by the Contractor on Forms approved by the Project Manager. Each completed form shall be verified and signed by the Project Manager within two days of the work being done.

8.29.3 The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.

8.30 **Early Warning**

8.30.1 The Contractor shall warn the Project Manager at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the Works, increase the contract price or delay the execution of the Works.

The Project Manager may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and completion date. The estimate shall be provided by the Contractor as soon as reasonably possible.

8.30.2 The Contractor shall cooperate with the Project Manager in making and considering proposals on how the effect of such an event or circumstance can be avoided or

reduced by anyone involved in the Works and in carrying out any resulting instructions of the Project Manager.

8.31 Defects

8.31.1 The Project Manager shall inspect the Contractor's work and notify the Contractor of any defects that are found. Such inspection shall not affect the Contractor's responsibilities. The Project Manager may instruct the Contractor to search for a defect and to uncover and test any Works that the Project Manager considers may have a defect. Should the defect be found, the cost of uncovering and making good shall be borne by the Contractor.

8.31 .2 The Project Manager shall give notice to the Contractor of any defects before the end of the Defects Liability Period which begins after issuance of the Certificate of Acceptance by KPLC to the Contractor. The Defects Liability Period shall be extended for as long as defects remain to be corrected.

8.31.3 When notice of a defect is given; the Contractor shall correct the notified defect within the length of time specified by the Project Manager's notice. If the Contractor has not corrected a defect within the time specified in the Project Manager's notice, the Project Manager will assess the cost of having the defect corrected by other parties and such cost shall be treated as a variation and be deducted from the Contract Price.

8.31.4 The Project Manager shall issue the Contractor with a Defects Liability Certificate after the defects are corrected.

8.32 Completion and taking over

8.32.1 Upon assessment by the Project Manager that the Works are complete, KPLC shall issue the Contractor with a Certificate of Acceptance.

8.33 Retention/Defects Liability

8.33.1 KPLC shall retain 10% of the Contract Price for the duration of the Defects Liability Period after issuing the Certificate of Acceptance for the whole of the Works.

8.34 **Early Completion**

7.33.1 No bonus for early completion of the Works shall be paid to the Contractor by the Employer.

8.35 Corrupt gifts

8.35.1 The Contractor shall not offer or give or agree to give to any person in the service of the KPLC any gift or consideration of any kind as an inducement or reward for doing

or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other Contract for KPLC for showing or forbearing to show favour or disfavour to any person in relation to this or any other contract with KPLC.

8.35.2 Any breach of this Condition by the Contractor or by anyone employed by him or acting on his behalf (whether with or without the knowledge of the Contractor) shall be an offence under the provisions of the Public Procurement and Disposal Regulations 2005 and the regulations made thereunder.

8.36 Termination

8.36.1 KPLC may, without prejudice to any other remedy for breach of contract, by written notice sent to the Contractor, terminate this contract in whole or in part due to any of the following: -

a) *if the Contractor fails to perform any obligation(s) under the contract.*

b) *if the Contractor in the judgment of KPLC has engaged in corrupt or fraudulent practices in competing for or in executing the contract.*

c) *by an act of force majeure.*

d) *if the Contractor becomes insolvent or bankrupt*

e) *if the Contractor has a receiving order issued against it, compounds with its creditors, or an order is made for its winding up (except for the purposes of its amalgamation or reconstruction), or a receiver is appointed over its or any part of its undertaking or assets, or if the Contractor suffers any other analogous action in consequence of debt.*

f) *the Contractor stops work for 30 days when no stoppage of work is shown on the current program and the stoppage has not been authorised by the Project Manager;*

g) *the Project Manager gives notice that failure to correct a particular defect which is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Project Manager;*

h) *if the Contractor abandons or repudiates the Contract*

8.36.2 KPLC may by written notice sent to the Contractor, terminate the Contract in whole or in part, at any time for its convenience. The notice of termination shall specify that the termination is for KPLC's convenience, the extent to which performance, by the Contractor, of the Contract, is terminated and the date on which such termination becomes effective.

8.36.3 For the remaining part of the Contract after termination for convenience, KPLC may pay to the Contractor an agreed amount for partially completed satisfactory performance of the Contract.

8.36.4 In the event that KPLC terminates the Contract in whole or in part, it may procure, upon such terms and in such manner as it deems appropriate, goods similar to those undelivered or not rendered, and the Contractor shall be liable to KPLC for any excess costs for such similar goods and or any other loss PROVIDED that the Contractor shall not be so liable where the termination is for convenience of KPLC.

8.36.5 The Parties may terminate the Contract by reason of an act of *force majeure* as provided for in the contract.

8.36.6 The Contract may automatically terminate by reason of an act of *force majeure* as provided for in the Contract.

8.36.7 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible. The Project Manager shall immediately thereafter arrange for a meeting for the purpose of taking record of the Works executed and materials, goods, equipment and temporary buildings on Site.

8.37 Force Majeure

8.37.1 *Force majeure* means any circumstances beyond the control of the parties, including but not limited to: -

a) *war and other hostilities (whether war be declared or not), invasion, act of foreign enemies, mobilization, requisition or embargo;*

b) *ionizing radiation or contamination by radio-activity from any nuclear fuel or from any nuclear waste from the combustion of nuclear fuel, radioactive toxic explosives or other hazardous properties of any explosive nuclear assembly or nuclear components thereof;*

c) *rebellion, revolution, insurrection, military or usurped power and civil war;*

d) *riot, commotion or disorder except where solely restricted to employees servants or agents of the parties;*

e) *un-navigable storm or tempest at sea.*

8.37.2 Notwithstanding the provisions of the contract, neither party shall be considered to be in default or in breach of its obligations under the contract to the extent that performance of such obligations is prevented by any circumstances of *force majeure* which arise after the Contract is entered into by the parties.

8.37.3 If either party considers that any circumstances of *force majeure* are occurring or have occurred which may affect performance of its obligations it shall promptly notify the other party and provide reasonable proof of such circumstances.

8.37.4 Upon the occurrence of any circumstances of *force majeure*, the Contractor shall endeavour to continue to perform its obligations under the contract so far as is reasonably practicable. The Contractor shall notify KPLC of the steps it proposes to take including any reasonable alternative means for performance, which is not prevented by *force majeure*. The Contractor shall not take any such steps unless directed so to do by KPLC.

8.37.5 If the Contractor incurs additional costs in complying with KPLC's directions under sub clause 8.37.4, then notwithstanding the provisions of the Contract, the amount thereof shall be agreed upon with KPLC and added to the contract price.

8.37.6 If circumstances of *force majeure* have occurred and shall continue for a period of twenty one (21) days then, notwithstanding that the Contractor may by reason thereof have been granted an extension of time for performance of the contract, either party shall be entitled to serve upon the other seven (7) days' notice to terminate the Contract. If at the expiry of the period of twenty-eight (28) days, *force majeure* shall still continue, the contract shall terminate.

8.38 Liquidated Damages

Notwithstanding and without prejudice to any other provisions of the Contract, if the Contractor fails to deliver any or all of the goods or complete the Works within the period specified in the contract, KPLC shall, without prejudice to its other remedies under the contract, deduct from the contract prices, liquidated damages sum equivalent to 0.5% of the delivered or shipment price (whichever is applicable) per day of delay of the delayed items up to a maximum of ten percent (10%) of the delivered price of the delayed goods.

8.39 Warranty

8.39.1 The Contractor warrants that the Goods supplied under the contract are new, unused, of the most recent or current specification and incorporate all recent improvements in design and materials unless provided otherwise in the contract. The Contractor further warrants that the goods supplied under this contract shall have no defect arising from manufacture, materials or workmanship or from any act or omission of the Contractor that may develop under normal use of the supplied goods under the conditions obtaining in Kenya.

8.39.2 This warranty will remain valid for one (1) year after the Goods, or any portion thereof as the case may be, have been delivered to the final destination indicated in the contract, or for eighteen (18) months after the date of shipment from the port of loading in the source country, whichever period concludes earlier.

8.39.3 KPLC shall promptly notify the Contractor in writing of any claims arising under this warranty.

8.39.4 Upon receipt of such a notice, the Contractor shall, with all reasonable speed, replace the defective goods without cost to KPLC.

8.39.5 If the Contractor having been notified fails to remedy the defect(s) within a reasonable period, KPLC may proceed to take such remedial action as may be necessary, at the Contractor's risk and expense and without prejudice to any other rights which KPLC may have against the Contractor under the contract.

8.40 Resolution of Disputes

8.39.1 KPLC and the Contractor may make every effort to resolve amicably by direct informal negotiation any disagreement or dispute arising between them under or in connection with the contract.

8.39.2 If, after thirty (30) days from the commencement of such informal negotiations both parties have been unable to resolve amicably a contract dispute, either party may resort to resolution before a recognised local forum for the resolution of disputes.

8.41 Language and Law

The language of the contract and the law governing the contract shall be the English language and the laws of Kenya respectively unless otherwise stated.

8.42 Waiver

Any omission or failure by KPLC to exercise any of its rights or enforce any of the penalties arising from the obligations imposed on the Contractor shall in no way, manner or otherwise howsoever, alter, amend, prejudice, vary, waive or be deemed to alter, amend, prejudice, vary, waive or otherwise whatsoever any of KPLC's powers and rights as expressly provided in and as regards this contract.

SECTION IX – SPECIAL CONDITIONS OF CONTRACT

The Special Conditions of Contract *hereinafter abbreviated as SCC* shall form part of the Conditions of Contract. They are made in accordance with the law and KPLC's guidelines, practices, procedures and working circumstances. They shall amend, add to and vary the GCC. The clauses in this section need not therefore, be completed but must be completed by KPLC if any changes to the GCC provisions are deemed necessary. Whenever there is a conflict between the GCC and SCC, the provisions of the SCC shall prevail over those in the GCC.

No.	GCC Reference Clause	Particulars of SCC
	8.14 Terms of Payment	*Payment shall be thirty (30) days from satisfactory delivery and submission of invoice together with other required and related documents as per the following milestones.* *15 % of the contract price upon completion of preliminary survey and design both civil and erection* *20 % of the contract price after completion of civil works* *30 % of the contract price fabrication and inspection lattice towers and 50% ERECTION* *25% upon completion of works* *10% retention for the defects liability period* *In **very exceptional** circumstances where a bidder requests for an advance payment and the same is accepted by KPLC, then, it will be limited to a maximum amount of 10% of the contract amount and subject to the following conditions:-* *a). The bidder should provide a valid bank guarantee as a security for the advance covering the advance period .* *b). The bidder agrees to an interest charge of 1.5% per month on the advanced amount, for the entire advance period.*
	8.20 Project Manager **Project Engineer**	*The Project Manager appointed by KPLC:* *Name: Eng. Wachira Kahoro* *Address: 30099 00100 NRB* *Telephone: 0711031182* *Name: Sande Semo* *Address: 30099 00100 NRB* *Telephone: 0711031182*
	8.33 Defects Liability Period	*The defects liability period shall be one year.*

	8.36 Warranty Period	*The period shall be Two (2yrs) from the date of the commissioning.*

PART 2

DESCRIPTION, TECHNICAL REQUIREMENTS AND SPECIFICATIONS OF THE PROJECT

Table of Contents

SECTION 1

SUMMARY OF SCOPE OF WORK

The project scope is divided into two parts;

a) **Central Rift Region Scope**, which involves construction and commissioning of approximately 4.5km of double circuit 132kV Transmission line on self-supporting lattice steel towers and ACSR 175mm^2 (code name "lynx") conductor with overhead OPGW shield wires on a high twin peaks to cover both circuits complete with junction boxes.

b) **Western Kenya Region Scope** involves construction erection and stringing of a total approximately 4kms single circuit 132kV Transmission line sections on self-supporting lattice steel towers and ACSR 175mm^2 (code name "lynx") conductor with overhead OPGW shield wires on a high peak to cover the circuit complete with junction boxes. The works will span three different locations across the west region.

SCOPE 1; CENTRAL RIFT REGION

PROJECT DESCRIPTION

The project shall involve construction of approximately 4.5KM of UEB 132kV Double Circuit Transmission Line within the lake Nakuru National Park. The line will be constructed in self-supporting lattice steel towers and ACSR-175 mm^2 "Lynx" conductor with overhead OPGW shield wires on a high peak to cover both circuits.

The scope of work for the transmission line will cover design, factory testing, manufacture, supply, shipping, transport from docks to stores, delivery to site, unloading, check survey and all associated profile plotting, support pegging, provision of access facilities and route clearing, transportation to site, installation of foundations and all associated civil works, erection of supports, installation of insulators, conductors and all associated fittings.

The works shall further include, but not limited to, factory testing, testing on site and setting to work as set out in the general conditions of the contract and prices stated in the schedules or at such other prices or rates as may from time to time be agreed, together with the provision of such spares as directed and training of the Employer's personnel (if specified) to all works associated with the transmission line in accordance with the specification, standards, schedules and accompanying drawings and maps for the transmission line defined in **Appendix.**

The transmission line shall be constructed completely in accordance with the specifications and associated design and general arrangement/outline drawings.

Tenderers shall submit a program of works in bar chart indicating the planned plant manufacture, delivery and erection program (as appropriate) to complete the works. The bar chart shall indicate the various phases of work for all appropriate items of the project from commencement to final completion e.g. design, survey, approval of drawings, ordering of materials, manufacture, delivery, erection (as appropriate) and commissioning. The program shall allow for periods of approval by the employer and/or any other regulatory body.

SCOPE 2; WESTERN REGION

PROJECT DESCRIPTION

The project shall involve reconstruction of sections of transmission lines in West Kenya. A cumulative length of approximately 4 Kilometers in 3(three) different locations to be redesign, constructed and line restored to the original wayleaves path. The line will be constructed in self-supporting lattice steel towers and ACSR-175 mm^2 "Lynx" conductor with overhead OPGW shield wire on a high peak to cover all the phases. The scope will be limited to the existing wayleaves and cumulative length of approximately 4 Kilometers to be constructed and ACSR 175mm^2 (code name "lynx") conductor to be strung with overhead OPGW shield wire on a high peak complete with junction boxes.

The scope of work for the transmission line will cover design, testing, manufacture, supply, shipping, transport from docks to stores, delivery to site, unloading, check survey and all associated profile plotting, support pegging, provision of access facilities and route clearing, transportation to site, installation of foundations and all associated civil works, erection of supports, installation of insulators, conductors and all associated fittings.

The works shall further include, but not limited to, factory testing, testing on site and setting to work as set out in the general conditions of the contract and prices stated in the schedules or at such other prices or rates as may from time to time be agreed, together with the provision of such spares as directed and training of the Employer's personnel (if specified) to all works associated with the transmission line in accordance with the specification, standards, schedules and accompanying drawings and maps for the transmission line defined in **Appendix**

The transmission line shall be constructed completely in accordance with the specifications and associated design and general arrangement/outline drawings.

Tenderers shall submit a program of works in bar chart indicating the planned plant manufacture, delivery and erection program (as appropriate) to complete the works. The bar chart shall indicate the various phases of work for all appropriate items of the project from commencement to final completion e.g. design, survey, approval of drawings, ordering of materials, manufacture, delivery, erection (as appropriate) and commissioning. The program shall allow for periods of approval by the employer and/or any other regulatory body.

SECTION 2

SITE CONDITIONS;

SCOPE 1;

LOCATION

No.	Location	Span(s)
1	Lake Nakuru	T 750 to T 760

The submerged line is along the shores of Lake Nakuru along the national park. approximately 186 km by road north-west of Nairobi.

CLIMATIC CONDITIONS

The following climatic information is given for tender purposes only:

Minimum ambient temperature	:	6^0C
Maximum ambient temperature	:	36^0C
Average ambient temperature	:	27^0C
Relative humidity- maximum	:	90 - 100%
Average Annual Rainfall	:	1500-2500 mm
Maximum Wind velocity	:	120km/hr. (33.3 m/s)
Isokeraunic level	:	180 thunderstorm days
Seismicity Coefficient:	:	0.16
Altitude or Terrain	:	2000m a.s.l.

SOILS

Ground condition is fairly homogenous along the transmission line route, being mainly residual soil comprising silty clay, loam soil, as well as disintegrated rock that should be encountered at different depths. The Contractor will be expected to carry out extensive soil investigations during the detailed design stage.

SCOPE 2;

LOCATION

SR NO	LOCATION	SPANS	Collapsed Towers
1	MUMIAS –MUSAGA (MUMIAS)	T 8 – T 13	9, 10, 12
2	SONDU-KISUMU (RABUOR)	T 116 – T 119	117, 118
3	MUHORONI –KISUMU (NYANDO)	T 244 – T 248	245, 246, 247

CLIMATIC CONDITIONS

The following climatic information is given for tender purposes only:

Minimum ambient temperature	:	6^0C
Maximum ambient temperature	:	36^0C
Average ambient temperature	:	$21\text{-}27^0$C
Relative humidity- maximum	:	90 - 100%
Average Annual Rainfall	:	1500-2500 mm
Maximum Wind velocity	:	180km/hr (33.3 m/s)
Isokeraunic level	:	180 thunderstorm days
Seismicity Coefficient	:	0.16
Altitude or Terrain	:	1500-2000m a.s.l.

SOILS

Ground condition is fairly homogenous along the transmission line route, being mainly residual soil comprising silty clay, loam soil, as well as disintegrated rock that should be encountered at different depths. The Contractor will be expected to carry out extensive soil investigations during the detailed design stage.

SECTION 3

QUALITY ASSURANCE

GENERAL

The quality assurance arrangements shall conform to the appropriate sections of ISO 9001:2008 or 9002.

The Contractors/suppliers Quality Programme for the Works shall define the system and procedures adopted to ensure compliance with the contract requirements. These systems shall include the following.

Hold point - "A stage in the material procurement or fabrication/workmanship process beyond which work shall not exceed without the documented approval of the employer or their appointed representatives.

Notification point -"A stage in the material procurement or fabrication/workmanship process for which advance notice of the activity is required to permit attendance.

The Contractors/suppliers are required to give the employer or their appointed representatives the requisite period of notice of any notification point for which attendance is required. If the employer or their appointed representatives do not respond/attend after receiving the documented notification the work may proceed.

QUALITY ASSURANCE PROGRAMME

The quality assurance programme shall give a description system for the works and shall include the following details:-

a. The structure of the following Contractors/Suppliers organization
b. The duties and responsibilities of staff assigned to ensure quality of the work
c. The system for purchasing, taking delivery and verification of materials
d. The system for ensuring quality of workmanship
e. The system for control documentation
f. The system for retention of records
g. The arrangement for the Contractors/suppliers auditing
h. A list of the administrative and work procedures required to achieve and verify the Contractor's quality requirements. These procedures shall be made readily available to the employer for inspection on request.

The Quality assurance programme for the works shall be submitted to the employer for approval within the requisite period prior to the commencement of the works. This will be a hold Point.

QUALITY PLAN

A specific Quality plan for each section of the work shall be produced by the Contractor and/or supplier. Each quality plan shall set out the activities in a logical sequence and shall take into account the following:

a) An outline of the proposed work and programme sequence
b) The structure of the contractor's and/or supplier's organisation for the project
c) The duties and responsibilities of staff assigned to ensure quality of the work for the project
d) Hold and Notification points
e) Submission of Engineering Documents required by this specification
f) The inspection of materials and components on receipt
g) Reference to the Contractor's and/or supplier's quality assurance procedures appropriate to each activity
h) Inspection during fabrication/construction
i) Final inspection and tests.

The Contractor's and/or suppliers Quality plan shall be submitted to the employer for approval, within the requisite period prior to the commencement of the works. This will be a hold point.

RELATED STANDARDS

The specified BS, KS, ISO, IEC standards or other relevant internationally recognized standards approved by KPLC shall be applied in this project.

It is the Contractor's responsibility to ensure that they are in possession of the latest edition of the specified IEC standards and other relevant standards specified, including all amendments current on the defined date prior to the tender closing date.

Materials or equipment conforming to alternative international or national standards will be considered by the employer, provided that these standards ensure an equivalent or higher quality.

The Contractor/supplier shall bring to the attention of the employer any inconsistencies between the requirements of these standards and this specification.

The Contractor/supplier shall supply the requisite number of copies of the applicable reference standards specified in each appropriate section within the requisite period after the signing of the contract

Where equivalent standards are offered as an alternative, the Contractor/supplier shall, when requested by the employer, provide the requisite number of English language translation copies of the standards at no extra cost to the project.

QUALITY CONTROL

Inspection and Testing

The prime responsibility for inspection and testing shall rest with the Contractor/supplier. The inspection and acceptance of drawings, materials and workmanship, or the waiver of

inspection by the employer, shall not relieve the Contractor/supplier of any obligations or responsibilities to carry out the work in accordance with specification and good engineering requirements. The inspection and testing shall be documented such that it is possible to verify that it was undertaken. Records of inspection shall include as a minimum the project identity, the name of the inspector/tester, date of inspection/ test, operation/inspection, technique used, acceptance standard and acceptability.

Type, Sample and Routine Tests

Type, sample and routine tests shall be undertaken on all components supplied and/or installed under this project, in accordance with the requirements of this specification.

The Employer may waive the requirements for type tests on submission by the Contractor/supplier of the requisite number of test certificates, either certified by an independent quality assurance organisation, or undertaken by an internationally acknowledged independent testing organisation, showing that the component had successfully passed the type tests specified in this specification.

Certificate of Conformity

Prior to the issue of the Release Certificate or agreement to shipping the Contractor/supplier shall submit to the employer the requisite copies of the completed certificates of conformity (see Appendix 3.A1). The certificate shall be supported by copies of the appropriate material test certificate inspection records, type and sample test reports as detailed in the relevant section of this specification.

NON CONFORMING PRODUCTS

The employer shall be responsible for reviewing the non–conforming products in accordance with ISO 9001 or 9002.

MONITORING OF QUALITY ASSURANCE AGREEMENTS

Monitoring of the Quality Assurance arrangements may be undertaken by the employer during the course of the project. This will take the form of surveillance of the activities at work locations and/or by formal audits of the Contractors/supplier system and procedures which constitutes their quality assurance arrangements. Corrective actions shall be agreed and implemented in respect of any deficiencies.

The Contractor/supplier shall provide all facilities including access (including their suppliers or sub-contractors) which may be required by the employer for monitoring activities.

SUPPLIERS AND SUB-CONTRACTORS

The Contractor shall ensure that any supplier or sub-contractor appointed by them under the project shall conform to the requirements of this specification. Prior to the appointments of any supplier/sub-contractor the Contractor shall ensure that their quality assurance arrangements comply with the requirements of ISO 9001 or 9002 and this specification.

The Contractor’s auditing of their suppliers/sub-contractors quality assurance arrangements shall be documented to demonstrate to the employer their extent and effectiveness.

METHOD STATEMENTS

Prior to commencing any section of the work, the Contractor shall submit method statement in accordance with the requirement of the relevant section of this specification. Submission of these method statements shall be treated as Hold Points.

When requested by the Employer or their appointed representative, the Contractor shall provide additional method statements related to specific item of work.

APPENDIX 3.A1

CERTIFICATE OF CONFORMITY

From: (Contractor Details)

To: Kenya Power and Lighting Company Ltd,
P. O Box 30099 - 00100,
Nairobi,
Kenya.

For the Attention of …….

REPLACEMENT OF 132KV COLAPSED TOWERS –WEST KENYA AND REROUTING UEB SUBMERGED LINE IN LAKE NAKURU

We certify that the products detailed below have been inspected, tested and unless noted to the contrary, conform in all respects to the requirements.

QUANTITY DESCRIPTION

ATTACHMENTS

Test reports (details) _____

(Other details as per relevant section)

Dated _____ Signed _____

Status _____

APPENDIX 3.B1

QUALITY ASSURANCE DOCUMENTS TO BE SUBMITTED

1. **Quality Assurance Programme**

2. **Quality Plan**

3. **Reference Standards (As applicable)**

4. **Equivalent Standards (If Applicable)**

SECTION 4

DESIGN REQUIREMENTS

PHILOSOPHY OF DESIGN

The philosophy of design contained within this specification is based upon deterministic principles whereby the applied loading multiplied by the appropriate safety factor must be less than the ultimate strength of the component.

In tendering the Contractor will be deemed to have concurred as a practical manufacturer with the design and layout of the works as being sufficient to ensure reliability and safety in operation freedom from undue stresses and satisfactorily performance in all other essentials as a working plant.

The transmission lines shall be designed with high reliability and low cost of maintenance as the primary consideration in accordance with the relevant sections of the specification.

The design shall incorporate all reasonable precautions and provisions for the safety of those concerned in the erection and subsequent maintenance of the contract works.

UNITS OF MEASUREMENT

In all correspondence, technical schedules design calculations and drawings the metric (SI) units of measurement shall be used. Angular measurements shall be degrees with 90^0 comprising a right angle.

DOCUMENT SUBMISSION

The Contractor shall submit to the Employer all design calculation drawings, method statements, test programmes and test records of the relevant section of the specification or as otherwise agreed by the Employer.

DESIGN CALCULATIONS

All sets of calculation shall be complete, bound titled and given a unique drawing number (see clause 4.5.1) the binding shall be such as to allow the easy introduction of subsequent pages if necessary.

Bound into each set shall be fully detailed index. Following this shall be a design information sheets which incorporates the following details:-

a) The design concept shall be summarized

b) Full details of manual design papers or other aids referred to in the text shall be given with photocopies of relevant sheets if appropriate.

c) Full loadings shall be reiterated with their deviations if appropriate.

d) Design stresses shall be reiterated.

e) Code or standard references should be quoted and equation written out in full for initial calculation.

Should the Contractor be required to re-submit amended calculations or additional sheets the following annotation shall be adopted:-

f) Amended sheets should retain the same sheet number but have a lower case revision letter suffix i.e. sheet 14 when amended becomes 14a then 14b.

g) Additional sheets that needed to be inserted shall be given the sheet number they are added to plus an upper case letter prefix i.e. additional sheets to page 60 become A60, B60 and if subsequently amended A60a etc.

Where a computer program is used for design calculations a full explanation in the English language shall be provided to assist the Employers approval of the calculations for each and every program used. Details must include name of program author source, comprehensive description of theoretical basis including all references to relevant documentation, checks undertaken on program and list of projects on which the program has been used.

DRAWINGS

General Requirements

Drawings shall be to scale fully detailed and all dimensions shall be in Metric Units. General arrangements drawings submitted shall be to scale of not less than1 to 50 and all detail drawings not less than 1 to 20. Profile drawings shall normally be drawn to a vertical scale of 1 to 200 and a horizontal scale of 1 to 2,000.

Drawings sheets shall conform in size to BS 3429, mainly A0, A1, A2, A3, and A4. A3 drawings shall be used as much as possible for construction drawings. The sheet size is to be stated on the drawing within or adjacent to the title block.

Drawings shall conform to BS 308 or equivalent. The scale used shall be stated on the drawing as a ratio together with linear scale at a convenient position along the margin of the original drawing sheet.

The physical draughting requirement in respect of line density, strength, contrast, spacing and character legibility shall be met to ensure drawings are suitable for microfilming in accordance with BS 5536 and the specification for micro-copying of drawings to BS 4210.

All drawings shall bear in English, serial number of the project, drawing number, which shall be unique to this project and scale. The system of numbering and layout of the title block will be to the approval of the Employer. The title block shall include the name and address of the Employer. The revision notes shall detail the nature of each revision. The revision shall be enclosed in a cloud with the revision letter indicated.

Computer Generated Drawings

The submissions generated drawings sent by electronic transmission or any other electronic form shall be subject to agreement by the Employer.

Contract Drawings List

At defined interval the Contractor shall submit the requisite number of copies of the contract drawing list.

The list shall contain the following information:

a. Drawing number,
b. Drawing title
c. Revision status
d. Approval status

All changes since the previous issue shall be clearly indicated and when agreed only the front (index) revised sheets need to be submitted.

Contract Record Drawings

The Contractor shall submit to the Employer:

a) A final issue of the contract drawing list indicating which of the drawings design calculations, methods statements etc. that they propose to issue as final contract drawings. These drawings shall be updated to incorporate all modifications made during erection and commissioning.

b) Requisite number of prints (minimum of four) of each schedule, including where appropriate the supply and installation material manual.

c) Requisite number of drawings (minimum of four) including design calculations schedules including the supply and installation material manual in data stick format in either WPG or DXF format.

d) Requisite number of polyester/transparency film copy of each drawing, including design calculations, profile and route maps.

The distribution of the contract record drawings will be advised by the Employer.

Route maps

During the progress of the work the Contractor shall record on profiles, supply and install material manuals (SIMMs) and on a set Survey Maps of approved scale such particulars as will allow an accurate reference to be made afterwards in case of any faults or projected modifications to the line.

The map and/or profile sheet shall show the exact position of every support with approved reference marks. The maps shall be supplemented or profiles marked by sketches where necessary to delineate boundary position of support which cannot be clearly indicated on the maps.

The date included on the maps profile sketches and SIMMS shall be submitted to the employer to whom facilities shall be given for examining such records during the progress of the work.

SAG TEMPLATES

The Contractor shall supply the specified sets (minimum of two) of templates in strong stable colourless plastic or similar material not less than 3mm thick. Engraving shall be on the back face of the templates. The templates shall be for the specified equivalent spans.

Each template shall be accurately shaped to provide the sag curve; the same curve shall be engraved on the template at a distance below representing the minimum allowable vertical clearance to normal ground. A further sag curve in still air at minimum temperature shall also be shown. Each template shall be clearly endorsed with the sagging basis, conductor particulars equivalent span and unless otherwise specified to a scale of 1:200 vertical and 1:2000 horizontal.

Templates shall be supplied to the Employer before the submission of the profiles. Failure to do so may result in delay which will be responsibility of the Contractor.

SUPPLY AND INSTALL MATERIAL MANUAL

As soon as final support positions are approved, the Contractor shall provide the requisite copies of the A4 size Supply Install Material Manual (SIMM).

Each support position shall be represented by one of the manuals with the following information recorded:

a. Provisional and final support numbers.
b. Profile and record map reference drawing numbers.
c. Span
d. Wind span
e. Weight Span
f. Angle of deviation

g. Support type, leg and body extensions and General Arrangement (G.A.) drawing reference numbers

h. Foundation type and G.A. drawing reference number
i. Earthing details and G.A. drawing reference number
j. Insulator set details and G.A. drawing reference number
k. Sag adjustment setting and linkage requirements – (where appropriate)
l. Phase conductor jumper details including spacer and general arrangements drawing reference number – (where appropriate)

m. Earth wire set details and G.A. drawing reference number
n. Earth wire vibration damper G.A. drawing reference number
o. Aircraft navigator (obstruction aids) drawing reference number – (where appropriate)
p. Fibre optic junction boxes and cabling G.A. drawing reference number – (where appropriate)

In addition the following schedules shall be included:-

i. Phase conductor and OPGW (ground wire) sags and tension (erection and final)
ii. Suspension insulator sets off-sets
iii. Location and spacing of all phase conductor spacers dampers – (where appropriate)
iv. Location of all phase conductor and earth wire tension and non-tension joints
v. Location and spacing of all aircraft warning spheres (where appropriate)
vi. Location of all fibre optic joint boxes – (where appropriate)

The appropriate reference drawing numbers shall also be included. Preliminary copies of SIMMs shall be available prior to any site work commencing, together with materials summaries. This is Hold Point.

MAINTENANCE MANUAL

The Contractor shall provide at the specified period before the end of the construction period of the contract, a maintenance manual covering the following information:-

a) Type, code numbers and description of all plant erected, together with names and addresses of manufacturers

b) Methods of assembly of all fittings

c) Method of replacing any part of the plant including the use of maintenance holes provided on the support access provisions and where appropriate the application of "live – line' maintenance techniques.

d) Recommendations of preventive maintenance including frequency of inspection.

e) List of recommended maintenance equipment with a description of its use and limitations

f) Type and application of temporary earthing equipment.

g) Personal safety equipment requirement and any risk assessment required.

The above information must be specified to this contract and entirely in the English language.

Drawings and diagrams shall be used where necessary to enable the Employer/Purchaser to properly maintain the whole of the works.

The manual shall be suitably bound within a hard cover and all materials used shall be reasonably hard wearing.

The manual shall be submitted to the Employer. This is Hold Point.

SAMPLES AND MODELS

If the nature of the works makes it desirable the Contractor/ supplier may be asked to submit or prepare for the Employer such samples, patterns and models as the Employer may reasonably require for the purpose of design approval at the expense of the Contractor/supplier.

PHOTOGRAPHS

The Contractor shall make all arrangements to provide progress photographs of all tests and such sections of the work in progress as directed by the Employer. Each photograph shall be of size 25cm x 20cm suitably entitled, in digital format. The photographs shall be the property of the Employer and no copies of the photographs shall be released without the authority of the Employer.

The Contractor will normally be required to provide every month at his own cost the specified number of sets of un-mounted progress photographs suitably inscribed of potions of the work in progress throughout the period of construction. Any variation to these quantities will only be with the permission of the Employer.

SECTION 5

TRANSPORT, ACCESS AND SERVITUDE

WAYLEAVES

General
Wayleaves and access facilities, subject to the requirement of landowners and occupiers, will be provided by the Employer to enable the Contractor to carry out the erection of the contract works. Such facilities will not necessarily include facilities for storing materials nor necessarily include access for wheeled vehicles.

The Contractor shall satisfy themselves that the necessary rights of entry and access have been obtained before

The contractor shall indicate to the employer such pipes or other obstructions telephone telegraph and power lines which infringe the clearance specified or otherwise fail to satisfy the requirement of the specification.

The necessary agreement for the removal of obstruction such as trees and for the permanent removal or guarding of pipes telegraph telephone and power lines, will be obtained by the Employer.

Wayleaves Schedule
Before the Contractor commences work on any property he shall obtain the wayleaves schedule from the Employer, including details of any special requirement of the occupiers concerned. This is a Hold Point.

ACCESS TO SITE, NOTICE OF ENTRY

Access Routes – General
The Employer may indicate to the Contractor the general route for access to each or any position as agreed by the Employer, otherwise the Contractor shall make all necessary arrangements (other than questions of way leaves) with the occupier.

Subject to the provisions of the preceding paragraph before commencing work, the Contractor shall at his own expenses do what is necessary to make the access suitable for his use and shall take all reasonable precautions to avoid damage, including if required erection of temporary fences or gates where permanent fences, hedges or gates have been removed. The Contractor shall not be entitled to any additional payment in the event of a particular access being difficult.

The Contractor shall be responsible for maintaining agreed access routes in a usable condition without undue widening for the duration of the contract. The occupier shall not be put to any inconvenience in gaining access to his land or buildings. No unauthorized access routes shall be taken by the Contractor.

Commencement of work
Before beginning on any property the Contractor shall be responsible for obtaining confirmation from the Employer that wayleaves are in order and any agreed accesses have

not been altered and for giving not less than 48 hours notice to the occupier that work is to begin. Work shall proceed on any land within the requisite period of such notice being given to the occupier.

Suspension of work
Where work is to be suspended without the expectation of it being resumed within the specified period, the Contractor must notify the occupier of such intention and shall similarly give the occupier prior notification of the resumption of work. The purpose of this Clause is to assist in maintaining good relations between the occupier, the Contractor and the Employer and to keep the occupier informed of what is going to happen on or across his land.

Compliance with occupier's requirements
At all times during the execution of the works, the Contractor shall ensure compliance with all such reasonable requirements of the occupier as are brought to the Contractor's notice by the Employer. The Contractor shall not be entitled to any additional payment in respect of his compliance with the reasonable requirements of the occupier.

Notice to Authorities
Before the Contractor carries out the stringing of conductors along or across power or telecommunication circuits, public roads, etc., he shall give the requisite notice to the appropriate Authorities of the time and date when he proposes to perform the work and shall send a duplicate copy of each notice to the Employer.

Route Clearance
For details of the clearance requirements for survey, access routes, line route, support locations and conductor stringing, reference shall be made to Appendix 5.A1.

ACCESS ROADS

For details of the access road requirements reference shall be made to Appendix 5.A2

CROSSING OF OBSTACLES

General
The Contractor shall, at his own expense, make any necessary arrangements and take the necessary precautions where the route crosses buildings, telecommunication, power or pipe lines, orchards, gardens, railways, antiquities or other obstructions or ground over or across which erection cannot be carried out in the normal manner or has to be avoided. These arrangements must be submitted to the Employer. This is a Hold Point.

Where a support is set across a fence, hedge, bank or wall, the Contractor shall remove and reinstate the fence, hedge, bank or wall at his own expense and he shall be responsible at his own expense for making good to the satisfaction of the Employer, owners and tenants concerned, all land, property, roads, drains, fences, walls hedges, gates and the like which he has damaged or disturbed during the execution of the contrast works and shall remove all surplus material after erection. The Contractor shall take proper precautions to prevent the straying of and damage to livestock until after the backfilling of excavations and permanent reinstatement of fences, walls, hedges, gates and the like are completed.

Public Utilities
The Contractor shall ensure that the erection of the contract works does not cause damage to or interference with existing telecommunication, power or pipe lines.

Where appropriate Authorities affected deem it necessary for the protection of their employees, property, or the public, or for the assistance of traffic, to provide flagmen and watchmen, the cost of such provision shall be borne by the Contractor. Where required by the appropriate Authorities work shall be carried on outside normal hours and at the Contractor's own expense.

The Contractor shall also be liable to make good at least to the original condition or compensate the owners, operators and users or any public undertaking in respect of any damage however caused to their property, lands or roads arising out of or in consequence of the execution of the works.

Scaffolding
The Contractor shall provide all necessary scaffolding and the like for the crossing of telecommunications or power lines, roads, railways building or other obstacles. The Contractor shall advise the Employer in each instance of the scaffolding he proposes to use. Drawings of the proposed scaffolding shall be submitted to the Employer, and the appropriate regulatory authorities. This is Hold Point

Live Line Scaffolds
The scaffolding which is used to cross specified low, medium and high voltage power lines shall be of such dimensions and allow such clearances that the power lines being crossed may remain in commission during construction of the new transmission line. It may only be possible to have shut-downs on the lines to be crossed for sufficient periods of time to top out and net the scaffolds. Such restrictions in building and use of the scaffolds will not be grounds for claiming additional costs. Design and construction of the live scaffold shall not be inferior to the minimum standards outline in the following clause.

Live Line Scaffold-Construction
The scaffold shall be designed to withstand the maximum design wind speed, except that a reduced return period will be accepted. Consideration shall also be given due to impact loading, due to dropping of the upper phase conductor.

The scaffold shall, unless otherwise approved by the Employer, consist of 3m wide 300mm squire mesh nylon nets attached to steel wire ropes running perpendicular to the lower line route, carried by metal scaffolding at 3m intervals. The nets shall be attached to the catenary wires by means that do not require the presence of any persons on the net or the catenary wires whilst the lower line is alive. An additional movable 3m by 50 mm mesh walk net laid over the 300 mesh nets may be used whilst the lower line is dead.

Normally, steel or aluminium tubular scaffolding to BS 1139 and BS 6323 should be used. The use of pre-formed units or frames shall be subject to the Employer's approval.

The mechanical construction shall be in accordance with BS 5950. Reference shall also be made where appropriate to BS 5973.

The design of the scaffold shall have due regard to the requirements of safety with particular respect to accidental contact with live conductors during construction, use and removal.

The scaffold, including foundations, shall be designed and constructed to ensure stability during the process of erection and removal, and also at times when work has caused for any reason including adverse weather conditions. The foundations shall be suitable for the ground concerned.

The base width of any tubular steel supporting structure shall not be less than 25 percent of its height. Lighter materials (e.g. Aluminium) shall be used with caution. Adequate diagonal bracing shall be provided.

The scaffold shall extend at least 5m either side of the outermost conductors of the upper line. A maximum of 2m of this distance may be provided by means of catchers.

Catchers shall be provided at each end of each scaffold support. The catcher may be vertical or inclined to a maximum angle of 45^0 from the vertical. They shall be capable of withstanding the specified impact loads without excessive distortion that would permit a falling conductor to approach or touch a live-line.

The upper parts of the scaffold shall be provided with soft wood rubbing boards or otherwise protected in an approved manner to prevent damage to the conductors resting on or being drawn over the guard. Soft wood poles may be used for this purpose. The height of these boards shall be sufficient to prevent the conductor damaging the nylon net. To avoid damaging the conductors no object other than non-metallic lashing or the catchers shall protrude above the rubbing boards.

Sufficient endless or double ended lead lines for hauling over pilot wires shall be placed over the scaffold prior to re-energization of the lower line.

The side supports shall have working platforms to facilitate the required running of conductors and prior wires. Working platforms shall be provided with hand rails, toe boards and notices warning of the danger of live conductors. The heights of hand rails shall be 1m and the toe boards 230 mm. Each working platform shall have a notice plate indicating the "Safe Climbing Height".

The scaffold shall be fitted with danger plates at intervals of not more than 6m along the anti-climbing device with at least one plate on each face of the structure.

The scaffold shall be constructed to prevent unauthorized access or climbing by the use of barbed wire anti-climbing devices, fences or other means approved by the Employer. The scaffolding shall be lit with red warning lamps from ½ hour before sunset to ½ hour after sunrise if erected within 2m from a highway or footpath without an intervening fence. The scaffold the Contractor shall provide or arrange for the supply and maintenance of these lamps (e.g. with the line Contractor).

If the scaffolding is constructed adjacent to a roadway, a guard constructed from steel drums filled with soil or a soil bund shall be provided and suitably lit.

Where possible the resistance to earth of the scaffold shall be less than 10 ohms. Special consideration by the Employer and the lower line operator shall be given in cases where this is not attainable with a reasonable number of driven earth rods.

Bonding the scaffold to the earthing systems of either the live-line, or the line under construction is not normally acceptance. In the former case a nearby line fault could cause the scaffold to become live. In the latter case a fault between the live-line and the scaffold could cause components of the line under construction to become alive, particularly as its earthing system may not be complete.

The earth rods should normally be driven into the ground around the outside and approximately 1 m from the scaffold structure. The rods should be securely connected electrically and mechanically to the scaffold structure by flexible copper or aluminium leads with minimum across-sectional areas of 64 mm^2 or 100 mm^2 respectively.

Drawings of the scaffold complete with details of the clearance plates and earthing arrangement, together with supporting calculations shall be submitted to the Employer and appropriate regulatory authorities. This is a Hold Point.

DAMAGE

General

The Contractor shall take all reasonable precautions to avoid damage to land, property, roads, crops, fields drains, fences walls, hedges, gates, trees and the like and shall ensure that the work is adequately supervised so that any damage is reduced to the minimum. Save as otherwise provided, the Contractor will be liable for all damage arising by or in consequence of the works except unavoidable damage to crops and shall pay compensation or make good at the option of the Employer.

Contractor's Responsibility

The Contractor's liability for loss or damage shall extend to any such loss or damage resulting from the employment of a Subcontractor. This does not relieve the Contractor of his liability for all actions of his Subcontractor.

Livestock

Adequate provision shall be made by the Contractor to prevent the straying of or injury to livestock during the execution of the work and until the permanent reinstatement of fences, wall, hedges, gates and the like is completed.

The Contractors shall be liable for any injury to or loss of livestock due to failure to comply with the above requirements.

APPENDIX 5.A1

ROUTE CLEARANCE

Where clearing is required, the following requirements shall be observed:

a) Tree and tall scrub shall be cleared to a distance of 15m on either side of the centre line of the route. Trees and bushes shall be cut down to a height of not more than 0.25m above ground level. In addition, tall danger trees outside the cleared area, of such height that could fall within 3m of the conductors, shall be trimmed by the Contractor. No tree may be felled without the express permission of the Employer. This is a Hold Point.

b) Felled trees and scrub shall be removed a distance of 15m on either side of the centre line of the route and form a path 2.5m wide and running as far as possible continuously along the route. The Contractor shall grub up tree stumps and roots from this track and leave a graded way for negotiation by Land Cruiser or similar four-wheeled drive light vehicle for patrolling and maintenance by the Employer.

c) All felled trees and tree trimmings shall remain the property of the landowner.

APPENDIX 5.A2

ACCESS ROADS

Where access roads are required, the following requirements shall be observed:

a) The Contractor shall clear a 4m wide agreed construction track from public roads, of all trees, stumps, scrub and vegetation to tower positions as required by the Employer. Such tracks need not be surfaced but shall be graded and shall include culverts to prevent wash-way.

SECTION 6

SURVEY, PROFILE AND GEOTECHNICAL INVESTIGATIONS

ROUTE SELECTION

The Employer will indicate to the Contractor either on maps or during visits to the sites the proposed route of the transmission line, with approximately positions of the angle and terminal support and the position of such intermediate supports as it may have been desirable to determine during preliminary wayleaves negotiations. The Contractor shall give the Employer the requisite period of notice prior to commencing the survey. This is Hold Point.

CONTRACTOR SURVEY

Access for Survey
The Contractor's surveyors shall in all cases announce himself to the occupier/landowner immediately before entering any private property for the purpose of survey.

Accuracy
Profiles shall be produced as a result of a precision ground or aerial survey, the accuracy of which shall be such that the vertical tolerance between levels forming the profile and actual ground level shall not exceed 300 mm, and the measured to an accuracy of not less than 0.2 percent. All levels shall be related to the specified national datum.

Profile Drawings – Size & Scales
Computer plotted profiles on plain plastics drawings sheets will be accepted by the Employer.

The profile shall either be drawn on a mixture of a melinex type material or as otherwise approved with printed grid lines of increasing thickness in 1, 5, 10 and 50 mm squares and shall be drawn on the reverse side of the melinex to the grid lines.

However the format of the profile shall not differ from the details specified in the following clauses.

Unless specified to the contrary the scale of the profile shall be:

- 1:2000 horizontally and
- 1:200 vertically

The profile shall be plotted with the direction of the line route left to right on profile sheet. In general individual profile sheet shall commence and finish at tension supports but where this is not practicable and continuation sheets are found to be necessary the ground line is to be drawn so that there is an overlap of at least 300 mm between adjacent sheets. The chainage of each section between tensions structures shall start at zero be on 50mm printed grid line and not less than 150mm from the left-hand margin. Each section shall normally be started on a new sheet. The date of survey of each section shall be added.
If more than one section is drawn on one sheet a gap shall be left in the ground line of not less than 150mm.

Profile Drawings – Details

The following details and information are to be included on the profile drawings:

a. At each angle position "tie– in" sketch shall be provided on the profile sheet. This sketch shall show clearly the location of the support using as reference where possible points which can be located on the ground and on the 1:5,000 or closest available scale of survey map. The direction of the line and angle of deviation are to be shown stating also whether the deviation is left or right. Where reliable maps of reasonable scale and accuracy are not available for locating and plotting support positions survey methods acceptable to the Employer shall be employed to establish grid co-ordinates supports and ground features shall be related to these.

b. Where ground slope across the line route exceeds 1 in 25 the level of ground left and right of the centre line shall be recorded at specified horizontal offset distances where the side slope is uniform. Where the slope breaks upwards beyond this distance levels will be recoded up to a specified horizontal offset distance. The offset levels shall indicate on the profile as broken and/or chain lines and the distance off-line started.

c. The profile shall show all changes of level of 300 mm or more along the route centre line and along the off-set lines. All features such as hedges, fences, graves, ditches, roads, railways, rivers, buildings, canals, telephone and railway lines and all power lines shall be shown. Route numbers or name of roads shall be stated or, if unclassified the destination. Railways are to be given the destination, number of tracks, whether or not electrified and the level at the top of rail stated.

d. The chainage is to be shown at each 300 m and at every geographic feature or obstruction. Chainage shall also be given to all pegs.

e. The specified Datum shall be the basis for all levels and the levels above the specified Datum shall be shown at 10 m vertical interval at the beginning and end of each profile sheet. Levels shall be shown at each peg on line and at every obstruction or geographical feature.

f. The visual nature of the ground shall be noted whether cultivated, woodland, etc., with special reference to marsh soft ground or rock and other relevant information such as soil instability.

g. All buildings or high obstruction within 30 m of the centre line shall be shown dotted at their measured height with the distance left or right of line indicated.

h. Where the ground contour rises to a point which would be less than 100 mm from the top of the profile sheet, the ground line shall be terminated and continued on a new sheet with an overlap of 300 m of line route.

i. The following detail shall be shown for crossing of power lines:-

- Voltage and type of construction
- Ground levels at point of crossing and support structures;
- Height of top conductor and earth wire at point of crossing and at point of support;

- Distance from crossing point to support structures along route of line to be crossed;
- Angle of crossing;
- Temperature at time levels were taken (state date and time);
- Support structures members.

j. Along the bottom of the profile sheet a route map shall be drawn, to the same scale as the horizontal scale of the profile, showing all relevant details, within a distance of 30m each side of the route centre line. All items covered by sub-paragraphs (a) and (i) above as appropriate shall be included

k. On tower spot locations, local profile for each tower shall be provided. Stub length and foundation depth design shall refer local profiles as much as possible.

Support Location on Profiles

The Contractor shall submit to the Employer the requisite copies of the profile drawings upon which shall be indicated the proposed location and type of each support, spans, section lengths, (i.e. distances between tension supports), equivalent spans, wind and weight span, phase conductor swing angles, difference in level between adjacent phase conductor attachment points and the sag templates used. This is a Hold Point.
In addition, the relevant position of the bottom or lowest phase conductor at the specified maximum conductor temperature, together with another line parallel to the phase conductor at the minimum statutory ground clearance, shall be shown on the profile.

Check Survey

The Contractor shall carry out a check survey. Proposed surveyed route for which wayleaves has been obtained will be made available to the Contractor, who will be required to check the profile survey and survey and design final route for approval.

The Contractor is required to check thereon the proposed support positions and submit the profile to the Employer. Profile details and support locations shall be in accordance with the preceding clauses. Check survey shall include Contractor notes on final route selected and shall be approved by Employer; approved centre shall be the transmission line approved design centre. Design and construction set out will be based on this without changes, and any deviation shall be reported immediately to the Employer with the proposal for restoring design centre.

GEOTECHNICAL INVESTIGATION

General

Geotechnical investigations shall be undertaken in accordance with the technical requirements detailed in the following clauses and British standard code of site investigations BS 5930. Tests shall be to BS 1377 British standard for civil engineering soils properties.

Where required by the Employer, the Contractor or his appointed geotechnical consultant shall undertake the specified slope stability analysis and design.

The Contractor shall give the Employer the requisite period of notice prior to commencing the geotechnical investigation. This is a Hold Point.

Level 1
Level 1 geotechnical investigations shall be based on a visual-tactile examination of disturbed soil samples for the determination of both soil classification and strength.

Level 2
Level 2 geotechnical investigations shall be based on in-situ testing for the determination of the soil strength and visual tactile examination of disturbed samples for the determination of soil classification

Level 3
Level 3 geotechnical investigations shall be based on in-situ testing (as level 2) for the determination of the soil strength and the recovery of disturbed soil samples for the subsequent laboratory testing.

Laboratory soil classification tests for non-cohesive soils shall be particle size distribution, moisture content and relative density, whilst those for cohesive soils shall be moisture content and atterberg limits.

Level 4
Level 4 geotechnical investigations shall be based on a combination of in-situ testing (as level 2) and the recovery of disturbed/undisturbed soil samples for the subsequent laboratory testing.

Soil and Ground Water Samples
Where specified, soil and ground water samples shall be obtained for determination of the chemical content i.e. organic matter, sulphate, pH and chloride content.

Geotechnical Investigation Criteria
Geotechnical investigation shall be undertaken to the following criteria:

a) Geotechnical investigation shall be undertaken as near as possible to the tower site. For test foundations the investigation shall be undertaken as near as possible to the test site, and shall take account of the theoretical failure surface of the foundation. ;

b) Time lapses between the investigation and foundation installation shall take into account any noticeable effect on the geotechnical properties due to rainfall or seasonal variations in the groundwater level;

c) Depth of investigation shall be:

i. For trial pits 2m; or
ii. the foundation depth plus 1.5 times the maximum base width dimension for concrete pad and chimney or steel grillage foundations; or

iii. 3m or 5 times shaft diameters (whichever is greater) below the foundation depth for drilled shaft, piled foundations; or

iv. at least2m into rock or hard dense stratum (N_{SPT}> 50) if this occurs before the recommended depth; or
v. For uplift or lateral foundation tests not less than 1m below the base of the test foundation.

d) SPTs (standard penetration tests) should be undertaken at the top of each stratum and then at 1m intervals in soil or weak rock;

e) PMTs (Pressure meter tests) should be undertaken in each stratum or as required;

f) CPTs(Cone Penetration Tests) should be taken continuously over depth of investigation

g) VSTs (Vane Shear Tests) should be undertaken at top of each stratum and then at 1m intervals;

h) Soil/rock description should be based on disturbed samples taken in each stratum and thereafter at 1m intervals.

i) Highest ground water level and variation in water level

j) Electrical resistivity of the soil shall be verified on every tower site in accordance with British standard code CP 1013-1965,

APPENDIX 6.A.1

GEOTECHNICAL INVESTIGATION

Geotechnical Investigation Level	Frequency
Level 2	Every tower site
Electrical resistivity	Every tower site

Ground water samples shall be taken at every tension tower position for chemical analysis.

SECTION 7

CONDUCTORS AND FITTINGS

POWER CONDUCTOR

The power conductor shall be Aluminium Conductor Steel Reinforced (ACSR) -175mm2 codename "Lynx" and shall comply with IEC 60889. The outermost layer of the conductors shall be right-handed lay (z-lay). The Aluminium shall be of the highest purity commercially obtainable and shall not be less than 99.5%. The Contractor shall submit certificates of analysis giving the percentage and nature of impurities in the metal from which the wires were made. There shall be no joints in the individual wire of the outer layers of aluminium wires. All steel core wires unless specified to the contrary shall be hot-dipped galvanized to comply with the requirements of IEC 60888.

Unless specified to the contrary all conductors shall be uniformly covered with neutral grease as per IEC 61089. The minimum fill factor of grease shall not be less than 70 percent. Each layer of wire except the outer layer shall have, both lengthwise and peripherally, an even and continuous coating of grease. Wax thickened greases shall be applied at a temperature above the dropping point and shall be substantially free from contaminants.

The grease shall protect the conductors from corrosion in service, not corrode the steel or aluminium, be compatible with any wire drawing lubricant that might be applied on the conductor, not flow nor exude from the conductor during storage, transport, erection or service at temperatures of up to 100 degrees C. In addition the grease should have adequate resistance to oxidation and conform to relevant current health and safety requirements.

Technical details of Power Conductor

Nominal section : 175 mm2		
Conductor strand	:	30/7 (2.79 mm)
Tolerance of diameter: Aluminium	:	$\pm$ 1.0%
Steel	:	$\pm$ 2.0%
Minimum tensile strength after stranding	:	
Aluminium	:	17.2 kg/mm^2
Steel	:	128.5 kg/mm^2
Minimum coating weight of zinc	:	240g/m^2
Calculated section : Aluminium	:	183.40 mm^2
Steel	:	42.80 mm^2
Total	:	226.20 mm^2
Outside diameter	:	19.53mm
Unit weight of conductor	:	0.842kg/m
Ultimate tensile strength (UTS)	:	8,140kg
DC resistance at 20 deg. C	:	0.1576 Ohm/km

Approximate current carrying capacity : 527 A

Conductor Sag Design

Sags shall be computed under the following conditions:

Most severe design conditions -	Max. wind pressure under min temperature
Max. wind pressure on conductor	385 N/m^2
Max air temperature	36^0 C
Min. air temperature	10^0 C.
Min. conductor temperature	0^0 C
Max. Conductor temperature (continuous loading)	75^0 C
Max. Conductor temperature (fault conditions)	200^0 C
Average conductor temperature	35^0 C
Factor of safety	
- Max. Working tension to UTS	more than 2.5
- Everyday stress to UTS	more than 5.0
Young's modulus of aluminium	6,300kg/mm^2
Young's modulus of steel	21,000kg/mm^2
Linear expansion coefficient	17.8/^{0}C x 10^{-6}

DRUMS

The conductors shall be supplied on impregnated drums of approved materials constructed so as to enable the conductors and earthwire to run smoothly and those as spare materials shall be supplied on steel drums of approved materials for storage for long duration. Length of conductors on one drum shall not be less than 2,000m. Actual conductor lengths shall depend on stacking chart stringing sections and drum schedule so prepared shall be submitted for approval.

JOINTS AND REPAIR SLEEVES

Tension joints of the conductors shall be of compression type and shall be free from slipping off, causing damage to or failure of the complete conductors, earth wire or any parts thereof at loads less than 95 per cent of the ultimate breaking strength of the conductors and earthwire.

Electrical conductivity and current carrying capacity of the tension joints for the power conductors shall not be less than those of equivalent length of the conductors.
The cut ends of steel wires and steel component inside the joint shall be protected from the weather in an effective and permanent manner.

Aluminium sleeves shall have plugholes for injecting compound.

All tension joints shall be supplied with aluminium fool-proof gauges or anti-displacement pins for correct positioning, adequate quantity of filling compound in injectors and aluminium collars for gap filling.

Full details of the joints including an illustration of practices for filling the air gap between sleeves, method of correct positioning of steel sleeves, gauges for ascertaining the compressed size, etc. shall be submitted with the tender.

Repair sleeves for the power conductors shall be of the compression type and the conditions stated above for the tension joints shall apply to the repair sleeves where applicable.

Accessories for Power Conductors and Earth wire

In order to prevent fatigue of power conductors and earth wires due to repeated vibrations caused by breeze, the following countermeasures shall be applied.

a) Trunnion type suspension clamps

b) Vibration dampers

c) Armor rods.

Trunnion type suspension clamps

Suspension clamps shall be of trunnion type, made of aluminium alloy and as light as possible. They shall be designed to avoid any possibility of deforming the stranded conductors and earth wires and of separating the individual strands and shall be free to pivot in the vertical plane containing the conductors and earth wires.

Suspension clamps except jumper suspension sets shall have a suitable dimension for clamping the conductor with preformed armor rods; and shall not permit the complete conductor with armor rods to split at load less than 2,250kg for ACSR. Particular attention shall be paid to the elimination of corona emission from all parts of the suspension clamp.

Vibration Dampers

Vibration dampers shall be of Stockbridge type for both conductors and earth wire. The dampers shall be applied in all conductors and earthwires in every span except slack spans into the substations. The dampers shall be designed to be attached to the conductors and earthwire in a manner, which will prevent damage thereto and free drop of the weight in service. Clamping bolts shall be provided with domed self-locking nuts designed to prevent corrosion to the thread.

The nominal weight of damper shall be 12 pounds (5.44kg) for the conductors and 4 pounds (1.81kg) for the earthwire. The numbers of the dampers to be installed per span shall be:

a) 2 pieces per conductor or earthwire for spans up to 600 m and,
b) 4pieces for the spans longer than 600 m.

First and second dampers will be positioned at 1.1m and 2.2m for power conductors and 0.6m and 1.2 m for earthwires respectively from the centre of suspension clamps or from the mouth of tension clamps.

Armour Rods

Preformed armour rods shall be applied to all suspension points of the power conductors except jumper suspension points.

Suspension clamps for those conductors protected by armour rods shall be suitable for the enlarged conductors.

CORONA AND RADIO INTERFERENCE

The design of all line conductor fittings, vibration dampers, etc., shall avoid sharp corners or projections which would produce high electrical stress in normal working. The design of adjacent metal parts and matching surfaces should be such as to maintain good electrical contact under service conditions. Particular care shall be taken during manufacture of conductors and fittings and during subsequent handling to ensure smooth surfaces free from abrasion.

SECTION 8
OPTICAL FIBRE GROUND WIRE

TECHNICAL DESCRIPTION

The transmission line earth wire integrating optical fibres shall be of design and construction to ensure long service with high economy and low maintenance costs. It shall be suitable in every respect for continuous operation at nominal parameters as well as in transient operating conditions under the climatic conditions peculiar to the site.

The OPGW shall incorporate at least 48 optical fibres. The fibre optic earth wire shall comprise an optical sub-unit containing optical fibres over which shall be laid aluminium, aluminium alloy or aluminium coated steel strands. The clad steel wire incorporated in fibre optic earth wire shall comply with the requirements of IEC 61232. Shaped aluminium or aluminium alloy wire sections shall conform to the requirements of the appropriate IEC standard. Other OPGW types are acceptable if the required performance characteristics are met.

All materials used shall be of the best quality and workmanship, and shall be of the highest class throughout with the designs and dimensions of all parts such that the stresses to which the OPGW are subjected to shall not render them liable to distortion or damage under the most severe conditions encountered during installation as well as in service.

Special attention shall be paid to the OPGW stranding process to ensure the necessary tightness between different layers in order to avoid slippage or relative movement of strands or cage formation during stringing.

Stranding tolerances as well as inspection and testing shall be as per IEC 61089 as far as applicable, and to the respective manufacturing standards.

The OPGW manufacturer shall have ISO 9000 quality assurance system certified and shall prove a minimum experience in successful supply of similar OPGW in the last 5 years.

The OPGW installation shall include all cable fittings (tension and suspension spirals, vibration dampers, earth connection etc.), joint boxes, termination boxes, fibre connectors and other accessories required for a complete working fibre link. The earth wire fittings and optical joint boxes shall be type approved.

The optical sub-unit shall withstand the temperature rise associated with the specified lightning fault current flowing in the earthwire without damage. The fibre optic earthwire (OPGW) shall be manufactured in continuous lengths of appropriate lengths to keep joints to a minimum.

The overall system design of the fibre optic system shall meet the following minimum requirements:

a) Single failure or degradation in any optical fibre not more than one year averaged over five years;

b) Failures or degradations affecting more than one optical fibre, not more than one in ten years;

c) Increase in optical system transmission attenuation due to accumulated ageing and other effects at the end of five years, not more than 0.05 dB/km.

3.17.3.1 Optical fibre parameter and performance

The OPGW, access cables and underground cables shall have at least 48 (forty-eight) single mode optical fibres with following characteristics:

- Transmission wavelength: 1310 nm and 1550 nm
- Mode field diameter: 9.0 to 11.5 micrometers (μm), including tolerances
- Optical cladding diameter: 125 μm ± 2.0%
- Cable Attenuation: not greater than 0.40 dB/km for every fibre in every drum at optical wavelength of 1310 nm; and not greater than 0.25 dB/km for every fibre in every drum at optical wavelength of 1550 nm
- Joint attenuation: not greater than 0.1 dB at optical wavelength of 1310 nm and not greater than 0.2 dB at 1550 nm for every fibre, measured on the fully installed joint
- Total dispersion: not greater than 3.5 ps/km.nm at optical wavelength of 1310 nm and not greater than 19.0 ps/km.nm at optical wavelength of 1550 nm
- Core numerical aperture: less than 0.23
- Life span: greater than 30 years

The Contractor is required to supply a graph of attenuation versus wavelength over the range of 1200 nm to 1600 nm

No joints shall be allowed in any fibre in any drum length.

Discontinuities will be acceptable if:

- Less than 0.10 dB in magnitude measured at 1310 nm, and
- OTDR traces from both ends of the cable at 1310 and 1550 nm wavelength show a difference of less than 0.05 dB/km for every fibre in every drum.
- Power Meter & Light source. The test shall be used to verify that the measured loss is in average equal or less than the calculated link budget.

The Contractor shall state the refractive index of the optical fibres at 1310 nm and 1550 nm.

OPTICAL FIBRES

Optical fibres shall be single mode fibre and shall conform to IEC 793-2-BI.

The fibre coating material shall be mechanically strippable. The optical fibres shall be capable of being jointed by fusion technique.

There shall be no measurable long term or short-term optical attenuation change due to the temperature rise associated with a fault current flowing in an earth wire, or a lightning strike on the earth wire.

OPGW FITTINGS

The fibre optic earth wire shall be with approved conductor fittings. The application of these fittings shall not damage the earth wire or fibres, either mechanically or optically.

At each support, a bypass device shall be provided to guide the cable around the earth wire fittings associated with the support.

OPTICAL JOINT BOXES

Optical joint boxes shall be provided to protect the splice joint of optical fibres, either when individual lengths of the fibre optic OPGW, are jointed or between the fibre optic earth wire and the underground fibre optic cable.

The joint boxes shall consist of external steel or die cast aluminium housing providing protection to IEC 529 IP 44 and an internal die cast aluminium or high impact plastic ABS box to IEC 529 IP54

The external housing shall be designed so that the rainwater is directed away from the door and there shall be no water ingress when the door is opened.

The joint boxes shall be supplied complete with all fittings to secure and seal the cable in the gland plates or blank the unused spigots. The cable cleats to secure the fibre optic OPGW or underground cable shall be fitted inside the box. The cleats shall not have a detrimental effect on the performance of the optical fibres when tightened to the recommended torque.

The top and bottom of the joint box shall be vented and the vents provided with the vermin shields.

The box shall be supplied complete with internal splice cassettes to accommodate the required number of splices. The glands shall be fitted to accommodate either the fibre optic OPGW or underground fibre optic cable.

FIXING CLAMPS

A bolted clamping system shall be used to attach the OPGW to the inside of the support, without drilling or modifications to the support steel work.

The attachment clamps shall be capable of being attached and detached from the support, without affecting the OPGW.

MATERIALS

Fibre optic earth wire materials

External aluminium, aluminium alloy or aluminium coated steel strands.

Optical Joint boxes

Optical joint boxes shall be made from either a suitable grade of aluminium alloy complying with the requirements of BS 1490 and / or BS EN 1676 or steel complying with requirements of BS 3100

Fixing Clamps

Fixing clamps shall be made from a suitable grade of aluminium alloy complying with the requirements of BS 1490 and / or BS EN 1676. Bolts shall be made from mild steel grade S275JR to BS EN 10 025. Bolts and nuts shall be ISO Metric Black Hexagon to BS 4190 and shall unless otherwise specified be threaded ISO Metric Coarse Pitch to BS 3643: Part 2, Tolerance Class 7h/8g.

PROTECTIVE TREATMENT

Fibre optic earth wire

Where two layers of wire strands are provided over the optical sub-unit, the external surface of the optical sub-unit and the inner strand layer shall be greased, using approved conductor grease.

Ingress of Moisture

The cable shall be capped before shipment to prevent the ingress of water.

Optical Joint boxes

Optical joint boxes (steel exterior) shall be hot dipped galvanized after manufacture to meet the requirements of BS 729.

INSTALLATION

General

The supplier of the OPGW shall be responsible for the supervision of installation by the Contractor; to ensure that system reliability requirements are met.

Workmanship

The Contractor shall ensure that the fibre optic cable are not strained or damaged either mechanically or optically during stringing and/ or jointing.

Fibre optic joints

Optical fibre joints in the OPGW, or between the OPGW and the non-metallic underground fibre optic cable, shall be housed in optical joint boxes. The joint boxes shall be located immediately above the anti-climbing device for convenient access by technical personnel. All joint boxes shall be earthed to the support steel work using approved multi-wire / multi-strand flexible aluminium earth bond.

TERMINAL EQUIPMENT

The All fibres of the OPGW shall be terminated at an Optical joint box provided on the terminal tower by the contractor. Lead in cable shall be provided at the substations by the employer, to connect the OPGW to the terminal equipment.

Scope of Work

The Contractor shall include detailed system design, manufacture, supply, installation, testing, commissioning, remedying of defects, maintaining the works during the defects

liability period and any incidental work necessary for the proper completion of the work in accordance with this contract.

The existing lines already has an optical fibre earth wire. The Contractor shall open this connection, and complete the OPGW link
Detailed requirements are as follows:-

- System design – The system design and preparation of Contractor's drawings to approval of the Engineer
- Supply and installation of fibre optic cable including mounting hardware and splicing
- Factory testing of the OPGW prior to delivery.
- Testing and commissioning of the systems up to the terminal joint box at KPC Nakuru depot substation

QUALITY CONTROL

FATs shall be carried out for the OPGW. During the attendance, the Contractor shall give the Employer's persons a brief explanation on design, manufacture, operation and maintenance of the materials and equipment.

Types of Tests
Type, sample and routine tests shall be undertaken on the OPGW, their associated fittings, non-metallic underground fibre optic cable and optical fibres in accordance with the requirements of specification, CCITT G652, IEC 793 and IEC 794 as appropriate.

OPGW Tests
a) **Fatigue**
The Contractor shall submit documentary evidence to show the fatigue life of the OPGW including that of the optical sub-unit compared to that of a conventional conductor of similar characteristics e.g. diameter, mass, stranding etc.

b) Stress-Strain
A sample of OPGW not less that 10m length, complete with the proposed end fittings shall be subject to a stress-strain test. The test shall be undertaken in accordance with IEC 1089 Annex B and the measuring techniques in accordance with IEC 794-1-E1.

c) Tensile performance
The test shall be undertaken in accordance with the load conditions specified in IEC 1089 Annex B and the measuring techniques in accordance with IEC 794-1-E1.

d) Crush and Impact
The test shall be undertaken in accordance with the recommendations of IEC 7941-1-E3 and IEC –794-1-E4.

The crush test shall be undertaken by applying a 10kN load for 1 minute to the OPGW via two 50mm x 50 mm flat plates.

The impact test shall be undertaken by dropping a 4 kg weight from a height of 150 mm onto the end of a 20mm diameter steel mandrel placed on the OPGW. These should be done 20 times.

e) Temperature cycling
The optical performance under temperature cycling shall be tested in accordance with IEC 794-1-F1 with specified temperature ranges for a duration of 4 hours. The test should be undertaken twice.

f) Water Ingress
The optical sub-unit shall be tested for water ingress in accordance with IEC 794-1-F5

g) Fault Current
A sample of OPGW not less than 2 metres in length shall be subjected to a fault current pulse. The test shall be performed twice with an interval of 30 minutes between tests. After the second impulse the OPGW shall be dismantled and the optical cable examined throughout its length for any signs of deterioration.

h) Lightning Strike
Tests shall be carried out to verify the effectiveness of the OPGW to withstand the effects of a lightning strike. The test shall consider both an initial stroke and a follow through. The test shall be carried out on a sample of OPGW not less than 2 metres long. The acceptable criteria shall be that earthwire' calculated residual strength is not less than 90 percent of the original stated ultimate strength.

Optical Fibres
Optical fibres shall be tested in accordance with the requirements of IEC 793.

Optical joint Boxes
Optical joint boxes shall be visually inspected to ensure they meet the specified requirements.

Non- metallic underground Fibre Optic cable
Non-metallic underground fibre optic cable and the optical fibres shall be tested in accordance with the requirements of IEC 793 and IEC 794 as appropriate.

Fibre Optic cable
All fibre optic cables shall be tested prior to dispatch using an OTDR on each fibre and other tests detailed in this document.

Test Certificates
Test records, covering type and sample tests shall be provided.

SECTION 9

LINE INSULATION

The transmission line for the project is aligned on an elevation level of2000m above sea level. The area has high humidity levels, tropical sunshine and prone to medium to heavy pollution by agricultural and industrial activities.

Silicon-rubber long-rod type Composite Insulators of the approved type shall be used to support the power conductors of the Transmission line. All insulator units will be composed of top and bottom arcing rings to equalize the voltage distribution over the insulator. The top shed of the insulators shall also have a larger diameter to prevent waste from birds and animals tracking down along the insulator.

INSULATORS DESIGN

The insulator units shall be designed to withstand the design service voltages including lightning, switching and power frequency, the mechanical loads relevant to the installation-service-maintenance conditions, the service temperature and environmental effects. Internal stresses due to expansion and contraction of any part of the insulator unit shall not lead to deterioration.

The insulators should withstand wind pressures of up to a maximum of 385N/ m^2.

The design of insulator units shall be with end over mould or such as to avoid local corona formation and no significant radio interferences shall be exhibited. The long rod Insulator units shall comply with the requirements of **IEC 61109.**

FITTINGS

All fittings to make each composite insulator set complete for beneficiary use shall be supplied and included in the rate for each insulator unit. Such bolts, nuts, washers, cotter pins and retaining pins with necessary spares as may be necessary for the use for erection shall be deemed to be included in the appropriate items.

Ball and socket couplings shall be in accordance with the requirements of IEC 60120/16. Sockets shall have “R” type security clips in accordance with the requirements of IEC 60372.

Clevis tongue couplings shall be in accordance with the requirements of IEC 60471.

All ferrous fittings shall be made of steel, ductile iron or malleable iron hot dip galvanized, and shall have sufficient strength for abrasion and weariness produced by repeated vibration. Cotter pins shall be made of non-ferrous metal or stainless steel and designed as the self-locking type.

The arcing ring shall be provided for the top and bottom of each insulator string and shall be of such design and shape that it reduces the voltage across the part of the insulator adjacent to the conductor for each insulator string, to a value which prevents visual corona formation on the metal caps and pins of the insulators and shall minimize the Radio / Video interference

voltage from complete insulator and hardware assemblies when operated at the voltage up to 420 KV.

The arcing rings shall be of such design that when added to suspension and tension assemblies, the resulting flash-over values of the complete insulator string shall not be reduced below the percentage indicated hereunder, of corresponding flash over values with the rings omitted.

The percentages are:
a) Wet 50 Hz: 100%
b) 1.2 / 50 Impulse: 96%

The rings shall be of hot dip galvanized steel or Aluminium tube having outside diameter as required for corona control and minimum thickness of 2.5mm. Both inner and outer surfaces shall be galvanized to the required specifications (BS 729). The details of the rings, brackets and methods of mounting shall be of such design that the rings may be readily replaced under 'hotline' maintenance.

The horizontal distance between corona rings at suspension rings at suspension insulator strings shall be kept as small as practicable to accomplish the required reduction in Radio/ Video Interference (RVI).

All the accessories and the fitting offered against this specification shall be subjected to corona test. The corona shall not take place and shall extinguish at the voltages specified i.e. when a voltage of the specified value applied (Phase to Neutral i.e. RMS) the corona shall appear and shall disappear again at the specified value of voltage.

Pollution

The design of insulator units should take into account the principles contained in the IEC 60815 for heavy pollution environment. For this project the minimum creepage value of 31 mm/kV shall be applied (Creepage distance of 4495 mm).

Zinc Collars

The insulator unit cap and pin shall be fitted with zinc-collared pins to prevent cracking due to pin corrosion caused by the effects of pollution and high humidity in the project area.

Insulator Protective Device

The design of insulator fittings including corona shields shall comply with the following requirements:

a) Shall effectively protect the insulator unit and fittings from damage caused by power arcs.
b) Shall effectively improve the voltage distribution along the insulator unit;
c) Shall effectively improve the corona performance of the insulator unit.
d) Shall be designed in such a way as not to subject to breakage fatigue due to wind induced vibration;
e) Shall withstand the specified mechanical load
f) Shall be suitable for live line maintenance

Materials
The silicon rubber composite insulator shall comply with requirements of **IEC 61109.** The tension bearing material shall be E-CR Fibre Glass and the housing and sheds made of HTV silicone rubber.

Insulator caps and pin bases of malleable cast iron shall be manufactured from a suitable grade of MCI complying with the requirement of BS EN 1563 for spheroidal graphite or BS EN 1562 for white heart and peralitic.

Insulator end fitting of forged or cast aluminium alloy shall be manufactured from a suitable grade of aluminium alloy complying with the requirements of BS 1472 or BS 1490 and/or BS EN 1676 respectively.

Security '**R**" clips shall be of phosphor-bronze composition in accordance with the requirements of BS 2870 and supplied in the half-hard condition with a minimum harness of 155 VPN

Zinc collars shall have a total impurity not greater than 0.05 percent and shall comply with the requirement of BS EN 1179.

All insulator caps, bases and pins shall either be inherently resistant to atmospheric corrosion or a suitably protected against corrosion, such as may occur in transit, storage and in service. All ferrous parts which will be exposed to the atmosphere in service, except those made in the appropriate grade of stainless steel, shall be protected by hot-dipped galvanising to comply with the requirements of BS 729.

TESTS

Type, sample and routine tests shall be undertaken on the insulator units in accordance with the IEC 61109.

MINIMUM CLEARANCES

Minimum Clearance of Live Parts to Towers
As Appendix 9.A.2 below

APPENDIX 9.A.1

Electrical & Mechanical specifications for the Composite Insulators

	Specifications	Suspension	Tension
1	Maximum System Voltage (kV)	145	145
2	Pollution Category	Heavy Category -III	Heavy Category -III
3	Dielectric	Silicon rubber	Silicon rubber
4	One-minute power frequency withstand voltage, 50 Hz, wet. (kV)	275	275
5	Lighting impulse withstand voltage, 1,2/50 pos. (kV)	650	650
6	Power arc current	25 kA, 0.5 sec	
7	Minimum creepage distance (mm)	4495	4495
8	Specified mechanical load, tension (kN)	70	100
9	Minimum Arc Gap (mm)	1450	1450
10	Material fittings	Steel h.d.g.	Steel h.d.g
11	Material of rod	E- CR Glass	E- CR Glass
12	Material of housing and sheds	HTV- Silicone	HTV Silicone
13	Socket	IEC 60120/16	IEC 60120/16
14	Ball	IEC 60120/16	IEC 60120/16
15	Arcing Rings material	Steel h.d.g	Steel h.d.g
16	Arcing rings	IEC 61284	IEC 61284

APPENDIX 9.A.2

MINIMUM CLEARANCES

Minimum clearance of live parts to towers

The minimum electrical clearances of live parts to earthed structures for the project shall be as follows (See Figures 1.A.2):

a) In still air (vertical position)	:	1350mm
b) Under 20^0 swing of suspension insulator set or jumper conductors	:	1350mm
c) Under 40^0 swing of suspension insulator set or jumper conductors	:	1140mm
d) Under 60^0 swing of suspension insulator set or jumper conductors	:	830mm

Minimum Ground clearances of conductors

Above general terrain	7.2m
Above main roads	7.5m
Above other Power lines	3.2m
Above Telephone lines	3.2m
Above railways	8.5m

SECTION 10

TOWERS

TYPE OF TOWER

The line shall be a double circuit of power conductor Lynx with overhead Optical Ground Wire on both circuits.

Towers shall be self-supporting and broad base galvanised steel lattice type with body and hillside extensions. The hillside extensions shall be applied for tower legs on the slope so that legs are suited to the original slope of tower site and also that excessive land cutting around foundations and land collapse is prevented.

The following tower types shall be designed for the project in order to meet various tower positions and loadings economically.

(a)	Type-S	:	Use at tangential positions or angle points up to 2 degrees of horizontal deviation, provided with suspension type insulator sets.
(b)	Type-L	:	Use at positions of light angle up to 15 degrees of horizontal angle deviation with tension type insulator sets.
(c)	Type-M	:	Use at positions of medium angle up to 30 degrees of horizontal angle deviation with tension insulator sets.
(d)	Type-H	:	Use at positions of heavy angle up to 60 degrees of horizontal angle deviation with tension insulator sets.
(e)	Type-HS	:	Use at positions of specifically heavy angle up to 75 degrees of horizontal angle deviation with tension type insulator sets.
(f)	Type-T	:	Use at positions of line termination or 90 degrees of horizontal angle deviation with tension type insulator sets.

The actual types and number of towers shall depend on the profile of the selected route and actual tower spotting.

TOWER DESIGN GENERAL ARRANGEMENT

Towers shall have the general arrangements and configurations shown in the drawings included with the specification. Please note that the drawing only give the general tower outline. Design of the towers shall be done by the contractor. Tower design with a high peak for a single ground wire shall be acceptable provided design calculations show the effectiveness of such aerial earth protection. They shall be designed to resist the specified ultimate system loading. Clearances between live parts and supporting steelwork and between the phase conductors and ground or other obstacles shall be as specified.

All tower designs shall be such as to facilitate inspection, painting, maintenance, repairs and operation with the continuity of supply being the prime consideration.

The design shall be such that the number of different parts shall be as few as possible to facilitate transport, erection and inspection. The maximum weight of the heaviest single member should be limited to that within the normal lifting capability of the proposed erection equipment.

Main leg members of lattice steel towers shall be formed of the maximum single lengths, appropriate to the body or leg extensions and shall not without the Employer's approval incorporate additional spliced sections.

For lattice steel towers a fully triangulated system of bracings shall preferably be adopted. If full triangulation is not adopted, the overall stability and secondary bending stresses must be considered in the design.

Where fabrication processes employed adversely affect the material properties, or introduce zones of high stress concentration the overall design of the structures shall take such factors into account.

Cross-arms shall be so arranged that they can be disconnected in the plane of the longitudinal face of the support without disturbing any members forming part of the support body.

The cross-arms should be designed to take and be compatible with the **AB CHANCE** Live Line maintenance tools and equipment.

Appropriate bird guard protective devises shall be installed to keep away birds from roosting directly over the insulator units.

Height of Towers

Height of towers shall be determined in the under-mentioned way:

$H = G_c + S_g + L_i + H_c + H_g$

Where,

- H = Total height of tower.
- G_c = Necessary ground clearance of power conductors above ground or other objectives.
- S_g = Maximum conductor sag
- L_i = Length of a suspension insulator set, but nil for a tension type towers.
- H_c = Vertical spacing of upper conductor cross -arm spacing
- H_g = Vertical spacing between upper conductor cross-arm and overhead earthwire.

Towers shall be provided with body extensions in a 3 m step to a standard height for maintaining necessary conductor ground clearance mentioned in **APPENDIX 1.A.2** on various ground profiles. In addition to the body extensions, each leg will have hillside extensions in a 1 m step to suit for the original ground slope and ensure that cutting ground to level setting will not be used. Standard tower structures are shown in Appendix **1.A.1** as well as insulation clearance diagram of conductors.

Design Span (adopt existing spans in this tender)

The design of all towers shall provide for the following basic, wind and weight spans:

Type of Tower	S	L	M	H	HS	T
Basic span (m)	350	350	350	350	350	350
Wind span (m)	350	350	350	350	350	350
Weight span (m)	700	1,200	1,200	1,200	1,200	1,200
Uplift Weight (m)	0	-300	-300	-300	-300	-300

The term basic span means the horizontal distance between centres of adjacent supports on the level ground which the height of standard towers is derived with the specified conductor clearances to ground in still air at maximum temperature.

The term wind span means half the sum of adjacent horizontal span lengths supported on any one tower.

The term uplift weight means the weights of conductors and overhead earthwire supported upwards at any one tower for reinforcing strength of cross arms.

Design Loads

Structural loading shall refer, ASCE Manual and Report on Engineering Practice No. 74 - 1991 "Guidelines for electrical transmission line structural loading".

The following loads shall be applied in the design of towers:

(a) Wind Loads
- on power conductors and overhead earthwire : 385N/m^2
  (On the projected area of conductor or wire)
- On tower structures : 690N/ m^2
  (On the projected area of structure members)
- On insulator sets : 385N/ m^2

(b) Maximum working Tensions of Conductor and Earthwire
- Power conductor Lynx : 22,400 N
- Overhead optical fibre earthwire : 14,100 N

(c) Vertical Loads
- Tower structures: actual weights of tower structures including accessories
- Power conductors: Weight of conductors of specified weight span with accessories
- Overhead optical fibre earthwire: weight of specified weight span with accessories
- Erection Loads: such loads as workers' weights on tower members, reaction of temporarily backstays during stringing operation, etc.

(d) Horizontal Angle Effect
-Power conductors and overhead earthwire :horizontal component of maximum working tension of conductors and earthwire due to the specified horizontal angle deviation.

The towers shall be designed for the following wind and weight spars.

TYPE OF TOWER	S	L	M	H	HS	T
Wind Span [m]						
- Normal working condition [m]	350	350	350	350	350	350
- Broken wire condition [m]	260	260	260	260	260	260
Weight Span [m]						
- Normal working condition [m]	700	1200	1200	1200	1200	1200
-Broken wire condition [m]	500	900	900	900	900	900
Uplift weight for cross arms	-	300	300	300	300	300

Design Conditions

(a) Assumed Normal Loading Condition:

The assumed maximum simultaneous working loading on towers shall be as follows:

(i) Vertical loads : as above-mentioned.

(ii) Transverse loads : wind loads horizontal angle deviation effects

(iii) Longitudinal loads :wind loads and erection loads buttogether with maximum working tensions of power conductors and overhead earthwire for their termination for Type-T tower.

(b) Assumed Broken-Wire Condition:

Under the condition, any one power conductor or an earthwire is assumed to be broken at their maximum working tensions in addition to the loads under the normal condition. In the case of Type-S tower, the pull will be assumed to be reduced to 70% of the specified maximum working tensions.

(c) Factor of Safety:

The following factors of safety for tower structures shall be applied in the design.

(i) More than 2.5 for the synthetic maximum load under the normal loading condition.
(ii) More than 1.5 for the synthetic maximum load under the broken-wire condition.

Those factors of safety shall be proved under tower loading tests on the proto-type towers in the manufacturer's testing station, and there should be no failure or permanent distortion during the tests when 100% loading is sustained for five minutes.

Design of Towers

Latticed steel structures shall be designed with geometric configurations based on structural strength, electrical, economic, and safety requirements. Member forces caused by the design factored loads shall be determined by established principles of structural analysis.

Each type of towers shall be designed so that no failure or permanent distortion shall occur when tested with applied force equivalent to 2.5 times the maximum simultaneous working loadings specified in the Clause 10.2.4 [Normal Working Loading] and also equivalent to 1.5 times the maximum simultaneous working loadings resulting from the assumed broken wire condition. Design loads shall consider:

a) Minimum legislated levels
b) Client specifications including factors of safety,
c) Expected climatic conditions,
d) Line security provisions,
e) Design life of not less than 50 years,
f) Construction and maintenance operations.

The ultimate design stress, obtained from the working stress multiplied by the factor of safety of 2.5 under the normal condition and 1.5 under the broken wire condition, in tension members shall not exceed the yield point of materials. The ultimate design stress, obtained from the working stress multiplied by the above mentioned factor of safety, in compression members shall not exceed a figure obtained from an approved formula to be entered in Tender based on the yield point of materials. Alternately, formulas in the American Society of Civil Engineers standard for the design of self-supporting latticed steel transmission structures ASCE 10- 97 and ASCE Manual and Report on Engineering Practice No. 74 guidelines for electrical transmission line structural loading shall refer.

Tower design report shall consist of full structural analysis report showing correctness of dimensional detail calculations, tower profile/layout drawings, shop detail drawings, erection drawings and bills of materials. Shop detail drawings shall be approved by the producing utility Engineer of Record (EOR) regarding compliance with the purchaser's specifications and the strength requirements of the design.

Designed tower full scale prototype proof test to BS EN 60652: 2004 loading tests on overhead line structures shall be conducted and approved before tower materials shop production and delivery to site.

Materials and Fabrication

The towers shall be fabricated with mild and/or high tensile steel of the finest quality or other approved materials, of which mechanical properties shall comply with Grade Fe 430 and Fe 510 specified in ISO 630-1980, BS 5950-1/2 or equivalent.

No member of the tower shall be less than 8 mm in thickness and 50 mm in width of flange for leg members of towers and main members of the cross-arm, and 6 mm and 45 mm for the web and nominal members respectively.

The slenderness ratio shall not exceed 150 for the leg and arm members, 200 for the web members and 250 for the nominal members as compression member and 350 for tension only member.

All the connection shall be made by mild and/or high tensile steel bolts and nuts. No bolt shall be less than 12 mm in diameter. All bolts and nuts shall be provided with approved spring washers. Antitheft bolts shall be used from ground level to the tower anti-climb level.

Bolt holes shall not be more than 1.5 mm larger in diameter than the corresponding diameter of bolts. Holes shall be drilled for the members not less than 13 mm in thickness. For the members having thickness below 13 mm, holes may be drilled or punched, but the former is preferred.

All the steel members should have clearly identifiable part numbers which enable quick identification of similar parts. The letters '***KPLC'*** should also be inscribed on each bracing-by punching or any other suitable method, with more than one inscription for parts of length greater than 0.5m.

All burs shall be removed completely by reaming and smoothing before hot-deep galvanising.

Tower Accessories

The following accessories shall be provided for every tower.

(i) **Anti-climbing device and climbing steps**: All towers will be provided with the anti-climb device on each leg at the height of 3 m to 5 m above the highest ground level at all tower locations. The device installed on the step-bolted legs shall be provided on all towers. Gates shall be designed to open upwards only and shall be secured with galvanised bolts and nuts. No padlocks are required.

Each tower shall be provided with step-bolts of an approved type on diagonal sides of the tower at a spacing no more than 380mm, starting immediately above the anti-climbing device and continuing to the earth wires.

Holes for removal step-bolts below the anti-climbing guards shall be provided at not more than 380mm centres on the step legs.

(ii) **Danger, Number and Helicopter patrol plates**: Danger plate which shows warning sign for tower climbing of other people than maintenance crew will be provided on all towers.
Number plates which show tower number set serially from the previous tower in ascending/descending sequence.

All plates shall be of anti-corrosive material. If enameled iron plates are used, the whole surface of each plate including the back and edges shall be properly covered and resistant to corrosion. On all plates the colours shall be permanent and free from fading. With enameled plates, washers or fibre or other approved material shall be provided back and front of the securing bolts.

(iii) **Tower Earthing**: No separate earth conductor from top to bottom of towers is required and earthing continuity will therefore depend on surface contact between bolted members.

All structures shall be provided with means for connecting earthing devices at or around nominal ground level, on each leg and for connecting earth wire bonds to each top cross-arm or earth wire peak.

Each leg of towers will have an earthing rod underneath its foundation to act as basic grounding required by good transmission line Engineering. Basic grounding shall be constructed in such a way that isolation from the tower and concrete foundation is possible to allow earthing survey if required during line service life.

Maximum earthing resistance of a tower is targeted on **10 ohms**, and in case of higher resistance than 10 ohms, additional horizontal counterpoise earthing system will be added in the ground longitudinally to the line route with more than 50 cm depth. The rate entered in the schedule of prices shall include for all necessary fittings and shall be adjusted at the variation rate for increased or reduced fittings.

(iv) **Aircraft Warning Devices**: Due to the activity of aircraft in the vicinity of certain parts of the transmission line, it shall be necessary to mount warning spheres on earth wires at some locations. Aircraft warning spheres shall be capable of being clamped securely to overhead earth wire. The sphere itself shall be of plastic or fiberglass construction of at least 0.5m in diameter and coloured orange or yellow as required by local regulations. The Contractor is to enter rates against appropriate item in the schedule of prices for the above and he will be advised early in the contract of actual requirements.

(v) **Bolts:** Where appropriate all metal parts hall be secured with bolts and nuts with single spring washers. When in position the bolts shall project through the corresponding nuts by at least three threads, but such projections shall not exceed 10mm. No screwed threads shall form part of a shearing plane between members.

In order to safeguard the tower members from theft; special anti-theft bolts shall be applied from ground level up to the anticlimb. The bolts shall be approved by the Employer. The bolts are of the type that shears once the full torque has been applied.

The nuts of all bolts attaching phase conductor insulator set, earth wire sets, maintenance brackets/plates shall be locked in an approved manner preferably by locknuts.

The bolts of any one diameter in a tower shall be one grade of steel. Leg members shall be joined in such a way that electrical continuity is maintained to ground.

(vi) Rectangular and Auxiliary Cross Arm

The type H, HS and T towers may be provided with rectangular arms where horizontal angle exceeds 45 degree.

The prices of the rectangular arm set shall be included in the prices for the towers.

MATERIALS

All steel shall comply with BS EN 10025 or BS EN 10210 as appropriate, unless otherwise specified and shall be suitable for all the usual fabrication processes, including hot and cold working within the specified ranges.

The quality of finished steel shall be in accordance with BS EN 10163. All steel shall be free from blisters, scale, laminations, segregations and other defects. There shall be no rolling laps at toes of angles or rolled-in mill scale.

Unless specified to the contrary the following grades of steel shall be applicable:

a) Mild steel shall be either grade S235JRG2 or S275JR.

b) High tensile steel shall be grade S355JR for sections less than 20 mm thick and S355JO for sections greater or equal to 20mm thick, except for plates which shall be greater or equal to 40mm thick.

WORKMANSHIP

All steel lattice members shall be cut to jig and all holes in steelwork shall be drilled or punched to jig using CNC machine. All steel parts shall be carefully cut and holes located so that when the members are in position the holes will be opposite each other before being bolted up. The drilling, cutting, punching and bending of all fabricated steelwork shall be such as to prevent any possibility of irregularity occurring which might introduce difficulty in the erection of structures on site. High tensile steel members shall be bent hot. Care shall be taken not to punch holes too close to the edge of members.

Means shall be provided to enable the Employer to carry out such checking of members, as he may consider necessary. Built-up sections, when finished, shall be true and free from all kinks, twists and open joints and the materials shall not be strained in any way.

In order to check the workmanship, not less than 1 per cent, of the members corresponding to each type of tower or cross-arm shall be selected at random and assembled to form complete latticed supports or cross-arms in the presence of the Employer representative at the manufacturer’s works.

SECTION 11

FOUNDATIONS

General

Concrete pad and chimney type foundations will be applied to most of the towers, the design of the concrete foundations of the towers shall be performed based on the requirements and assumptions set out below, and the details of the design and drawings for each type of foundations shall be submitted for approval.

Such design of foundations for the towers are subject to modifications to suit the site conditions as indicated in writing by the Engineer during execution of the Contract without any price adjustment of the items of the foundation stubs and foundations.

Concrete Block Foundation

Prior to determination of the type of foundation to be used, the contractor shall carry out geotechnical investigations to BS 5930 and BS 1377 to establish field ground conditions.

The concrete foundations shall be done to meet the following standards:

- BS 8004: Foundations
- BS 8081: Code of practice for ground anchorages
- BS 8100: Towers and masts
- ASCE 10-97: Design of latticed towers
- ASCE 74-1991: Guidelines for electrical transmission line structural loading
- BS 8110: Structural use of concrete
- BS 5328: Methods of specifying concrete

The types of the concrete foundations and natures of earth to be considered shall be as follows:-

- Shallow foundations shall be used for bearing capacity of more than 100kN/m^2
- For bearing capacity less than 100kN/ m^2, special foundations shall apply. Suitable special foundations shall be designed according to technical need and are further classified as:
  --Rock anchor for rocky foundations
  --Raft foundations for swampy areas and
  --Deep foundations, which require use of suitable piles.

All Structural Concrete shall be reinforced with deformed steel bars type 1 to BS 4449 and structural design details to BS 8110 and structural steel detailing to BS 4466.

The angle of frustum of earth shall mean the angle vertical of earth frustum to resist the uplift force and shall be established by geotechnical tests.

The factor of safety shall not be less than 2.5 under the normal working conditions and 1.5 under the broken wire conditions.

The upper surfaces of the foundation pads shall be reinforced and sloped within 45 degrees to the horizontal. The minimum thickness of the edges of base pad shall be not less than 300mm.

The frustum shall be assumed to start from the top edges of the pad. Where frustums overlap each other, allowance shall be made for loss of uplift resistance.

Concrete shall cover any part of the top steelwork by at least 100mm and shall extend above the ground level for the minimum height of 350mm. Additional 500mm minimum chimney extension shall be provided to foots on lower side in sloping areas. The upper surface of chimney shall be sloped to ensure drainage of water.

The cleats shall be attached by bolting at the base of each stub to assist in transfer of leg load to the foundation pad as shown on drawing **APPENDIX 1.A.3**. Minimum portion of stub loads in the design of cleats shall be assumed at 50 per cent.

Special Foundations

Besides the above mentioned concrete foundations, special foundations such as raft type foundation, rock anchor, piled foundation or others may be required. Final type of foundation to be applied for each tower shall be determined in accordance with results of soil investigation performed by the Contractor during execution of the Contract.

For the purpose of tendering, basic designs shall be submitted with the tender under the following assumptions, and prices for the special foundations shall be quoted based on the design.

[a] Raft type foundation

The foundation shall be designed with the following specifications: ultimate bearing capacity of 10 Ton/m^2, soil weight of 1.4 ton/m^3 and no angle of frustum of soil. Weights of reinforced concrete and soil shall be taken as entirely submerged. Other design conditions specified in this subsection will be applied.

[b] Piled foundation

Piles used for the foundation shall be either precast concrete pile with circular or square cross section or in-situ concrete pile.

[i] Pile data

Pile diameter or dimension

- Circular cross section - Φ300 mm.
- Square cross section - 300 x 300 mm
- Pile depth below ground level - 12 m
- Ratio or ultimate bearing/uplift capacity of pile - 2.5: 1

[ii] Uplift

The mass density of concrete below ground level shall be assumed as 1,600 kg/m^3 to allow for hydrostatic effects and similarly soil as 960 kg/m^3. Additional weight of

concrete shall be included as necessary to provide the specified resistance to uplifting under any condition. Where bored or driven piles are proposed having no specially made bulb or enlarged concrete foot to provide positive uplift resistance but relying on skin friction alone, at least 75% of the networking uplift force, and 50% of the net broken wire uplift force shall be provided in dead weight of concrete, whichever is the greater. The cost of such concrete shall be included in the piled foundation rate.

[iii] Compression

Mass density of plain concrete shall be assumed as 2,300 kg/m^3 on their technical acceptability and cast.

Contractors must justify assumptions of equal performance of their piling system with that proposed. No extra payment shall be made for access tracks necessary for heavy piling rigs.

Piles shall be embedded in a reinforced concrete cap of adequate dimensions and the caps tied with nominal reinforced concrete beams of a minimum size of 460 mm deep by 300 mm wide with at least eight 20 mm diameter main reinforcing bars per beam.

Piling shall be carried out using an approved procedure throughout. The actual length and numbers of piles required at any given location shall be approved by the Engineer on the basis of the final agreed design data.

[c] Other Foundations

Where special ground conditions exist which do not allow for any of the above designs in an original or modified fashion, special types of foundations may be employed. They will be paid for on basis of submitted rates schedule for concrete, steel and excavations applying throughout, irrespective of special conditions.

Tower prices shall cover for all costs not covered by special scheduled rates where admissible including the provision of access tracks and standings for piling equipment or building of bund for the Contractor's convenience in paddy fields or other flooded areas.

FOUNDATION WORKS

Soil Investigation

The Contractor shall make tests of subsoil conditions at every tower site by means of an approved simple hand-operated borer [sampling] and sounding tool, and indicate results on the approved soil test sheets together with ground water levels and proposed foundation type to be applied at the tower position.

The Contractor shall obtain the Engineer's approval for the foundation type in advance of the foundation works at each tower site. Particular note is to be made where any poor ground is encountered likely to require special foundations. The test results shall show firm evidences to prove reasons why the proposed type of foundation is selected from the specified foundation types. The cost of the sub-soil tests is deemed included in the rate for foundation work.

The Engineer may request the Contractor additional sub-soil tests at the bottom of excavated foundation holes, if the Engineer judges its necessity for further confirmation on the proposed foundation types. The sub-soil tests shall be done at the earliest stage of the field works to cater for the urgency of having tower stubs and templates on site and in order that foundation works can proceed with a minimum of delay. BS5930, British soil investigation code will apply as a technical guide for reference.

Excavation and Backfilling

Where angle towers are fitted with unequal length cross arms at each side of the tower, the tower centre shall be offset to ensure that conductors are located as near as possible equidistant either side of the route centreline in adjacent spans.

The Contractor shall ensure that excavations are made to the correct depth and width. If excavations are taken deeper that the designed dimension the excess depth shall be backfilled with concrete at the Contractor's expense. If excavations are made wider than the designed dimension, such modifications to the design as the Engineer may require shall be made at the Contractor's expense.

For uplift foundations, undercutting or other approved method shall be applied as far as possible for allowing upward bearing of the foundation pad against undisturbed soil for a minimum width of 250mm all around. Alternatively the concrete pad shall be cast to the edge of the excavation for a minimum height of 250 mm in order to gain assistance by adhesion to the original ground. In cases where the concrete block is cast in undercutting, the earth frustum assumed to resist uplift shall be considered to start from the bottom of the vertical edges of the block. Otherwise, the frustum shall be assumed to start from the upper top of the block edges.

The backfill of all types of foundations shall be thoroughly rammed with mechanical rammers, and the ramming shall be carried out at intervals of not greater than 300 mm to ensure thorough consolidation of the backfill as the Engineer requires.

Foundation Concrete faces shall be painted with three coats of an approved bituminous paint to separate backfill from concrete before backfilling.

In no circumstances shall peat, black Cotton soil or equivalent materials be used as backfill for foundations. Where excavations are made in peat ground, backfilling to the foundations shall be made with a suitable soil or hardcore from an approved source at the Contractor's expense. Backfill shall be finished in such a way that the original ground contours are restored as nearly as possible; any subsidence of backfill shall be made good before the issue of the Taking-Over Certificate.

Stub Setting

Stubs for tower foundations shall only be installed with the use of templates or by use of the lower sections of the tower with the suitable temporary bracings to ensure correct spacing. The stub setting templates shall be of approved type with sufficient rigidity to ensure correct setting of the stubs. The method selected shall be such that all four stubs are supported and interconnected by a rigid steel framework. The main members of the templates must be in the position by the template while the concrete is placed. The templates are not to be removed until at 48 hours after the foundations have been completed and backfilled.

The templates shall be manufactured from mild steel angle or channel or a combination of both, of approved and adequate cross-section, and shall be equipped with central alignment notches or holes, corner braces, riser-braces, and stub angle bolting legs to permit the accurate setting of stubs in respect of the following requirements:

a) Longitudinal centreline
b) Tower lateral centreline
c) Stub elevations [with reference to datum]
d) Stub leveling
e) Inclinations of stubs
f) Stub hip bevels
g) Spacing between stubs

No concrete shall be started before the stubs are confirmed to be in the design positions.

Concrete Works

[a] Concrete for concrete foundation and pile shall have the minimum required breaking strengths as specified in the technical schedules. BS 5328 will refer when specifying concrete and BS 8110 in reference to structural use of concrete.

[b] Cement used shall be Portland with minimum strength of 42.5 N/mm^2 or other approved composition obtained from an approved maker. Portland cement shall conform in all respects to BS-12.

[c] Aggregates shall be clean and free from dust, earthy or organic matter or salt. Coarse aggregate shall be approved grading to be retained on a mesh not less than 5mm square, and of a maximum size to pass a mesh not more than 30 mm square. Where specially approved in writing by the Engineer, coarse aggregate of uniform size which will pass a 25mm mesh may be used throughout. Fine aggregate shall be river sand and shall be coarse, sharp, clean and fee from dust, salt, clay, vegetable matter or other impurity and shall be screened through a mesh not more than 5mm in the clear. It shall be well graded mixture of coarse and fine grains from 5mm gauge downwards. Aggregates shall conform in all ways to BS812 and KS 95:2003.

[d] Water shall be clean and free from all earth, vegetable or organic matter, salt, soil, oil, acid and alkaline substances either in solution or in suspensions. Quality shall be confirmed by lab test to BS 3148.

[e] At least four weeks before commencing any concreting work, the Contractor shall make trial mixes using proposed samples of cement and fine and coarse aggregates.

The test specimens for the trial mixes shall be of cube type. Preliminary test specimens shall be taken from the proposed mixes as follows:

For each proposed mix a set of 6 specimens shall be made from each of 3 consecutive batches. Three from each set of six shall be tested at an age of seven [7] days and three [3] at an age of 28 days. The test shall be carried out in an approved laboratory.

Upon approval of trial mixes neither the mix proportions nor the source of supply of materials shall be altered without the prior approval of the Engineer except that the Contactor shall adjust the proportions of the mix as required, to take account of permitted variations in the materials, such approval shall be subject to the execution, to the Engineer's satisfaction, of trial mix procedures set out herein.

[f] Where directed by the Engineer concrete cubes are to be taken and tested to verify the concrete strength during site concreting works. The Contractor shall provide the cube moulds at site for the purpose accordingly. The test specimens shall be 150 mm cubed and the mould shall be of metal with inner faces accurately machined in order that opposite sides of the specimen are plane and parallel. Each mould shall be provided with the metal base having a smooth machined surface. The interior surfaces of the mould and base should be lightly oiled before concrete is placed in the mould.

[g] The cost of concrete testing shall be deemed to be included in the Contractor's general schedule rates or in the Contract Price. Testing Lab shall be approved.

[h] Requirements for testing concrete samples during construction are set out in Clause 11.8.

[i] The concrete shall thoroughly be wetted before backfilling commences. When shutters are to be struck, backfilling of excavation is not to take place immediately, and the concrete shall be kept continuously moist to avoid rapid drying.

[j] In the event that the Contractor proposes to use ready mixed concrete for foundation work, approval must first be obtained from the Engineer, who will inspect the batching plant and cement, sand and gravel used for concrete. No ready mixed concrete shall be used in foundation work if it has been mixed in the lorry during its journey for more than 45 minutes. At the discretion of the Engineer, ready mixed concrete may be used in foundations in excess of 45 minutes journey, if the cement is added to the drum at site and is thoroughly mixed prior to placing, or alternatively if the ready mixing lorry carried its own drum during the lorry's journey and not mixed for more than 45 minutes prior to placing. The Engineer's decision to reject any of the above methods of supplying ready mixed concrete shall be final.

[k] Throughout the line route, the Contractor shall at regular intervals and at the time of survey, obtain samples of subsoil and ground water, which he shall have analyzed to ascertain if any agents be present which may have an adverse effect on concrete made with normal Portland cement. The analyses shall be forwarded to the Engineer without delay together with any recommendations for the use of special cement. The Engineer's decision as to the type of cement to be used will be final. The cost of obtaining soil and ground water samples is deemed to be included in the Contract Price. The cost of any special cement used will be paid at an appropriate rate to be agreed with the Engineer.

[l] Concrete shall be placed immediately after mechanical mixing. All concrete shall be thoroughly compacted by mechanical vibration during the operation of placing, and shall be free from honeycombing and other defects. The upper surface of the concrete for all types of foundations shall be finished smooth and sloped in an approved manner to prevent accumulation of water. A concrete addictive of a type approved by the Engineer may be used.

Piling and Other Special Works

Pilling will be carried out using an approved procedure throughout. The actual length and numbers of piles required at any location will be approved by the Engineer on the basis of the final agreed design data and payment made for departures from the assumed tender design quantities on the basis of the difference of quantities times the Schedule variation rates. Piles shall be tested in accordance with Clause 11.8. Tender Prices shall include for all necessary casings, pumping, and depreciation of piling machines, materials, transportation, testing and others.

Where special ground conditions exist which do not allow for any of the designs in an original or modified form, special types of foundations may be employed which will be paid for on the basis of schedule rates submitted. To this extent the submitted schedule of rates for concrete, steel and excavations shall apply throughout irrespective of special conditions.

ERECTION OF TOWERS

Where tower members arrive on site with slight distortions due to handling in transit, they shall be straightened by the Contractor using approved means and offered to the Engineer for inspection and acceptance or rejection before erection commences.

In general, towers shall be assembled and erected with bolts finger tight only. Final tightening of bolts shall only take place when all members are in place. As far as practical, bolts shall be inserted with the nuts facing outwards or downwards.

Whenever wire slings or ropes are liable to abrade tower members, the members shall be suitably protected by heavy Hessian bags or strips, or by some other approved means.

The Contractor shall make use of temporary struts on panels prior to lifting, if in the opinion of the Engineer, there is likelihood of damage occurring to that panel during lifting. Where derricks are used for lifting panel they shall be securely guyed and shall be supported only at approved locations on the legs.

All towers shall be vertical under the stress set up by the completed overhead line to the satisfaction of the Engineer. The maximum acceptable deviation from vertical shall normally be 1^0.

Proper precautions shall be taken to ensure that no parts of the towers or supports are unduly stressed or damaged in any way during erection. Drifting shall not be allowed.

Suitable ladders shall be used whenever necessary during erection, but such ladders and removal step bolts shall be removed when erection work is in progress.

Before assembly of members, joints shall be free of all earth, or any other substances which might prevent the correct alignment of members. After erection, all materials shall be cleaned of all foreign matter or surplus paint.

Spanners used during erection shall be well shaped and fit closely on the nut to avoid damaging nuts and bolt heads. Approved equipment shall be used for tightening the shear bolts which will be used from ground level up to the lower cross-arm level.

Damage to the galvanised surfaces of bolts, tower steelwork or smashed bolts shall be repaired using zinc rich paint or similar and the cost of such repair is deemed to be included in the appropriate rates.

The Contractor must ensure that tower erection, steel handling and operation of equipment shall be such as to ensure the maximum safety of all personnel associated with the project as well as the public.

Lower parts of towers erected in the submerged area during wet seasons shall be protected from corrosion with an approved bitumastic paint as instructed by the Engineer. The cost for the paint shall be quoted in the Price Schedule.

GROUNDING OF TOWERS

Before placing foundation concrete, basic grounding earthing rods specified in Clause 11.8 shall be installed to each of the foundation cleats. Installation shall ensure that earthing can be isolated from the tower and concrete foundation to allow earthing survey. Measurement of footing resistances of all towers shall be carried out with an approved instrument before stringing of an overhead earth wire. A target value of the resistance is less than **10 ohms**. The Contractor shall report the measured value in an approved form to the Engineer. The Engineer will instruct necessitate of installation of counterpoises to the Contractor who shall then provide the counterpoises as specified in the Clause 11.8 to the instructed towers and measure the resistances for reporting the Engineer. In case the resistance is still high, the Engineer may order the Contractor to install additional counterpoises at no additional cost. Final confirmation of ground resistance shall be carried out before stringing of the overhead ground wire.

ERECTION OF CONDUCTOR AND OVERHEAD EARTHWIRE

a) The fullest possible use shall be made of the maximum conductor lengths in order to reduce the number of joints to the minimum. The number and location of conductor and overhead earthwire tension joints shall be approved. The proposed conductor lengths shall be designed specifically for the final stringing length and appropriate drum schedule submitted for approval before production. Tension joints shall not be less than 15m from the nearest clamp.

b) Unless the Engineer agrees to the contrary, midspan joints shall not be not used-

   (i) at locations which would allow less than 3 clear spans between mid-span joints on a given conductor and wire
   (ii) in spans crossing power lines, telecommunications lines, public roads or buildings, and
   (iii) in single span sections.

c) Conductor repair sleeves shall not be used without the permission of the Engineer, which will be granted only in exceptional circumstances.

d) Conductor and earthwire stringing shall be carried out entirely by tension stringing methods and the Contractor shall submit for approval full details of the precise method of tension stringing and of the stringing equipment which he intends to use. Conductors shall

be kept off the ground at all times when the conductor is in motion. The method of tension stringing required to install all conductors and earthwire shall be continuously controlled.

e) The conductor and earthwire tension during stringing operation shall be kept as low as possible, consistent with keeping the conductor and earthwire clear of the ground whilst in motion. At no time will the tensions be allowed to exceed 75% of the final tension.

f) All stringing equipment shall be properly anchored and shall be positioned in such a way that structures, insulators and fittings will not be overloaded.

g) Conductor and earthwire drums shall be securely anchored during the stringing operation and drum jacks shall be of the self braking type to prevent conductor over run.

h) Conductor and earthwire pulling shall be such as will ensure a continuously steady pull. Every precaution is to be taken to prevent damage to the conductor and earthwire. Clamps and other devices used for handling conductor and earthwire during erection shall allow no slippage or relative movement of strands or layers and shall not pinch or deform the conductor and earthwire. Grooves in sheaves and tensioners shall be lined with neoprene or rubber. Sheaves shall have an electrical conducting path between their suspension points and the conductor supported within them and shall run with minimum friction.

i) Conductor and earthwire shall be effectively earthed in an approved manner during running out and at all places where men are working on them.

j) At least one month before stringing commences, the Contractor shall give due to consideration to all the factors involved and submit to the Engineer for approval a fully detailed stringing schedule stating locations of conductor and earthwire drums, winch operation for stringing and the proposed positions of mid-span joints, together with temporary staying wires of towers and all other relevant information.

k) Conductor and earthwire drums shall be closely examined before conductor pulling commences and all nails and other things which could damage the conductors and earthwires shall be removed. During stringing, the conductor and earthwire drums are to be supervised at all times and the conductor and earthwire shall be inspected for defects while it is being pulled off the drums. Any damage caused to conductors or earthwires shall be reported to the Engineer whose decision to replace or repair will be final.

l) Conductors and earthwires shall be carefully regulated to the correct pre-stress and initial tensions by a measurement of sags. Ambient temperature shall be measured by a thermometer suspended on the tower at the sag measurement position. Making for and application of anchor clamps shall follow regulation to initial tension without delay. Immediately after regulation and clamping has been completed in a section, the sag of conductors and earthwire shall not depart from the correct value by more that $^{+}/_{-}$1.5%. Suspension insulator sets shall be installed so that clamps are within 20mm of their correct position on the conductor.

m) The insulators strings shall be cleaned and inspected before assembly. Any defective insulator be shall be removed from site forthwith. Insulators shall have the security clip,

cotter pins and other locking devices fully in place and shall be erected in a manner avoiding damage to the sheds, fibre-glass rod or locking devices.

n) Where required by the Engineer, the Contractor shall check prior to the issue of the Taking-Over Certificate that the sags of conductors and earthwire in selected spans are within the specified tolerance, and shall make any adjustment necessary to ensure compliance.

o) Joints, clamps, etc. shall be applied using the approved tools and in such a manner that no bird-caging, over-tensioning of individual wires or layers or other deformation or damage to the conductor and earthwire occurs. Cutting of layers of conductors shall be carried out with tools designed to prevent damage to underlying strands.

p) Compression fittings shall be applied only by linemen approved by the Engineer, using approved methods. The outer surfaces of conductors and earthwires and the interiors of compression sleeves shall be scratched-brushed immediately before assembly.

q) After conductors have been made off and landed, stringing sheaves shall be removed and suspension clamps and vibration dampers shall be fitted with minimum delay. Suspension clamps shall be fitted with due regard to offsets where appropriate, and the conductor and earthwire shall be cleaned before the clamp is assembled.

r) The Contractor shall keep a record of all sagging showing details of the section, the sagging and checking spans, ambient temperature, pre-stress, initial and final sags, the date of sagging and clipping-in offset, etc. This record shall form part of the final records for the line and shall be handed over to the Engineer prior to the issue of taking-Over Certificate. The records shall be available for inspection at any time.

TESTS AT SITE

[1] General

Following investigations and tests shall be carried out by the Contractor, when ordered by the Engineer.

Those investigations and tests as mentioned in the Price schedule will be paid for at the rates entered. Other investigations and tests not scheduled in the Price Schedule shall be deemed to be included in the prices of the relative items of the works.

[2] Ground Prove Tests

Tests by means of an approved type of penetrometer or other approved means shall be carried out during the check survey as provided for in Clause 11.4. Results of these tests shall be submitted to the Engineer on an approved form giving a preliminary indication of the ground bearing properties and water levels, etc. Bore penetration shall be at least 9m below ground level in poor ground.

[3] Laboratory Soil Tests

Where ordered by the Engineer, the Contractor shall obtain soil samples and submit these for tests to an approved laboratory to determine the necessary properties of the soils for the

purpose of foundation designs. Such information shall be detailed in an approved manner and conclusions given as to the recommended bearing pressures to be adopted. Tests shall be carried out generally in the manner described in BS-1377.

[4] Ground Bearing Test

Where ordered by the Engineer, the Contractor shall carry out ground bearing tests to determine the ground bearing capacity, by means of loading a 300 mm square plate in an approved manner. Tests shall be carried out generally in the manner described in BS-5930.

[5] Pile Bearing and Uplift Tests

Where ordered by the Engineer, the contract shall carry out pile bearing and uplift tests for all types of pile generally in accordance with the method given in the BS CP-2004. Such tests shall be carried out to determine the ultimate uplift and bearing values.

[6] Foundation Loading Tests

Where ordered by the Engineer, foundation loading tests shall be carried out in full scaled individual footings.

(7) Records of Site Investigation Tests

All records of site investigation tests shall be detailed in an approved manner. Sample log sheets, charts, etc. shall be submitted to the Engineer for approval before any investigation commences. All site investigation data, charts, etc. shall be handed over to the Engineer in triplicate upon satisfactory conclusion of the tests, and before the issue of Taking-Over Certificate.

Where the Contractor carried out other tests at his own expense, not ordered by the Engineer, and to the contrary, where the Employer had independent tests made along the route of the line, such information shall be made available to the Employer or Contractor as appropriate.

[8] Concrete Tests

The Contractor shall carry out tests on sample of concrete from the foundation works, as required by the Engineer as specified in Clause 11.4. The test specimens shall be stored at the site at a place free from vibration under damp sacks for 24 hours. They shall be then removed from the moulds, marked and stored in water at a temperature between 10^0 C and 21^0 C until the testing date. Specimens which are to be sent to a laboratory for testing shall be packed for transit in a damp sand, or other suitable damp materials, and shall be brought in the laboratory at least 24 hours before test. On arrival at the laboratory, they shall be similarly stored in water until the time of the test.
The results shall be handed in triplicate to the Engineer, as soon as possible after testing, and not later than seven days.

[9] Support Footing Resistance

The resistance to earth of the complete foundation of individual structures shall be measured in an approved manner before the stringing operation of overhead earthwire, as specific in Clause 11.6. The placing of tests electrodes shall normally be along the centre line of the

route in such direction as to ensure that the lowest resistance to earth is recorded, and a note shall be made of the direction in the time of the test.

[10] Additional Footing Resistance Test

If in the opinion of the Engineer, it is necessary to reduce the tower footing resistance by means of counterpoises, the Contractor shall make further measurement after the additional counterpoises have been carried out before the stringing operation of the overhead earthwire. Any further measurement shall be carried out as necessary without extra charge.

[11] Measurement of Galvanising Thickness

The Contractor shall have on site an instrument suitable for accurate checking of galvanizing thickness for the Engineer's use. The gauge shall be available from time of arrival of the first consignment of steel work until the issue of Taking-Over Certificate. The cost of the gauge and other operating expenses shall be deemed to be included in the contract price and the gauge shall remain the property of the Employer.

[12] Testing of Rock Anchors

Where rock anchor foundations are used in hard rock, as provided for by the Engineer's order, the Contractor shall test individual anchors by tensile test loading to failure for obtaining design data of the foundations. The test shall be considered satisfactory if the steel bar fails by yielding of the bar at or above its ultimate strength.

Anchor for the testing shall be installed away from permanent foundation anchors but in the same rock. The frequency of the test shall depend upon the different types of hard rock encountered and the number of tests performed shall be such as to give confidence in the employment of rock anchor foundations and experience of the type of rock suitable for their use. The frequency of test shall, in the case of dispute, be reasonably determined by the Engineer. Tests shall be carried out generally in the manner described in BS-8081 on ground anchorages. The cost of rock test shall be included in the relevant schedule rates.

[13] Test on Completion

The line shall be energized at full working voltage before handing over, and the arrangement for this and such other test as the Employer/ Engineer shall desire to make on the completed line shall be assisted by the Contractor who shall provide such labour, transport and other assistance as required without extra charge.

SECTION 12

METHOD OF MEASUREMENT & PAYMENT

Price Schedules

General

1. The Price Schedules are divided into separate Schedules as follows:

   AS PER PRICE SCHEDULE

2. The Schedules do not generally give a full description of the plant to be supplied and the services to be performed under each item. Bidders shall be deemed to have read the Employer's Requirements and other sections of the Bidding Document and reviewed the Drawings to ascertain the full scope of the requirements included in each item prior to filling in the rates and prices. The entered rates and prices shall be deemed to cover the full scope as aforesaid, including overheads and profit.

3. If bidders are unclear or uncertain as to the scope of any item, they shall seek clarification in accordance with ITB 7 prior to submitting their bid.

Pricing

4. Prices shall be filled in indelible ink, and any alterations necessary due to errors, etc., shall be initialed by the Bidder.

   As specified in the Bid Data Sheet and Special Conditions of Contract, prices shall be fixed and firm for the duration of the Contract, or prices shall be subject to adjustment in accordance with the corresponding Appendix (Price Adjustment) to the Contract Agreement.

5. Bid prices shall be quoted in the manner indicated and in the currencies specified in the Instructions to Bidders in the Bidding Document.

   For each item, bidders shall complete each appropriate column in the respective Schedules, giving the price breakdown as indicated in the Schedules.

   Prices given in the Schedules against each item shall be for the scope covered by that item as detailed in Section 6 (Employer's Requirements) or elsewhere in the Bidding Document.

6. Payments will be made to the Contractor in the currency or currencies indicated under each respective item.

7. When requested by the Employer for the purposes of making payments or partial payments, valuing variations or evaluating claims, or for such other purposes as the Employer may reasonably require, the Contractor shall provide the Employer with a breakdown of any composite or lump sum items included in the Schedules.

The Contractor when requested shall attend for purpose of measurement, or otherwise accept measurements made by the Employer alone.

Where applicable the Contractor shall indicate on each invoice the identification number of each support to which items in the invoice refer.

Where applicable, unit prices in the Schedule shall be deemed to include for all works on site irrespective of access conditions, including if necessary helicopter transportation, slope of ground, nature of subsoil, presence of water or other obstacles adjacent to or across the line of the route.

All unit prices in Volume 1, Schedule 4 shall include all incidental expenses which the Contractor or specialist Subcontractor may incur in the preparation of maintenance of access, in the provision of site services and of all transportation for labour whether skilled or unskilled.

The unit prices in the Schedules shall include all allowances or other supplementary payment to skilled or unskilled labour, customary, authorized or required by regulations in force at the date of the Tender.

All unit prices shall be deemed to include payment to labour, or other expenses incurred for idle time during which work on site is interrupted by weather conditions or flooding by storm overflow or the like.

While every assistance will be provided to facilitate line construction activities in sequence in accordance with the Contactor's agreed programme of work, there could be occasions when this may not be possible. No claims for additional costs to the Contractor will be accepted solely for such discontinuity of working.

Surplus Material

Surplus material paid for by the Employer shall remain property of the Employer and shall be stored at the project terminal substation. Waste material will not be taken over or paid for by the Employer.

Nominated Subcontractor/Supplier

Where the contract provides for the work to be executed by a Nominated Subcontractor, or goods to be supplied by a Nominated Supplier, the Contactor shall ensure that the Nominated Subcontractor's works are programmed and executed or nominated goods supplied to comply with the requirements of the Contractor's agreed programme. The Contractor shall ensure that enquiries for Nominated Subcontracts and Supplies are returned to the Employer. The Contractor shall obtain all necessary drawings and accounts, as may be directed by the Employer.

Specialist Subcontractors

Specialist Subcontractors' names shall be submitted to the Employer for approval before they are appointed.

Quantities

The quantities set out in the schedules are, unless otherwise defined, estimated quantities of the works. They are not to be assumed as the actual and correct quantities to be executed by the Contractor in fulfillment of his obligations under the Contract. The Contactor is presumed

to have satisfied himself as to the relevance of the estimated quantities in the preparation of his Tender.

Drawings, Reference Standards and Records

The provision of all drawings, design calculations, records and the supply of the relevant reference Standards etc. as stated or specified in the Contract shall be included in the Contract Price.

SURVEY

The cost of full precision or check ground survey undertaken by the Contractor on the Employer's instruction shall be entered in appropriate Schedules in Volume I of the tender document, and distances shall be measured to the nearest meter along the centre-line of the route. The unit price shall include for the establishment or re-establishment of the line route from terminal points and other such fixed points the Employer may define, full ground survey, profiling, support plotting, preparation of Simms document tree marking and tree schedule and pegging of support locations.

ROUTE CLEARANCE & ACCESS

Route clearance undertaken by the Contractor on the Employer's instruction shall be entered in the appropriate schedules in Volume I, and distances covered shall be measured to the nearest metre along the centre line of the route.

FOUNDATIONS

General

The cost of foundations shall be entered in Schedule 4 of Volume I. this shall refer to the supply and installation of foundations in accordance with the Specifications and good engineering.

Where additional work is required over and above that provided for in the Specifications, this will be paid on a measured basis at unit prices submitted.

The unit prices for foundations shall include all necessary geotechnical investigation and geotechnical studies as defined in the Specification, or as required by relevant authorities.

The unit prices for all foundations shall include for site clearing, excavating in any material by any means, manual or mechanical, and for ensuring stability and natural drainage inside the working area, steel formwork, reinforcement, concrete, bitumastic painting for all backfilled depth, compacting and disposal of surplus material, routine testing, site restoration and for all necessary supports to sides of excavations.

Removal of 'man-made' materials such as industrial waste, etc., which the Employer agrees is hazardous and which cannot be removed by normal means and not generated by the contractor shall be paid for at unit prices to be agreed.

The complete cost of foundations for a support shall be entered at the appropriate Schedule 4unit prices. The unit price shall include for all excavations, conventional pumping (including well-point dewatering), excavation supports, concrete work, formwork, reinforcing, stub

steelwork, stub cutting, routine testing, bitumastic painting, backfilling, clearing up and all other work required to complete the foundation in accordance with the Specification.

The unit prices shall also include supply of blinding concrete or the importation of any backfill material necessary due to the excavated material being unsuitable as backfill.

The unit prices for foundations shall include the use of whichever type of cement is to be used and density of concrete necessary to meet the requirements of the specification.

The unit prices for foundations shall include all stub steelwork installation and setting out including the use of templates, setting to any level and any excavation necessary for setting out. The protective treatment to defined concrete faces or support steelwork and provision of site protection barriers shall be included in the rates for the foundations.

The unit prices for foundations shall include the cost for all earthing requirements labour.

Where site stabilizations outside the defined 'working area' is required, this shall be undertaken at unit prices to be agreed.

The cost of design tests on foundations to prove the foundation design shall be entered in the appropriate section of Schedule 4. The unit prices shall include for the removal of concrete and steel down to 1m below ground level where this deemed necessary by the Employer.

Pile Foundations.

The cost of complete foundations for each support shall be entered at the appropriate Schedule 4 unit prices. The unit prices shall include for mobilization and de-mobilisation of piling rigs, setting out, cleaning, cutting to length, reinforcement and pile cap connection, jointing or piles as necessary, irrespective of number of piles, all excavations (including rock), conventional pumping (including well-point dewatering), exaction supports (including use of bentonite slurries), concrete work for piles, pile cap and tie beams, formwork, reinforcing, stub steelwork, stub cutting, routine testing, backfilling, clearing up and all other work required to complete the foundation in accordance with the Specification.

The unit prices for piled foundations shall be based on:

1. The unit price for a complete tower foundation including pile cap and tie beams.
2. A unit price for piles for the complete tower based on the nominal length defined in Schedule 4.
3. An additional unit price per foundation for the "average" length of pile greater than or less than the defined length below existing ground level. This unit price shall be applied once per complete support foundation irrespective of the number of piles in the foundation and shall be applied per metre length of increased or decreased "average" pile.

Flood Protection Walls

Where the Contractor considers that a gabion wall is necessary to protect a support, the cost shall be entered in the appropriate Schedule 4 unit prices.

SUPPORTS (STEEL TOWERS)

The cost of steel towers, normal extensions shall be entered in Volume I, Schedule 1 unit prices. The unit prices shall include for standard cross-arms, and shall include stub steelwork and setting template.

The unit prices for steel towers shall include for access facilities, anti-climbing devices, attachment plates, ancillary steelwork etc. used as standard on the support. The unit prices shall include for all support mounted notice plates.

The cost of type tests on individual supports to prove the support design shall be entered at the unit prices quoted in the Schedule 4 for successful tests only. All other quality control requirements shall be included within the appropriate unit price.

The cost of tower paint including all necessary preparation, sample and routine tests shall be entered at Schedule 1 unit prices.

INSULATOR SETS AND ASSOCIATED FITTINGS

The cost of all insulator sets shall be entered in Volume 1,Schedule 1. The unit prices for insulator sets shall include for all insulator units, links, sag adjusters, turnbuckles, weights, insulator protective devices (arc horns), tension joints (dead ends) and suspension clamps (inclusive of helical armour rods), used as a standard between the support and the phase conductor.

Unit prices for earthwire tension and suspension sets shall where specified include for all earthwire bonding to the supports including all earthwire bonding clamps in accordance with the Specification.

The cost of all conductor tee-connectors and line termination fittings shall be entered in Schedule1.

CONDUCTORS AND FITTINGS

The cost of phase conductors and earthwires (OPGW), and associated fittings shall be entered in Volume I Schedule 1, and distances shall be measured to the nearest metre after erection, along the centre of the route without allowance for sag, jumpers or scrap.

The unit price shall include for all normal phase and earthwire jumpers including the jumpers from the terminal towers to the substation gantries

The unit prices shall include for conductors, jumpers and associated fittings but excluding insulator sets and earthwire tension sets.

The cost of fibre optic earthwire connections to the joint boxes, fixing clamps, joint boxes and fusion splicing of optical fibres shall be included in the erection and stringing unit price.

MISCELLANEOUS

The cost of tools and spares to be supplied under the contract shall be entered in Volume 1, Schedule 1 (Mandatory Spares) and schedule 6 (Recommended).

SITE VISIT

In practicing due diligence, the contractor is specifically advised to inspect the site & terrain and be well acquainted with the actual working and other prevalent conditions, facilities available, position of material and labor. The bidder is advised to visit and examine the site where the plant is to be installed and its surroundings and obtain for himself on his own responsibility all the information that may be necessary for preparing the bid. The bidders shall ask for necessary clarifications required for clearly understanding the scope & technical /commercial requirements of the tender from KPLC before submitting their offer.

MOBILE PHONES

Mobile telephones are to be provided for use by the Employer's Project Engineer and Employer's Site Supervisors with usage charges relevant to the project paid for by the contractor. The Mobile telephone service provider and the mobile service usage limits are to be agreed on between the service contractor and the employer.

SCHEDULES

PREAMBLE

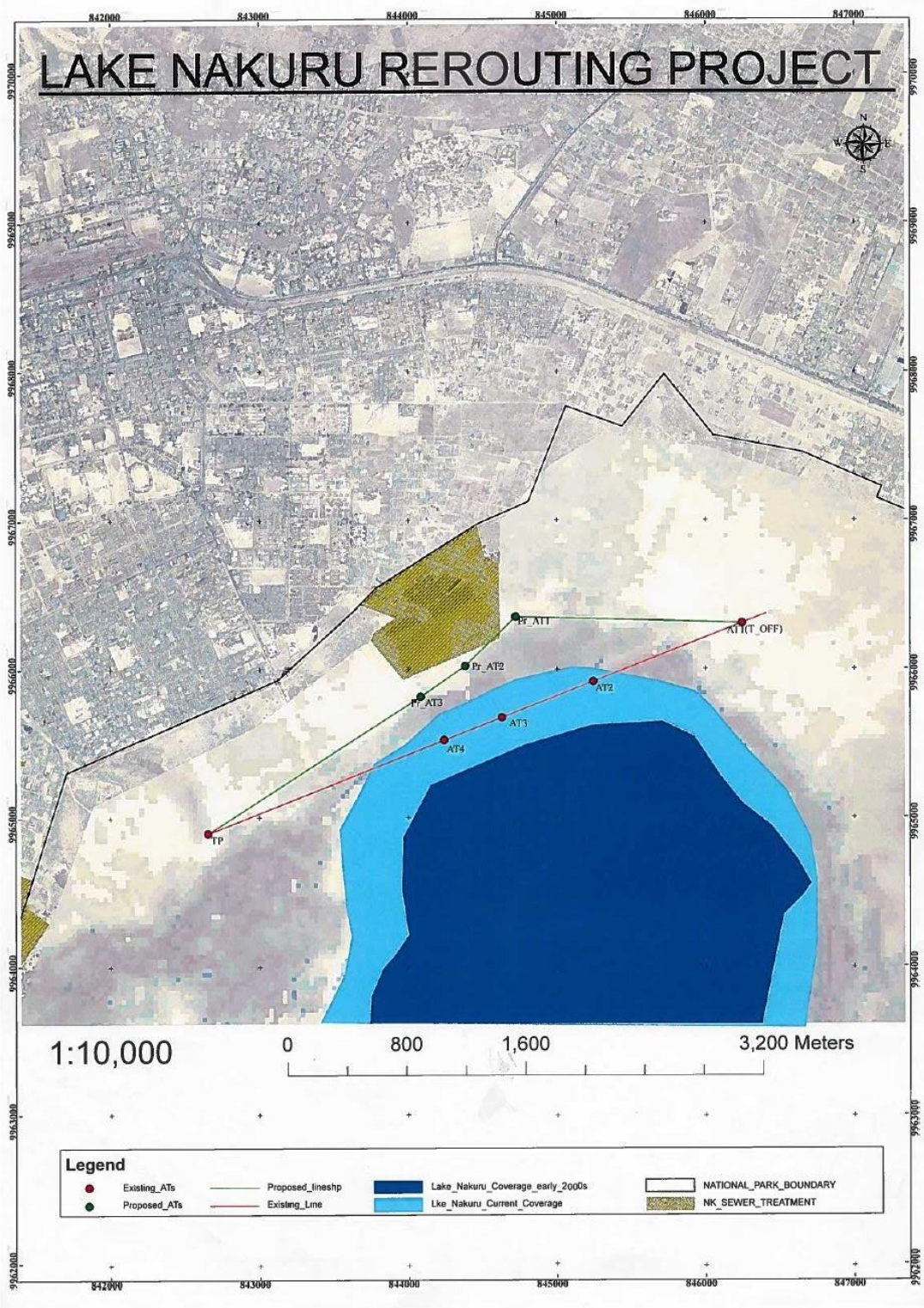
1 The Technical Schedules and appropriate appendixes shall be filled in and completed by the Bidder, and submitted with the Bid.

2 All documentation necessary to evaluate whether the equipment offered is in accordance with this Specification shall be submitted with the Bid.

3 All data entered in the Schedules of Technical Guarantees are guaranteed values by the Bidder and cannot be departed from whatsoever.

13.1 SCHEDULE A: LOCATION ORIENTATION

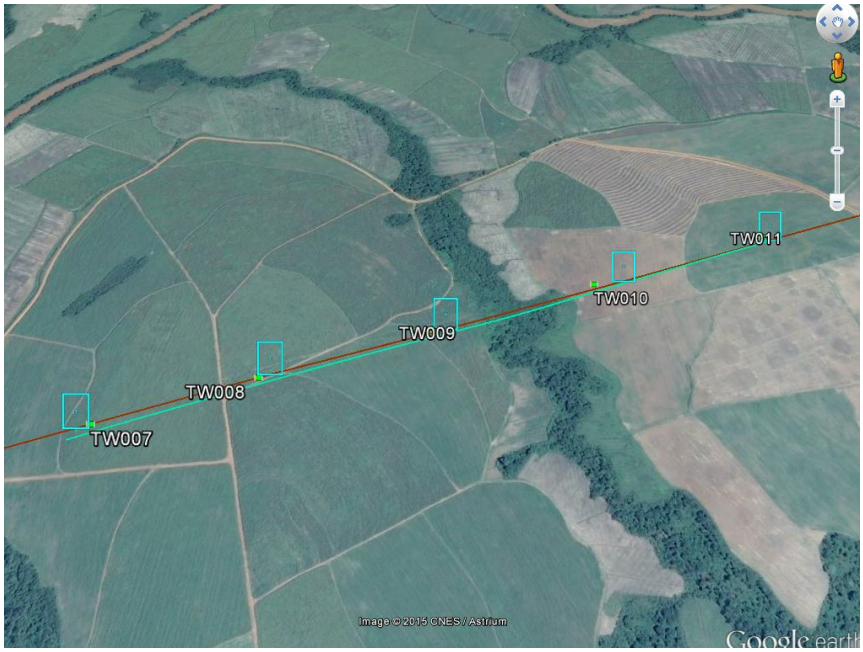
13.1.1 Scope 1;



UEB 132kV Transmission Line T780-T790

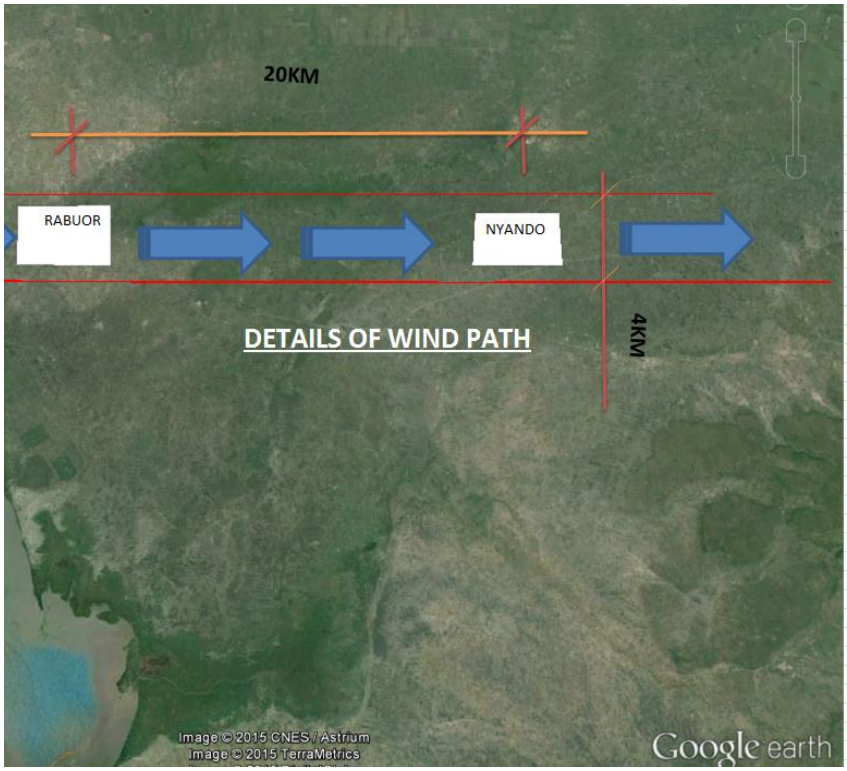
13.1.2 Scope 2

Muhoroni-Kisumu Transmission Line at Nyando **T 244 to T 248**

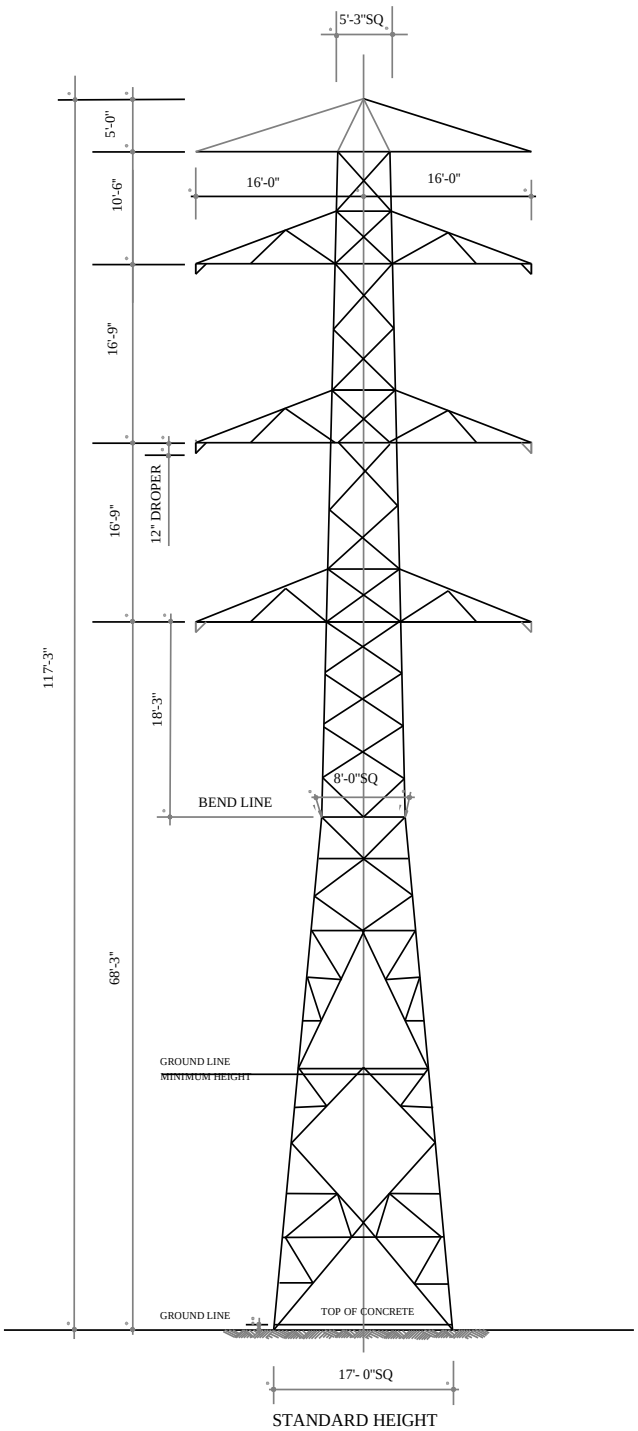


Mumias - Musaga Transmission Line at Mumias **T8 – T13**

Sondu-Kisumu Transmission Line at Rabuor **T116 – T118**



Appendix 1 A-1



STANDARD HEIGHT

G/A OF 132KV STEEL TOWER
SUSPENSION TOWER

	DATE	SIGN
APPROVED		
CHECKED ENGINEER I/C		
CHECKED HEAD D'MAN		
DRAWN	*13/Sep./06*	*I.M.Kahare*
TRACED		

REF	REVISION	DATE	SIGN

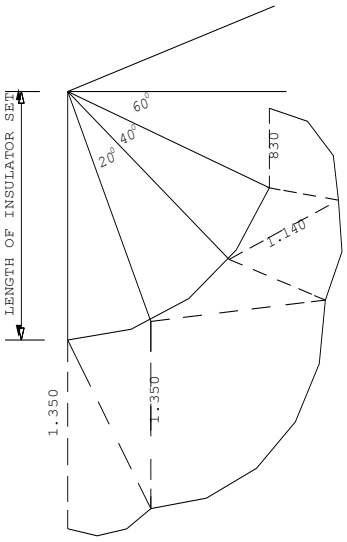
TITLE

GENERAL ARRANGEMENT OF TOWER

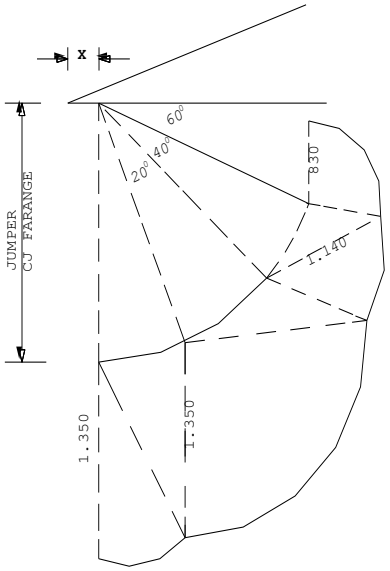
APPENDIX 1.A.1

Appendix 1 A-2

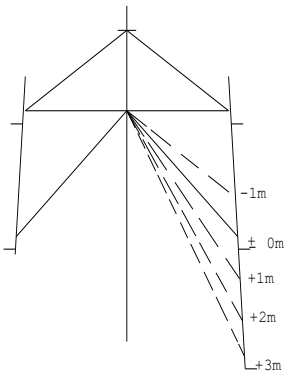
CLEARANCE DIAGRAMS



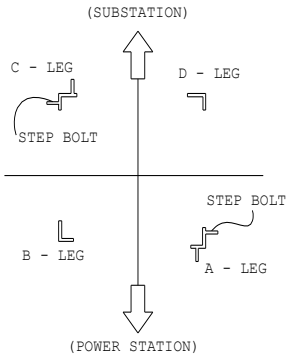
SUSPENSION TOWER



TENSION TOWER



LOWEST PANEL OF TOWER
AND HILL SIDE EXTENSION



LEG AND STEP BOLTS

	DATE	SIGN
APPROVED		
CHECKED ENGINEER I/C		
CHECKED HEAD D'MAN		
DRAWN	*13/Sep./06*	*J.M.Kahare*
TRACED		

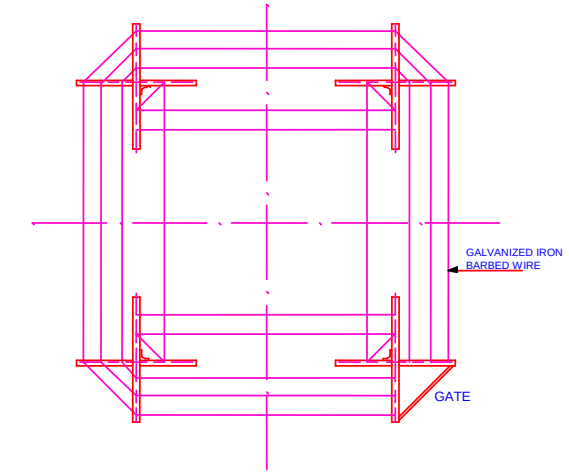
REF	REVISION	DATE	SIGN

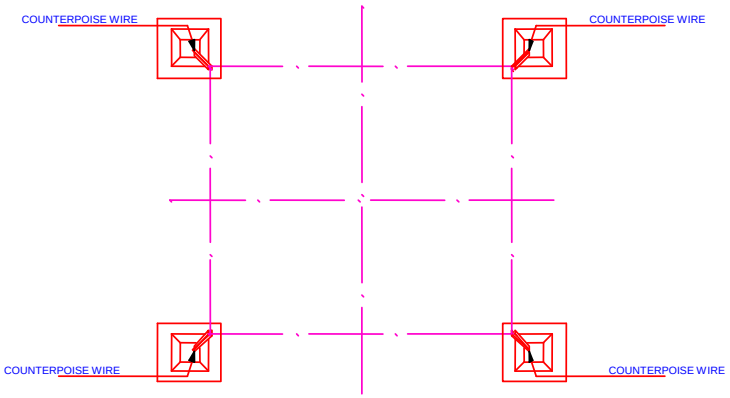
TITLE

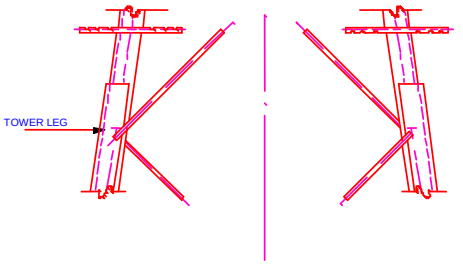
CLEARANCE OF TOWER

APPENDIX 1.A.2

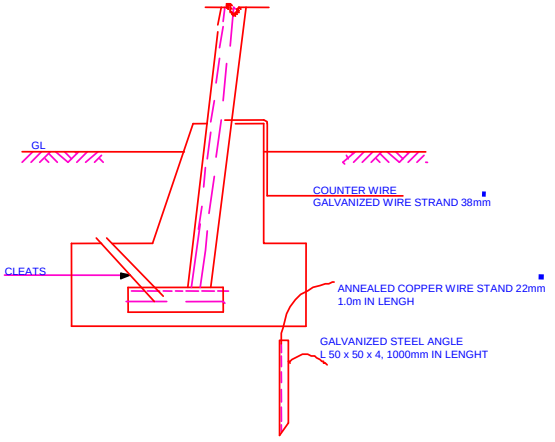
Appendix 1 A-3







ANTI - CLIMBING DEVICE



CLEAT AND GROUNDING ANGLE

	DATE	SIGN
APPROVED		
CHECKED ENGINEER I/C		
CHECKED HEAD D'MAN		
DRAWN	19/Sep./06	J.M.Kahare
TRACED		

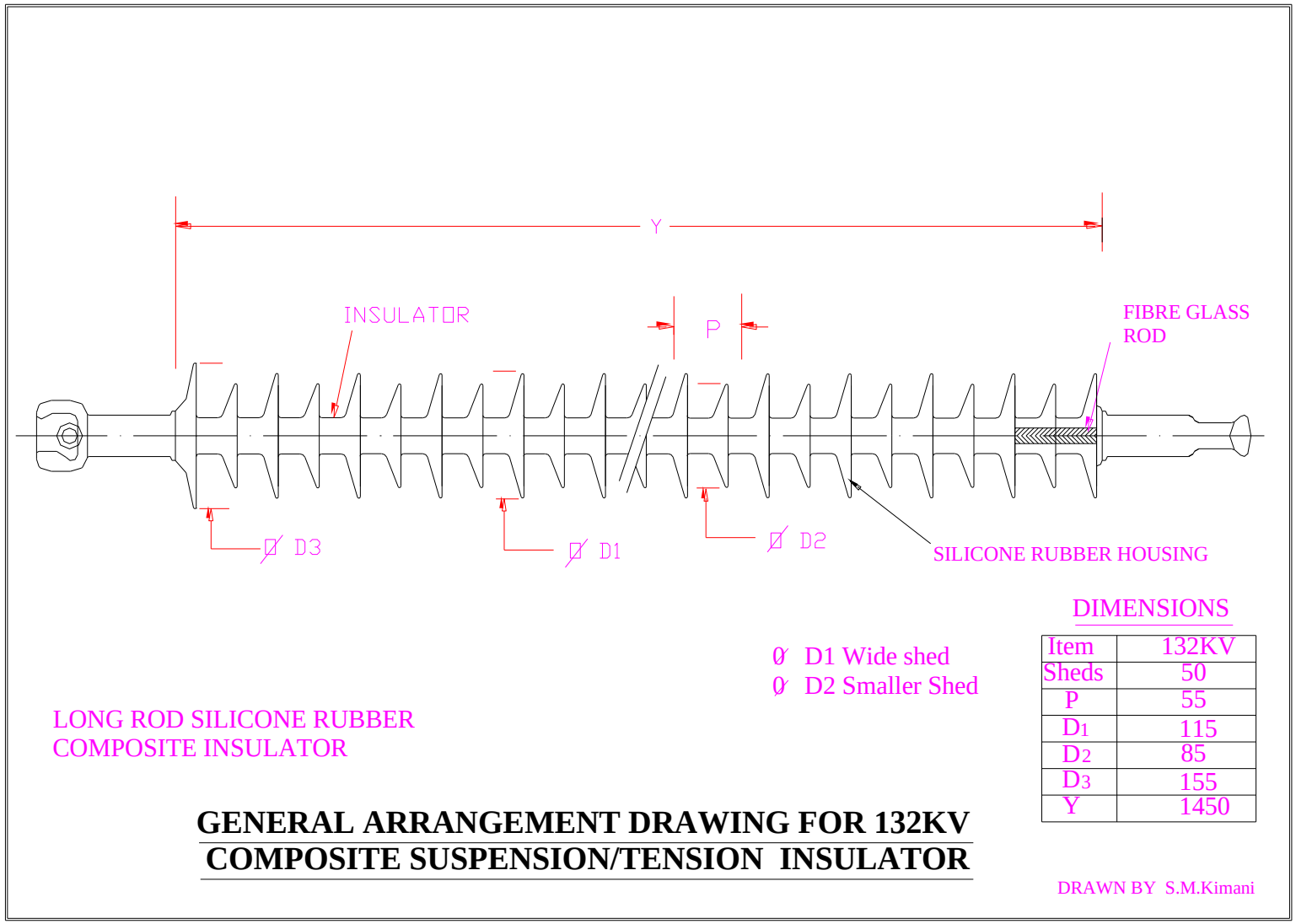
REF	REVISION	DATE	SIGN

TITLE

ANTI - CLIMBING DEVICE AND GROUNDING SYSTEM

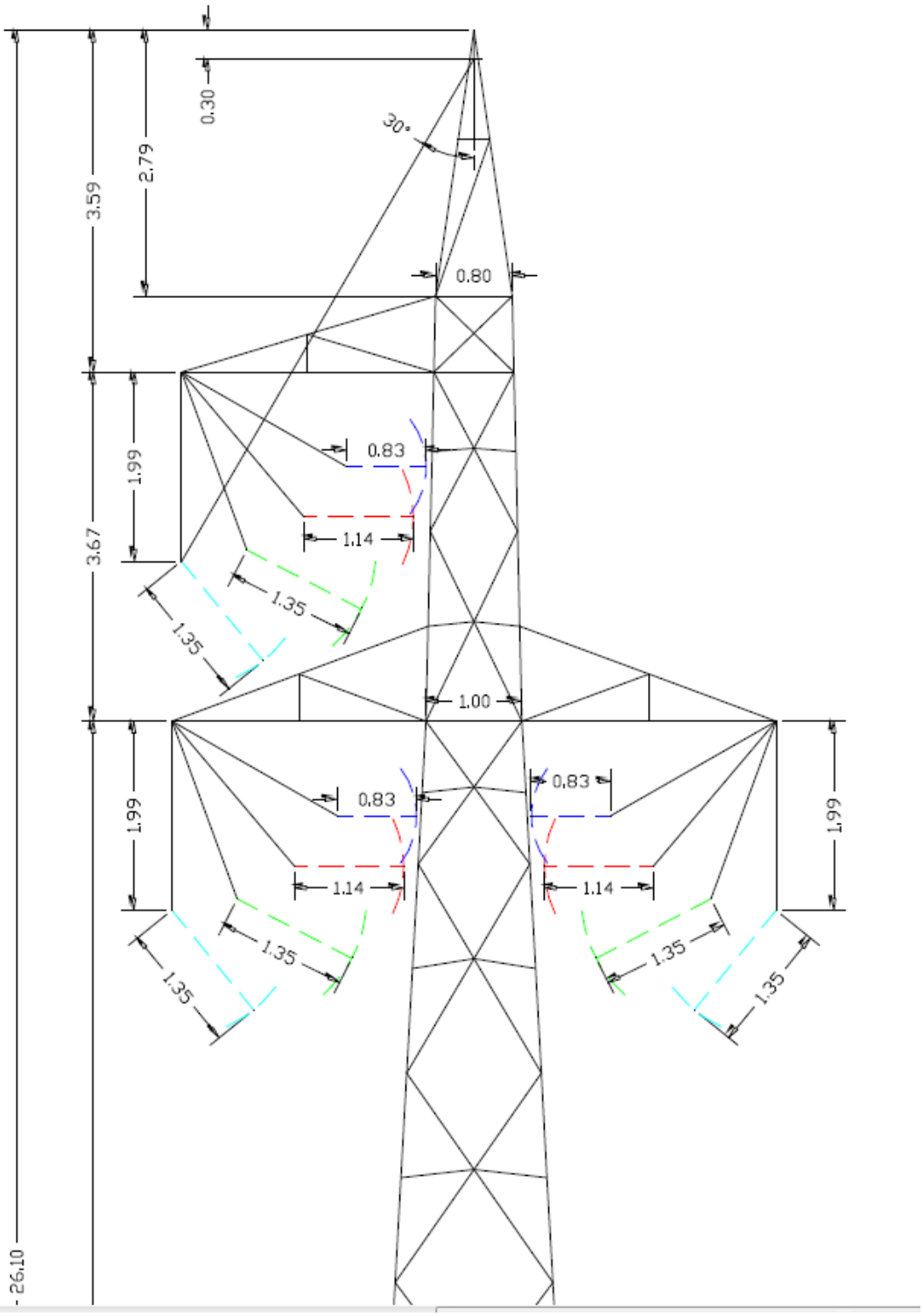
APPENDIX 1.A.3

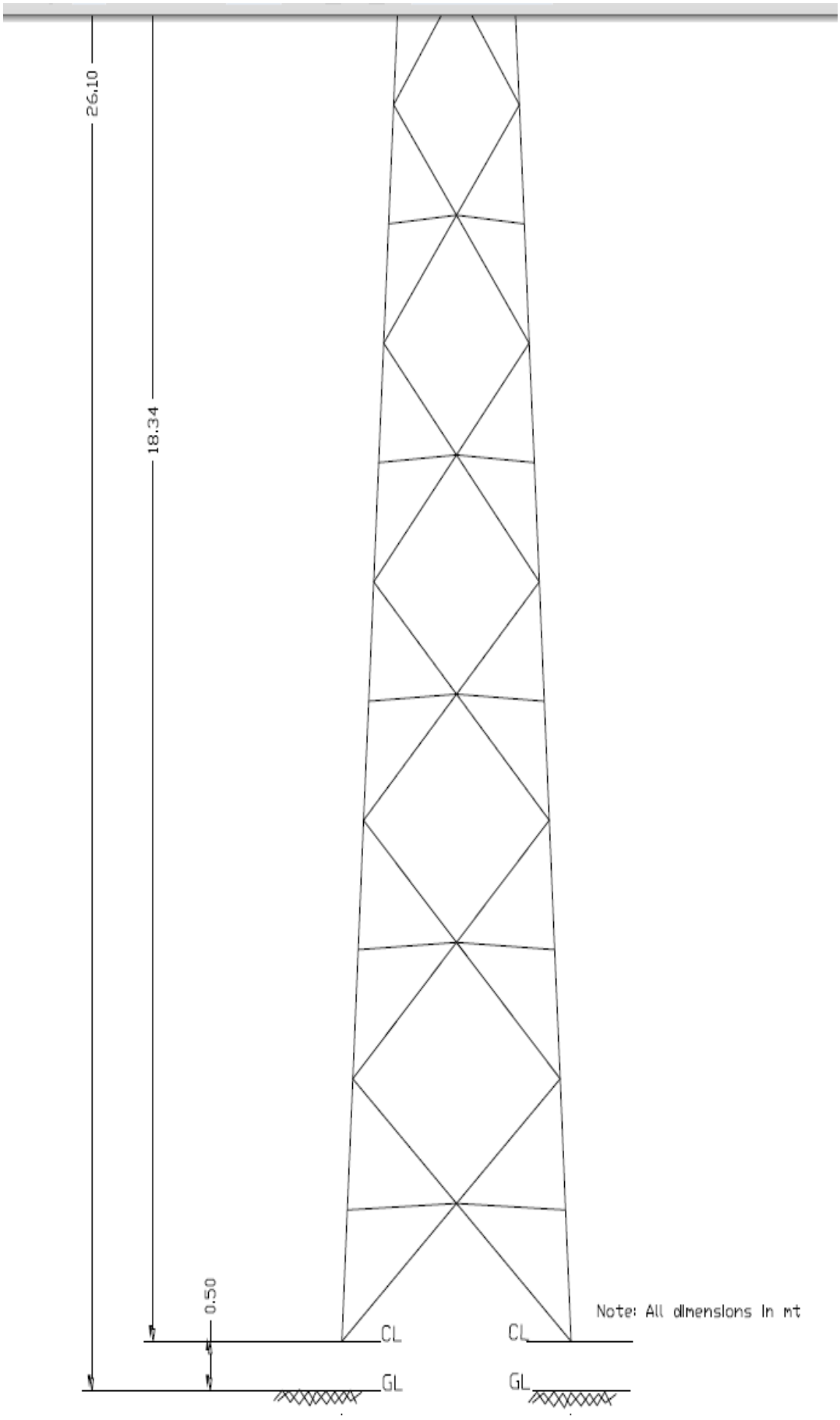
Appendix 1.A.4



DIMENSIONS

Item	132KV
Sheds	50
P	55
D_1	115
D_2	85
D_3	155
Y	1450


0.30
30°
2.79
3.59
0.80
0.83
1.99
1.14
3.67
1.35
1.35
1.00
0.83
0.83
1.99
1.99
1.14
1.14
1.35
1.35
1.35
1.35
26.10


26.10
18.34
0.50
CL
CL
GL
GL
Note: All dimensions in mt

13.2 SCHEDULE B - PLACES OF MANUFACTURE

MANUFACTUERS AND PLACES OF MANUFACTURE, TESTING, INSPECTIONS (MUST FILL THIS INFORMATION)

Item	Details	Manufacturer	Place of Manufacture	Place of Testing & Inspection
1	Design of Towers			
2	Steel Sections			
3	Fabrication			
4	Nuts & Bolts			
5	Galvanizing			
6	Tower Tests			
7	Composite Insulators			
8	Compression Joints & clamps			
9	Insulator fittings			
10	Aluminium wires			
11	Steel core wires			
12	Phase conductor stranding			
13	Optical Ground Wire			
14	Vibration dampers			
15	Jointing Compressors			

Note: The words “or Similar” or “equivalent” etc. will not be accepted

In the event of award of contract no manufacturers or sub-contractors other than those named above will be accepted by the Employer for the appropriate service or equipment.

13.3 SCHEDULE C; TECHNICAL PARTICULARS AND GUARANTEES FOR TRANSMISSION LINE

C1 - PHASE CONDUCTOR

Item	Description	Units	Proposed
a	**STRANDED CONDUCTORS**		
	Type of Conductor-	-	
	Code Name- LYNX	-	
	Aluminum wire	Nos./mm	
	Steel wire	Nos./mm	
	Overall diameter	mm	
	Cross-section of Aluminium area	mm^2	
	Cross-section of Steel area	mm^2	
	Weight per km	kg	
	Calculated Breaking load	ken	
	Maximum resistance at 20 deg. C per km	ohm	
	Modulus of Elasticity	kg/ mm^2	
	Conductor lay	-	
	Minimum weight of grease	Kg/km	
	Length of conductor per drum	m	
	Approximate net weight per drum	kg	
	Approximate gross weight per drum	kg	
	Dimension of drum (diameter x thickness)	mm x mm	
b	**INDIVIDUAL WIRES BEFORE STRANDING**		
	Tolerance of diameter of Aluminum wire	%	
	Tolerance of diameter of Steel wire	%	
	Minimum tensile strength of Aluminum wire	kg/ mm^2	
	Minimum tensile strength of Steel wire	kg/ mm^2	
	Conductivity	%	
	Minimum twisting number of steel wire: -100 x diameter (length)	Nos.	
	Galvanizing: - Min. coating weight of Zinc	Grams/m^2	

TECHNICAL PARTICULARS AND GUARANTEES FOR TRANSMISSION LINE

C2 - CONDUCTOR ACCESSORIES

Item	Description		Units	Proposed
2	**CONDUCTOR ACESSORIES**			
	a	**Tension Joint**		
		Type- Compression	-	
		Materials- Aluminum & steel	-	
		Length	mm	
		Ultimate breaking Load	kg	
	b	**Vibration Dampers**		
		Type- Stockbridge	-	
		Weight	kg	
		Galvanizing : - Min. quantity coating	g/ m^2	
		Galvanizing : - Min. number of uniformity 1 minute coating	times	
	c	**Preformed Armored Rod**		
		Number of individual wires	Nos.	
		Diameter of individual wires	mm	
		Length wires	mm	

C3 - CONDUCTOR FITTINGS

Description		Units	Proposed	
FITTINGS			**Suspension**	**Tension**
a	**Clamp for Conductor**			
	Type		Trunnion	Compression
	Material of clamp			
	Length of clamp	mm		
	Ultimate breaking Load	kg		
	Approx. slipping Load	kg		
b	**Clamp for Earth wire**		Trunnion	Bolted or Compression
	Type			
	Material of clamp	mm		
	Length of clamp	kg		
	Ultimate breaking Load	kg		
	Approx. slipping Load	kg		

C4 - INSULATOR UNITS & ACCESSORIES

	Description	Units	Proposed	
			Suspension	Tension
1	Maximum System Voltage	kV		
2	Pollution Category	class		
3	Dielectric			
4	One-minute power frequency withstand voltage, 50 Hz, wet.	kV		
5	Lighting impulse withstand voltage, 1,2/50 pos.	kV		
6	Power arc current	kA, 0.5sec		
7	Minimum creepage distance	mm		
8	Specified mechanical load,	KN		
9	Minimum Arc Gap	mm		
10	Material fittings			
11	Material of rod			
12	Material of housing and sheds			
13	Socket	IEC standard		
14	Ball	IEC Standard		
15	Arcing Rings material			
16	Arcing rings	IEC Standard		

C5 - OPGW

Type: _____

Item	Particulars	Unit	Employer's requirement	Tender value
1	***OPGW***			
2	Number of fibres		≥ 48	
3	Core diameter	µm	8.3 or 9 with a 3% tolerance	
4	Cladding design, either matched or depressed			
5	Clad diameter	µm	125.0 ± 2	
6	Core-clad concentricity		< 2%	
7	Coating diameter	µm	250.0 ± 15	
8	Coating concentricity	≥	0.70	
9	Attenuation: 1310 nm 1550 nm	dB/km	≤ 0.40 ≤ 0.25	
10	Bending attenuation: 1310 nm 1550 nm	dB/km	≤ 0.40 ≤ 0.25	
11	Temperature dependence	dB/km	≤0.05 (-20°C-+85°C)	
12	Cut-off wavelength	Nm	≤ 1250	
13	Chromatic dispersion:			
	Zero dispersion at	Nm	1310 ± 12 1550 ± 15	
	Zero dispersion slope (max.)	ps/nm^2 (km)	0.092 0.085	
	Zero dispersion slope (max.)	ps/nm^2 (km)	0.092 0.085	
14	Mode field diameter:			
	1300 nm	mm	9.30 ± 0.50	
	1550 nm	mm	10.50 ± 1.00	
15	IL-proof test level	g/m2	35 x 106	
16	Splice attenuation	dB/ splice	0.02	
17	Connector loss	dB/ connector	< 0.5	

	ODF			
Item	**Particulars**	**Unit**	**Employer's requirement**	**Tender value**
	Manufacturer	-		
	Type	-		
	Number of fiber interconnections	-	96	
	Connector loss	dB/connector	< 0.5	
	Screw on type connectors	-	yes	
	designed for 19” cubicles	-	yes	
		-	-	

C6. TOWERS & FOUNDATIONS

Item	Particulars	Unit	Type-S	Type-M
5.1	**DIMENSIONS AND WEIGHT OF TOWER**			
	Overall height of standard tower (+0m)	m		
	Length of top conductor cross-arm	m		
	Length of bottom conductor cross-arm	m		
	Vertical spacing of conductor: Ground wire and top conductor Top conductor and bottom conductors	 m m		
	Width of tower body at: Top of tower Lowest cross-arm Ground level of standard tower (+0m)	 m m m		

Item	Particulars	Unit	Type-S	Type-M
	Weight of towers			
	-3m body extension	kg		
	+0m body extension	kg		
	+3m body extension	kg		
	+6m body extension	kg		
5.2	**LOAD ON FOUNDATION FROM TOWERS**			
5.2.1	Compression Load			
	-3m body extension	kg		
	+0m body extension	kg		
	+3m body extension	kg		
	+6m body extension	kg		
5.2.2	Uplifting Load			
	-3m body extension	kg		
	+0m body extension	kg		
	+3m body extension	kg		
	+6m body extension	kg		

Item	Particulars	Unit	Type-S	Type-M
5.3	**CONCRETE PAD FOUNDATION AND STUB LENGTH**			
5.3.1	Depth of Foundations			
	-3m body extension	mm		
	+0m body extension	mm		
	+3m body extension	mm		
	+6m body extension	mm		
5.3.2	Width of Base Pad			
	-3m body extension	mm		
	+0m body extension	mm		
	+3m body extension	mm		
	+6m body extension	mm		
5.3.3	Thickness of Base Pad			
	-3m body extension	mm		
	+0m body extension	mm		
	+3m body extension	mm		
	+6m body extension	mm		

Item	Particulars	Unit	Type-S	Type-M
5.3.4	Top Width of Chimney			
	-3m body extension	mm		
	+0m body extension	mm		
	+3m body extension	mm		
	+6m body extension	mm		
5.3.5	Bottom Width of Chimney			
	-3m body extension	mm		
	+0m body extension	mm		
	+3m body extension	mm		
	+6m body extension	mm		
5.3.6	Volume of Excavation			
	-3m body extension	cu. m		
	+0m body extension	cu. m		
	+3m body extension	cu. m		
	+6m body extension	cu. m		
5.3.7	Volume of Concrete			
	-3m body extension	cu. m		
	+0m body extension	cu. m		
	+3m body extension	cu. m		

Item	Particulars	Unit	Type-S	Type-M
	+6m body extension	cu. m		
5.3.8	Length of Stubs: (stub length x cleat) -3m body extension +0m body extension +3m body extension +6m body extension	 mm mm mm mm		

14. SCHEDULES OF RATES AND PRICES (LOT 1-3)

14.1 Schedule No. 1. TOWER & LINE ACCESORIES

Item	Description	Unit	Qty.	Rate	
					Amount
			(1)	*(2)*	*(1) x (2)*
	TRANSMISSION LINE				
	TOWERS				
T01	Type S towers inclusive of all fittings	Lot	1		
T02	Type S towers extension inclusive of all fittings	Lot	1		
T03	Type T towers inclusive of all fittings	Lot	1		
T04	Type T towers extension inclusive of all fittings	Lot	1		
T5	Tower earthing materials	Lot	1		
T6	Bitumastic paint	Lot	1		
	CONDUCTOR AND FITTINGS				
T7	175 mm^2 ACSR conductor /km	/km	10		
T8	Vibration dampers	Lot	1		
T9	Midspan joints	Lot	1		
T10	Line termination fittings	Lot	1		
	OPGW EARTH WIRE				
T11	OPGW	Km	5		
T12	Vibration dampers	Lot	1		
T13	Tension and suspension clamps	Lot	1		
T14	Aircraft warning balls	Lot	1		
T15	Splicing boxes	Lot	1		
	INSULATORS AND FITTINGS				
T16	Suspension insulators with arcing rings and associated clamp and fittings for LYNX	Lot	1		
T17	Tension insulators with arcing rings and associated clamp and fittings for LYNX conductor	Lot	1		
Name of Bidder;					
Signature of Bidder;					

14.2 Schedule No.2. MANDATORY SPARES

Item	Description	Unit	Qty.	Rate	
	MANDATORY SPARES				**Amount**
			(1)	*(2)*	*(1) x (2)*
	TOWERS				
S1	Mid-span Compression joints for LYNX	pc	3		
S2	Repair sleeve for LYNX	Pc	5		
S3	OPGW Splice boxes	Pc	2		
S4	Vibration damper for LYNX	Pc	5		
S5	Vibration damper for overhead earth wire (OPGW)	Pc	5		
S6	Dead-ends (Compression joints) for LYNX with jumper set	Pc	2		
	Insulators and Fittings				
S7	Suspension insulator string with complete set of fittings	Pc	10		
S8	Tension insulator string with complete set of fittings	Pc	10		
S9	Suspension clamp (shoe clamps) for ACSR Wolf	Pc	10		
Name of Bidder;					
Signature of Bidder;					

14.3 Schedule No. 3. DESIGN SERVICES

Item	Description	Unit	Qty.		
				Local Currency Portion	**Total Price**[1]
			(1)	*(2)*	*(1) x (2)*
KD01	132 kV Transmission Line designs/redesign	Lot	1		
KD02	132 kV Tower Foundation designs	Lot			
	TOTALS				

Name of Bidder:
Signature of Bidder:

14.4 Schedule No. 4. INSTALLATION AND OTHER SERVICES

Item	Description	Qty.		
			Local Currency Portion	**Total Price**[1]
		(1)	*(2)*	*(1) x (2)*
T100	Survey works (check survey, profile and plan surveys)	1		
T101	Civil works (Route clearance, geotechnical investigations and studies, foundation excavation, foundation works and stub setting etc.)- per tower	Lot		
T102	Erection and stringing per km (including OPGW fusion splicing)	Lot		
T103	Demolish existing stub where they obstruct new works. Erosion Mitigation, Gabions, Foundation Protection and Site Restoration for all sites. Removal of existing stubs up to 1.5 Meter Depth. Site Restoration for all sites.	1 lot		
	SITE OFFICE			
SO01	Office	1		
SO02	Administrative costs, Statutory legislation, DOSH, County Government	1		
SO03	Project Management facilitation; Mobile Phones (4)	1		
	FACTORY ACCEPTANCE TESTS (FATs)			
FAT01	Tower tests; Full scale test at a internationally accredited testing facility. (Destructive test on S Type suspension tower without any extensions, for both single circuit and double circuit towers.)	1 lot		
FAT02	Foundation Tests	1 lot		
FAT03	Conductor and OPGW tests	1 lot		
FAT04	Insulator tests	1 lot		
FAT05	Facilitation for project personnel for FATs, including all costs –max 6 staff	1 lot		
Name of Bidder:				
Signature of Bidder:				

14.5 SCHEDULE NO. 5. GRAND SUMMARY

Item	Description	Total Price(Scope 1 and 2)	
		Foreign	**Local**
1	Total Schedule No. 1. Tower and line accessories		
2	Total Schedule No. 2. Mandatory maintenance spares		
3	Total Schedule No. 3. Design Services		
4	Total Schedule No. 4. Installation and Other Services		
TOTAL (to Bid Form)			

	Name of Bidder;
	Signature of Bidder;

SECTION XII - STANDARD FORMS

(i) Tender Form

(ii) Confidential Business Questionnaire

(iii) Tender Security Form (Bank Guarantee)

(iv) Tender Security Form (Institutions)

(v) Tender Security Form (Letter of Credit)

(vi) Manufacturers Authorization Form

(vii) Manufacturer's Warranty Form

(viii) Declaration Form

(ix) Letter of notification of award

(x) Letter of notification of regret

(xi) Contract Agreement Form

(xii) Performance Security Form (Bank Guarantee)

(xiii) Performance Security Form (LC)

(xiv) Letter of Acceptance

(xv) Qualification Information Forms

(xvi) Details of Proposed Sub-Contractors

(xvii) Site Visit Form

(xviii) Manufacturers Authorization Form

(xix) Supplier Evaluation Form

(i) - TENDER FORM

Date:……
Tender No……

To:
The Kenya Power & Lighting Company Limited,
Stima Plaza,
Kolobot Road, Parklands,
P.O Box 30099 – 00100,
Nairobi, Kenya.

Ladies and Gentlemen,

1. Having read, examined and understood the Tender Document including all Addenda, the receipt of which is hereby duly acknowledged, we, the undersigned Tenderer, offer to supply, deliver, install and commission *(the latter two where applicable)* ……. *(insert goods description*) in accordance and conformity with the said tender document for the sum of …….(*total tender amount inclusive of all taxes in words and figures)* or such sums as may be ascertained in accordance with the Price Schedule attached herewith and made part of this Tender.

2. We undertake, if our Tender is accepted, to deliver, install and commission the goods in accordance with the delivery schedule specified in the Schedule of Requirements.

3. If our Tender is accepted, we will obtain the performance security of a licensed commercial bank in Kenya in a sum equivalent to ten percent (10%) of the contract price for the due performance of the contract, in the form(s) prescribed by The Kenya Power & Lighting Company Limited.

4.* We agree to abide by this Tender for a **period of……..….days (Tenderer please indicate validity of your tender)** from the date fixed for tender opening as per the Tender Document, and it shall remain binding upon us and may be accepted at any time before the expiration of that period.

5. This Tender, together with your written acceptance thereof and your notification of award, shall not constitute a contract, between us. The contract shall be formed between us when both parties duly sign the written contract.

6. We understand that you are not bound to accept any Tender you may receive.

Yours sincerely,

_____
Name of Tenderer

_____
Signature of duly authorized person signing the Tender

_____
Name and Capacity of duly authorized person signing the Tender

_____
Stamp or Seal of Tenderer

***NOTES:**

1. KPLC requires a validity period of at least one hundred & twenty (120) days.
2. This form must be duly completed, signed, stamped and/or sealed.

(ii) - CONFIDENTIAL BUSINESS QUESTIONNAIRE FORM

All Tenderers are requested to give the particulars indicated in Part 1 and either Part 2 (a), 2 (b) or 2 (c), whichever applies to your type of business. You are advised that it is a serious offence to give false information on this form.

Part 1 – General

Business Name……

Location of business premises……

Plot No. ……Street/ Road ……..

Postal Address …….. Postal Code …….

Tel No……..

Facsimile..……..

Mobile and/ or CDMA No…….

E-mail:……

Nature of your business ……..
Registration Certificate No.……

Maximum value of business which you can handle at any time KShs…….

Name of your Bankers ……..Branch… ……

*Names of Tenderer's contact person(s) …….

Designation/ capacity of the Tenderer's contact person(s) ……

Address, Tel, Fax and E-mail of the Tenderer's contact person(s) …….
……...
……

Part 2 (a) Sole Proprietor

Your name in full …….

Nationality ……Country of origin ……..

*Citizenship details…….

Part 2 (b) Partnership

Give details of partners as follows: -

Names	Nationality	*Citizenship Details	Shares
1……			
2……			
3……			
4…….			
5…….			

Part 2 (c) Registered Company

Private or Public …….

State the nominal and issued capital of company-

Nominal KShs……

Issued KShs……

Give details of all directors as follows

Name	Nationality	*Citizenship Details	Shares
1…….			
2…….			
3……..			
4……..			
5……..			

Name of duly authorized person to sign for and on behalf of the Tenderer

……..……..

Capacity of the duly authorized person……

Signature of the duly authorized person……..

Part 2 (d) List of Associated Companies Participating in this Tender

Give details as follows: -

Name of Company	Country of Registration	Directors	Shares (%)
1……..			
2…….			
3…..……..			
4…….			
5…….…….			

Name of duly authorized person to sign for and on behalf of the Tenderer ..……..

Capacity of the duly authorized person……

Signature of the duly authorized person……..

***NOTES TO THE TENDERERS ON THE QUESTIONNAIRE**

1. *The address and contact person of the Tenderer provided above shall at all times be used for purposes of this tender.*
2. *If a Kenyan citizen, please indicate under "Citizenship Details" whether by birth, naturalization or registration.*
3. *The details on this Form are essential and compulsory for all Tenderers.* **Failure to provide all the information requested shall lead to the Tenderer's disqualification**.
4. *For foreign Tenderers please give the details of nominal and issued share capital in the currency of the country of origin of the Tenderer.*

(iii) - TENDER SECURITY FORM – (BANK GUARANTEE)

(To Be Submitted On Bank's Letterhead) **Date:**

To:
The Kenya Power & Lighting Company Limited,
Stima Plaza,
Kolobot Road, Parklands,
P.O Box 30099 – 00100,
Nairobi, Kenya.

WHEREAS …… (*Name of the Tenderer*) (*Hereinafter called "the Tenderer")* has submitted its Tender dated …… for the supply, installation and commissioning of…… *(Please insert KPLC tender no.* a*nd name*) *(Hereinafter called "the Tender");*

KNOW ALL PEOPLE by these presents that **WE**…….of ……having our registered office at…….*(hereinafter called "the Bank"),* are bound unto The Kenya Power and Lighting Company Limited (*hereinafter called "KPLC" which expression shall where the context so admits include its successors-in-title and assigns*) in the sum of ……. for which payment well and truly to be made to the said KPLC, the Bank binds itself, its successors, and assignees by these presents.

We undertake to pay you, upon your first written demand declaring the Tenderer to be in breach of the tender requirements and without cavil or argument, the entire sum of this guarantee being …….. (*Amount of guarantee*) as aforesaid, without you needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This tender guarantee will remain in force up to and including thirty (30) days after the period of tender validity, and any demand in respect thereof should reach the Bank not later than the date below.

This guarantee is valid until the …..…day of……20……

EITHER

SEALED with the)
COMMON SEAL)

of the said **BANK**) _____
this ……day) BANK SEAL
of ……20….)
)
in the presence of :-)
)
_____)
)
and in the presence of:-)
)
_____)

OR

SIGNED by the **DULY AUTHORISED REPRESENTATIVE(S)/ ATTORNEY(S)** of the **BANK**

_____
Name(s) and Capacity (ies) of duly authorised representative(s)/ attorney(s) of the Bank

_____
Signature(s) of the duly authorised person(s)

NOTES TO TENDERERS AND BANKS

1. *Please note that no material additions, deletions or alterations regarding the contents of this Form shall be made to the Tender Security to be furnished by the Tenderer. If any are made, the Tender Security shall not be accepted and shall be rejected by KPLC. For the avoidance of doubt, such rejection will be treated as non-submission of the Tender Security where such Security is required in the tender.*

2. *It is the responsibility of the Tenderer to sensitize its issuing bank on the need to respond directly and expeditiously to queries from KPLC. The period for response shall not exceed three (3) days from the date of KPLC's query. Should there be no conclusive response by the Bank within this period, such Tenderer's Tender Security shall be deemed as invalid and the bid rejected.*

3. ***The issuing bank should address its response or communication regarding the bond to KPLC at the following e-mail address – "guarantees@ kplc.co.ke"***

4. *The Tender validity period is ninety (120) days as set out in the Invitation to Tender (at Section I of the Tender document) or as otherwise may be extended by KPLC. Therefore the Tender Security must at all times be valid for at least 30 days beyond the tender validity period.*

(iv)

TENDER SECURITY FORM (SACCO SOCIETY, DEPOSIT TAKING MICRO FINANCE INSTITUTIONS, WOMEN ENTERPRISE FUND & YOUTH ENTERPRISE FUND)

(To Be Submitted On Institutions Letterhead) **Date:**

To:
The Kenya Power & Lighting Company Limited,
Stima Plaza,
Kolobot Road, Parklands,
P.O Box 30099 – 00100,
Nairobi, Kenya.

WHEREAS……(hereinafter called "the Contractor") has undertaken, in pursuance of your Tender Number……..(*reference number of the Tender)* and its Tender dated ……*(insert Contractor's date of Tender taken from the Tender Form)* to supply ……(*description of the Works*) (hereinafter called "the Contract);

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with an Institution's guarantee by an acceptable Institution for the sum specified therein as security for compliance of the Contractor's performance obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor a Guarantee;

THEREFORE WE HEREBY AFFIRM that we are Guarantors and responsible to you, on behalf of the Contractor, up to a total of……. (*amount of the guarantee in words and figures*) and we undertake to pay you, upon your first written demand declaring the Contractor to be in default under the Contract and without cavil or argument, any sum or sums within the limits of ……...
(*amount of guarantee*) as aforesaid, without you needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until the ……day of…….…..…20….

EITHER

SEALED with the)
COMMON SEAL)
of the said **INSTITUTION**)

)

this ……day) _____
) INSTITUTION SEAL
of ……20….)
in the presence of :-)
)
_____)
)
and in the presence of:-)
)
_____)

OR

SIGNED by the **DULY AUTHORISED REPRESENTATIVE(S)/ ATTORNEY(S)** of the **INSTITUTION**

_____
Name(s) and Capacity(ies) of duly authorised representative(s)/ attorney(s) of the **Institution**.

_____
Signature(s) of the duly authorised person(s)

NOTES TO SUPPLIERS AND INSTITUTIONS

1. *Please note that no material additions, deletions or alterations regarding the contents of this Form shall be made to the Tender Security to be furnished by the Tenderer. If any are made, the Tender Security shall not be accepted and shall be rejected by KPLC. For the avoidance of doubt, such rejection will be treated as non-submission of the Tender Security where such Security is required in the tender.*

2. *It is the responsibility of the Tenderer to sensitize its issuing institution on the need to respond directly and expeditiously to queries from KPLC. The period for response shall not exceed three (3) days from the date of KPLC's query. Should there be no conclusive response by the institution within this period, such Tenderer's Tender Security shall be deemed as invalid and the bid rejected.*

3. ***The issuing institution should address its response or communication regarding the Tender Security to KPLC at the following e-mail address – "guarantees@ kplc.co.ke"***

4. *The Tender validity period is ninety (90) days as set out in the Invitation to Tender (at Section I of the Tender document) or as otherwise may be extended by KPLC. Therefore the Tender Security must at all times be valid for at least 30 days beyond the tender validity period.*

(v)
TENDER SECURITY – (LETTERS OF CREDIT)

The Mandatory Conditions to be included in the Letters are in two parts, A and B.

Part A

Form of Documentary credit - "Irrevocable Standby"

Applicable rules - "Must be UCP Latest Version" i.e. Uniform Customs and Practices (UCP) 600 (2007 REVISION) ICC Publication No. 600.

Place of expiry - At the counters of the advising bank.

The SBLC should be available – "By Payment"

Drafts should be payable at - "SIGHT"

Documents required -

1. Beneficiary's signed and dated statement demanding for payment under the letter of credit no…….. (*Insert LC No*.) as…….(*Name of applicant*) (hereinafter called the "Tenderer") indicating that the "Tenderer*"* has defaulted in the obligations of the Tenderer as stated by the Beneficiary.

2. The Original Letter of Credit and all amendments, if any.

Additional Conditions -

1. All charges levied by any bank that is party to this documentary credit are for the account of the applicant.

2. There should be no conditions requiring compliance with the specific regulations or a particular country's Law and regulations.

Charges - All bank charges are for the account of the applicant.

*****Confirmation instructions – (See notes below)

Part B

The proceeds of these Letters are payable to KPLC -

a) if the Tenderer withdraws its Tender after the deadline for submitting Tenders but before the expiry of the period during which the Tenders must remain valid.
b) if the Tenderer rejects a correction of an arithmetic error
c) if the Tenderer fails to enter into a written contract in accordance with the Tender Document
d) if the successful Tenderer fails to furnish the performance security in accordance with the Tender Document.

e) if the Tenderer fails to extend the validity of the tender security where KPLC has extended the tender validity period in accordance with the Tender Document.

NOTES TO TENDERERS AND BANKS

1. *Please note that should the Tender Security (LC) omit any of the above conditions the LC shall not be accepted and shall be rejected by KPLC. For the avoidance of doubt, such rejection will be treated as non-submission of the LC where such LC is required in the Tender.*

2. *It is the responsibility of the Tenderer to sensitize its issuing bank on the need to respond directly and expeditiously to any queries from KPLC. The period for response shall not exceed three (3) days from the date of KPLC's query. Should there be no conclusive response by the Bank within this period, such Tenderer's Tender Security shall be deemed as invalid and the bid rejected.*

3. ***The issuing bank should address its response or communication regarding the bond to KPLC at the following e-mail address – "guarantees@ kplc.co.ke"***

4. *The Tender validity period is ninety (90) days as set out in the Invitation to Tender (at Section I of the Tender document) or as otherwise may be extended by KPLC. Therefore the Tender Security must at all times be valid for at least 30 days beyond the tender validity period.*

5. *All Guarantees issued by foreign banks must be confirmed by a local bank in Kenya.*

(vi) - MANUFACTURER'S AUTHORIZATION FORM

(To Be Submitted On Manufacturer's Letterhead)

To:
The Kenya Power & Lighting Company Limited,
Stima Plaza, Kolobot Road, Parklands,
P.O Box 30099 – 00100,
Nairobi, Kenya.

WHEREAS WE ……(*name of the manufacturer*) who are established and reputable manufacturers of ……
(*name and description of the goods*) having factories at *……*(full address and physical location of factory(ies) where goods to be supplied are manufactured)* do hereby confirm that ……
(*name and address of Supplier*) is authorized by us to transact in the goods required against your Tender …… (*insert reference number and name of the Tender*) in respect of the above goods manufactured by us.

DATED THIS…….. DAY OF…….20……

_____
Signature of duly authorised person for and on behalf of the Manufacturer.

_____
Name and Capacity of duly authorised person signing on behalf of the Manufacturer

NOTES TO TENDERERS AND MANUFACTURERS

Only a competent person in the service of the Manufacturer should sign this letter of authority.

(vii) - MANUFACTURER'S WARRANTY FORM

To Be Submitted On Manufacturer's Letterhead)

To:
The Kenya Power & Lighting Company Limited,
Stima Plaza, Kolobot Road, Parklands,
P.O Box 30099 – 00100,
Nairobi, Kenya.

RE: MANUFACTURER'S WARRANTY FOR GOODS REQUIRED UNDER TENDER NO …….. TO BE SUPPLIED BY …….(*indicate your name or the supplier you have authorized)*

WE HEREBY WARRANT THAT:

a) The goods to be supplied under the contract are new, unused, of the most recent or current specification and incorporate all recent improvements in design and materials unless provided otherwise in the Tender.
b) The goods in the Tenderer's bid have no defect arising from manufacture, materials or workmanship or from any act or omission of the Tenderer that may develop under normal use of the goods under the conditions obtaining in Kenya.

The Warranty will remain valid for one (1) year after the goods, or any portion thereof as the case may be, have been delivered to the final destination indicated in the contract.

DATED THIS…….. DAY OF…….20……

_____

Signature of duly authorised person for and on behalf of the Manufacturer.

_____

Name and Capacity of duly authorised person signing on behalf of the Manufacturer

NOTES TO TENDERERS AND MANUFACTURERS

1. *Only a competent person in the service of the Manufacturer should sign this letter of authority.*
2. *Provide full contact details including physical address, e-mail, telephone numbers and the website on the Warranty.*

(viii) - DECLARATION FORM

Date _____

To:
The Kenya Power & Lighting Company Limited,
Stima Plaza,
Kolobot Road, Parklands,
P.O Box 30099 – 00100,
Nairobi,
KENYA.

Ladies and Gentlemen,

The Tenderer i.e. (full name and complete physical and postal address)_____
_____declare the following: -

a) That I/ We have not been debarred from participating in public procurement by anybody, institution or person.
b) That I/ We have not been involved in and will not be involved in corrupt and fraudulent practices regarding public procurement anywhere.
c) That I/We or any director of the firm or company is not a person within the meaning of paragraph 3.2 of ITT (Eligible Tenderers) of the Instruction to Bidders.
d) That I/ We are not insolvent, in receivership, bankrupt or in the process of being wound up and is not the subject of legal proceedings relating to the foregoing.
e) That I/ We are not associated with any other Tenderer participating in this tender.
f) That I/ We do hereby confirm that all the information given in this Tender is accurate, factual and true to the best of our knowledge.

Yours sincerely,

_____
Name of Tenderer

_____
Signature of duly authorised person signing the Tender

_____
Name and Capacity of duly authorised person signing the Tender

_____
Stamp or Seal of Tenderer

(ix) - LETTER OF NOTIFICATION OF AWARD

To:
(Name and full address of the Successful Tenderer)……..

Dear Sirs/ Madams,

RE: NOTIFICATION OF AWARD OF TENDER NO. ……

We refer to your Tender dated…… and are pleased to inform you that following evaluation, your Tender has been accepted as follows: -

……
……

This notification does not constitute a contract. The formal Contract Agreement, which is enclosed herewith shall be entered into upon expiry of Seven (7) days from the date hereof but not later than thirty (30) days after expiry of tender validity pursuant to the provisions of the Public Procurement and Disposal Act, 2005 *(or as may be amended from time to time, or replaced).*

Kindly sign, and seal the Contract Agreement. Further, initial and stamp on all pages of the documents forming the Contract that are forwarded to you with this letter. Thereafter return the signed and sealed Contract together with the documents to us within seven (7) days of the date hereof for our further action.

We take this opportunity to remind you to again note and strictly comply with the provisions as regards the Tender Security, Signing of Contract and Performance Security as stated in the Instructions to Tenderers.

We look forward to a cordial and mutually beneficial business relationship.

Yours faithfully,
FOR: THE KENYA POWER & LIGHTING COMPANY LIMITED

CHIEF MANAGER, SUPPLY CHAIN & LOGISTICS

Enclosures

(x) - LETTER OF NOTIFICATION OF REGRET

To: *(Name and full address of the Unsuccessful Tenderer)……* **Date:**

Dear Sirs/ Madams,

RE: **NOTIFICATION OF REGRET IN RESPECT OF TENDER NO. ……**

We refer to your Tender dated…… and regret to inform you that following evaluation, your Tender is unsuccessful. It is therefore not accepted. The brief reasons are as follows:-

1. ……
2. ……
3. …… etc…

The successful bidder was _____.

However, this notification does not reduce the validity period of your Tender Security. In this regard, we request you to relook at the provisions regarding the Tender Security, Signing of Contract and Performance Security as stated in the Instructions to Tenderers.

You may collect the tender security from our *Legal Department (Guarantees Section), on the 2nd Floor, Stima Plaza, Kolobot Road, Parklands, Nairobi* only after expiry of eighteen (18) days from the date hereof on Mondays and Wednesdays ONLY between 9.00 a.m to 12.30 pm and 2.00p.m to 4.00p.m.

It is expected that by that time KPLC and the successful bidder will have entered into a contract pursuant to the Public Procurement and Disposal Act, 2005 *(or as may be amended from time to time or replaced).* When collecting the Security, you will be required to produce the original or certified copy of this letter.

We thank you for the interest shown in participating in this tender and wish you well in all your future endeavours.

Yours faithfully,

FOR: THE KENYA POWER & LIGHTING COMPANY LIMITED

CHIEF MANAGER, SUPPLY CHAIN & LOGISTICS.

(xi) - CONTRACT AGREEMENT FORM

THIS AGREEMENT made this**……**day of**…….20…. BETWEEN THE KENYA POWER & LIGHTING COMPANY LIMITED**, a limited liability company duly incorporated under the Companies Act, Chapter 486 of the Laws of Kenya, with its registered office situated at Stima Plaza, Kolobot Road, Parklands, Nairobi in the Republic of Kenya and of Post Office Box Number 30099-00100, Nairobi in the Republic aforesaid *(hereinafter referred to as "KPLC")* of the one part,

AND

…….. (*Contractor's full name and principal place of business)* a duly registered entity according to the laws of**..…… *(state country)*** and of Post Office Box Number**…….*(full address physical and postal of Contractor)*** in the Republic aforesaid, *(hereinafter referred to as the "Contractor"* of the other part;

WHEREAS KPLC invited tenders for certain works, that is to say for **……(*KPLC insert description of Works*)** under Tender Number**…….. (*KPLC insert tender number*)**

AND WHEREAS KPLC has accepted the Tender by the Contractor for the services in the sum of **……**(***KPLC specify the total amount in words which should include*** insurances, duties, levies, Value Added Tax (V.A.T), Withholding Tax and other taxes payable ***where applicable*** (*hereinafter called "the Contract Price"*).

NOW THIS AGREEMENT WITNESSETH AS FOLLOWS: -

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract and the Tender Document.

2. Unless the context or express provision otherwise requires: -
   a) reference to "this Agreement" includes its recitals, any schedules and documents mentioned hereunder and any reference to this Agreement or to any other document includes a reference to the other document as varied supplemented and or replaced in any manner from time to time.
   b) any reference to any Act shall include any statutory extension, amendment, modification, re-amendment or replacement of such Act and any rule, regulation or order made thereunder.

   c) the Official Purchase Order shall also mean the Official Order or Local Purchase Order.

d) words importing the masculine gender only, include the feminine gender or (as the case may be) the neutral gender.

e) words importing the singular number only include the plural number and vice-versa and where there are two or more persons included in the expression the *"Contractor"* the covenants, agreements obligations expressed to be made or performed by the Contractor shall be deemed to be made or performed by such persons jointly and severally.

f) where there are two or more persons included in the expression the *"Contractor"* any act default or omission by the Contractor shall be deemed to be an act default or omission by any one or more of such persons.

3. In consideration of the payment to be made by KPLC to the Contractor as hereinbefore mentioned, the Contractor hereby covenants with KPLC to perform and Contractor in consideration of the execution, completion, and maintenance of the Works by the Contractor as prescribed by the Contract provide the services and remedy any defects thereon in conformity in all respects with the provisions of the Contract.

4. KPLC hereby covenants to pay the Contractor in consideration of the proper performance and provision of the services and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

5. The following documents shall constitute the Contract between KPLC and the Contractor and each shall be read and construed as an integral part of the Contract: -

a) this Contract Agreement
b) Letter of Acceptance dated ……..
c) General Conditions of Contract
d) Special Conditions of Contract
e) Official Purchase Order where applicable
f) Technical Specifications
g) Drawings
h) Bill of Quantities/Schedule of Requirements
i) Implementation Plan (work methods and schedule)
j) KPLC's Notification of Award dated……
k) Tender Form signed by the Contractor
l) Declaration Form signed by the Contractor/ successful Tenderer
m) Warranty

6. In the event of any ambiguity or conflict between the contract documents listed above, the order of precedence shall be the order in which the contract documents are listed in 5 above except where otherwise mutually agreed in writing.

7. The Commencement date shall be the working day immediately following the fulfillment of all the following: -
   a) Execution of this Contract Agreement by KPLC and the Contractor.
   b) Issuance of the Performance Bond by the Contractor and confirmation of its authenticity by KPLC.
   c) Issuance of the Official Order by KPLC to the Contractor.
   d) Where applicable, Opening of the Letter of Credit by KPLC.

8. The period of contract validity shall begin from the Commencement date and end at the expiry of the Defects Liability Period.
   Provided that the expiry period of the Warranty shall be as prescribed and further provided that the Warranty shall survive the expiry of the contract.

9. It shall be the responsibility of the Contractor to ensure that its Performance Security is valid at all times during the period of contract validity and further is in the full amount as contracted.

10. Any amendment, change, addition, deletion or variation howsoever to this Contract shall only be valid and effective where expressed in writing and signed by both parties.

11. No failure or delay to exercise any power, right or remedy by KPLC shall operate as a waiver of that right, power or remedy and no single or partial exercise of any other right, power or remedy.

12. Notwithstanding proper completion of performance or parts thereof, all the provisions of this Contract shall continue in full force and effect to the extent that any of them remain to be implemented or performed unless otherwise expressly agreed upon by both parties.

13. Any notice required to be given in writing to any Party herein shall be deemed to have been sufficiently served, if where delivered personally, one day after such delivery; notices by electronic mail and facsimile shall be deemed to be served one day after the date of such transmission and delivery respectively, notices sent by post shall be deemed served seven (7) days after posting by registered post (*and proof of posting shall be proof of service*), notices sent by courier shall be deemed served two (2) days after such receipt by the courier service for Local contractors and five (5) days for Foreign contractors.

14. For the purposes of Notices, the address of KPLC shall be Company Secretary, The Kenya Power & Lighting Company Limited, 7th Floor, Stima Plaza, Kolobot Road,

Post Office Box Number 30099–00100, Nairobi, Kenya, Facsimile + 254-20-3750240/ 3514485. The address for the Contractor shall be the Contractor's address as stated by it in the Confidential Business Questionnaire provided in the Tender Document.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of Kenya the day and year first above written.

SIGNED for and on behalf
of **THE KENYA POWER & LIGHTING COMPANY LIMITED**

_____
COMPANY SECRETARY

SEALED with the **COMMON SEAL**
of the **CONTRACTOR**
in the presence of:-

_____ _____
DIRECTOR *Affix Contractor's Seal here*

_____
DIRECTOR'S FULL NAMES

and in the presence of:-

_____
DIRECTOR/ COMPANY SECRETARY

_____
DIRECTOR/ COMPANY SECRETARY'S FULL NAMES

DRAWN BY: -
Beatrice Meso
Advocate,
C/o The Kenya Power & Lighting Company Limited,

7th Floor, Stima Plaza,
Kolobot Road, Parklands,
Post Office Box Number 30099–00100,
NAIROBI, KENYA,

Telephones: + 254-20-3201000/ 731
Facsimile: + 254-20-3514485/ 3750240

(xii)

PERFORMANCE SECURITY FORM (BANK GUARANTEE)

(To Be Submitted On Bank's Letterhead) **Date:**

To:
The Kenya Power & Lighting Company Limited,
Stima Plaza,
Kolobot Road, Parklands,
P.O Box 30099 – 00100,
Nairobi, Kenya.

WHEREAS……(hereinafter called "the Contractor") has undertaken, in pursuance of your Tender Number……..(*reference number of the Tender)* and its Tender dated ……*(insert Contractor's date of Tender taken from the Tender Form)* to supply ……(*description of the works*) (hereinafter called "the Contract);

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a bank guarantee by an acceptable bank for the sum specified therein as security for compliance of the Contractor's performance obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor a guarantee;

THEREFORE WE HEREBY AFFIRM that we are Guarantors and responsible to you, on behalf of the Contractor, up to a total of……. (*amount of the guarantee in words and figures*) and we undertake to pay you, upon your first written demand declaring the Contractor to be in default under the Contract and without cavil or argument, any sum or sums within the limits of ……...
(*amount of guarantee*) as aforesaid, without you needing to prove or to show grounds or reasons for your demand or the sum specified therein.

This guarantee is valid until the ……day of…….…..…20….

EITHER

SEALED with the)
COMMON SEAL)
of the said **BANK**)
)

this ……day)
)
of ……20….)
in the presence of :-)
)
_____)
)
and in the presence of:-)
)
_____)

_____
BANK SEAL

OR

SIGNED by the **DULY AUTHORISED REPRESENTATIVE(S)/ ATTORNEY(S)** of the **BANK**

_____
Name(s) and Capacity(ies) of duly authorised representative(s)/ attorney(s) of the Bank

_____
Signature(s) of the duly authorised person(s)

NOTES TO CONTRACTORS AND BANKS

1. *Please note that no material additions, deletions or alterations regarding the contents of this Form shall be made to the Performance Security Bond (the Bond) to be furnished by the successful Tenderer/ Supplier. If any are made, the Bond may not be accepted and shall be rejected by KPLC. For the avoidance of doubt, such rejection will be treated as non-submission of the Bond where such Bond is required in the tender and Contract.*

2. *KPLC shall seek authentication of the Performance Security from the issuing bank. It is the responsibility of the Contractor to sensitize its issuing bank on the need to respond directly and expeditiously to queries from KPLC. The period for response shall not exceed three (3) days from the date of KPLC's query. Should there be no conclusive response by the Bank within this period, such Contractor's Performance Security may be deemed as invalid and the Contract nullified.*

3. ***The issuing Bank should address its response or communication regarding the bond to KPLC at the following e-mail address – "guarantees@ kplc.co.ke"***

(xiii) -PERFORMANCE SECURITY (LC)

Mandatory Conditions that should appear on the Performance Security (LC).

Form of Documentary credit - "Irrevocable Standby"

Applicable rules - "Must be UCP Latest Version" i.e. UCP 600 (2007 REVISION) ICC Publication No. 600.

Place of expiry - At the counters of the advising bank.

The SBLC should be available – "By Payment"

Drafts should be payable at - "SIGHT"

Documents required -

1. Beneficiary's signed and dated statement demanding for payment under the letter of credit no…….. (*Insert LC No*.) as…….(*Name of Applicant*) (hereinafter called the "Contractor") indicating that the "Contractor" has defaulted in the performance and adherence to and performance of the contract between the Beneficiary and the Contractor.

2. The Original Letter of Credit and all amendments, if any.

Additional Conditions -

1. All charges levied by any bank that is party to this documentary credit are for the account of the Applicant.

2. (Include) that there should be no conditions requiring compliance with the specific regulations or a particular country's laws and regulations.

Charges - All bank charges are for the account of the Applicant.

Confirmation instructions – (See notes below)

NOTES TO CONTRACTORS AND BANKS

1. Please note that should the Performance Security (LC) omit any of the above conditions the LC shall not be accepted and shall be rejected by KPLC. For the avoidance of doubt, such rejection will be treated as non-submission of the LC where such LC is required in the tender and Contract.

2. KPLC may seek authentication of the Performance Security (LC) from the issuing bank. It is the responsibility of the Contractor to sensitize its issuing bank on the need to respond directly and expeditiously to queries from KPLC. The period for

response shall not exceed three (3) days from the date of KPLC's query. Should there be no conclusive response by the Bank within this period, such Contractor's Performance Security (LC) may be deemed as invalid and the Contract nullified.

3. ***The issuing bank should address its response or communication regarding the bond to KPLC at the following e-mail address – "guarantees@ kplc.co.ke"***

4. *All Guarantees issued by foreign banks must be confirmed by a local bank in Kenya.*

(xiv) - LETTER OF ACCEPTANCE

[letter-head paper of the Employer]

_____*[date]*

To: _____
[name of the Contractor]

_____
[address of the Contractor]

Dear Sir,

This is to notify you that your Tender dated _____
for the execution of _____
[name of the Contract and identification number, as given in the Tender documents] for the Contract Price of (Indicate Currency) _____ *[amount in figures]* (Indicate Currency) _____*(amount in words)*] in accordance with the Instructions to Tenderers is hereby accepted.

You are hereby instructed to proceed with the execution of the said Works in accordance with the Contract documents.

Authorized Signature ……

Name and Title of Signatory ……

Attachment : Agreement

(xv) - QUALIFICATION INFORMATION

1. Individual Tenderers or Individual Members of Joint Ventures

1.1 Constitution or legal status of tenderer (attach copy or Incorporation Certificate)

Place of registration: _____

Principal place of business _____

Power of attorney of signatory of tender _____

1.2 Total annual volume of construction work performed in the last three years

Year	Volume	
	Currency	Value
Year 1		
Year 2		
Year 3		

1.3 Work performed as Main Contractor on works of a similar nature and volume over the last three years. Also list details of work under way or committed, including expected completion date.

Project Name	Name of Client and contact person (Address & Telephone No.)	Type of Work performed and year of completion	Value of contract

1.4 Major items of Contractor's Tools & Equipment proposed for carrying out the Works. List all information requested below. (Attach evidence of ownership or lease)

Item of Tools & Equipment	Description, Make and age (years)	Condition(new, good, poor) and number available	Owned, leased (from whom?), or to be purchased (from whom?)
_____ _____ _____(etc.)	_____ _____ ____	_____ _____ ___	_____ _____ _____

1.5 Qualifications and experience of key personnel proposed for administration and execution of the Contract as required by Subsection 3.20 of the Instructions to Tenderer, Attach biographical data.

Bidders should provide the names of suitably qualified personnel.

1.	**Title of position***
	Name
2.	**Title of position***
	Name
3.	**Title of position***
	Name
4.	**Title of position***
	Name

Resume f**or each** Proposed Personnel
The data on their experience should be supplied using the Form below for each candidate.

Name of Bidder

Position		
Personnel information	**Name**	**Date of birth**
	Professional qualifications	
Present employment	**Name of employer**	
	Address of employer	
	Telephone	**Contact (manager / personnel officer)**
	Fax	**E-mail**
	Job title	**Years with present employer**

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

From	To	Company / Project / Position / Relevant technical and management experience

1.6 Proposed Subcontractors for works

As per the requirements of Clause 3.20 of Conditions of Contract, following is a list of subcontractors and the portions of the Work to be subcontracted:

The following Subcontractors and/or manufacturers are proposed for carrying out the item of the facilities indicated. Bidders are free to propose more than one for each item

Sections of the Works	Value of Subcontract	Subcontractor (name and address)	Experience in similar work
_____ _____ _____ (etc.)	_____ _____ _____	_____ _____ _____	_____ _____ _____

1.7 Financial reports for the last three years: balance sheets, profit and loss statements, auditor's reports, etc. List below and attach copies of audited financial statements.

_____
_____

1.8 Evidence of access to financial resources to meet the qualification requirements: cash in hand, lines of credit, etc. List below and attach copies of supportive documents.

_____
_____

_____

1.9 Name, address and telephone, telex and facsimile numbers of banks and/or institution that may provide reference if contacted by the Employer.

_____
_____

1.10 Statement of compliance with the requirements the Instructions to Tenderers.

_____
_____
_____

1.11 Proposed program (work method and schedule) in compliance with requirement in the Instructions to Tenderers. Descriptions, drawings and charts, as necessary, to comply with the requirements of the tendering documents.

2 Joint Ventures

2.1 The information listed in 1.1 – 1.10 above shall be provided for each partner of the joint venture.

2.2 The information required in 1.11 above shall be provided for the joint venture.

2.3 Attach the power of attorney of the signatory(ies) of the tender authorizing signature of the tender on behalf of the joint venture

2.4 Attach the Agreement among all partners of the joint venture (and which is legally binding on all partners), which shows that:

a) all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms;

b) one of the partners will be nominated as being in charge, authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the joint venture; and

c) the execution of the entire Contract, including payment, shall be done exclusively with the partner in charge

(xvi) - SITE VISIT FORM

CONFIRMATION OF PRE-BID SITE VISIT

Name of Tenderer……..
Site Visited…….
Date of Visit……

Name, position and signature of the Tenderer's staff visiting the site.

Name:……..
Position……..
Qualification
Signature…… Tenderer's Official Stamp…….

Site Visit conducted by Employer's Authorised Officer's

Name ……
Signature……