



KPLC FTTX PILOT PROJECT

BIDDING DOCUMENT

**DESIGN, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF
FTTX FACILITIES FOR RUAKA, RIDGEWAYS AND MUTHITHI GARDENS**

TENDER NO. KPI/9A/5F/OT/001/16-17

VOLUME 1/2

Commercial & Contractual

SEPTEMBER 2016

Employer:

*Kenya Power & Lighting Company Limited
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ABBREVIATIONS AND ACRONYMS

Figure 1-1 Abbreviations and Acronyms

Abbreviation/ Acronym	Description
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 Joint Venture
KPLC	The Kenya Power & Lighting Company Limited
PPDA 2015	Public Procurement and Disposal Act, 2015
PPOA	Public Procurement and Oversight Authority
VAT	Value Added Tax
ISO	International Organization of Standardization
QMS	Quality Management System
Weight and Measures	
km	Kilometre (1,000 m)
kV	Kilovolt (1,000 volts)
kVA	Kilovolt-ampere
kW	Kilowatt
kWh	Kilowatt-hour
M	Million
m	meter
MVA	Mega volt-ampere (10 ⁶ volt-ampere)
MWh	Megawatt-hour
MW	Megawatt
Yr	Year
Currency	
USD	United States Dollar
KES	Kenya Shillings

1. SECTION I – INVITATION TO TENDER

September 29, 2016

TENDER NO: KPI/9A/5F/OT/001/16-17 FOR DESIGN, SUPPLY, INSTALLATION, TESTING AND KPLC FTTX PILOT PROJECT

1.1. The Kenya Power & Lighting Company Ltd (KPLC) invites bids from eligible Tenderers for Design, Supply, Installation, Testing and Commissioning of KPLC FTTX Pilot Project. Interested eligible Tenderers may obtain further information from the General Manager, Supply Chain, The Kenya Power & Lighting Company Ltd at Stima Plaza, 3rd Floor, Kolobot Road, and P.O. Box 30099 – 00100 Nairobi, Kenya.

1.2. Obtaining Tender documents

1.2.1. Tender Documents detailing the requirements of the above tenders may be obtained from KPLC E-Procurement Portal available on KPLC website www.kplc.co.ke from Thursday 29th September, 2016 as shown above.

1.2.3. Upon downloading the tender, bidders are required to immediately send/e-mail their Names and contact details to: JOchieng@kplc.co.ke, LBalera@kplc.co.ke and CMAende@kplc.co.ke.

1.3 Submission of Tender documents

1.3.1. Prospective bidders should register for E-Procurement to enable them access the KPLC portal under” New Supplier Registration” found under the Tenders Tab.

1.3.2. Completed Tenders are to be saved as PDF documents and submitted in the KPLC E-Procurement Web Portal so as to be received not later than 21st October 2016 at 10.00hours.

1.3.3. Tenders will be opened electronically promptly after closing time and Bidders or their representatives are welcome to witness the opening at the Auditorium - Stima Plaza.

1.3.4. Save when responding to KPLC’s request for clarification, bidders shall not contact or discuss any aspect of their tenders with KPLC after tender closing date before receipt of notification of award of tenders or letters of regret, as applicable. Any such contact shall lead to disqualification of the tenderer.

1.3.5. 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 pre-bid meeting to be held at KPLC’s premises, Stima Plaza, Auditorium, Kolobot Road, Nairobi, Kenya on 7th October, 2016 as from 8.30 a.m. A site visit shall be held as from 10.00a.m.

2. SECTION II - TENDER SUBMISSION CHECKLIST

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.	Duly Completed Tender Form	
2.	Duly Completed Price Schedule	
3.	Tender Questionnaire	
4.	Confidential Business Questionnaire (CBQ)	
5.	Tender Security – Bank Guarantee or Letters of Credit (issued by Banks Licensed by the Central Bank of Kenya)	
6.	Declaration Form	
7.	Duly completed 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 Contractor’s or Sub-Contractor’s Certificate of Registration for the relevant category from the Communications Authority of Kenya	
11.	Copy of Contractor’s or Sub-Contractor’s Certificate of Registration for the relevant category by the National Construction Authority	
12.	Copy of Contractor’s Valid Tax Compliance Certificate	
13.	Copy of Contractor’s KRA PIN certificate	
14.	Type Test Certificates for Major Equipment	
15.	Contractor’s Experience in Similar Works	
16.	Details of Sub-Contractors	
17.	Sub-Contractor’s Experience in Similar Works	
18.	Key Personnel Capabilities	
19.	CVs of Key Personnel	
20.	Program of Works	
21.	Contractor’s and Suppliers Quality Assurance Details	
22.	Commercial/Contractual Deviations	
23.	Catalogues, Brochures, Drawings and Documentation to be submitted with tender	
24.	Proposed Work Plan and Methodology	
25.	Contractor’s Turnover	
26.	Audited Financial Statements and Financial Information	
27.	Contractor’s Equipment	
28.	Duly Filled Manufacturer’s Authorization (for equipment/materials)	
29.	Duly Completed Guaranteed Technical Data Sheets	
30.	Litigation History	

3. SECTION III – INSTRUCTIONS TO TENDERERS (ITT)

Definitions

- 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.*
- o) *Citizen contractors-a firm shall be qualified as a citizen contractor if its owners and shareholders are Kenyan citizens*
- p) *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.
- 3.3.1 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 subparagraph 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.

3.3. Ineligible Tenderers

3.4. Declarations of Eligibility

- 3.3.4 Tenderers shall not be under declarations as prescribed at Section XIII.
- 3.3.5 Tenderers who are not under these declarations shall complete the Declaration Form strictly in the form and content as prescribed at Section XIII.
- 3.3.6 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.
- 3.4.1 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 at the Ministry of Lands/National Land Commission or, at the Office of the Attorney General, or 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.
- c) The JV agreement should be signed by at least two directors from each company or firm that is a party to the JV.
- d) The JV agreement must be under the company or firm seal
- e) 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

3.6.1 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

3.7.1 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.

3.9. One Tender per Tenderer

- 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.
- 3.9.1 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 pre-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 by 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 documents

- 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) Price Schedule*
 - (g) Summary of Evaluation Process/Evaluation Criteria*
 - (h) General Conditions of Contract*
 - (i) Special Conditions of Contracts*
 - (j) Technical Specifications and Drawings*
 - (k) Standard 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

3.13.1 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.*
- i) *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.*
 - iii. *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*
 - iii. The Tenderer's undertaking that the key site management and technical personnel will be available for the contract*
 - iv. 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 authorized 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,*
- a) 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.*
- b) 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.

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

- 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'.
- 3.22.1 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 or a deposit taking Microfinance Institution, Sacco Society, Youth Enterprise Development Fund or the Women Enterprise Fund. The bank or
- 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 sensitize 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.*

3.25. 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

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

3.27. Number of Sets of and Tender Formats

- 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 subparagraphs, 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 -

- a) *Shall be quantified to the extent possible,*
- b) *Shall be taken into account in the evaluation process, and,*
- c) *Shall be applied uniformly and consistently to all qualified Tenders duly received by KPLC.*

3.37. Technical Evaluation and Comparison of Tenders

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

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 -

- a) *The funding is one hundred percent (100%) from the Government of Kenya or a Kenyan body, and,*
- b) *The amount of the tender as evaluated is below;*
 - i. *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.*
 - ii. *Ksh. 500 Million in respect of other works*
 - iii. *Ksh. 100 Million in respect of goods.*
 - iv. *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

3.40.1 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 whose Tender has been determined to be substantially responsive, compliant with the evaluation criteria and has been determined to be the lowest evaluated tender, and further, where deemed necessary, that the Tenderer is confirmed to be qualified to perform the contract satisfactorily.
- 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 Tenderers**
- 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) *Finalizing payment arrangements*
- e) *Mobilization 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. Signing of Contract

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 it's 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 anything 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.

3.49. 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;*
- c) *Directly or indirectly fixing purchase or selling prices or any other trading conditions, and/or*
- d) *Collusive tendering.*

4. SECTION IV – BID DATA SHEET

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.

ITT Reference Clause	Particulars of Appendix
3.2 Eligible Tenderers	This tender is open to locally registered companies only.
3.6 Time for Completion of Works	Time for completion is Seventy (70) calendar days.
3.10 Site Visit and Pre-Bid Meeting	<i>There shall be a pre-bid meeting on 7th October 2016 at 8.30 a.m at Stima Plaza. Site visit shall be held on the same day as from 10.00am.</i>
3.11. Cost of Tendering	<i>Delete Section 3.11.2.</i>
3.16– List of Previous Customers	<i>Bidders shall submit three names of customers with similar works.</i>
3.17 Tender Form	<i>The validity of the tender shall be 120 days from the date of the tender opening.</i>
3.20 Documents of evidence of eligibility and qualification	<i>(a) Confidential Business questionnaire, copy of VAT (b) Registration Certificate, Copy of PIN Registration certificate, KRA Tax Compliance certificate, (c) Audited Financial Statements (d) Turnover (e) 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 obligations prescribed in the Conditions of Contract.</i>

ITT Reference Clause	Particulars of Appendix
<p>3.21.3 (a) Catalogues, Brochures, Manufacturer's/ Principal's Drawings</p>	<p>(f) Particular Experience record of the tenderer (g) Details of Contracts of a similar nature and complexity (h) Contractor's Equipment (i) Key Personnel capabilities (j) CVs of Key Personnel (k) Proposed Work Plan and Methodology (l) Contractor's and supplier's quality assurance Details (m) Manufacturer's Authorization for Plant and Equipment to be supplied. (n) Tender Questionnaire (o) Manufacturer's Warranty for Plant and Equipment to be supplied. (p) Completed declaration form (q) Completed site visit form a) Duly completed Guaranteed Technical Particulars b) Catalogues , brochures and or drawings.</p>
<p>3.22.4 Demonstration and/or Inspection and/or Test Report(s)</p>	<p>Type Reports for the fiber optic cables, hardware and fittings and other items of plant to be supplied.</p>
<p>3.23.3 Warranty/Warranty Period</p>	<p>Warranty period shall be one year after installation and commissioning.</p>
<p>3.24.1 Tender Security</p>	<p>Tender security shall be 2% of the tender value.</p>
<p>3.25 Validity of Tenders</p>	<p>Validity shall be 120 days from the date of the opening.</p>

5. SECTION V – SCHEDULE OF REQUIREMENTS

5.1. Scope of Supply

For Schedule of Requirements, Bidders should take note that these are detailed in *Volume 2* of the Tender Documents.

5.2. Delivery Requirements

All unused equipment and materials shall be delivered KPLC stores or as otherwise indicated in accordance with the Delivery Schedule.

All equipment delivered shall be marked “property of KPLC” before delivery. The marking shall be ‘engraved’ appropriately on the equipment so as to be visible clearly to anybody handling the equipment.

KPLC reserves the right to inspect the equipment at the source before shipment.

6. SECTION VI- PRICE SCHEDULE

Price Schedule							
Schedule No. 1. Plant and Mandatory Spare Parts Supplied from Abroad							
Schedule No. 1.1: Lot 1-Ruaka							
Item (1)	Description (2)	Unit (3)	Qty (4)	Manufacturer (5)	Code ⁽¹⁾ (6)	Unit Price ⁽²⁾	Total Price ⁽²⁾
						CIP Site (7)	(4) x (7)
1LT01-100	FIBER OPTIC CABLES						
1LT01-101	144 Core ADSS Aerial Fiber Optic Cable	km	4.325				0.00
1LT01-102	96 Core ADSS Aerial Fiber Optic Cable	km	9.427				0.00
1LT01-103	48 Core ADSS Aerial Fiber Optic Cable	km	6.864				0.00
1LT01-104	12 Core ADSS Aerial Fiber Optic Cable	km	0.000				0.00
1LT01-105	144 Core underground armoured Fiber Optic Cable	km	0.200				0.00
	Subtotal						0.00
1LT01-200	POLES, FITTINGS AND ACCESSORIES						
1LT01-201	Suspension Assembly Fittings (12-144 core cable)	pcs	180				0.00
1LT01-202	Tension Assembly Fittings (12- 144 core Cable)	pcs	990				0.00
1LT01-203	Pole Fastening Clamp	pcs	1,170				0.00
1LT01-204	Downlead Clamps	pcs	622				0.00
1LT01-205	Transformer Bypass Arms	No	24				0.00
1LT01-206	Terminal Wall/Building Mount Clamps	No	283				0.00
1LT01-207	Stockbridge Vibration Dampers	No	2				0.00
	Subtotal						0.00
1LT01-300	FDTs, ENCLOSURES AND ACCESSORIES						
1LT01-301	Fiber Distribution Points (FDPs)	No	94				0.00
1LT01-302	Splice /Joint Enclosures (144 Core)	No	31				0.00
1LT01-303	Splice /Joint Enclosures (96 Core)	No	117				0.00
1LT01-304	Splice /Joint Enclosures (48 Core)	No	0				0.00
1LT01-305	Connectors	Lot	1				0.00
1LT01-306	Optical Distribution Frame (ODF)	No	2				0.00
1LT01-307	Mounting Clamps and Connectors for FDPs and Splice/Joint Enclosures	Lot	1				0.00
1LT01-308	Mounting for FDPs	No	94				0.00
1LT01-309	Cable Storage Structures and connecting accessories (96/144 core)	No	215				0.00
1LT01-310	Cable Storage Structures and connecting accessories (12/48 core)	No	0				0.00
1LT01-311	Modular Fiber Access Terminal - upto 96 core	No	283				0.00
1LT01-312	Earthing,ODFs,FDPs and Splice/Joint Enclosures	No	527				0.00
	Subtotal						0.00

Price Schedule Schedule No. 1. Plant and Mandatory Spare Parts Supplied from Abroad Schedule No. 1.1: Lot 1-Ruaka							
Item (1)	Description (2)	Unit (3)	Qty (4)	Manufacturer (5)	Code ⁽¹⁾ (6)	Unit Price ⁽²⁾	Total Price ⁽²⁾
						CIP Site (7)	(4) x (7)
1LT01-400	DUCTING, UNDERGROUND INSTALLATION ACCESSORIES						
1LT01-401	50mm diameter PLB HDPE Pipe	pcs	40				0.00
1LT01-402	KPLC Printed Trench Warning Tape	roll	1				0.00
1LT01-403	Cable Guard complete with connecting clamps for wooden and concrete poles	Lot	1				0.00
	Subtotal						0.00
1LT01-500	MANDATORY TOOLS AND SPARE PARTS						
1LT01-501	Splicing Kit as specified	pcs	1				0.00
1LT01-502	Fault Locator as specified	pcs	1				0.00
1LT01-503	Termination Kit as specified	pcs	1				0.00
1LT01-504	Splice /Joint Enclosures (144 Core)	pcs	10				0.00
1LT01-505	Splice /Joint Enclosures (96 Core)	pcs	10				0.00
1LT01-506	Splice /Joint Enclosures (48 Core)	pcs	10				0.00
1LT01-507	Complete Suspension fitting for 12-144 Core ADSS Cable	pcs	20				0.00
1LT01-508	Complete Tension fitting for 12-144 Core ADSS Cable	pcs	20				0.00
1LT01-509	Transformer bypass arms	pcs	20				0.00
1LT01-510	Downlead Clamps	pcs	60				0.00
1LT01-511	Cable Storage Assembly (12-96 Core cable)	pcs	10				0.00
1LT01-512	Cable Storage Assembly (144 Core cable)	pcs	10				0.00
1LT01-513	Modular Access Terminal Boxes (ATB) - upto 96 core	pcs	20				0.00
1LT01-514	Connectors of each type used	pcs	20				0.00
1LT01-515	Terminal Wall/Building Mount Clamps	pcs	20				0.00
1LT01-516	Vibration Dampers	pcs	10				0.00
	Subtotal						0.00
	Schedule 1.1 Lot 1 total (to Schedule 1 Summary)						0.00

Price Schedule							
Schedule No. 1. Plant and Mandatory Spare Parts Supplied from Abroad							
Schedule No. 1.2: Lot 2-Muthithi Gardens							
Item (1)	Description (2)	Unit (3)	Qty (4)	Manufacturer (5)	Code ⁽¹⁾ (6)	Unit Price ⁽²⁾	Total Price ⁽²⁾
						CIP Site (7)	(4) x (7)
1LT02-100	FIBER OPTIC CABLES						
1LT02-101	144 Core ADSS Aerial Fiber Optic Cable	km	0.000				0.00
1LT02-102	96 Core ADSS Aerial Fiber Optic Cable	km	2.860				0.00
1LT02-103	48 Core ADSS Aerial Fiber Optic Cable	km	5.390				0.00
1LT02-104	12 Core ADSS Aerial Fiber Optic Cable	km	9.460				0.00
1LT02-105	96 Core underground armoured Fiber Optic Cable	km	0.100				0.00
	Subtotal						0.00
1LT02-200	POLES, FITTINGS AND ACCESSORIES						
1LT02-201	Suspension Assembly Fittings (12-144 core cable)	pcs	104				0.00
1LT02-202	Tension Assembly Fittings (12- 144 core Cable)	pcs	661				0.00
1LT02-203	Pole Fastening Clamp	pcs	765				0.00
1LT02-204	Downlead Clamps	pcs	338				0.00
1LT02-205	Transformer Bypass Arms	No	20				0.00
1LT02-206	Terminal Wall/Building Mount Clamps	No	173				0.00
1LT02-207	Stockbridge Vibration Dampers	No	2				0.00
	Subtotal						0.00
1LT02-300	FDTs, ENCLOSURES AND ACCESSORIES						
1LT02-301	Fiber Distribution Points (FDPs)	No	4				0.00
1LT02-302	Splice /Joint Enclosures (144 Core)	No	0				0.00
1LT02-303	Splice /Joint Enclosures (96 Core)	No	11				0.00
1LT02-304	Splice /Joint Enclosures (48 Core)	No	64				0.00
1LT02-305	Connectors	Lot	1				0.00
1LT02-306	Optical Distribution Frame (ODF)	No	1				0.00
1LT02-307	Mounting Clamps and Connectors for FDPs and Splice/Joint Enclosures	Lot	1				0.00
1LT02-308	Mounting for FDPs	No	4				0.00
1LT02-309	Cable Storage Structures and connecting accessories (96/144 core)	No	15				0.00
1LT02-310	Cable Storage Structures and connecting accessories (12/48 core)	No	64				0.00
1LT02-311	Modular Fiber Access Terminal- upto 6 core	No	160				0.00
1LT02-312	Modular Fiber Access Terminal - upto 96 core	No	13				0.00
1LT02-313	Earthing for FDTs and Splice/Joint Enclosures	No	252				0.00

Price Schedule Schedule No. 1. Plant and Mandatory Spare Parts Supplied from Abroad Schedule No. 1.2: Lot 2-Muthithi Gardens							
Item (1)	Description (2)	Unit (3)	Qty (4)	Manufacturer (5)	Code ⁽¹⁾ (6)	Unit Price ⁽²⁾	Total Price ⁽²⁾
						CIP Site (7)	(4) x (7)
	Subtotal						0.00
1LT02-400	DUCTING, UNDERGROUND INSTALLATION ACCESSORIES						
1LT02-401	50mm diameter PLB HDPE Pipe	pcs	10				0.00
1LT02-402	KPLC printed trench warning tape	roll	1				
1LT02-402	Cable Guard complete with connecting clamps for wooden and concrete poles	Lot	1				0.00
	Subtotal						0.00
1LT02-500	MANDATORY TOOLS AND SPARE PARTS						
1LT02-501	Splicing Kit as specified	pcs	0				0.00
1LT02-502	Fault Locator as specified	pcs	0				0.00
1LT02-503	Termination Kit as specified	pcs	0				0.00
1LT02-504	Splice /Joint Enclosures (144 Core)	pcs	10				0.00
1LT02-505	Splice /Joint Enclosures (96 Core)	pcs	10				0.00
1LT02-506	Splice /Joint Enclosures (48 Core)	pcs	10				0.00
1LT02-507	Complete Suspension fitting for 12-144 Core ADSS Cable	pcs	20				0.00
1LT02-508	Complete Tension fitting for 12-144 Core ADSS Cable	pcs	20				0.00
1LT02-509	Transformer bypass arms	pcs	20				0.00
1LT02-510	Downlead Clamps	pcs	60				0.00
1LT02-511	Cable Storage Assembly (12-96 Core cable)	pcs	10				0.00
1LT02-512	Cable Storage Assembly (144 Core cable)	pcs	10				0.00
1LT02-513	Connectors of each type used	pcs	20				0.00
1LT02-514	Terminal Wall/Building Mount Clamps	pcs	20				0.00
1LT02-515	Vibration Dampers	pcs	10				0.00
	Subtotal						0.00
	Schedule 1.2 Lot 2 total (to Schedule 1 Summary)						0.00

Price Schedule Schedule No. 1. Plant and Mandatory Spare Parts Supplied from Abroad Schedule No. 1.3: Lot 3-Ridgeways and North Muthaiga							
Item (1)	Description (2)	Unit (3)	Qty (4)	Manufacturer (5)	Code ⁽¹⁾ (6)	Unit Price ⁽²⁾	Total Price ⁽²⁾
						CIP Site (7)	(4) x (7)
1LT03-100	FIBER OPTIC CABLES						
1LT03-101	144 Core ADSS Aerial Fiber Optic Cable	km	0.000				0.00
1LT03-102	96 Core ADSS Aerial Fiber Optic Cable	km	4.730				0.00
1LT03-103	48 Core ADSS Aerial Fiber Optic Cable	km	4.950				0.00
1LT03-104	12 Core ADSS Aerial Fiber Optic Cable	km	8.470				0.00
1LT03-105	96 Core underground armoured Fiber Optic Cable	km	0.100				0.00
	Subtotal						0.00
1LT03-200	POLES, FITTINGS AND ACCESSORIES						
1LT03-201	Suspension Assembly Fittings (12-144 core cable)	pcs	95				0.00
1LT03-202	Tension Assembly Fittings (12- 144 core Cable)	pcs	740				0.00
1LT03-203	Pole Fastening Clamp	pcs	497				0.00
1LT03-204	Downlead Clamps	pcs	426				0.00
1LT03-205	Transformer Bypass Arms	No	20				0.00
1LT03-206	Terminal Wall/Building Mount Clamps	No	183				0.00
1LT03-207	Stockbridge Vibration Dampers	No	4				0.00
	Subtotal						0.00
1LT03-300	FDTs, ENCLOSURES AND ACCESSORIES						
1LT03-301	Fiber Distribution Terminals	No	4				0.00
1LT03-302	Splice /Joint Enclosures (144 Core)	No	0				0.00
1LT03-303	Splice /Joint Enclosures (96 Core)	No	41				0.00
1LT03-304	Splice /Joint Enclosures (48 Core)	No	62				0.00
1LT03-305	Connectors	Lot	1				0.00
1LT03-306	Optical Distribution Frame (ODF)	No	1				0.00
1LT03-307	Mounting Clamps and Connectors for FDTs and Splice/Joint Enclosures	Lot	1				0.00
1LT03-308	Mountng for FDPs	No	4				0.00
1LT03-309	Cable Storage Structures and connecting accessories (96/144 core)	No	45				0.00
1LT03-310	Cable Storage Structures and connecting accessories (12/48 core)	No	62				0.00
1LT03-311	Modular Fiber Access Terminal(FAT) - upto 6 core	No	170				0.00
1LT03-312	Modular Fiber Access Terminal(FAT) - upto 96 core	No	13				0.00
1LT03-313	Earthing for FDPs, ATBs and Splice/Joint Enclosures	No	290				0.00

Price Schedule Schedule No. 1. Plant and Mandatory Spare Parts Supplied from Abroad Schedule No. 1.3: Lot 3-Ridgeways and North Muthaiga							
Item (1)	Description (2)	Unit (3)	Qty (4)	Manufacturer (5)	Code ⁽¹⁾ (6)	Unit Price ⁽²⁾	Total Price ⁽²⁾
						CIP Site (7)	(4) x (7)
	Subtotal						0.00
1LT03-400	DUCTING, UNDERGROUND INSTALLATION ACCESSORIES						
1LT03-401	50mm diameter PLB HDPE Pipe	pcs	30				0.00
1LT03-402	KPLC printed trench tape	pcs	0				0.00
1LT03-403	Cable Guard complete with connecting clamps for wooden and concrete poles	Lot	1				0.00
	Subtotal						0.00
1LT03-500	MANDATORY TOOLS AND SPARE PARTS						
1LT03-501	Splicing Kit as specified	pcs	0				0.00
1LT03-502	Fault Locator as specified	pcs	0				0.00
1LT03-503	Termination Kit as specified	pcs	0				0.00
1LT03-504	Splice /Joint Enclosures (144 Core)	pcs	10				0.00
1LT03-505	Splice /Joint Enclosures (96 Core)	pcs	10				0.00
1LT03-506	Splice /Joint Enclosures (48 Core)	pcs	10				0.00
1LT03-507	Complete Suspension fitting for 12-144 Core ADSS Cable	pcs	20				0.00
1LT03-508	Complete Tension fitting for 12-144 Core ADSS Cable	pcs	20				0.00
1LT03-509	Transformer bypass arms	pcs	20				0.00
1LT03-510	Downlead Clamps	pcs	60				0.00
1LT03-511	Cable Storage Assembly (12-96 Core cable)	pcs	10				0.00
1LT03-512	Cable Storage Assembly (144 Core cable)	pcs	10				0.00
1LT03-513	Connectors of each type used	pcs	20				0.00
1LT03-514	Terminal Wall/Building Mount Clamps	pcs	20				0.00
1LT03-515	Vibration Dampers	pcs	10				0.00
	Subtotal						0.00
	Schedule 1.3 Lot 3 total (to Schedule 1 Summary)						0.00

Price Schedule

Schedule No. 1. Plant and Mandatory Spare Parts Supplied from Abroad

Grand Total - Schedule No. 1

Schedule 1	Description 2	Total Price ⁽²⁾ 3
Schedule No.1.1: Lot 1 - Ruaka	Lot 1 - Plant, Equipment and Mandatory Spare Parts Supplied from Abroad	0.00
Schedule No.1.2: Lot 2- Muthithi	Lot 2- Plant, Equipment and Mandatory Spare Parts Supplied from Abroad	0.00
Schedule No.1.3: Lot 3 - Ridgeways /Muthaiga North	Lot 3 - Plant, Equipment and Mandatory Spare Parts Supplied from Abroad	0.00
GRAND TOTAL SCHEDULE NO. 1 - Equipment Supplied from Abroad (to Schedule No. 5: Grand Summary)		0.00

² Specify currency. Create and use as many columns for Unit Price and Total Price as there are currencies

Price Schedule

Schedule No. 2. Plant and Mandatory Spare Parts Supplied from Employers country

Schedule No. 2.1 Lot 1: - Ruaka

Item (1)	Description (2)	Unit (3)	Qty (4)	Manufacturer (5)	Code ⁽¹⁾ (6)	Unit Price ⁽²⁾	Total Price ⁽²⁾
						CIP Site (7)	(4) x (7)
	Schedule 2.1 Lot 2 total (to Schedule 2 Summary)						

Price Schedule

Schedule No. 2. Plant and Mandatory Spare Parts Supplied from Employers country

Schedule No. 2.3 Lot 3: - Ridgeways/North Muthaiga

Item (1)	Description (2)	Unit (3)	Qty (4)	Manufacturer (5)	Code ⁽¹⁾ (6)	Unit Price ⁽²⁾	Total Price ⁽²⁾
						CIP Site (7)	(4) x (7)
	Schedule 2.4 Lot 2 total (to Schedule 2 Summary)						

<p align="center">Price Schedule</p> <p align="center">Schedule No. 2. Plant and Mandatory Spare Parts Supplied from Within the Employer's Country</p> <p align="center">Grand Total - Schedule No. 2</p>		
<p align="center">Schedule 1</p>	<p align="center">Description 2</p>	<p align="center">Total Price (1)</p>
		<p align="center">Local Currency 3</p>
Schedule No. 2.1: Lot 1 - Ruaka	Lot 1 Plant, Equipment and Mandatory Spare Parts Supplied from Within the Employer's Country	0.00
Schedule No.2.2: Lot 2 - Muthithi	Lot 2 Plant, Equipment and Mandatory Spare Parts Supplied from Within the Employer's Country	0.00
Schedule No.2.3: Lot 3 - Ridgeways and Muthaiga North	Lot 4 Plant, Equipment and Mandatory Spare Parts Supplied from Within the Employer's Country	0.00
<p>GRAND TOTAL SCHEDULE NO. 2 : - Equipment Supplied from Within the Employer's Country (to Schedule No. 5: Grand Summary)</p>		<p>0.00</p>

**Price Schedule
Schedule No. 3: Design Services
Design Services for Lots all Lots**

Item 1	Description 2	Unit 3	Qty 4	Unit Price ⁽¹⁾		Total Price ⁽¹⁾	
				Foreign Currency Portion 5	Local Currency Portion (Optional) 6	Foreign Currency Portion (4) X (5)	Local Currency Portion (Optional) (4) X (6)
3ALT-100	SURVEY AND PROFILING						
3ALT-101	Cost of Survey and detailed design for Lot 1- Ruaka	km				0.00	0.00
3ALT-102	Cost of survey and detailed design for Lot 2- Muthithi	km				0.00	0.00
3ALT-103	Cost of survey and detailed design for Lot 3- Ridgeways/Muthaiga North	km				0.00	0.00
	TOTAL SCHEDULE NO. 3 (to Schedule No. 5: Grand Summary)					0.00	0.00

¹ Specify currency

Price Schedule Schedule No. 4. Installation and Other Services Schedule No. 4.1: Lot 1-Ruaka							
Item (1)	Description (2)	Unit (3)	Qty (4)	Manufacturer (5)	Code ⁽¹⁾ (6)	Unit Price ⁽²⁾	Total Price ⁽²⁾
						CIP Site (7)	(4) x (7)
1LT01-100	FIBER OPTIC CABLES						
1LT01-101	144 Core ADSS Aerial Fiber Optic Cable	km	4.325				0.00
1LT01-102	96 Core ADSS Aerial Fiber Optic Cable	km	9.427				0.00
1LT01-103	48 Core ADSS Aerial Fiber Optic Cable	km	6.864				0.00
1LT01-104	12 Core ADSS Aerial Fiber Optic Cable	km	0.000				0.00
1LT01-105	144 Core underground armoured Fiber Optic Cable	km	0.200				0.00
	Subtotal						0.00
1LT01-200	POLES, FITTINGS AND ACCESSORIES						
1LT01-201	Suspension Assembly Fittings (12-144 core cable)	pcs	180				0.00
1LT01-202	Tension Assembly Fittings (12- 144 core Cable)	pcs	990				0.00
1LT01-203	Pole Fastening Clamp	pcs	1,170				0.00
1LT01-204	Downlead Clamps	pcs	622				0.00
1LT01-205	Transformer Bypass Arms	No	24				0.00
1LT01-206	Terminal Wall/Building Mount Clamps	No	283				0.00
1LT01-207	Stockbridge Vibration Dampers	No	2				0.00
	Subtotal						0.00
1LT01-300	FDTs, ENCLOSURES AND ACCESSORIES						
1LT01-301	Fiber Distribution Points (FDPs)	No	94				0.00
1LT01-302	Splice /Joint Enclosures (144 Core)	No	31				0.00
1LT01-303	Splice /Joint Enclosures (96 Core)	No	117				0.00
1LT01-304	Splice /Joint Enclosures (48 Core)	No	0				0.00
1LT01-305	Connectors	Lot	1				0.00
1LT01-306	Optical Distribution Frame (ODF)	No	2				0.00
1LT01-307	Mounting Clamps and Connectors for FDPs and Splice/Joint Enclosures	Lot	1				0.00
1LT01-308	Mounting for FDPs	No	94				0.00
1LT01-309	Cable Storage Structures and connecting accessories (96/144 core)	No	215				0.00
1LT01-310	Cable Storage Structures and connecting accessories (12/48 core)	No	0				0.00
1LT01-311	Modular Fiber Access Terminal (FAT) - upto 96 core	No	283				
1LT01-312	Earthing,ODFs,FDPs and Splice/Joint Enclosures	No	527				0.00
	Subtotal						0.00

Price Schedule Schedule No. 4. Installation and Other Services Schedule No. 4.1: Lot 1-Ruaka							
Item (1)	Description (2)	Unit (3)	Qty (4)	Manufacturer (5)	Code ⁽¹⁾ (6)	Unit Price ⁽²⁾	Total Price ⁽²⁾
						CIP Site (7)	(4) x (7)
1LT01-400	DUCTING, UNDERGROUND INSTALLATION ACCESSORIES						
1LT01-401	50mm diameter PLB HDPE Pipe	pcs	40				0.00
1LT01-402	KPLC Printed Trench Warning Tape	roll	1				0.00
1LT01-403	Cable Guard complete with connecting clamps for wooden and concrete poles	Lot	1				0.00
	Subtotal						0.00
1LT01-500	MANDATORY TOOLS AND SPARE PARTS						
1LT01-501	Splicing Kit as specified	pcs	1				0.00
1LT01-502	Fault Locator as specified	pcs	1				0.00
1LT01-503	Termination Kit as specified	pcs	1				0.00
1LT01-504	Splice /Joint Enclosures (144 Core)	pcs	10				0.00
1LT01-505	Splice /Joint Enclosures (96 Core)	pcs	10				0.00
1LT01-506	Splice /Joint Enclosures (48 Core)	pcs	10				0.00
1LT01-507	Complete Suspension fitting for 12-144 Core ADSS Cable	pcs	20				0.00
1LT01-508	Complete Tension fitting for 12-144 Core ADSS Cable	pcs	20				0.00
1LT01-509	Transformer bypass arms	pcs	20				0.00
1LT01-510	Downlead Clamps	pcs	60				0.00
1LT01-511	Cable Storage Assembly (12-96 Core cable)	pcs	10				0.00
1LT01-512	Cable Storage Assembly (144 Core cable)	pcs	10				0.00
1LT01-513	Modular Access Terminal Boxes (ATB) - upto 96 core	pcs	20				0.00
1LT01-514	Connectors of each type used	pcs	20				0.00
1LT01-515	Terminal Wall/Building Mount Clamps	pcs	20				0.00
1LT01-516	Vibration Dampers	pcs	10				0.00
	Subtotal						0.00
	Schedule 4.1 Lot 1 total (to Schedule 1 Summary)						0.00

<p align="center">Price Schedule Schedule No. 4. Installation and Other Services Schedule No. 4.2: Lot 4-Muthithi Gardens</p>							
Item (1)	Description (2)	Unit (3)	Qty (4)	Manufacturer (5)	Code ⁽¹⁾ (6)	Unit Price ⁽²⁾	Total Price ⁽²⁾
						CIP Site (7)	(4) x (7)
1LT02-100	FIBER OPTIC CABLES						
1LT02-101	144 Core ADSS Aerial Fiber Optic Cable	km	0.000				0.00
1LT02-102	96 Core ADSS Aerial Fiber Optic Cable	km	2.860				0.00
1LT02-103	48 Core ADSS Aerial Fiber Optic Cable	km	5.390				0.00
1LT02-104	12 Core ADSS Aerial Fiber Optic Cable	km	9.460				0.00
1LT02-105	96 Core underground armoured Fiber Optic Cable	km	0.100				0.00
	Subtotal						0.00
1LT02-200	POLES, FITTINGS AND ACCESSORIES						
1LT02-201	Suspension Assembly Fittings (12-144 core cable)	pcs	104				0.00
1LT02-202	Tension Assembly Fittings (12- 144 core Cable)	pcs	661				0.00
1LT02-203	Pole Fastening Clamp	pcs	765				0.00
1LT02-204	Downlead Clamps	pcs	338				0.00
1LT02-205	Transformer Bypass Arms	No	20				0.00
1LT02-206	Terminal Wall/Building Mount Clamps	No	173				0.00
1LT02-207	Stockbridge Vibration Dampers	No	2				0.00
	Subtotal						0.00
1LT02-300	FDTs, ENCLOSURES AND ACCESSORIES						
1LT02-301	Fiber Distribution Points (FDPs)	No	4				0.00
1LT02-302	Splice /Joint Enclosures (144 Core)	No	0				0.00
1LT02-303	Splice /Joint Enclosures (96 Core)	No	11				0.00
1LT02-304	Splice /Joint Enclosures (48 Core)	No	64				0.00
1LT02-305	Connectors	Lot	1				0.00
1LT02-306	Optical Distribution Frame (ODF)	No	1				0.00
1LT02-307	Mounting Clamps and Connectors for FDPs and Splice/Joint Enclosures	Lot	1				0.00
1LT02-308	Mounting for FDPs	No	4				0.00
1LT02-309	Cable Storage Structures and connecting accessories (96/144 core)	No	15				0.00
1LT02-310	Cable Storage Structures and connecting accessories (12/48 core)	No	64				0.00
1LT02-311	Modular Fiber Access Terminal (FAT) - upto 6 core	No	160				0.00
1LT02-312	Modular Fiber Access Terminal (FAT) - upto 96 core	No	13				0.00
1LT02-313	Earthing for FDTs and Splice/Joint Enclosures	No	252				0.00

Price Schedule Schedule No. 4. Installation and Other Services Schedule No. 4.2: Lot 4-Muthithi Gardens							
Item (1)	Description (2)	Unit (3)	Qty (4)	Manufacturer (5)	Code ⁽¹⁾ (6)	Unit Price ⁽²⁾	Total Price ⁽²⁾
						CIP Site (7)	(4) x (7)
	Subtotal						0.00
1LT02-400	DUCTING, UNDERGROUND INSTALLATION ACCESSORIES						
1LT02-401	50mm diameter PLB HDPE Pipe	pcs	10				0.00
1LT02-402	KPLC printed trench warning tape	roll	1				
1LT02-402	Cable Guard complete with connecting clamps for wooden and concrete poles	Lot	1				0.00
	Subtotal						0.00
1LT02-500	MANDATORY TOOLS AND SPARE PARTS						
1LT02-501	Splicing Kit as specified	pcs	0				0.00
1LT02-502	Fault Locator as specified	pcs	0				0.00
1LT02-503	Termination Kit as specified	pcs	0				0.00
1LT02-504	Splice /Joint Enclosures (144 Core)	pcs	10				0.00
1LT02-505	Splice /Joint Enclosures (96 Core)	pcs	10				0.00
1LT02-506	Splice /Joint Enclosures (48 Core)	pcs	10				0.00
1LT02-507	Complete Suspension fitting for 12-144 Core ADSS Cable	pcs	20				0.00
1LT02-508	Complete Tension fitting for 12-144 Core ADSS Cable	pcs	20				0.00
1LT02-509	Transformer bypass arms	pcs	20				0.00
1LT02-510	Downlead Clamps	pcs	60				0.00
1LT02-511	Cable Storage Assembly (12-96 Core cable)	pcs	10				0.00
1LT02-512	Cable Storage Assembly (144 Core cable)	pcs	10				0.00
1LT02-513	Connectors of each type used	pcs	20				0.00
1LT02-514	Terminal Wall/Building Mount Clamps	pcs	20				0.00
1LT02-515	Vibration Dampers	pcs	10				0.00
	Subtotal						0.00
	Schedule 4.2 Lot 4 total (to Schedule 1 Summary)						0.00

Price Schedule Schedule No. 4. Installation and Other Services Schedule No. 4.3: Lot 3-Ridgeways and North Muthaiga							
Item (1)	Description (2)	Unit (3)	Qty (4)	Manufacturer (5)	Code ⁽¹⁾ (6)	Unit Price ⁽²⁾	Total Price ⁽²⁾
						CIP Site (7)	(4) x (7)
1LT03-100	FIBER OPTIC CABLES						
1LT03-101	144 Core ADSS Aerial Fiber Optic Cable	km	0.000				0.00
1LT03-102	96 Core ADSS Aerial Fiber Optic Cable	km	4.730				0.00
1LT03-103	48 Core ADSS Aerial Fiber Optic Cable	km	4.950				0.00
1LT03-104	12 Core ADSS Aerial Fiber Optic Cable	km	8.470				0.00
1LT03-105	96 Core underground armoured Fiber Optic Cable	km	0.100				0.00
	Subtotal						0.00
1LT03-200	POLES, FITTINGS AND ACCESSORIES						
1LT03-201	Suspension Assembly Fittings (12-144 core cable)	pcs	95				0.00
1LT03-202	Tension Assembly Fittings (12- 144 core Cable)	pcs	740				0.00
1LT03-203	Pole Fastening Clamp	pcs	497				0.00
1LT03-204	Downlead Clamps	pcs	426				0.00
1LT03-205	Transformer Bypass Arms	No	20				0.00
1LT03-206	Terminal Wall/Building Mount Clamps	No	183				0.00
1LT03-207	Stockbridge Vibration Dampers	No	4				0.00
	Subtotal						0.00
1LT03-300	FDTs, ENCLOSURES AND ACCESSORIES						
1LT03-301	Fiber Distribution Terminals	No	4				0.00
1LT03-302	Splice /Joint Enclosures (144 Core)	No	0				0.00
1LT03-303	Splice /Joint Enclosures (96 Core)	No	41				0.00
1LT03-304	Splice /Joint Enclosures (48 Core)	No	62				0.00
1LT03-305	Connectors	Lot	1				0.00
1LT03-306	Optical Distribution Frame (ODF)	No	1				0.00
1LT03-307	Mounting Clamps and Connectors for FDTs and Splice/Joint Enclosures	Lot	1				0.00
1LT03-308	Mountng for FDPs	No	4				0.00
1LT03-309	Cable Storage Structures and connecting accessories (96/144 core)	No	45				0.00
1LT03-310	Cable Storage Structures and connecting accessories (12/48 core)	No	62				0.00
1LT03-311	Modular Fiber Access Terminal (FAT) - upto 6 core	No	170				0.00
1LT03-312	Modular Fiber Access Terminal (FAT) - upto 96 core	No	13				0.00
1LT03-313	Earthing for FDPs, ATBs and Splice/Joint Enclosures	No	290				0.00

Price Schedule Schedule No. 4. Installation and Other Services Schedule No. 4.3: Lot 3-Ridgeways and North Muthaiga							
Item (1)	Description (2)	Unit (3)	Qty (4)	Manufacturer (5)	Code ⁽¹⁾ (6)	Unit Price ⁽²⁾	Total Price ⁽²⁾
						CIP Site (7)	(4) x (7)
	Subtotal						0.00
1LT03-400	DUCTING, UNDERGROUND INSTALLATION ACCESSORIES						
1LT03-401	50mm diameter PLB HDPE Pipe	pcs	30				0.00
1LT03-402	KPLC printed trench tape	pcs	0				0.00
1LT03-403	Cable Guard complete with connecting clamps for wooden and concrete poles	Lot	1				0.00
	Subtotal						0.00
1LT03-500	MANDATORY TOOLS AND SPARE PARTS						
1LT03-501	Splicing Kit as specified	pcs	0				0.00
1LT03-502	Fault Locator as specified	pcs	0				0.00
1LT03-503	Termination Kit as specified	pcs	0				0.00
1LT03-504	Splice /Joint Enclosures (144 Core)	pcs	10				0.00
1LT03-505	Splice /Joint Enclosures (96 Core)	pcs	10				0.00
1LT03-506	Splice /Joint Enclosures (48 Core)	pcs	10				0.00
1LT03-507	Complete Suspension fitting for 12-144 Core ADSS Cable	pcs	20				0.00
1LT03-508	Complete Tension fitting for 12-144 Core ADSS Cable	pcs	20				0.00
1LT03-509	Transformer bypass arms	pcs	20				0.00
1LT03-510	Downlead Clamps	pcs	60				0.00
1LT03-511	Cable Storage Assembly (12-96 Core cable)	pcs	10				0.00
1LT03-512	Cable Storage Assembly (144 Core cable)	pcs	10				0.00
1LT03-513	Connectors of each type used	pcs	20				0.00
1LT03-514	Terminal Wall/Building Mount Clamps	pcs	20				0.00
1LT03-515	Vibration Dampers	pcs	10				0.00
	Subtotal						0.00
	Schedule 4.3 Lot 3 total (to Schedule 1 Summary)						0.00

Price Schedule Schedule No. 4: Installation and Other Services Schedule No. 4.4 Lot 4-Other Services							
Item (1)	Description (2)	Unit (3)	Qty (4)	Unit Price ⁽¹⁾		Total Price ⁽¹⁾	
				Local Currency 5	Foreign Currency 6	Local Currency (4) X (5)	Foreign Currency (4) X (6)
4LT05-100	PRELIMINARIES AND GENERAL						
	Preliminaries						
4LT05-101	Site office complete with furniture as specified	Lumpsum	1			0.00	0.00
4LT05-102	Cost of Employer's ommunication (as specified)	Lumpsum	1			0.00	0.00
4LT05-103	Cost of EHS Compliance	Lumpsum	1			0.00	0.00
4LT05-104	Cost of Engineer's Transport as specified	Lumpsum	1			0.00	0.00
	Subtotal					0.00	0.00
	Factory Acceptance Testing						
4LT05-104	ADSS Cable and Fittings	Lumpsum	1			0.00	0.00
	Subtotal					0.00	0.00
	Operations & Maintenance Training						
4LT05-105	Training as specified	Lumpsum				0.00	0.00
	Subtotal					0.00	0.00
	Total transferred to Schedule 4 Summary					0.00	0.00

Price Schedule
Schedule No. 4: Installation and Other Services
Grand Total - Schedule No. 4

Schedule 1	Description 2	Total Price (1)	
		Foreign Currency 3	Local Currency 4
Schedule No. 4.1: Lot 1	Installation and Other Services - Ruaka		0.00
Schedule No. 4.2: Lot 2	Installation and Other Services - Muthithi		0.00
Schedule No. 4.3: Lot 3	Installation and Other Services - Ridgeways and Muthaiga North		0.00
Schedule No. 4.4: Others	Other Services		0.00
GRAND TOTAL : Installation and Other Services (to Schedule No. 5: Grand Summary)			0.00

Price Schedule
Schedule No. 5. :Grand Summary

Schedule 1	Description 2	Total Price ⁽¹⁾	
		Foreign Currency Portion	Local Currency Portion
1	Total Schedule No. 1: Plant and Mandatory Spare Parts Supplied from Abroad	0.00	
2	Total Schedule No. 2. Plant and Mandatory Spare Parts Supplied from Within the Employer's Country		0.00
3	Total Schedule No. 3: Design Services	0.00	0.00
4	Total Schedule No. 4: Installation and Other Services	0.00	0.00
GRAND TOTAL (To Bid Form)		0.00	0.00

¹ Specify currency . Create and use as many columns for Foreign Currency as there are foreign currencies

Price Schedule

Schedule No. 6: Recommended Spare Parts (Additional to Scheduled - recommended by Contractor)

Item 1	Description 2	Unit 3	Qty 4	Unit Price		Total Price	
				EXW (Local Parts) 7	CIF or CIP (Foreign Parts) 8	Local Currency Portion (4) x (7)	Foreign Currency Portion (4) x (8)
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
						0.00	0.00
Subtotal Recommended Spare Parts						0.00	0.00

7. 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- ITT Clause 3.35 (Mandatory)

This shall include confirmation of the following: -

- 7.1.1 Submission of Tender Security - Checking its validity, whether it is Original; whether it is issued as required in the tender document; whether it is from a local bank or institution; 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 *Local Tenderers and subcontractors*
 - a) *Company or Firm's Registration Certificate*
 - b) *PIN Certificate.*
 - c) *Valid Tax Compliance Certificate.*
 - 7.1.4.2 *For sub-contracted firms*
 - (a) *Registration with Energy Regulatory Commission*
 - (b) *Registration with National Construction Authority*
 - (c) *Registration with Communications Authority of Kenya*
 - (d) *Certificate of Registration under Company's Act*
 - (e) *Valid Tax Compliant Certificate*
- 7.1.5. That the Tender is valid for the period required.
- 7.1.6. Site/survey visit signed and stamped form by authorized staff (where applicable).
- 7.1.7. Submission and considering that the required number of sets (original and two (2) Copies) of Tender.
- 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.*
- 7.1.9. 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 3.41 of the ITT.
- 7.1.10. Confirming that the subcontracted firms have not been subcontracted by more than one main contractor.
- 7.1.11. 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.
- 7.1.12. Tenderers will proceed to the Technical Stage only if they qualify in compliance with Part 1, Preliminary Evaluation under clause 7.

7.2. Part II - Technical Evaluation-ITT Clause 3.41

Part II (a) – Mandatory requirements

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. Contractor's and Manufacturer's Quality Assurance Data
- 7.2.1.2. Type Test Certificates for equipment confirming compliance with technical specifications.
Attendant reports may also be requested if required.
- 7.2.1.3. Manufacturer's Authorization
- 7.2.1.4. Catalogues and or Brochures and or Manufacturer's drawings.
- 7.2.1.5. Contractor's Experience in similar works
- 7.2.1.6. Details of Sub-Contractors
- 7.2.1.7. Sub-Contractor's Experience in similar works
- 7.2.1.8. Key Personnel Capabilities
- 7.2.1.9. CVs of key Personnel
- 7.2.1.10. Program of Works
- 7.2.1.11. Commercial/Contractual Deviations
- 7.2.1.12. Proposed Work Plan and Methodology
- 7.2.1.13. Turnover
- 7.2.1.14. Audited Financial Statements & Information
- 7.2.1.15. Contractor's Equipment
- 7.2.1.16. Duly Filled Guaranteed Technical Data Sheets

7.2.2. Detailed Technical Evaluation

The Schedule of 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- ITT Clause 3.20

Bidders are expected to meet all the prequalification requirements listed in the following table:

NO.	REQUIRMENT	CRITERIA
7.2.1	<i>Presentation</i>	<p><i>Neatness of document as per Tender Format i.e.</i></p> <ul style="list-style-type: none"> <i>(a) Proper Binding and paginating of all documents without any breaks</i> <i>(b) Clarity of information</i> <i>(c) Proper labeling of contents</i> <i>(d) Proper referencing of contents</i> <i>(e) Relevance of all attached documents in conformity with the requested information in Tender document</i>
7.2.2	<i>Capability of the Contractor</i>	<ul style="list-style-type: none"> <i>a) The Contractor/Sub-Contractor should have completed at least two (2) similar contracts. Similarity is to be considered in terms of contract price as well as complexity of the works.</i> <i>b) Contractor to demonstrate availability of equipment to complete the works.</i> <i>c) Sub-Contractors shall have performed similar works in terms of cost and complexity like the works proposed to be sub-contracted.</i>
7.2.3	<i>Program of Works</i>	<i>Time to complete the assignment shall be no more than 70 working days.</i>
7.2.4	<i>Contractor's Quality Assurance Details</i>	<i>The Contractors/subcontractors and suppliers quality assurance system as evidenced by documents provided shall conform to ISO QMS or equivalent.</i>

NO.	REQUIRMENT	CRITERIA
7.2.5	<i>Qualifications of Contractor's Personnel</i>	<p>Bidders should submit CVs of qualified personnel for following positions:</p> <p>a) Project Manager- Degree in Engineering plus 8years of postgraduate experience in similar works</p> <p>b) FTTX Design Engineer - Degree in Engineering plus 5years of postgraduate experience in similar works</p> <p>c) Construction Engineer - Degree in Engineering plus 5years of postgraduate experience in similar works.</p>
7.2.6	<i>Methodology for Performing the works</i>	Contractor to submit work plan and methodology for performing the works including a time schedule in form of Gantt Chart and brief description to cover design, supply, installation, testing and commissioning.
7.2.7	<i>Manufacturer's Authorization</i>	Where the Contractor is not the manufacturer, a manufacturer's authorization letter for equipment and materials should be submitted.
7.2.8	<i>Guaranteed Technical Data Sheets</i>	Data should confirm compliance with technical specifications.
7.2.9	<i>Commercial/Contractual Deviations</i>	Deviations do not have substantial financial impact.
7.2.10	<i>Type Test Certificates</i>	Certificates should confirm compliance with technical specifications.
7.2.11	<i>Litigation History</i>	Frequent litigation ending up in conviction of the Contractor on matters arising from performance in related works may lead to disqualification.

Tenderers will proceed to the next evaluation stage if they if they qualify at this stage. Tenderers should note that the Employer may conduct a due diligence to confirm the authenticity of submitted data and information.

7.3. Part III – Financial Evaluation under clause 3.38 of the ITT

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

NO.	EVALUATION CRITERIA
7.3.1	<i>a) Confirmation of the authenticity and sufficiency of the submitted Tender Security</i>
	<i>b) Confirmation of and considering schedule of rates and prices and/or priced Bill of Quantities duly completed and signed.</i>
	<i>c) Checking that the Tenderer has quoted prices based on all costs including insurances, duties, levies, Value Added Tax (V.A.T), Withholding Tax and other taxes payable and delivery to the premises of KPLC or designated site(s)</i>
	<i>d) Where applicable, Conducting a financial comparison, including conversion of tender currencies into one common currency</i>
	<i>e) Correction of arithmetical errors</i>
	<i>f) Taking into account the cost of any deviation(s) from the tender requirements</i>
7.3.2	<p><i>Ascertaining the financial capability through Last Financial Year's audited financial statements issued within the last 18 months which Statements should conform to International Accounting Standards One (IAS 1) which includes the following:-</i></p> <p><i>a) Turnover in the Last Financial Year i.e. twelve months of at least 40% of the total tendered value.</i></p> <p><i>b) Checking and considering that the Tenderer's solvency ratios are acceptable to KPLC and meet the threshold of:-</i></p> <p><i>(i) Solvency ratio of Debt to Assets Ratio which should be at least 1:1</i></p> <p><i>Or</i></p> <p><i>(ii) for companies or firms that are registered or incorporated within the last one calendar year of the Date of the Tender Document, a spot cash balance of a minimum of 20% of the Tender Price. The same should be as evidenced in the certified copies of bank statements at least in ALL days of the month of the Date of the Tender Document.</i></p>
7.3.3	<i>Provide documentary evidence of liquid assets and/or credit facilities, net of other contractual commitments and exclusive of any advance payments which may be made under the contract.)</i>
7.3.4	<p><i>Considering information submitted in the Confidential Business Questionnaire against other information in the bid including:-</i></p> <p><i>a) Declared maximum value of business</i></p>

The Successful Tenderer shall be the one with the lowest evaluated price or described in bid Data sheet.

***NOTES: -**

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 works it offers to provide.

- a) 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.
- b) 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.

8. SECTION VIII – GENERAL CONDITIONS OF CONTRACT

The Conditions of Contract comprise the “General Conditions” which form part of the “Conditions of Contract for EPC/Turnkey Projects”, First Edition 1999, ISBN 2-88432-021-0, published by the Federation Internationale Des Ingenieurs-Conseils (FIDIC), and the following “Particular Conditions”, which include amendments and additions to such General Conditions.

The FIDIC Conditions of Contract document is a copyright protected document and the Contractor shall be responsible for obtaining and familiarizing themselves with the Conditions of Contract.

Information as to how to obtain copies of FIDIC documents can be obtained from the website www.fidic.org.

9. SECTION IX – PARTICULAR CONDITIONS OF CONTRACT

The following particular Conditions of Contract (PCC) shall supplement the General Conditions of Contract (GCC). Whenever there is a conflict, the provisions herein shall prevail over those in the GCC.

- Sub-Clause 1.1.2.2 Employer** The Employer is :
Kenya Power & Lighting Company Limited
7th Floor, Stima Plaza
Kolobot Road, Parklands
P.O. Box 30099-00100
NAIROBI, KENYA

Tel: + 254-020 2666349/132
- Sub-Clause 1.1.2.4 Employer’s Representative** The Employer’s Representative is :
Name: Christopher Maende
Address: P.O.Box 30099,00100,Nairobi,Kenya
Email: CMaende@kplc.co.ke
- Sub-Clause 1.1.3.3 Time for Completion of the Works** The time for completion of the works shall 70days from the commencement date.
- Sub-Clause 1.1.3.7 Defects Notification Period** The Defects Notification Period shall be 365 calendar days from the day of issuance of the Taking-Over Certificate.
- Sub-Clause 1.3 Electronic Transmission Systems** Add Email and Fax. Documents may be emailed in pdf format with transmittal receipt acknowledgement required.
- Sub-Clause 1.4 Law and Language:** Governing Law is the law of the Republic of Kenya
Ruling language is English.
Language of communication is English.
Fluent English shall be spoken by an adequate number of the staff of the Contractor.

After Paragraph 1: “The Parties shall act reasonably and shall perform their obligations hereunder in accordance with the principles of good faith and fair dealing.”

Sub-Clause 1.5 Priority of Documents

Delete Sub-Clause 1.5 and substitute:

The documents forming the Contract are to be taken as mutually explanatory of one another. For the purposes of interpretation, the documents forming the Contract shall take precedence in the following order:

- a) The Contract Agreement.
- b) The Letter of Award and Acceptance thereof.
- c) The Completed Letter of Tender
- d) The Particular Conditions of Contract.
- e) The General Conditions of Contract
- f) The Completed Schedule of Guarantees.
- g) The Detailed Technical Specifications.
- h) The Completed Schedule of Prices.
- i) The Completed Technical Schedules.
- j) The Contractor's Tender.

Where there is a contradiction in any item in two of the above documents, then the item in the earlier positioned document in order above shall take precedence over the item in the lower document, except where otherwise mutually agreed in writing.

Sub-Clause 1.6 Contract Agreement

This section of the General Conditions of Contract shall be replaced as follows:

“The Contract between the Employer and the Contractor will enter into full force and effect on the date when all of the following conditions have been satisfied:

- (i) Signing of the Contract;
- (ii) Receipt by the Employer of the Performance Security in the prescribed form. “

Sub-Clause 2.1 Right of Access to Site

The Employer shall grant the Contractor access to site within a period of 7 days after the Contract comes into full force and effect.

**Sub-Clause 3.5
Determinations**

Sub-Clause 3.5 of the General Conditions shall be replaced as follows:

Determinations

Whenever these Conditions provide that the Employer shall proceed in accordance with this Sub-Clause 3.5 to agree or determine any matter, the Employer shall consult with the Contractor in an endeavour to reach agreement. If agreement is not achieved within 28 days of notification by the Employer relating to matters referred for determination, the Employer shall make a fair determination in accordance with the Contract within a further 14 days, taking due regard of all relevant circumstances.

The Employer shall give notice to the Contractor of each agreement or determination, with supporting particulars. Each Party shall give effect to each agreement or determination, unless the Contractor gives notice, to the Employer, of his dissatisfaction with a determination within 21 days of receiving it. Either Party may then refer the dispute to the DAB in accordance with Sub-Clause 20.4 [Obtaining Dispute Adjudication Board's Decision].

**Sub-Clause 4.2
Performance Security**

Amount of performance security is 10% of the Contract Price from Commencement Date to Issue of Taking-Over Certificate and 5% from Issue of Taking Over Certificate to the end of the Defects Notification Period. The Performance Security shall be in the currencies and proportions in which the Contract Price is payable.

To the end of Paragraph 2 add:

“If the Performance Security is in the form of a bank guarantee, it shall be issued either (a) by a bank located in the Country, or (b) directly by a foreign bank acceptable to the Employer. If the Performance Security is not in the form of a bank guarantee, it shall be furnished by a financial entity which is registered or licensed to do business in the Country and acceptable by the Employer.”

**Sub-Clause 4.12
Unforeseeable
Difficulties**

Sub clause 4.12 General Conditions shall be replaced as follows:

Unforeseeable Difficulties

Except as otherwise stated in the Contract:

- (a) the Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Works; save for provisions included in d);

- (b) by signing the Contract, the Contractor accepts total responsibility for having foreseen all difficulties and costs of successfully completing the Works; save for provisions included in d)
- (c) the Contract Price shall not be adjusted to take account of any unforeseen difficulties or costs save for provisions included in d).

- (d) In this Sub-Clause, "physical conditions" means natural physical conditions, man-made and other physical obstructions and pollutants, including contaminated or hazardous substances, which the Contractor encounters at the Site when executing the Works, including sub-surface and hydrological conditions but excluding climatic conditions, which could not have been foreseen by an experienced Contractor. The removal of contaminated or hazardous substances shall be arranged by the Employer at his responsibility and cost. During such time, the Employer shall suspend such part of the affected Works in accordance with Sub-Clause 8.8 (*Suspension of Work*). If the Contractor encounters adverse physical conditions which he considers to have been Unforeseeable, the Contractor shall give notice to the Employer as soon as practicable. To the extent possible, the Contractor shall continue executing the Works, using such proper and reasonable measures as are appropriate for the physical conditions, if and to the extent that the Contractor encounters physical conditions which are Unforeseeable and suffers delay and/or incurs Cost due to these conditions, the Contractor shall be entitled subject to Sub-Clause 20.1 (Contractor's Claims) to an extension of time for any such delay, if completion is or will be delayed, under Sub-Clause 8.4 (Extension of Time for Completion), and payment of any such Cost.

**Sub-Clause 4.21
Progress Reports**

Add the following:

The monthly progress reports shall be soft copies only in pdf sent via email. Number of personnel to be copied shall be advised by the Employer's Representative.

Throughout the duration of the Contract regular Contract Monthly Progress Meetings will be held within 7days of receipt by the Employer of monthly Progress Report and shall be minuted and shall be attended by representatives of the Employer and the Contractor.

The Progress Meetings will include review of the current Monthly Contract Progress Reports.

In addition to monthly progress meetings, bi-weekly early warning meetings shall also be held to review potential future problems and seek solutions as appropriate.

Sub-Clause 5.7 Operations and Maintenance Manuals	<p>After paragraph 1 add:</p> <p>No later than 2weeks after issue of the Taking-Over Certificate, the Contractor shall supply to the Employer three(3) hard copies and three(3) soft copies of the final Operation and Maintenance Manuals. Operation and Maintenance Manuals shall be in the English Language.</p>
Sub-Clause 6.1 Engagement of Staff and Labour	<p>Add:</p> <p>“The Contractor is encouraged, to the extent practicable and reasonable, to employ staff and labour with the required qualifications and experience from sources within Kenya generally and in particular from the neighbourhood of the Site.”</p>
Sub-Clause 6.5 Working Hours	<p>Add the following:</p> <p>Normal working hours at the Site are between 8.00 am and 6.00 pm on weekdays (six days per week).</p> <p>Work outside this period and weekend or holiday shall only be carried out where specifically approved by the Employer. Where the Contractor chooses to work in excess of eight hours a day or to work at weekends or public holidays, there shall be no additional cost added to the Contract Price.”</p>
Sub-Clause 6.7 Health and Safety	<p>At the end of Sub-Clause 6.7, add:</p> <p>The Contractor shall comply with any Health and Safety regulations which may be in force in Kenya and take measures to prevent the development of unsanitary conditions in the work, living and surrounding areas and shall take precautions to prevent the spread of infectious diseases.</p>
Sub-Clause 6.12 Festivals and Religious Customs	<p>Insert new Sub-Clause 6.12:</p> <p>Festivals and Religious Customs</p> <p>The Contractor shall respect the Country’s recognised festivals, days of rest or religious or other customs and shall take them into account when preparing the Contractual Programme (Schedule).</p>
Sub-Clause 7.7 Ownership of Plant and Materials:	<p>At the end of Sub-Clause 7.7 add:</p> <p>“If the Contractor or any of his sub-contractors or suppliers becomes insolvent during manufacturing of plant, any plant being processed for this Contract shall, upon progress payment for value of goods/work “in process”, be duly marked and pass in ownership to the Employer. The Employer shall then have the right to remove these goods from the Contractor’s or subcontractor’s works for completion by others.”</p>

Sub-Clause 8.1 Commencement of the Works	<p>Replace Sub-Clause 8.1 with the following:</p> <p>The Commencement Date” shall be the date upon which the following conditions precedent shall have all been fulfilled and the Employer’s notification of such fulfilment and instruction to commence the Works is received by the Contractor:</p> <p>a) The Contract has entered into full force and effect b) Receipt by the Contractor of Advance Payment</p> <p>The Employer shall issue a letter to the Contractor confirming the date when the conditions precedent above are met (the “Commencement Date”) within seven (7) days of their fulfilment.</p>
Sub-Clause 8.2 Time for Completion	<p>At the end of Sub-Clause 8.2 add:</p> <p>The Time for Completion shall be 70days from the Commencement Date.</p>
Sub-Clause 8.7 Delay Damages	<p>Delay damages for the works shall be United States Dollar One Thousand (USD.1,000) per day up to a maximum of 10% of the Contract Price.</p>
Sub-Clause 13.8 Adjustments for Changes in Costs	<p>There will be no adjustments for changes in costs.</p>
Sub-Clause 14.1 The Contract Price	<p>The Contract Price comprises the following:</p> <p>Price of Detailed Design, Price of Equipment, Consumables, Spare Parts and Tools, Price of Factory Acceptance Tests, Price of Training Services, Price of Installation Services and all other works or goods and services as specified.</p>
Sub-Clause 14.2 Advance payment	<p>There shall be no advance payment.</p>
Sub-Clause 14.3 Application for Interim Payment Certificates	<p>At the end of Sub-Clause 14.3, add;</p> <p>The application for payment shall state the amount claimed and shall set forth in detail, in the order of the Schedule of Prices, particulars of the Works executed up to the date of application.</p> <p>The application for payment shall clearly and separately show all taxes, duties and levies payable by the Contractor.</p> <p>Payments shall be made according to the Schedule of Payments defined in Sub-Clause 14.4.</p>
Sub-Clause 14.3 Application of Interim Payments	<p>The amount of retention to be deducted shall be 10%. The limit of retention shall be 10% of the Contract price.</p>

Sub-Clause 14.4
Schedule of Payments

Employer shall pay the Contractor in the following manner and at the following times, on the basis of the Price Breakdown given in the section on Price Schedules. Payments will be made in the currencies quoted by the Bidder unless otherwise agreed between the Parties. Applications for payment in respect of part deliveries may be made by the Contractor as work proceeds. The Payment from KPLC will be made through direct payment to the contractor's account. No Letter of credit will be opened.

Schedule No. 1. Plant and Equipment Supplied from Abroad

In respect of plant and equipment supplied from abroad, the following payments shall be made:

- (a) Ninety percent (90%) of the total or pro rata amount upon Incoterm "DDP", upon delivery to site and after receipt of the required documents, such as a negotiable bill of lading, a non-negotiable sea way bill, an airway bill, a railway consignment note, a road consignment note, insurance certificate, etc.
- (b) Five percent (5%) of the total or pro rata DDP amount upon issue of the Taking-Over Certificate.
- (c) Five percent (5%) of the total or pro rata DDP amount upon issue of the Performance Certificate.

Schedule No. 2. Plant and Equipment Supplied from within the Employer's Country

In respect of plant and equipment supplied from within the Employer's country, the following payments shall be made:

- (a) Ninety percent (90%) of the total or pro rata EXW amount upon Incoterm "Ex-Works," upon delivery of equipment to site and after receipt of required documents, such as a railway consignment note, a road consignment note, insurance certificate, etc.].
- (b) Five percent (5%) of the total or pro rata EXW amount upon issue of the Taking-Over Certificate.
- (c) Five percent (5%) of the total or pro rata EXW amount upon issue of the Performance Certificate.

Schedule No. 3. Design Services

In respect of design services for both the foreign currency and the local currency portions, the following payments shall be made:

- (a) One Hundred percent (100%) of the total or pro rata design services amount upon acceptance of design by the Employer's Representative.

Schedule No. 4. Installation Services

In respect of installation services for both the foreign and local currency portions, the following payments shall be made:

- (a) Ninety percent (90%) of the total or pro rata upon completion of installation works.
- (b) Five percent (5%) of the total or pro rata value of installation services, upon issue of the Taking-Over Certificate.
- (c) Five percent (5%) of the total or pro rata value of installation services upon issue of the Performance Certificate.

**Sub-Clause 14.8
Delayed Payment**

Amend Paragraph 2 as follows:

"These financing charges shall be calculated at the rate of 0.5% points above the LIBOR, and shall be paid in the currency in which the Contract price is payable."

**Sub-Clause 14.15
Currencies of Payment**

All payments shall be made in the currency in which the Contract Price is quoted.

Sub-Clause 14.16
Taxation

Insert new Sub-Clause 14.16 as follows:

Taxation

Nothing in the Contract shall relieve the Contractor from his responsibility to pay any tax that may be levied in the Employer's country on profits made by him in respect of the Contract. The Contractor shall be deemed to be familiar with the tax laws in the Employer's country and to have made all necessary enquiries with the relevant government authorities and completely satisfied himself with the requirements for all taxes, statutory contributions and duties to which he may be subjected to during the execution of the Works under the Contract.

Sub-Clause 14.17
Income Taxes on Staff

Insert new Sub-Clause 14.17 as follows:

Income Taxes on Staff

All of the Contractor's staff and labour (foreign and local) will be liable to pay personal income taxes in the Employer's country (Republic of Kenya) in respect of such of their salaries and wages as are chargeable under the laws and regulations for the time being in force, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such laws and regulations.

**Sub-Clause 16.2
Termination by
Contractor**

Termination by Contractor

Amend as follows:

Paragraph 2, line 1: change "14 days" to "30 days"

**Sub-Clause 17.7
Use of Employer's
Facilities**

Insert new Sub-Clause 17.7 as follows:

Use of Employer's Facilities

Use of Employer's facilities is not envisaged. However should any facilities of the Employer be assigned to the Contractor for the purposes of carrying out the works under the Contract, and any loss or damage happens to any of the above items while the Contractor is responsible for their care, arising from any cause whatsoever other than those for which the Employer is liable, the Contractor shall, at his own cost, rectify the loss or damage to the satisfaction of the Employer.

**Sub-Clause 18.1
General Requirements
for Insurances**

The Contractor is the insuring Party

Insurance policies shall meet the Conditions of Contract and shall include:

- a) Contractor's All risks including Work Injury Benefits Act (WIBA), Public Liability and material damage
- b) Employer's Liability
- c) Motor Vehicle Insurance
- d) Comprehensive General Liability

The insurance underwriters criteria shall be:-

- a) Insurer older than six(6) years
- b) Have a minimum solvency margin of 150%-general business
- c) Have a minimum turnover of Kenya shillings 300 million per annum excluding motor insurance,
- d) Selected insurers should have adequate reinsurance arrangement

Add the following:

"The Contractor shall be the insuring party, but the Employer's broker shall check and satisfy itself that the Contractor has endorsed the Employer's interest upon the policies and that the policies specifically extend to the levels stipulated in this Contract".

Periods of submission of insurance:

- a) Evidence of insurance: 40 days before commencement of site works
- b) Relevant policies: 20 days before commencement of site works.

Sub-Clause 18.2 Insurance for Works and Contractor's Equipment	After the first sentence of the first paragraph insert the following sentence: This insurance shall be for not less than 110% of the Contract Price.
Sub-Clause 18.3 Insurance Against Injury to third party Persons and Damage to Property	Limit of KSh. 100,000,000 per occurrence, any one period unlimited.
Sub-Clause 20.2 Appointment of the Dispute Adjudication Board	The DAB shall consist of one (1) member.
Sub-Clause 20.3 Failure to Agree Dispute Adjudication Board	The appointing entity shall be the Chartered Institute of Arbitrators (Kenya Branch).
Clause 21 Sub-Clause 21.1 Tax	Insert new Clause 21 and Sub-Clauses as follows: Tax Nothing in the Contract shall relieve the Contractor of his responsibility to pay any tax that may be levied in the Employer's country on profits made by him in respect of the Contract. The Contractor shall be deemed to be familiar with the tax laws in the Employer's country and to have made all necessary enquiries with all relevant government authorities and completely satisfied himself with the requirements for all taxes, statutory contributions and duties to which he may be subjected to during the execution of the works under the Contract.
Sub-Clause 21.2 Income Taxes on Staff	Income Taxes on Staff The Contractor's staff, personnel and labour will be liable to pay personal taxes in the Employer's country in respect of such salaries and wages as are chargeable under the laws and regulations for the time in force, and the Contractor shall perform such duties in regard to such deductions thereof as may be imposed on him by such laws and regulations.
Sub-Clause 22 Importation Arrangements	Insert new Sub-Clause 22 and Sub-Clauses as follows: Importation Arrangements General arrangements for importation of goods are as follows: The Contractor shall arrange the importation of Goods into Kenya in and on behalf of the Employer, but will be required to employ his own qualified procurement personnel, develop working procedures for such importation, manage and coordinate this in liaison with the staff of the Employer.

Sub-Clause 22.1
Master List

Master List

The Contractor shall ensure that all major Plant and Materials to be incorporated in the Permanent Works are included on the Master List. The Master List shall be submitted to the Procuring Entity within one (1) month from the Start Date.

The Master List shall be in a form to be agreed with the Procuring Entity, but must show various quantities and unit/total CIF prices.

Sub-Clause 22.2
Import Customs Bond

Import Customs Bond

Where applicable, an import bond in the form of a Customs Bond is required to be issued by the Contractor for temporary imports into the country. The Customs Bond is discharged when the Contractor's equipment is re-exported.

Sub-Clause 22.3
Import Declaration Form (IDF)

Import Declaration Form (IDF)

The Contractor shall be responsible for obtaining all the necessary Import Declaration Form (IDF) required under the Kenyan law for declaration of the import of all Goods being supplied from outside the country. The Contractor shall be responsible for the initial IDF fees as well as all other costs associated with this process including but not limited to the agent's fees and other administrative costs. The Employer shall provide assistance as necessary.

**Sub-Clause 22.4
Pre-shipment
Verification of
Conformity (PVoC) to
Standards**

Pre-shipment Verification of Conformity (PVoC) to Standards

The PVoC programme is based on Article 5 of Technical Barriers to Trade (TBT/WTO), which requires that technical requirements (i.e. standards) applied to foreign products must also be applied to domestic products.

The PVoC is a conformity assessment and verification process applied to specific Goods/Products at the respective exporting countries to verify that products imported into Kenya are in compliance with the applicable Kenya standards or approved equivalents, regulations and technical requirements before shipment. It is the sole responsibility of the Contractor (exporter/Contractor) to demonstrate the same and hence meet any associated costs of verification.

All consignments subject to PVoC must obtain a Certificate of Conformity (CoC) issued by PVoC country offices prior to shipment. The CoC is a mandatory Customs Clearance document in Kenya; consignments arriving at Kenyan ports without this document will be denied entry into the country. In exceptional cases, at the sole discretion of the Kenya Bureau of Standards (KEBS), specific consignments may be allowed to undergo destination inspections after receiving appropriate application from importers. Such consignments will be subject to a penalty of 15% of CIF value of the goods plus 15% bond and the inspection costs, payable by the Contractor. All expenses incurred at destination will be borne by the Contractor.

The names of inspection agencies appointed by the Kenyan authorities through KEBS to act under this Contract will be notified to the Contractor on receipt of Import Declaration Forms which are obtained by the Contractor. The Contractor should establish contact and liaise with Inspection Agencies immediately upon learning of their names. The Contractor shall be responsible for procuring the necessary pre-shipment inspection. The Contractor shall pay the inspection fees.

Kenyan regulations require that all imported plant, materials, Contractor's Equipment and Temporary Works be inspected prior to shipment to verify quality and quantity.

The pre-shipment inspection, if positive, authorises the Contractor to ship the Plant, materials, Contractor's Equipment and Temporary Works. The Contractor shall not import any item which is prohibited by the laws of the Republic of Kenya.

Prior to issue of the Defects Liability Certificate, the Contractor shall issue a "customs clearance" notice to the Employer to confirm that all of the Contractor's Equipment and Temporary Works, which have been temporarily imported for the execution of the Works, have been subsequently re-exported and that all of the requirements of the Contract have been complied with.

The inspection of Goods does not relieve the Contractor of its contractual obligations to the Employer, and items may be rejected by the Employer if they fail to meet the requirements of the Contract even though they have been cleared by the Inspection Agency for shipment.

**Sub-Clause 23 Delivery
, Transport &
Insurance of Goods**

Insert new Sub-Clause 23 and Sub-Clauses

The Contractor shall deliver all the Goods in an effective and organized manner to the Site in accordance with the Implementation Programme agreed by both parties. The Contractor shall commit to carry out the following tasks:

- (a) Transport to the Site at its own expense all Goods, under usual conditions, through a usual route and in the usual manner, under all the circumstances. Partial shipments to transport the Goods will be allowed.
- (b) Provide the packing and marking of the Goods as required to transport them to the Project Site in order to prevent their damage or deterioration. During transit, the packing shall be sufficient to withstand, without limitation, rough, handling and exposure to extreme temperatures, salt and precipitations and open storage. Packing case size and weights shall take into consideration, where appropriate, the remoteness of the Project Site and the absence of heavy handling facilities at all points in transit.
- (c) The packing, marking and documentation within and outside the packages shall comply strictly with such special requirements as shall be expressly provided for in the Contract and in any other regulation that shall be observed.
- (d) Carry out the inspection of the Goods prior to its departure, in order to verify its adjustment to the amount and the packing characteristics agreed in accordance to the Contract.
- (e) To avail the following set of shipping documents to the Employer at least three(3) weeks before arrival of imported goods at the port of entry:
 - Four(4) copies of the Commercial Invoice showing Goods description, quantity, unit price, total amount;

- One (1) original and four(4)copies of Non-negotiable bill of lading marked with freight pre-paid;
- Four(4) copies of the Packing list identifying contents of each package;
- Four(4) copies of the Manufacturer’s/Contractor’s Certificate;
- Four (4) copies of the Insurance Certificate for 110% (one hundred and ten percent) of the CIP value for such shipment.
- Four (4) copies of the Shipment Inspection certificate (Clean Report of Findings and CoC) issued by the nominated inspection agency;
- Four (4) copies of the Contractor’s factory inspection report; and
- Four (4) copies of the Certificate of Origin.

ADDRESSES

The Equipment shall be marked with the following marks:-

**KENYA POWER & LIGHTING COMPANY LIMITED
 DESIGN, SUPPLY, INSTALLATION, TESTING AND
 COMMISSIONING OF KPLC FTTX PROJECT
 CONTRACT No.
 ORDER No.....
 C/O KPLC, NAIROBI - KENYA.**

Packing lists, inspection reports, material reports, etc. as indicated above shall be sent to:-

**PROJECTS EXECUTION TEAM LEADER
 KPLC FTTX PILOT PROJECT
 KENYA POWER & LIGHTING COMPANY LIMITED
 P.O. BOX 30099-00100
 NAIROBI, KENYA**

- (f) The Contractor shall warranty that the Goods are delivered in the Project Site, according to the Implementation Programme, so the Procuring Entity can arrange in good time the reception of the Goods.
- (g) Whenever written evidence of the delivery of the Goods in accordance with Articles of this Contract is accessible by both Parties, the delivery at the Project Site shall be considered as executed.
- (h) Upon delivery of Goods at the Site, the Employer shall identify the Goods with the purpose of checking that they comply with the technical specifications established in the Contract and no

later than seven (7) calendar days from the date of notification of arrival by the Contractor.

- (i) Upon delivery of Goods at the Site, the Employer shall issue a Delivery Certificate of the Goods, which shall be signed by the Contractor and the Employer. In case the Employer does not issue the Delivery Certificate or reject the Contractor's request within fifteen (15) calendar days, the mentioned certificate will be considered to have been issued on the last day of that period.

10. SECTION X – TECHNICAL SPECIFICATIONS & DRAWINGS

Refer to *Volume 2* of the Tender Documents.

11. SECTION XI – STANDARD FORMS

11.1. 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 and twenty (120) days.
2. This form must be duly completed, signed, stamped and/or sealed.

11.2. Tender Questionnaire

Please fill in block letters.

1. Full names of Tenderer

.....

2. Full address of Tenderer to which tender correspondence is to be sent (unless an agent has been appointed below)

.....

3. Telephone number (s) of Tenderer

.....

4. E-mail and Fax address of Tenderer

.....

5. Name of Tenderer's representative to be contacted on matters of the tender during the tender period

.....

6. Details of Tenderer's nominated agent (if any) to receive tender notices. This is essential if the Tenderer does not have his registered address in Kenya (name, address, telephone, e-mail)

.....

.....

Signature of Tenderer

Make copy and deliver to: _____ (Name of Employer)

11.3. 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.

<p>Part 1 – General</p> <p>Business Name.....</p> <p>Location of business premises.....</p> <p>Plot No.Street/ Road</p> <p>Postal Address Postal Code</p> <p>Tel No.....</p> <p>Facsimile.....</p> <p>Mobile and/ or CDMA No.....</p> <p>E-mail:.....</p> <p>Nature of your business</p> <p>Registration Certificate No.....</p> <p>Maximum value of business which you can handle at any time KSh.....</p> <p>Name of your BankersBranch... ..</p> <p>*Names of Tenderer’s contact person(s)</p> <p>Designation/ capacity of the Tenderer’s contact person(s)</p> <p>Address, Tel, Fax and E-mail of the Tenderer’s contact person(s)</p> <p>.....</p> <p>.....</p>
--

Part 2 (a) Sole Proprietor

Your name in full
NationalityCountry 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 KSh.....

Issued KSh.....

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.*

11.4. 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. and name) (hereinafter called "the Tender");

KNOW ALL PEOPLE by these presents that **WE**.....ofhaving 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 theday of.....20.....

EITHER

SEALED with the)
COMMON SEAL)

of the said **BANK**) _____
thisday) **BANK SEAL**
of20....)

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 authorized representative(s)/ attorney(s) of the Bank

Signature(s) of the duly authorized 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 one hundred and twenty (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.*

5. *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.*

11.5. 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"***
-
- 1. *The Tender validity period is one hundred and twenty (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.*
 - 2. *All Guarantees issued by foreign banks must be confirmed by a local bank in Kenya.*

11.6. 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 authorized person signing the Tender

Name and Capacity of duly authorized person signing the Tender

Stamp or Seal of Tenderer

11.7. 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

GENERAL MANAGER, SUPPLY CHAIN

Enclosures

11.8. 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 originator 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

GENERAL MANAGER, SUPPLY CHAIN

11.9. Contract Agreement Form

THIS AGREEMENT made this.....day of.....**20....BETWEENTHE 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) KPLC’s Notification of Award dated.....
 - d) Tender Form signed by the Contractor
 - h) Schedule of Prices
 - e) General Conditions of Contract
 - f) Special Conditions of Contract
 - g) Official Purchase Order where applicable
 - h) Guaranteed Technical Data Sheets
 - i) Technical Specifications and Drawings
 - i) Implementation Plan (work methods and schedule)
 - j) Declaration Form signed by the Contractor/ successful Tenderer

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.

6. 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**

GENERAL MANAGER, LEGAL AND CORPORATE AFFAIRS AND COMPANY SECRETARY

in the presence of:-

GENERAL MANAGER, LEGAL AND CORPORATE AFFAIRS AND 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

11.10. 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 theday of.....20....

EITHER

SEALED with the)
COMMON SEAL)
of the said **BANK**)
)

thisday) _____
) BANK SEAL
 of20....)
 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 authorized representative(s)/ attorney(s) of the Bank

 Signature(s) of the duly authorized 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”***

11.11. 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.*

11.12. 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

11.13. Site Visit Form

CONFIRMATION OF PRE-BID SITE VISIT

Site (s) Name.....

Name of Tenderer.....

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.....

11.14. Forms for Qualification Data

As a minimum, the Tenderer shall complete and submit the following Qualification Data with the Form of Tender:

- Details of Sub-Contractors (if any)
- Key Personnel Capabilities
- CVs of Key Personnel
- Programme of Works
- Contractor's and Suppliers Quality Assurance Details
- Deviations from Specifications
- Drawings and Documentation to be submitted with the Tender
- Proposed Work Plan & Methodology
- Turn-Over
- Details of Contracts of a Similar Nature and Complexity for the Tenderer
- Financial Information
- Contractor's Equipment

11.14.1. Contractor's Experience in Similar Works

Name of Applicant or partner of a joint venture

Use a separate sheet for each Contract.

1.	Number of Contract
	Name of Contract
	Country
2.	Name of employer
3.	Employer's address
4.	Nature of works and special features relevant to the Contract for which the Tenderer wishes to bid
5.	Contract role (check one) <input type="checkbox"/> Sole Contractor <input type="checkbox"/> Subcontractor <input type="checkbox"/> Partner in a joint venture
6.	Portion of the total Contract (in specified currencies at completion, or at date of award for current contracts) undertaken by the Tenderer.
7.	Equivalent value of item 6 in USD
8.	Date of award
9.	Date of completion
10	Contract duration (years and months)
	_____years _____months
11.	Specified requirements ¹

12.	Details of Works meeting qualification criteria
13.	Client Certificate confirming two years satisfactory operation attached? (Yes/No).
14.	Contact details of a senior person in the client's organisation, whom can be contacted to verify details of the Client certificate

¹Insert any specific criteria required for the execution of the Contract(if any).

This information is declared to be correct by (Tenderer's authorised representative)

Name.....

Signature.....

Position in the Firm.....

Date.....

11.14.2. Details of Subcontractors

Name of Applicant or partner of a joint venture

The Tenderer shall indicate in this schedule, the proposals for subcontracting elements of the Works together with the names and addresses of the subcontractors he proposes to employ (if any).

A statement of similar works executed by each of the proposed subcontractors shall be provided, which shall include details of the work executed, year of completion, value of the works and the name and address of the client.

Work to be Subcontracted	Name and Address of Subcontractor	Similar works previously executed

This information is declared to be correct by (Tenderer’s authorised representative)

Name.....

Signature.....

Position in the Firm.....

Date.....

11.14.3. Sub-Contractor's Experience in Similar Works

Name of Applicant or partner of a joint venture

Use a separate sheet for each Contract.

1.	Number of Contract
	Name of Contract
	Country
2.	Name of employer
3.	Employer's address
4.	Nature of works and special features relevant to the Contract for which the Tenderer wishes to bid
5.	Contract role (check one) <input type="checkbox"/> Sole Contractor <input type="checkbox"/> Subcontractor <input type="checkbox"/> Partner in a joint venture
6.	Portion of the total Contract (in specified currencies at completion, or at date of award for current contracts) undertaken by the Tenderer.
7.	Equivalent value of item 6 in USD
8.	Date of award
9.	Date of completion
10	Contract duration (years and months)
	_____years _____months
11.	Specified requirements ¹

12.	Details of Works meeting qualification criteria
13.	Client Certificate confirming two years satisfactory operation attached? (Yes/No).
14.	Contact details of a senior person in the client's organisation, whom can be contacted to verify details of the Client certificate

¹Insert any specific criteria required for the execution of the Contract(if any).

This information is declared to be correct by (Tenderer's authorised representative)

Name.....

Signature.....

Position in the Firm.....

Date.....

11.14.4. Key Personnel Capabilities

Name of Tenderer

For specific positions essential to Contract implementation, applicants should provide the names of candidates qualified to meet the specified requirements stated for each position set out in Instructions to Tenderers Sub-Clause 3.20.

The data on their experience should be supplied in separate sheets using the form in Section 11.5.5 which should be submitted for each candidate.

1.	Title of position: Project Manager
	Name of candidate:
2.	Title of position: FTTX Design Engineer
	Name of candidate:
3.	Title of position: Construction Engineer
	Name of candidate:

This information is declared to be correct by (Tenderer’s authorised representative)

Name.....

Signature.....

Position in the Firm.....

Date.....

11.14.5. CVs of Key Personnel

Name of Tenderer:		
Position		
Candidate information	1. Name of candidate	2. Date of birth
	3. Professional qualifications	
Present employment	4. Name of employer	
	Address of employer	
	Telephone	Contact (manager/personnel officer)
	Fax	E-mail
	Job title of candidate	Years with present employer

Summarise professional experience over the last 5 years, in reverse chronological order. Indicate particular technical and managerial experience relevant to the Project.

From	To	Company/Project/Position/ Relevant technical and management experience

This information is declared to be correct by (Tenderer’s authorised representative)

Name.....

Signature.....

Position in the Firm.....

Date.....

11.14.6. Programme of Works

Name of Applicant or partner of a joint venture

Based on the specified completion periods given under Sub-Clause 3.6 of the Instructions To Tenderers, the Tenderer shall provide a proposed programme of Works in a bar chart form showing the sequence of work and time duration for each activity.

The proposed programme shall include activities such as design, schedule for the drawing submittal, ordering and procurement of materials, manufacturing, fabrication, shop assembly and testing, transportation, erection, site testing and commissioning of the Plant to be supplied under the Contract.

We offer to complete all the works as required under tender within _____ calendar days as per the attached schedule.

This information is declared to be correct by (Tenderer’s authorised representative)

Name.....

Signature.....

Position in the Firm.....

Date.....

11.14.7. Contractor’s and Suppliers Quality Assurance Details

Name of Applicant or partner of a joint venture

The Tenderer shall provide copies of valid certificates issued by competent Quality Assurance Agencies showing that the transformer manufacturer conforms to the Quality System Standard ISO 9001 or its equivalent.

The Tenderer is required to list below the valid certificates submitted with his tender.

Name of Tenderer, subcontractor or supplier	Equipment or service being supplied	ISO 9001 or equivalent certificate provided

This information is declared to be correct by (Tenderer’s authorised representative)

Name.....

Signature.....

Position in the Firm.....

Date.....

11.14.8. Commercial/Contractual Deviations

Name of Applicant or partner of a joint venture

Any deviations from the Conditions of Contract or the Technical Specifications shall be clearly indicated in the table below and reasons given.

Clause or Section No.	Deviation	Reason for Deviation
	1.Commercial / Contractual Deviations	
	2. Technical Deviations	

This information is declared to be correct by (Tenderer’s authorised representative)

Name.....

Signature.....

Position in the Firm.....

Date.....

11.14.9. Drawings and Documentation to be Submitted with Tender

Name of Applicant or partner of a joint venture

Pursuant to Sub-Clause 3.21 of Instructions to Tenderers (ITT), the Tenderer is required to submit drawings, brochures, technical data, type test certificates, etc. for the plant and equipment to be incorporated in the Works, sufficient to demonstrate compliance with the technical specifications. The Tenderer is required to list under each item in the table below, those documents being submitted with the tender. The reference number of the document shall be included so that the document can easily be identified.

No.	Description	Document Type	Document Reference
1.	144 Core ADSS Aerial Fiber Optic Cable		
2.	96 Core ADSS Aerial Fiber Optic Cable		
3.	48 Core ADSS Aerial Fiber Optic Cable		
4.	96 Core Underground Armoured Fiber Approach Cable		
5.	12 Core Aerial ADSS Fiber Optic Cable		
6.	Suspension Assembly Fitting		
7.	Tension Assembly Fitting		
8.	Fiber Distribution Point (FDP)		
9.	Optic Distribution Frame (ODP)		
10.	Cable Storage Assembly		
11.	Cable Splice Enclosure/Joint Box		
12.	Fiber Access Terminal (FAT)		

This information is declared to be correct by (Tenderer’s authorised representative)

Name.....

Signature.....

Position in the Firm.....

Date.....

11.14.10. Proposed Work Plan & Methodology

The Tenderer shall submit a write up on the proposed work plan and methodology for performing the works covering design, supply, installation commissioning and training (overseas and on site).

11.14.11. Turn-Over

Name of Applicant or partner of joint venture

The Tenderer is requested to complete the information in this form for all individual firms, all partners of a joint venture. The information supplied should be the annual turnover of the Tenderer (or each member of a joint venture), in terms of the amounts billed to clients for each year for work in progress or completed, **converted to US Dollars** at the rate of exchange at the end of the period reported.

Use a separated sheet for each partner of a joint venture and each supplier.

Annual Turnover Data		
Year	Turnover	US Dollar equivalent
1.		
2.		
3.		
4.		
5.		

This information is declared to be correct by (Tenderer’s authorised representative)

Name.....

Signature.....

Position in the Firm.....

Date.....

11.14.12. Audited Financial Statements and Financial Information

Name of Tenderer or partner of a joint venture
--

The Tenderer, including each of the partners of a joint venture, and the main suppliers should provide the financial information requested below demonstrating the current soundness of their financial positions and long term profitability as well as evidence of financial resources to meet the Contract cash flow. A separate sheet should be used for each partner of a joint venture as well as for the principal suppliers.

1. 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.

.....
.....

.....
.....

2. Evidence of access to lines of credit and availability of other financial resources sufficient to meet the Contract cash flow over contract period, net of the Tenderer’s or supplier’s commitments for other contracts. List the documents submitted as evidence and attach copies.

.....
.....

.....
.....

3. Name, address, telephone, e-mail, fax numbers of the Tenderer’s Bankers who may provide reference if contacted by the Employer.

.....
.....

.....
.....

This information is declared to be correct by (Tenderer's authorised representative)

Name.....

Signature.....

Position in the Firm.....

Date.....

11.14.14. 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.

WE HEREBY extend our full guarantee and warranty as per the Conditions of Contract for the goods offered for supply by the above firm against the Invitation to Tender.

DATED THIS..... DAY OF.....20.....

Signature of duly authorized person for and on behalf of the Manufacturer.

Name and Capacity of duly authorized 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.



KPLC FTTX PILOT PROJECT

BIDDING DOCUMENT

**DESIGN, SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF
FTTX FACILITIES FOR RUAKA, RIDGEWAYS AND MUTHITHI GARDENS**

TENDER NO. KPI/9A/5F/OT/001/16-17

VOLUME 2/2

Technical Specifications

AUGUST 2016

Employer:

*Kenya Power & Lighting Company Limited
Central Office, Stima Plaza,
Kolobot Road, Parklands,
P.O. Box 30099-00100,
Nairobi, Kenya.*

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ABBREVIATIONS AND ACRONYMS

Figure 0-1 Abbreviations and Acronyms

Abbreviation/ Acronym	Description
ADSS	All Dielectric Self Supporting Fiber
AP	Attenuation Profile
CAK	Communications Authority of Kenya
CD	Chromatic Dispersion
CWDM	Coarse Wave Division Multiplexing
DWDM	Dense Wavelength Division Multiplexing
DWSM	Dual Window Single Mode
DUT	Device Under Test
FCP	Fiber Concentration Point
FDT	Fiber Distribution Terminal
FTTB	Fiber to the Building
FTTC	Fiber to the Curb (Street Cabinet)
FTTH	Fiber to the Home
FTTDp	Fiber to the Distribution Point
FTTX	Collective term for various optical fiber delivery topologies
GPON	Gigabit Passive Optical Network
HDPE	High Density Polyethylene
H-P Structure	Structure comprising of power pole and additional supporting pole
IL	Insertion Loss
KPLC	Kenya Power and Lighting Company Limited
MDU	Multi-Dwelling Units
NMS	Network Management System
OCWR	Optical Continuous Wave Reflectometer
ODF	Optical Distribution Frame
OFAC	Optical Fiber Approach Cable
OLT	Optical Line Terminal (usually at Point of Presence)
ORL	Optical Return Loss
OPGW	Optical Ground Wire
OPPC	Optical Phase Conductor
OTDR	Optical Time Domain Reflectometer
PMD	Polarization Mode Dispersion
PLB	Permanently Lubricated
PON	Passive Optical Network

Abbreviation/ Acronym	Description
ROW	Right-of-Way (i.e. wayleave or easement)
RTS	Rated Tensile Stress
SDU	Single Dwelling Units
TSPs	Telecommunication Service Providers
UV	Ultra Violet
Weight and Measures	
km	Kilometre (1,000m)
kV	Kilovolt (1,000volts)
kVA	Kilovolt-ampere
kW	Kilowatt
kWh	Kilowatt-hour
M	Million
m	meter
MVA	Mega volt-ampere (106 volt-ampere)
MWh	Megawatt-hour
MW	Megawatt
Yr	Year
Currency	
USD	United States Dollar
KES	Kenya Shillings

1. INTRODUCTION

1.1. Background

As part of its business diversification strategy, KPLC intends to grow its fiber business by focusing on expansion of the last mile fiber segment among other new initiatives. To this end, the company has signed a Memorandum of Understanding (MoU) with Safaricom Limited for the development of a Pilot last mile fiber project.

The MoU signed on 5th April 2016 promotes cooperation between the two companies through a development process aimed at connecting broadband services to several homes in selected areas within Nairobi and Kiambu counties. Under the arrangement, KPLC will develop and own passive fiber optic infrastructure which Safaricom or any other licensed Telecom Service Providers (TSPs) will utilize to provide broadband services to their customers.

Lessons learned from the pilot project are expected to inform KPLC country-wide rollout of last mile fiber.

1.2. KPLC FTTH Pilot Project

The FTTH pilot project is a project that is aimed at connecting fiber to 12000 homes in Ruaka, Ridgeways, Thindigua, and Muthithi Gardens.

The scope of works under the project will involve extending fiber optic network from Safaricom's existing points of presence in these areas to their target customers via the existing aerial power distribution network comprising of a mix of 66kV, 11kV and 415/240V network.

The passive optical network which will be owned by KPLC will comprise of an All Dielectric Self Supporting (ADSS) cable strung along the power lines approximately 1.1m below 11kV lines but above existing 415/240V lines.

In order to minimize power interruptions during installation, Contractors will be required to install the proposed fiber optic network under live conditions except a few cases where a shutdown might be found to be extremely necessary.

According to preliminary planning by KPLC, the project should be completed by the second week of February 2017. The construction of the project is expected to take no more than 70 working days.

In order to achieve time for completion, KPLC is seeking for the services of a Contractor to carry detailed design, supply, installation, testing and commissioning of the facilities on an EPC/Turnkey basis.

This document outlines the scope of services as well as detailed specifications of the works to be carried out by the Contractor.

2. SCOPE OF WORKS

2.1. Introduction

The Contractor’s scope of works includes design, manufacturing, pre-shipment inspection, seaworthy packing, shipment, clearing of goods at the port of destination, transportation to site, installation, testing and commissioning.

The works shall be implemented in a single contract package comprising of four (4) different lots as follows:

Lot 1- Ruaka

Lot 2 – Muthithi Gardens

Lot 3 – Ridgeways and Muthaiga North

The network to be installed will comprise of the following components:

- a) Aerial All Dielectric Self Supporting cable (ADSS) of sizes ranging from 12 core to 144 core installed along existing power lines including all the cable support fittings and hardware.
- b) Fiber Distribution Points (FDPs) to be installed at strategic points along the power lines. The scope of installation includes splicing and termination.
- c) Fiber Access Terminal (FAT) to be installed at customer locations preferably next to Kenya Power Metering Points.
- d) Optical Distribution Frame (ODF) to be installed at Safaricom’s Point of Presence shelter and at KPLC substations as specified.
- e) Optical Fiber Enclosures including splicing and termination.

Features of proposed network are summarized in *Table 2-1*.

Table 2-1 Summary of Network Features

Network Segment	Cable Size	Ridgeways /North Muthaiga	Ruaka	Muthithi Gardens	Total Cable Length (km)
Feeder Cable length (km)	144 Core	0.000	4.325	0.000	4.325
Distribution Cable length (km)	96 Core	4.730	9.427	2.860	17.017
Building Approach Cable length (km)	48 Core	4.950	6.864	5.390	17.204
Building Approach Cable length (km)	12 Core	8.470	0.000	9.460	17.930

2.2. Lot 1-Ruaka

The site lies in Kiambu County on one part and Nairobi County on the other part within Ruaka town. The general location of the site is as shown in *Figure 2-1*.



Figure 2-1 Ruaka Area

Homes in this area are predominantly Multi Dweller Units (MDU) supplied via KPLC overhead power distribution lines.

Features of the proposed network for this region as are shown in Table 2-2.

Table 2-2 Ruaka Network Features

Network Type	Cable Size	Cable Length (km)
Feeder Cable	144 Core	4.325
Distribution Cable	96 Core	9.427
Building Approach Cable	48 Core	6.864
Building Approach Cable	12 Core	0.000

2.3. Lot 2-Muthithi Gardens

The site lies in Kiambu County, approximately 1.37km from Kiambu town. The general location is as shown in Figure 2-2.



Figure 2-2 Muthithi Gardens Area

Homes in this area are predominantly Single Dweller Units (SDU) supplied via KPLC overhead power distribution lines.

Features of the proposed network for this region as are shown in Table 2-3.

Table 2-3 Muthithi Gardens Network Features

Network Type	Cable Size	Cable Length (km)
Feeder Cable	144 Core	0.000
Distribution Cable	96 Core	2.860
Building Approach Cable	48 Core	5.390
Building Approach Cable	12 Core	9.460

2.4. Lot 3- Ridgeways and Muthaiga North

The site lies in Nairobi County, to the right of Kiambu road approximately 3.6km from the Thika road junction and covers Muthaiga north as well as Ridgeways Estates. The general location is as shown in Figure 2-4.



Figure 2-3 Muthaiga North and Ridgeways Area

Homes in this area are predominantly Single Dweller Units (SDU) supplied via KPLC overhead power distribution lines.

Features of the proposed network for this region as are shown in *Table 2-5*.

Table 2-4 Ridgeways and Muthaiga North Network

Network Type	Cable Size	Cable Length (km)
Feeder Cable	144 Core	0.000
Distribution Cable	96 Core	4.730
Building Approach Cable	48 Core	4.950
Building Approach Cable	12 Core	8.470

3. GENERAL TECHNICAL SPECIFICATIONS

3.2. Units of Measurement

In all correspondences, technical schedules and drawings, metric units of measurement shall be used. On drawings or printed pamphlets where other units have been used, the equivalent metric measurement shall be marked in addition.

3.2. Standards

3.2.1. Units of Measurement

Metric units of measurement (System International) shall be used in all Contract documentation. Angular measurement shall be in degrees with 90 degrees comprising one right angle.

3.2.2. Standard Specifications

All equipment supplied under this Specification shall conform to the latest editions of the ITU-T, International Electrotechnical Commission (IEC), IEEE or KPLC Specifications. Alternative standards will only be accepted if the Contractor is able to satisfactorily demonstrate to KPLC that such Standards are equal to or better than IEC/ BIS. Full details of differences, which affect the design or performance of the equipment, shall be stated in the Tender.

3.3. Site Conditions

Local site conditions in the project area are as shown *Table 3-1*.

Table 3-1 Site Conditions

Item No	Description	Value
1.	Altitude	1800m asl
2.	Maximum outdoor ambient temperature	+40°C
3.	Minimum outdoor ambient temperature	-1°C
4.	Annual average temperature	30°C
5.	Average annual isokeraunic level	180 thunderstorm days
6.	Average annual rainfall	800-1700 mm
7.	Maximum Solar radiation	169 kCal/cm ²
8.	Seismic coefficient	1.5
9.	Climate	Tropical wet
10.	Relative humidity	Above 90%
11.	Maximum wind pressure on projected area of cables and cylindrical objects	400N/m ²
12.	EMC Class (IEC 61000)	Industrial environments
13.	Pollution (IEC 60185)	Heavy: Class II

All equipment and materials must be tropicalized and shall operate efficiently under prevailing site conditions.

In choosing materials and their finishes, due regard shall be paid to the equatorial conditions. The bidder shall submit details on his practice and recommendations to the Employer.

3.4. Quality Assurance

3.4.1. General Quality Assurance Program

Within one (1) month after commencement date of the works, the Contractor shall submit a detailed Quality Assurance Plan (QAP), which shall generally conform to relevant ISO requirements. Approval to proceed with manufacture of equipment within this Contract will not be given until the QAP for all major equipment / material has been received and approved by the Employer. Delays to the Contract completion date due to non-compliance with this specification requirement will be the Contractor's responsibility.

3.4.2. Features of the Quality Assurance Plan

Major features of the QAP shall ensure:

- a) The Contractor has defined all staff responsibilities and the QA systems operating within the organization for the purpose of ensuring adequate quality of the end product.
- b) The Contractor has a senior officer with the authority available at site all the time to resolve matters of quality to the satisfaction of the Employer.
- c) The Contractor has adequate facilities under the control of properly trained staff to perform the quality control duties available to any relevant member of the Contractor's workforce.
- d) A detailed inspection and test plan is prepared for the whole manufacturing operation.
- e) Regular and systematic programmes of testing are carried out for all incoming raw materials.
- f) Regular calibration checks are carried out on all measuring equipment used in the manufacturing operations.
- g) Statistical analyses are carried out regularly on appropriate test results to confirm that all processes are performing within the specified tolerances.
- h) Adequate procedures are planned for corrective action in the event that quality checks show that performance is not satisfactory.
- i) All checking activities, test results etc. are recorded on appropriate standardized forms and these are verified, certified, recorded and filed in a systematic manner.

The above listing is not exhaustive and any additional systems are to be put in by Contractor to ensure timely and effective execution of the project.

3.5. Working Stresses & Design

The design, dimensions and materials of all parts shall be such that they will be new and shall not suffer damage under the most adverse conditions nor result in deflections and vibrations that might adversely affect that operation of the equipment. Equipment Mechanisms shall be constructed so as to avoid sticking due to rust and corrosion.

The equipment and apparatuses shall be designed and manufactured in the best and most substantial and skilful manner with materials best suited to their respective purpose and generally in accordance with up-to-date recognized standards of goods practice.

All parts that will have to be dismantled or which might have to be dismantled, for purposes of servicing or replacement shall be retained with anti-corrosive fasteners. The type, material and size of all fasteners shall be selected to safely withstand the maximum superimposed direct, alternating, kinetic and thermal loads induced by workmen when installing or removing the fasteners during the life of equipment.

All designs shall be such that the installation, replacement and general maintenance may be undertaken with the minimum of time and expense. The tolerances used for dimensions and finishes shall be selected with due consideration to the particular properties and functions of the parts and the corresponding accuracy required to obtain proper operation and tight sealing.

All materials and equipment shall be designed, to minimize the risk of fire and consequential damage, to prevent ingress of vermin, dust and dirt, and accidental contact with electrically live parts or moving parts. The different Materials and Equipment shall be capable of continuous operation with minimum attention and maintenance in the exceptionally severe conditions likely to be encountered in a tropical climate.

The Facilities shall be designed for reliable, long and continuous service and safe operation under all conditions, with high economy and low maintenance cost. Facilities shall be available to simplify inspection, testing, maintenance and repair of the Plant. The design shall also include all necessary provisions ensuring the safety of the operating and maintenance personnel.

All materials and plant used under this Contract shall be new and of the best quality; workmanship shall be of the highest class throughout the Facilities. All outdoor Plant including towers, insulators, busbar conductor, hardware and fittings shall be designed so that water cannot collect at any point. Welding, filling, plugging or any repairs to defective items of Plant or parts thereof shall not be permitted without the approval in writing of the Employer's Representative.

3.6. Nuts and Bolts

Nuts and Bolts shall conform to ISO Metric. On outdoor equipment and structures all steel bolts and screwed rods shall be galvanized including the threaded portions. All associated nuts shall be galvanized with the exception of the thread that shall be oiled. The thickness of zinc coating shall be not less than 70 µm of surface area.

On outdoor equipment all bolts, nuts and washers shall be of non-corroding material where they are in contact with non-ferrous parts in conductor clamps and fitting.

In order to prevent risk of corrosion, bolts shall protrude by no more than three thread pitches from the surface of the nuts.

3.7. Surface Coating & Galvanizing

Unless specifically mentioned to the contrary, all iron and steel used in the Contract shall be protected against corrosion effects, after the whole fabrication is completed, by galvanization, metal coating or paint applications.

The surface coating shall be uniform, clean and smooth. The formulation and application procedure shall be as recommended by the manufacturer for the appropriate exposure conditions.

All iron and steel wires shall be galvanized by an approved process (e.g.: hot dip process) before straining. The galvanization shall be smooth, clean, of uniform thickness and free from defects and shall withstand the tests set out in ISO 1460 or equivalent.

The preparation for surface coating and the coating itself shall not distort or adversely affect the mechanical properties of the materials.

The colour of all outer coats shall be approved by the Employer, if not described in detailed specification below.

Any coated part found to be imperfect must be replaced. The whole of the expense involved in the replacement of the imperfect part shall be borne by the Contractor.

3.8. Spares, Special Tools & Appliances

The Price Schedule covers all items that are required under the contract. Any spares ordered shall be strictly interchangeable with the original parts intended and shall be packed or treated in such a manner as to be suitable for storage in the tropical climate at site for an indefinite period and each part shall be clearly marked for identification purpose, outside the package when applicable.

All spares, special tools and appliances shall be subject to inspections and/or tests on the functions specified in the Specifications.

Spare parts supplied under the contract shall be packed and preserved for long time storage.

Instruction manuals of special tools and appliances as well as the drawings shall be prepared and 3 copies forwarded to the Employer.

The Contractor shall supply in lockable boxes, for the Employer's use, any special tools that may be required for assembly, dismantling adjustments and maintenance of the equipment. The tools shall be unused and in new condition at the time of handover. Suitable special spanners shall be provided for bolts and nuts, which are not properly accessible by means of an ordinary spanner.

Each special tool and appliance shall be clearly marked with its size and/or purpose and shall be packed in the appropriate box with three (3) sets of operation and maintenance instruction books.

3.9. Packing & Shipping

All goods shall be packed or bundled properly so that no damage shall be sustained through rough handling during overseas and inland transportation to the tropical country.

The contents of packing cases shall be securely fixed or fastened in position in their cases with struts or cross battens. Wood fiber shall not be used for packing purpose.

All wood and other materials used in packing cases shall be insect free. Adequate protection and precaution are to be taken to exclude termites and other vermin, noxious insects, larvae or fungus from the packing materials.

The Contractor shall protect all steelworks before shipment, to prevent corrosion and/or damage.

Bundles of steel sections shall be properly tied together by a proven method and care shall be taken to ensure that they are robust and that they can be handled easily during shipment.

Packing cases where used shall be constructed rigid and strongly and in no case shall timber less than 20 mm in thickness be used. Cross battens supporting weight in any direction shall not rely for their support on nails or screws driven lengthwise into the grain of the wood, but shall be supported by cleats secured from the inside.

Waterproof papers and felt linings shall overlap at seams and the seams secured together in an adequate manner, and the enclosure shall be provided with screened openings to obtain ventilation.

The Contractor shall be entirely responsible for ensuring that the packing is suitable for transit and transportation.

3.10. Nameplates and Escutcheon Plates

Where equipment is provided with a permanently attached nameplate or escutcheon plate for identification, the plates shall be made of weatherproof and corrosion-proof material and shall not be deformed under the service conditions at the Site. The entries on the plate shall be indelibly marked, by engraving to black letter, on a white background or contrasting colours. The language of all plates shall be English in accordance with the instruction of the Contractor.

3.11. Locks

All padlocks for equipment or keys for locking devices of boxes as required by the specification or necessary to limit access, or for the safety of personnel shall be provided by the Contractor.

3.12. Welding

Welding where specified or required shall be by metal-arc welding and shall be as per BS5135. After welding and before galvanizing, welds shall be thoroughly cleared to remove slag and spatter, preferably by sand blasting.

All materials before and after fabrication shall be straight and free from twists. The material shall be free from blisters, scale and other defects.

All dimensions specified shall be subject to the following tolerances, unless otherwise stated.

- Dimensions up to and including 50 mm: ± 1 mm
- Dimensions greater than 50 mm: ± 2 mm

Erection clearance for cleated ends of members connecting steel to steel shall not be greater than 2mm at each end. Bolt holes shall not be more than 2mm greater than the diameter of the bolt for bolts up to 24mm diameter.

Cutting may be by shearing, cropping, sawing or machine flare cutting. Sheared or cropped edge shall be dressed to a neat finish and be free from distortion where parts are to be in metal contact.

All holes shall be drilled in one operation and burrs shall be removed. Holes shall not be formed by a gas cutting process. All matching holes for bolts shall register with each other so that a gauge 2mm less in diameter than the diameter of the bolt shall pass freely through the assembled members in a direction at right angle to such members.

3.13. Site Supervision

The Contractor shall provide a sufficient number of suitable personnel throughout the erection and maintenance periods to supervise efficiently all work carried out under the Contract. The personnel

shall have had thorough experience in the erection, commissioning, operation and maintenance of plant comparable with that being supplied under the Contract.

The Contractor shall nominate a representative who shall be engaged solely in a supervisory capacity and shall be capable of dealing with and making decisions in relation to all matters arising in connection with the execution of the Facilities and Temporary Facilities on the Site. He shall have had previous experience in supervising Facilities of a similar type and magnitude and shall co-ordinate the work of the Contractor and its Sub-Contractors at the Site. He shall maintain to the satisfaction of the Employer's Representative a reasonable standard of discipline amongst the Contractor's and his Sub-Contractor's employees whilst they are on the Site.

Both the Contractor's Representative shall remain in the Project area during the periods when erection or commissioning of any of the Facilities is taking place. He shall not leave the Project area during these periods without the approval of the Employer's Representative.

The Contractor shall maintain a Project Office at which its Representative is based. This Office shall be adequately staffed to enable the representative to be conveniently contacted and the Site Facilities and properly co-ordinated. It shall have telephone and internet communications facilities.

The Contractor shall keep in his Project Office a copy of the Contract including all variation orders and a copy of all standards, design documents, codes and statutory regulations relevant to execution of the Facilities and all related Installation Services.

The Contractor's Representative shall when requested by the Employer's Representative, attend any meetings convened for the purpose of co-coordinating the Facilities.

The Contractor's Representative may be contacted by telephone outside normal working hours throughout the erection and commissioning periods (and Defects Liability Period) if required by the Employer's Representative). The Contractor shall notify the Employer's Representative of the 'after hours' telephone number of its Contractor's Representative and Construction Manager and of any change in those numbers.

3.14. Training

During performance of design, installation and commissioning work, the Contractor shall train Employers Personnel in development of the FTTX network and in particular the following:

- Detailed Survey and Design
- Installation
- Testing and commissioning

Main objective of the training is to transfer key knowledge and practice to the engineers and technicians in the respective subjects in order to enable them to work also as trainers to transfer the knowledge further to KPLC's personnel and to build up erection and maintenance competence of the Employer's personnel to enable them to perform all erection and maintenance works on the respective installations and equipment.

Certificates will be awarded to the trained staff mentioning the areas of training received.

Training will take part in two formats namely a) classroom training and b) hands on training as explained below.

3.14.1. Classroom Training

The Contractor shall perform comprehensive formal classroom training in Nairobi, at a training centre as well as at site as it may be considered appropriate. Training can take place at the contractor's offices if suitable.

Training shall be arranged for a number of about ten (10) persons of the Employer's design and maintenance crews. It is envisaged that this training will take a minimum period of five (5) days. The training shall take place at the beginning of the project at a time to be considered mutually convenient. Additional material may be covered in the repeat/refresher training to reflect actual equipment/facilities installed.

The training will be for a full day with lunch facilities provided to the trainees.

The Employer will nominate the persons to participate in the training.

During the training, the Contractor's Representative and his representatives will be responsible for assignment of the trainees.

The trainees shall be furnished with supporting material, e.g. erection, installation and maintenance instructions and drawings.

The Contractor shall prepare a draft training proposal showing the main activity for each type of issue to be covered. The training schedules shall be submitted for approval prior to training implementation. Details will be discussed and agreed.

The scope of the training shall cover the following:

- a) FTTX Network Design and Documentation (using MapInfo Software)
- b) Network Maintenance

3.14.2. On the job Training

On the job training will take the form of normal "hands on work" over the duration of the project. It is intended that some staff of the Employer will be seconded to the Contractor on a full time basis over the duration of the project. The hands on training shall commence from the survey right through to the commissioning of the works.

This will be discussed at the beginning of the contract to decide details of training and number of personnel that the utility can afford to provide to the contractor.

3.15. Site Facilities

3.15.1. Contractor's Site Accommodation

The Contractor shall make his own arrangements with regard to living and office accommodation for staff and labour during the construction of the Facilities together with all associated work including storage and workshop facilities.

All dwellings and buildings, existing or erected by the Contractor shall comply with local regulations with regard to construction, water supply, sanitation and other requirements. Where temporary construction camps are provided by a Contractor, it shall ensure such camps are provided with proper

sanitation and other necessary facilities. All such accommodation, office, storage and workshops erected by the Contractor shall be removed when no longer required. Following removal of such facilities, the grounds they occupied shall be left in a clean and tidy condition.

The Contractor shall supply safe drinking water for all living/office accommodation and at all work sites.

The cost for site accommodation shall be deemed to be included in the Contract Price.

3.15.2. Site Storage Facilities and Services

The Contractor shall make his own arrangements for site facilities including electricity, water, communications and crane lifting facilities.

All storage, facilities workshop or labour camp locations shall only be made by appropriate arrangements with the relevant property owners, at the Contractor's own expense.

The Contractor shall in all cases obtain the approval of the Employer's Representative in respect of the locations of any of the above temporary including facilities.

Particular attention shall be paid to places along distribution line route where it intends to distribute line materials, even when within the line Right-of-Way (RoW). In no case will this be outside a distribution line RoW, unless appropriate arrangements are made with the owners of the affected property, which shall be at the Contractor's own expense.

All such arrangements for the use of land outside the line route and its RoW shall be subject to consultation with and to the approval of the Employer's Representative.

The Contractor shall arrange for protection of all Plant; shipping and transport packaging to be robust and placed in suitable outdoor storage until incorporation into the Facilities. All packages shall be placed on packing, to raise them above ground level. If any package or plant is unsuitable for outdoor storage, the Contractor shall arrange for indoor storage elsewhere.

The Contractor shall exercise special care in the storage of electrical plant.

3.15.3. Employer's Site Office

The Contractor shall also provide at a cost included in the Contract Price, a site office at a location to be agreed upon with the Employer's Representative to accommodate four (4) representatives of the Employer. The site office provided by the Contractor shall be fully furnished using a good standard office furniture to be approved by the Employer's Representative. The office shall have one (1) room reserved for meetings. The office shall also have a kitchen. The meeting room shall have a capacity of at least ten (10) persons. The office shall be equipped with:

- One (1) filing cabinet
- Three (3) workstations complete with a table, chair and power supply points and computer data points.
- Two (2) laptop computers, Intel Core i7, 2.6GHz, HDD 500GB, 4GB complete with windows 7, Office 2016.

- Latest Version of Mapinfo Professional Software (Pitney Bowes) complete with One (1) year license for four (4) users.
- Two(2) latest version Autodesk AUTOCAD Software licenses for Employer
- One (1) A3/A4 Size Colour Printer/Scanner/Photocopying Machine. Costs to include supply of printing paper for the duration of the Contract.
- High speed internet connection for the entire duration of the project.
- Water dispenser with safe drinking water to be replenished regularly throughout the duration of the project.
- An Overhead digital video projector to be fitted in the meeting room for presentations during meetings.
- A flip chart to be stationed in the meeting room. Felt pens and paper to be replenished regularly throughout the duration of the project.
- Air Conditioning System (if required due to prevailing weather conditions)
- Fire Fighting Facilities in line with local regulations
- Wireless LAN for all the laptop computers in the office.

All software shall be licensed to the Employer.

Except for the office building, ownership all the above named facilities shall revert back to the Employer at the completion of the project.

The Contractor shall also provide an office assistant for preparation of refreshments as well as cleaning of the office during the entire duration of the project. The Contractor shall also provide an ICT personnel whenever required for purpose of assisting users with computer problems within the office.

The Contract Price includes costs for electricity and water supplies to be consumed by the project office which shall be paid by the Contractor.

3.15.4. Transport for Employer's Representative

The Contractor shall provide two (2) four wheel drive car, a Toyota Fortuner or equivalent to be available for use by the Employer's Representative during the entire duration of the Contract. The Contractor shall also provide two (2) drivers and shall provide fuel and maintenance of the car for the entire duration of the construction phase of the project.

The cost of providing the service shall be included in the Contract Price. Transport shall be a service only to be provided by the Contractor during implementation period of the project.

3.15.5. Contractor's Water Supplies

The Contractor shall be responsible for providing, obtaining and making all arrangements for the use for the works of supplies of water required (if any), including the provision at his own cost of all apparatus necessary for such use.

3.15.56. Electricity Supplies

The Contractor shall be responsible for providing, obtaining and making all arrangements for the use for the Works of supplies of electricity required, including the provision at his own cost of all apparatus necessary for such use. All precautions which are necessary to ensure the safety of every person on the Site shall be taken. The Contractor's installation shall be to the satisfaction of the Employer's Representative who may require the disconnection or alteration of any parts that he

considers may be dangerous. Such installation shall comply also with all appropriate statutory regulations and be in accordance with IEC 60364 and IEC/TR 61200-704.

As soon as any parts or whole of the Contractor's installation is no longer required for carrying out the Contract Works, the Contractor shall disconnect and remove the same to the satisfaction of the Engineer.

3.15.7. Contractor's Communication

The Contractor shall make arrangements for voice communication between his project office and all locations at which he has people working. The cost of the site communication facilities shall be deemed to be included in the Contract Price.

3.15.8. Communication for the Employer's Representative

During the entire duration of the Contract, the Contractor shall provide air time for use by the Employer's representative for an amount of Ksh. 50,000 per month for the entire period of the construction phase of the works. This cost shall be included in the Contract Price.

3.16. Health & Safety, Environmental and Social Management

The contractor shall comply with the Labour Regulations of the Republic of Kenya and enforce requirements for gender inclusiveness in staffing.

3.16.1. Laws & Regulations

The Contractor shall comply with all the relevant statutory regulations of South Sudan with respect to safety and occupational health.

3.16.2. Health & Safety

The Contractor is responsible for employing a health worker to inform the workforce and affected villages about the increased health risks, especially HIV/AIDS.

The Contractor is also responsible for equipping all his workers with necessary safety equipment as helmets, eye protection glasses and safety belts and enforce the non-use of toxic materials (such as Halon, PCB, Asbestos) shall be utilized neither during construction nor under operation and maintenance.

The Contractor shall at all times during the course of work prevent accumulation of debris caused by the work. He shall also remove all debris and temporary structures when finishing the work. The Contractor shall also be responsible for removal of old equipment and cables.

All surplus material should be disposed in an environmental satisfying way. Particular attention should be given to safe disposal of environmentally hazardous substances such as battery acid, transformer oil and capacitors. Workable equipment shall be handed over to the Employer.

The Contractor shall provide at all accommodation and work sites, medical and first aid facilities for its employees. The extent of medical facilities at each location shall be agreed with the Employer's Representative.

All working areas shall be deemed safety helmet and safety boots areas and the Contractor shall provide all his employees with safety helmets, safety boots, and subject to task, safety gloves, disposable air/fume filtering facial masks and safety glasses or goggles.

Contractor's personnel working at heights and aerial work of any kind must be equipped with safety belts/harness and their associated straps and safety rope lines and shall make available such plant to the Employer's Representative for associated inspections.

In the performance of the Facilities, the Contractor shall exercise every reasonable precaution to protect persons or property from injury.

The Contractor shall co-operate fully with the Employer's Representative's supervising staff on all matters affecting safety.

The Employer's Representative may require the immediate removal from the Facilities of any person who in the opinion of the Employer's Representative fails properly to observe these provisions and such person shall not be employed upon the Facilities without the permission of the Employer's Representative.

The contractor shall follow the required measures for Health and Safety as shown in *Table 3-2*.

Table 3-2 Health and Safety Measures

Risk	Cause (Source) / requirements	Safety action in place
Physical injuries	Falling debris	<ul style="list-style-type: none"> Safety gear that includes Wellington boots, helmets, overalls, leather gloves etc will be given to workers on site
	Sharp objects	
	Hard objects and surfaces	
Respiratory tract effects	Inhalation of dust and cement particle	<ul style="list-style-type: none"> Gas masks and eye goggles will be provided to protect workers against cement and other dust particles.
Fire outbreak	Inflammable fuels	<ul style="list-style-type: none"> Proper storage of fuels and gas cylinders in designated areas. Elementary fire fighting equipment such as fire extinguishers will be installed on site.
	Welding and other gases	
	Burning waste	
Welfare on site	Toilet/sanitation facilities	<ul style="list-style-type: none"> Toilets will be installed where applicable on site under guidance of site engineer
	Storage and changing clothing	<ul style="list-style-type: none"> Site will be provided with a store for keeping clothes not used during working hours Changing cubicles for both men and women will be put up
	Drinking water	<ul style="list-style-type: none"> The site will be provided with clean drinking water Water storage containers will be properly marked and protected from potential contamination
HIV/AIDS & other Pandemics		<ul style="list-style-type: none"> Sensitize site workers on HIV/AIDS and Provide condoms to avoid negative effects from social & multicultural inclusion at the area.

Note:

To comply with these, Contractors will be required to produce the following documents and implement them:

- ESMP & ARAP (separately)
- Risk Management and Mitigation (Health, safety and emergency) Plans
- HIV/AIDS Strategy

3.16.3. Environment and Social Management

The Contractor shall comply with all local and international laws and regulations applicable to the project area with respect to environmental matters.

The Contractor shall prepare and implement an environmental management plan which includes, but is not limited to, the following:

- The operation of the Contractor's accommodation facilities
- The operation of any manufacturing facilities at site
- Operation of the site erection Facilities
- Waste management
- Storage of fuel, oil and other hazardous substances
- Internal environmental audit plan
- Emergency response plan.

The Contractor shall obtain all approvals required from Government authorities and agencies for his operations and activities.

The Contractor's environmental management plan and associated records may be audited by the Employer's Representative or by a third party agency appointed by the Employer.

In addition, the Contractor shall be furnished with a copy of the Environmental and Social Impact Assessment Report and NEMA License for the project. The Contractor will be required to review the report and comply with the Environmental Management Plan (EMP) as well as the conditions of license.

3.16.4. Work on Live Electric System

If work is to be done on live electric systems the following factors are of paramount importance:

- a) Minimization of outage time and
- b) Adaptation to operational constraints.

All work must be planned with this in mind. The Contractor must obey all instructions and safety rules given by the Government and the Employer and must strictly follow all instructions from the Employer's supervisory personnel. The Contractor shall appoint his Safety Personnel who will be authorized to receive work permits at the work sites as required by safety rules. All outages shall be discussed with the Employer and the Employer's Representative at least three (3) weeks before the outage is required. The Contractor will normally only be allowed to have only one medium voltage circuit out of operation at a time. No work must start before Employer's Representative has authorized the work, established the required earthing and marked the safe area. All switching on live parts shall be done by the Employer. In the rare cases where more than one circuit have to be

taken out of operation the Contractor must be prepared to do the work during nights or at off-peak time. The Contractor and his personnel must respect the physical constraints as well as constraints for scheduling set by these circumstances. However, the Employer will co-operate in making the work conditions and the scheduling as efficient as possible for the Contractor and keep a responsible person with switching authority at site during all working hours (including night time).

If physical constraints make it necessary to replace cabinets needed for operation, the Contractor must as far as possible erect and connect the new cabinets temporarily adjacent to the one in operation. A quick disconnection and removal of the old cabinets can then be performed and the new cabinets pulled in with most of its cables already fitted. Location of new cabinets shall be approved by the Employer's Representative and a proposal for such shall be given by the Contractor one month prior to erection.

3.16.5. Cleaning Up By Contractor

Throughout the conduct of all work at Site, the Contractor shall maintain the Facilities, Plant, its Contractor's Plant and all related Installation Services at all locations in a clean and tidy condition.

All Contractor's Plant and/or Plant and its component materials not in use and/or no longer required for the Facilities completion and related Installation Services, all condemned materials and all rubbish shall be removed from the Site at the least once per week. Combustible rubbish shall be removed daily and may be burned in an area designated by the Employer's Representative.

Upon completion of the Facilities, the Contractor shall deliver any surplus Plant to the Employer in a manner agreed with the Employer's Representative.

The Contractor shall also remove all its Contractor's Plant together with all manner of items or material associated to its Installation Services, whether specified or not, and any remaining rubbish which may have accumulated in the execution of the Contract and shall leave the whole of the Site in a clean and tidy condition.

If the Contractor fails to comply with any of the above requirements within 24 hours of notice in writing by the Employer's Representative, the work may be carried out by the Employer's Representative and the total cost to the Employer of the work will be charged to the Contractor.

3.16.6. Exchange of Interface Information

The Contractor shall where needed supply in a timely manner all interface information to its sub-contractors/Contractors, the Employer's Representative and/or other Contractors engaged by the Employer in other Facilities.

If the Contractor lacks such information from other contractors, he is obliged to request such from the Employer's Representative. The Contractor cannot claim liability exemption for his own contractual responsibilities because of actions performed or omitted by other sub-contractors.

3.17. Correspondence, Meetings & Reports

3.17.1. Correspondence

The Contractor shall address all correspondence on matters arising out of the Contract, to the Employer's Representative with copies to the Employer's personnel and Employer's Representative's personnel as shall be advised in the course of the construction phase of the project.

3.17.2. Progress Reports

After approval of the Program of Performance by the Employer's Representative, the Contractor shall submit formal, detailed progress reports in an approved format, indicating the status of design, material procurement including, manufacture, testing, delivery, transport and erection Facilities, at monthly intervals. The reports shall clearly identify any delay in progress and its cause including its sub-contractors or manufacturers and Contractors, with intended remedial action to recover programmed progress.

These reports shall clearly state all the Contractor's resources including manpower and Contractor's Plant employed by the Contractor during the reporting period. These reports shall be forwarded promptly so that on receipt by the Employer's Representative the information contained therein is not more than 5 days out-of-date.

The monthly progress reports shall also include an appendix presenting a reasonable number of photographs depicting the progress of the Facilities during the report period, including any unique or irregular aspects of construction work carried out during the reporting period. The photographs size and finish shall be as agreed with the Employer's Representative. When requested, the Contractor shall provide up to 3 additional copies of the progress photographs to the Employer's Representative for use by the Employer.

Monthly reports shall be provided in bound hardcopy and softcopy (pdf) format. The progress photographs shall be provided in hardcopy colour prints and softcopy (jpg) format and accompany the report due within seven days of the defined reporting period.

3.17.3. Meetings

The Contractor shall participate in regular project progress meetings with the Employer and the Employer's Representative. In addition to the regular monthly meetings, the Contractor shall participate in meetings called by the Employer or Employer's Representative, where specific aspects of work in progress require particular attention whether technical, commercial or where the Employer or Employer's Representative consider the progress position of any section of the work to be unsatisfactory.

Unless otherwise agreed, all meetings will be held at Site in the Office accommodation provided by the Contractor. The meetings may be held either at the Employer or Employer's Representative's offices or at the Contractor's Facilities, as deemed appropriate by the Employer or Employer's Representative.

Access to the Contractor's and sub-contractor's Facilities shall be granted to the Employer's Representative at all reasonable times for the purpose of ascertaining progress and for supervisory Facilities.

3.18. Contractor's Documents

3.18.1. General

The Contractor shall prepare and shall be fully responsible for the correctness of all drawings and other documents which are necessary for the manufacture, supply, delivery, erection, operation, commissioning and maintenance of the Facilities.

The Contractor shall use the English language in all drawings, information and documents pertaining to the Contract and in all correspondence between the Contractor the Employer and the Employer's Representative. Whenever anything is required under the terms of the Contract to be written, marked, printed or engraved, the English language is to be used except where otherwise may be provided in these Employer's Requirements.

'Preliminary drawings' means drawings to be provided by the Contractor to the Employer's Representative for review and comment.

'Final drawings' means all approved drawings embodying, where required, all design modifications as approved by the Employer's Representative.

'Work-as-executed drawings' means drawings showing the arrangement of the Facilities in the final and complete state as installed or to be installed at the time of Take-Over of the Facilities.

Submission by the Contractor of drawings for approval, including those prepared by others, shall be deemed to mean that the Contractor has fully examined such drawings and that they comply with the requirements of the Contract.

Approval of a drawing by the Employer's Representative will imply that:

- General arrangement and layout drawings and key diagrams have been examined and appear to be in accordance with the basic design concept as provided for by the Employer's Requirements;
- Other drawings of plant and plant have only been examined in relation to compatibility of the plant and plant with the Employer's Requirements;
- Approval of a drawing shall not relieve the Contractor of his responsibilities under the Contract.

The Employer's Representative will not normally require copies of detailed manufacturing drawings, but the Contractor shall make these available to the Employer's Representative if so requested.

The Employer's Representative may require the Contractor to make changes to the drawings which are necessary, in the opinion of the Employer's Representative, to make the Facilities conform to the intent of the Contract.

3.18.2. Drawing Management

Drawings/sketches shall be ISO standard size, between A1 and A4 and shall be completely legible when printed at the appropriate size.

All drawings and other documents shall be identified using a systematic document numbering system which gives a unique identifier for each document, shown on each sheet of the document.

The Contractor shall maintain a drawing and other document register, which identifies each document and the date and reference of submission of the original and each revision. The register shall be in electronic format and shall include a facility by which associated groups of documents may be readily identified and retrieved, for example, one such group could be transmission tower foundation drawings. The document register shall be maintained at current status and an electronic copy submitted with each of the Contractor's monthly reports.

The number and format of documents to be submitted to the Employer's Representative shall be agreed with the Employer's Representative and may be varied from time to time. At commencement of the Contract, two paper copies and one electronic copy shall be submitted.

If a document includes generic material provided by any plant Contractor, that material shall be clearly marked to identify which portions are applicable to the Contract.

All drawings and other documents shall be included in the operation and maintenance instruction manuals (see "Standard Technical Requirements). In addition, the Contractor shall provide two complete sets of drawings and other documents revised to 'Work-as-Executed' status in the same electronic format as the source file (e.g. AutoCAD or MS Word).

3.18.3. Document Submission & Management

All documents shall be submitted in the language of the Contract as stipulated in the Conditions of Contract. Upon commencement of the Works, the Contractor shall in consultation with the Employer's Representative establish a document management system for handling all correspondence, submission, issue and back up of all documents under Contract. All documents shall be submitted in the numbers and forms as detailed in the following *Table 3-3*.

Table 3-3 Drawing Submissions

Descriptions	Prints		Electronic Copy by E-mail (see notes)		Electronic Copy CD	
	Employer	Engineer	Employer	Engineer	Employer	Engineer
For approval						
Calculations and drawings			2	1	1	1
Other design documents			2	1	1	1
Method statements			2	1	1	1
Commissioning procedures			2	1	1	1
For construction					1	1
Calculations and drawings		2	2	1	1	1
Other design documents		2	2	1	1	1
Method Statements		2	2	1	1	1
Commissioning procedures		2	2	1	1	1
Final records						
Calculations and drawings	3		2	1	4	1
Other design documents	3		2	1	4	1
Method Statements	3		2	1	4	1
Commissioning procedures	3		2	1	4	1

Note: In addition to pdf formats, design drawings for approval, construction and final records shall where applicable be submitted in AUTOCAD format.

The Contractor will be required as a minimum to submit the following documents in accordance with timelines as set out in the Programme of performance:

- a) A master list of all documents to be submitted by the Contractor under Contract.
- b) Programme of Performance with the details of activities to be performed complete with the sequence in which the Contractor intends to perform in form of gantt- chart in Microsoft Project format.
- c) Project Insurance Documents as specified
- d) Contractor's Quality Assurance Plan
- e) Contractor's Environmental, Health and Safety Plan
- f) Site Mobilization Plan
- g) Contractor's Cash Flow Projections
- h) Method Statements for all Construction Works
- i) Contractor's Inspections and Test Plan detailing tests to be performed, test methods, reference standards, test criteria and the timing for the tests
- j) Type Test Reports, Routine Test reports and or Acceptance Test reports for all tests to be performed
- k) Guaranteed Technical Parameters and Technical Specifications for all equipment to be supplied under Contract.
- l) Drawings of all equipment and fittings to be adopted for the network.
- m) Route maps in AutoCAD and Arc GIS formats including: GIS coordinate of House location, Length of service connection (Direct distance from Household to the nearest LV pole).
- n) Assembly Drawings
- o) Operations and Maintenance Manuals (as applicable)
- p) As- Built Drawings
- q) All other documents as required by the Conditions of Contract

3.18.4. Operations & Maintenance Instructions

The Contractor shall provide operation and maintenance instructions, the scope of which shall be suitable for fully informing the Employer's staff on all aspects of the erection, Operation and Maintenance of the Plant and Equipment, as further defined in this section.

The content of the instructions shall be directly applicable to the Plant. Typical instructions will not be accepted. Standard instructions and brochures covering a number of sizes and/or models of proprietary equipment will be accepted provided they cover the items supplied and these items are clearly identified throughout the instructions and brochures. Clear and concise cross-references to these brochures and standard instructions shall be made in each appropriate section of the operation and maintenance instructions.

The Contractor shall, in preparing the instructions, assume the lack of experience and lack of familiarity of the operating and maintenance staff with the type of equipment supplied. The information shall be presented as simply, clearly and precisely as possible.

The Operations and Maintenance Instructions shall be submitted for all major items of plant including splice enclosures, Fiber Distribution Terminals, maintenance tools and any other items as shall be advised by the Employer's Representative. The instructions shall be delivered at least one (1) month prior to commencement of installation works. Should any errors be noticed during installation, the Contractor will be required to correct and resubmit corrected versions of the instructions. The last final date of submission of the corrected instructions shall be one (1) month after commissioning of the facilities.

3.18.5. As-Built Documentation

Preliminary (initial), final (approved) and Work as Executed (as built) drawings shall be submitted as CAD files readable by the latest version of Autodesk's AutoCAD. All drawings shall be clear and legible. As – Built drawings for the ADSS network shall also be submitted in a version readable by the latest version of Autodesk AutoCAD software.

Work as Executed drawings presented by the Contractor in accordance with the Employer's Requirements shall be the Contractor's original drawings.

The Work as Executed CAD files shall be delivered to the Employer in the form of CD-ROMs. Five (5) copies of the CD-ROMs shall be provided.

3.19. Making Good

The Contractor shall take every reasonable care in the execution of the Facilities to avoid loss of or damage to any property of the Employer or of others, including landholders.

Where, in the performance of its obligations under the Contract, the Contractor causes loss of or damage to any property of the Employer or others, he shall make good such loss or damage to the reasonable satisfaction of the Employer's Representative.

3.19. Fire Protection & Fire Fighting

The Contractor shall be responsible for the fire protection of its Site facilities at all locations, whether living or office accommodation, storage facilities, Facilities, shops or other work areas, all Plant and Contractor's Plant at any of these locations and any place at which it has Facilities.

Portable firefighting plant shall be available at work sites at all times, when the Contractor's employees are present and shall be kept available at other times as directed by the Employer's Representative.

The Contractor shall maintain the firefighting plant in a condition satisfactory to the Employer's Representative and shall re-charge extinguishers after use, regardless of by whom they were discharged. Adequate stocks of fresh extinguisher charges including chemical charges shall be kept in readiness by the Contractor.

All firefighting plant provided under this Clause shall be the property of the Contractor and shall be removed by the Contractor when requested by the Employer's Representative.

3.20. Resistance to Environmental Conditions

All cables, Joint boxes/enclosures, Fiber Distribution Points, clamps, fittings, Fiber Access Terminals to be supplied under contract shall withstand prevailing environmental conditions including ultra violet radiations without degrading in performance for a period of more than 25 years.

3.21. Degree of Protection

For all outdoor equipments, the degree of protection shall unless specified be IP65 while for indoor equipment, the degree of protection shall be IP54 in accordance with IEC 60529.

3.22. Equipment Earthing

All passive equipment including Fiber Distribution Terminals, Fiber Access Terminals, Splice Enclosures, Cable Storage Kits, Optical Distribution Frames (ODF), shall be earthed. Resistance to ground for all earthing points shall not be more than 10 ohms.

4. ADSS AERIAL FIBER OPTIC CABLE

4.1. General

The ADSS optical cable shall be of non-metallic Aerial type designed for installation on 66/11/0.415kV and with span lengths of up to 150m. The Cable shall be Dual Window Single Mode (DWDM) optical fibers in conformity with ITU-T recommendations G-652D. The cable shall be designed to withstand all prevailing environmental conditions including the effects of high electric and magnetic fields produced by the proximity of live power conductors.

Detailed requirements are as indicated in the Guaranteed Technical Data Sheets attached as *Annex 1* and which must be duly filled and submitted with tender.

4.2. Reference Standards

The cable shall be designed and manufactured in accordance with the following standards:

- Cable IEEE 1222
- Fiber IEC 60793, ITU-T G.65X series
- Color code ANSI/EIA 359-A, EIA/TIA-598

4.4. Cable Structure

The ADSS cable shall be designed to withstand the Electromagnetic fields when erected on power lines. The ADSS cable shall have a very low Electrical Conductivity to avoid currents on the surface of the cable in all situations.

The mechanical structure of the ADSS cable shall be designed to withstand the wind and other environmental conditions in the routes, which have been specified in this document. The location of the fibers inside the structure shall be such that the application of the ADSS cable in the specified routes is possible.

The ADSS cable selected shall tolerate the normal installation procedures. The cable structure shall be such that the fibers are protected against water, hydrogen, ultraviolet radiation and other environmental hazards encountered in Kenya.

4.5. Design

The cable shall be constructed from materials which have been technically proven and able to withstand the electrical and environmental conditions. A non-magnetic strength member shall be incorporated in the cable and this shall provide sufficient strength to Withstand Wind load without being unduly stiff. The cable shall be smooth and of circular cross-section to avoid aerodynamic instability and shall be of minimum diameter to reduce pole/tower loadings to a minimum. The cable shall be fully filled so as to prevent Water Condensation and electrical degradation within the sheath. The sheath of the cable shall be stable to withstand solar ultra-violet radiation.

4.6. Fiber Splice Loss

The splicing loss of any two fibers in any case shall not exceed 0.10 db/splice. Ageing shall not cause increase of the nominal optical attenuation at ambient temperature at 1550 nm by more than 0.05 db/km of fiber over a period of 25 years.

4.7. Fiber Material

The fiber shall be manufactured from high grade silica and doped as necessary to provide required transmission performance. The chemical composition of the fibers shall be specifically designed to minimize the effect of hydrogen on the transmission properties. The fibers shall be heat resistant.

4.8. Fiber Identification

Individual optical fibers within the fiber unit, and fiber units shall be identifiable in accordance with EIA/TIA 598 or IEC 60304 .Each optical fiber cable shall be colour coded corresponding to sequential numbering. The colors and numbering shall be in accordance with relevant International Standards. The colour shall be integrated in the fiber coating and shall be homogeneous. The colour shall not be erased when handled during splicing. The colour shall not bleed from one fiber to the other and not fade when wiping the fiber with acetone or alcohol. If the fibers are regrouped in bundles or in tubes the later shall be colored according to a determined code.

4.9. Fiber Link Lengths

However, the contractor shall supply and install the optical fiber cable as required based on actual work requirements finalized after detailed site survey carried out by the Contractor during the project execution.

There shall be no factory splice allowed within a continuous length of cable. Only one continuous cable length shall be provided on each drum. The lengths of the cable to be supplied on each drum shall be determined by a "cable drum schedule" prepared by the Contractor after the survey duly taking into account sag, splicing, wastage, unequal heights etc. of the line route.

A minimum length of 2.0 km shall be maintained for all the ADSS cable between splices except as approved by the Employer's Representative for any intermediate T-offs.

4.10. ADSS Cable Construction

ADSS cable construction shall comply with IEEE and IEC 60794-4 ED1 or equivalent. The cable provided shall meet both the construction and performance requirement such that the optical fiber integrity and optical transmission characteristics are suitable for the intended purpose. There shall be no factory splices within the cable structure of a continuous cable length. The tubes and fillers are SZ-stranded and layered up around a dielectric central strength member, dry blocked, taped, and sheathed with inner and outer jacket. Peripheral strength elements are laid between the two jackets. The composite fiber optic shall be made up of buffered optical fiber units embedded in a water tight buffer tubes. The maximum number of fibers in a single tube shall be twelve (12).

4.11. Fiber Types

All fibers shall be of the single mode dual window type. Fibers shall comply with ITU-T recommendation G.652D (Characteristics of a Dual – Window Single Mode Optical Fiber Cable). The fiber shall be entirely suitable for splicing by means of a normal fusion splicing techniques.

The fibre shall be manufactured from high grade silica and doped as necessary to provide the required transmission performance. The chemical composition of the fibres shall be specially designed to minimize the effect of hydrogen on the transmission properties. The fiber cable life expectancy shall be at least 30 years.

5.12. Number of Fibers

The number of fibers shall be 144 fibers and 96 fibers, 48 fibers and 12 fibers in such quantities as indicated in the Schedule of Prices (*Volume 1* of the Tender Documents).

4.13. Fiber Colouring

Fibre coloring shall conform to EIA/TIA-598. The color-coding shall be permanent thus withstanding normal handling; e.g., during termination, testing, or cable relocation. Refer to EIA – 359 for color identification and coding.

4.14. Fibre Buffering and Protection

The primary coating shall consist of an inert material, which can be readily removed for splicing purposes without damage to the fibre and without necessitating the use of hazardous chemicals. Secondary coating may be applied directly over the primary coating (tight buffering), or alternatively, a loose jacket may be provided (loose buffering).

Where a tight fitting secondary coating is provided, it shall consist of an inert material. Where a loose jacket is provided, a jell or hydroscopic substance shall be included in the cable structure to prevent moisture from being retained inside the loose jacket.

The fibre coating shall be translucent such that fibre splicing techniques using optical alignment of cores by means of injection and detection of light through the cladding shall be supported. In addition, the fibre coating shall be optically matched to the cladding to promote cladding mode stripping.

The composition of the cable shall be specifically designed to reduce the production of hydrogen gas and to prevent the migration of hydrogen into the fibre.

The Contractor shall submit a report on specific measures taken to reduce the production of hydrogen gases and any installation constraints that should be observed for review and approval prior to shipment of the cable.

4.15. Cable Drums

The cables shall be supplied in non-returnable strong wooden (or alternatively steel) drums provided with lagging of adequate strength, constructed to protect the cable against any damage and displacement during transit, storage and subsequent handling and stringing operations in the field. The bidder shall list the information concerning the following: weight, dimensions, material and standards applied.

All wooden components shall be manufactured out of seasoned soft wood free from defects that may materially weaken the component parts of the drums. Preservative treatment for anti-termite /anti-fungus shall be applied to the entire drum with preservatives of a quality which is not harmful to the cable. The bidder shall furnish in the bid details of anti-termite /anti fungus treatment given to the drum.

Before reeling, cardboard or double corrugated or thick bituminous water proof bamboo paper shall be secured to the drum barrel and inside of flanges of the dry drum by means of a suitable commercial adhesive material. The paper should be dried before use After reeling the cable the exposed surface of the outer layer of the cable shall be wrapped with thin polythene sheet across the flanges to protect the cable from dirt, grit and damage during transportation and handling and also to prevent ingress of rain water during storage and transport.

A minimum space of 75 mm shall be provided between the inner surfaces of the external protective lagging. A few staggered lagging on the outermost layer of cable shall be provided to avoid unreeling of cable during transit. There shall be minimum of two binders consisting of iron/ galvanized steel wire. Each protective lagging shall have two recesses to accommodate the binders.

The cable ends shall be properly sealed and secured with the use of U-nails or bolts on the side of one of the flanges to avoid loosening of the cables layers in transport and handling.

Only one length of cable shall be wound on each drum. The method of lagging to be employed shall be clearly stated in the tender. Each drum shall be accompanied by the following information.

- Manufacturer's name and address
- Contract number
- Type of the cable
- Gross weight of the cable and drum
- Weight of empty drum with lagging
- Net weight of the cable
- Length of the cable
- Drum and lot number
- Name and address of the consignee
- Month and year of manufacture
- Rotation of drum

5. FIBER OPTIC APPROACH AND UNDERGROUND CABLE

5.1. General

This section describes the functional & technical specifications for supply and installation of Fiber Optic Approach Cable and the underground cable.

For purposes of this specification, a fibre optic approach cable is defined as the cable installed between the high voltage substation and the outgoing distribution pole and other areas where overhead installation on distribution poles are not possible.

The estimated fibre optic approach cabling length requirements are indicated in table below and same has been reflected in Price Schedule. However, the Contractor shall supply & install the optical fibre approach cable as required based on detailed site survey to be carried out by the Contractor during the project execution and the Contractor shall be paid for the actual quantity supplied and installed at site.

5.2. Requirements

The Approach cable shall be Dual-Window Single Mode (DWSM) telecommunications grade fibres as specified Clause 2.2(G.652 D). All optical fibre cabling including fibre itself and all associated installation hardware shall have a minimum guaranteed design life span of 30 years.

The cable shall be suitable for direct burial, laying in trenches & PVC/Hume ducts, laying under false flooring and on indoor or outdoor cable raceways.

The Approach Cable shall be a UV resistant, rodent proof, armoured cable with non-metallic type of armouring.

The outer cable jacket for approach cable shall consist of carbon black polyethylene resin to prevent damage from exposure to ultra-violet light, weathering and high levels of pollution. The jacket shall conform to low density, medium density and high density polyethylene standards as defined in ASTM D1248.

Approach cable shall contain fibres with identical optical/ physical characteristics as those in the OPGW cables. The cable core shall comprise of tensile strength member(s), fibre support/bedding structure, core wrap/bedding, and an overall impervious jacket.

Loose tube construction shall be implemented. The individually coated optical fibre(s) shall be surrounded by a buffer for protection from physical damage during fabrication, installation and operation of the cable. The fibre coating and buffer shall be strippable for splicing and termination. Buffer tubes shall be filled with a water-blocking gel.

The cable core shall comprise of tensile strength member(s), fibre support/bedding structure, core wrap/bedding, and an overall impervious jacket.

A suitable marking indicating Employer's Name, Manufacturer's name, running meter length, Number of fibres, Year of manufacture and Laser symbol & caution notice shall be applied in order to identify the cable.

5.3. Cable Drums, Marking, Packaging and Transport

The length of the cable should be as per the drum schedule approved by the Employer's Representative. All optical fibre cable shall be supplied on strong drums provided with lagging with adequate strength, constructed to protect the cabling against all damage and displacement during transit, storage and subsequent handling during installation. Both cable ends in the drum shall be sealed and shall be readily accessible. The drum shall be marked with consignee details.

Packing list supplied with each drum shall have all the information provided on marking on the respective cable drum, OTDR length measurement of each fibre and Ratio of fibre and cable length.

5.4 Service Loops

For purposes of this specification, cable and fibre service loops are defined as slack (extra) cable and fibre provided for facilitating the installation, maintenance and repair of the optical fibre cable plant.

- (a) Outdoor Cable Service Loops: FDP and in-line splice enclosures installed outdoors and mounted on the utility poles, shall be installed with sufficient fibre optic cable service loops such that the recommended minimum bend radius is maintained while allowing for installation or maintenance of the cable to be performed in a controlled environment at ground level.
- (b) Indoor Cable Service Loops: FDTs shall provide at least five (5) metres of cable service loop. Service loops shall be neatly secured and stored, coiled such that the minimum recommended bend radius' are maintained.
- (c) Fibre Units Service Loops: For all fibre optic cable splicing, the cable shall be stripped back a sufficient length such that the fan-out of fibre units shall provide for at least one (1) metre of fibre unit service loop between the stripped cable and the bare fibre fan-out.
- (d) Pigtail Service Loops: Connectorized pigtails spliced to bare fibres shall provide at least 0.5 metre of service loop installed in the FDP fibre organizer and at least one (1) metre of service loop to the couplings neatly stored behind the FDP coupling panels.
- (e) Fibre Service Loops: At least 0.5 metre of bare fibre service loop shall be provided on each side of all fibre splices. The bare fibre service loops shall be neatly and safely installed inside covered splice trays.

5.5. Installation of Approach Cable

A network of cable trenches and/or ducts exists at sites at some of the stations. The contractor shall route the cable through the existing available cable trenches. In case, small amount of works are need in widening the cable trenches or ducts, the contractor is expected to do the same and accommodate the cost in the unit rate of other items.

The Contractor is therefore advised to visit sites and understand the site situations before quoting for the tender. It shall be the responsibility of the Contractor to efficiently use the existing infrastructure for the on-station communications cabling. The existing cable trenches/ cable raceways proposed to be used shall be identified in the survey report.

It may be noted that in order to utilize the existing trenches, the approach cable may be required to be co-located with HV and LV cables. Accordingly, the approach cable shall be installed in corrosion resistant flexible conduit also across the trenches and other areas/sites where necessary. Suitable provisions shall be made by the Contractor to ensure adequate safety earthing and insulated protection for the approach cable.

Approach cables exiting from the ground or passing through floors shall be protected against mechanical damage.

Approach cables shall penetrate buildings through cable ducts. The cabling shall route within buildings in cable raceways or under raised floors. The Contractor may utilize existing ducts, building penetrations, cable trays, racks, etc., where appropriate and approved by the Employer. The cables shall be affixed to cable supports using approved ties, clips or cleats at regular intervals.

On short approach cable runs for which cable supports are not required, the Contractor shall fix the cable to the structure of the building using approved fixings and cable cleats.

The Contractor shall be responsible for new building penetrations required for approach cabling. Caution shall be taken to ensure existing equipment and site personnel are protected from dust and debris incident to the cable penetration work. Penetrations shall be neatly formed and sealed for protection from moisture, dust, wind and vermin intrusion. The cables shall be affixed to cable supports using approved ties, clips or cleats at regular intervals

All required fittings, supports, accessories, ducts, inner ducts, conduits, risers and any item not specially mentioned but required for lay and installation of approach cables shall be supplied and installed by the Contractor as part of this Contract.

Similar methodology will have to be adopted for underground armoured optical cables to sufficiently protect the optical fiber cable from physical damage with the use of corrosion resistant conduits and sufficiently bury it to an adequate depth with sand bedding.

5.6 Cable Raceways

The Contractor is required to provide and install any additional indoor cable raceways which may be required for proper implementation of the fibre optic cabling system. The cable raceways shall conform to the following:

- (a) All cable raceways shall be sized to support full loading requirements plus at least a 200% safety loading factor.
- (b) Indoor cable raceways shall be fabricated from construction grade aluminium, galvanized iron or anodized sheet metal or any other suitable material approved by the Employer. Suitable anti-corrosion measures shall be provided. Steel fabricated raceways shall be finished inside and out, treated to resist rust and to form a metal-to-paint bond.
- (c) Mechanical construction drawings of the cable raceways shall be submitted for Employer's approval.

6. FIBER DISTRIBUTION POINTS/TERMINALS

6.1. General

This section covers specifications for outdoor Fiber Distribution Points (FDP) to be mounted on power distribution poles as well as Fiber Access Terminals (FAT) to be mounted at the terminal buildings (outdoor).

6.2. Location

Based on preliminary design carried out by the Employer, the locations of all FDPs have been recommended.

The Contractor will reassess these positions during detailed design with a view to optimizing the design. Any changes arising out of this optimization process shall be submitted for approval by the Employer's Representative.

All FDPs shall be located in areas that are accessible for ease of maintenance.

FDPs shall be outdoor type and shall be mounted along power distribution poles at height accessible to maintenance crew without requiring a power outage. The equipment shall be installed at strategic locations central to a number of customer buildings.

FATs shall be outdoor type and shall be installed at the customer buildings preferably next to the power metering panel.

6.3. Mounting

Unless otherwise approved by the Employer, all FDPs shall be mounted on a single pole structure. The design of the structure complete with mounting details for the panel shall be prepared by the Contractor and submitted for the review and approval of the Employer's Representative.

FATs shall be mounted on a wall next to the customer power metering panel. The design of the structure complete with mounting details for the FAT panel shall be prepared by the Contractor and submitted for the review and approval of the Employer's Representative.

6.4. Minimum Design Requirements

FDPs shall be Outdoor type, vandalism proof and shall meet the following minimum design requirements:

- a) The FDPs/FATs shall be provisioned with splice organizers and splice trays. All fibres within a cable shall be fusion spliced to pre-connected pigtails and fitted to the provided fibre optic couplings.
- b) FDPs/FATs shall accommodate pass-through splicing and fibre terminations.
- c) The FDPs/FATs shall be supplied with suitable sub rack which can accommodate all the fibers in each for fibre terminations from incoming individual distribution fiber optic cable. Each termination shall clearly mark fiber number, direction of the fiber and other relevant information.

- d) All FDPs/FATs shall be suitable for outdoor conditions, water resistant, corrosion resistant, robust construction and shall allow both top or bottom entry for access to the splice trays. Specific selection of the entry points shall be made at the time of installation. Ground lugs shall be provided on all FDTs and the Contractor shall ensure that all FDTs are properly grounded.
- e) Flexible protection shall be provided to the patch cord bunches going out from FDT to other equipment.
- f) The FDPs/FATs shall be properly earthed through dual grounding to obtain acceptable levels of grounding. Maximum resistance to ground shall be 10 ohm.
- g) Each FDPs/FATs shall also have fixed couplers to prevent dust ingress to the couplers of unused fibres.
- h) The FDPs/FATs shall be made of PVC material

6.5. Installation Requirements

The Contractor shall be expected to carry out the following installation works:

- a) Mounting of the FDT on Single Pole Structures
- b) Mounting of FATs on customer walls
- c) Installation of splitters provided by the Client,
- d) Splicing and carrying out of all terminations at the FDPs, FATs and enclosures

7. OPTICAL CONNECTORS AND ADAPTERS

7.1. Scope

This section specifies the requirement of optical connector sets of LC-type to be used in single-mode optical fiber telecommunication systems.

A connector set is: "The complete set of connector components required to provide demountable coupling between optical fibers". The length of fiber or cable on each side of the connector set shall be 3 meters (minimum).

7.2. Design

7.2.1. General

The ferrule of the optical connector shall be made of zirconia stabilized ceramic. When the connector is mounted on a cable (or a tight buffered fiber) the fiber shall be fixed with epoxy in the cavity of the ferrule. Then the end face of the ferrule with the fiber shall be polished. In order to ensure physical contact the shape of the ferrule shall be spherical.

The cable (jacket and strength members) shall be fixed to the connector by means of a crimp sleeve. Mating with another connector shall be accomplished by the means of an adapter with a split sleeve.

7.2.2. Material

The supplier shall give details of the materials used in different parts of the proposed connector. The connector housing shall be of an all-metal design.

7.2.3. Ferrule

The ferrule end face shall meet the following requirements:

Ferrule end face curvature	$10 < r < 25 \text{ mm}$
Vertex offset of ferrule tip (convex vertex eccentricity from ferrule center)	$< 50 \text{ } \mu\text{m}$
Fiber undercut from ferrule end face	$\leq 0.05 \text{ } \mu\text{m}$
Fiber protrusion from ferrule end face	$\leq 0.10 \text{ } \mu\text{m}$
Outside Diameter (A)	$2.4990 \pm 0.0005 \text{ mm}$
Tolerance of Cavity Diameter	$+1, -0 \text{ } \mu\text{m}$
Concentricity error of cavity	$< 1.4 \text{ } \mu\text{m}$
Angular Misalignment	$< 0.2^\circ$

7.3. Performance Requirements

7.3.1. Visual Inspection

Each connector shall be properly packed. The package shall be marked with, the name of the manufacturer and the manufacturing date. The connector itself shall be legibly and durably marked with the identity mark of the manufacturer and the manufacturing date code.

The end face shall be clean and free from residues of glue. Using a microscope with a maximum magnification of 200x no scratches or break out of glass pieces shall be seen.

7.3.2. Insertion Loss

Requirements:

Property	Mean	Maximum
Allowable Attenuation	$\leq 0.25\text{dB}$	$\leq 0.50\text{dB}$

7.3.3. Return Loss

Property	Maximum
Allowable Return Loss	$\geq 40\text{dB}$

7.3.4. Temperature

The connector shall be capable of operating over a full temperature range of (-30°C to $+70^{\circ}\text{C}$), without any damage or significant change in optical performance.

8. OPTICAL CABLE SPLICE ENCLOSURES

8.1. Scope

This specification covers the requirements of splice enclosures to be used for splicing of all types of optical cables. Thus it is applicable for both duct and aerial cables.

8.2. General

The design of the splice closure shall consider ITU-T recommendation L.13 “Sheath joints and organizers of optical fiber cables in the outside plant” and the requirements of this specification.

It shall be possible to use the splice closure installed in manholes, in hand holes, on poles, in cable vault, etc. It is the intention to use the splice closure to be installed in chambers or on poles.

The closure shall be re-enterable, i.e. possible to open and close several times, without wear or impairment of its water tightness and/or other essential features.

The closure shall be equipped with fiber cassettes and organizers that are easy to use and which provide full protection to the fibers.

8.3. Handling Aspects

The splice closure shall have a robust and reliable design and well adapted to the conditions in the field. It has to work even if minor un-intentional deviations at the installation procedure are made.

The splice closure shall have as few parts as possible. Tools that require calibration should not be required for work with the closure.

The use of melt resin or glue shall be avoided if possible.

Work with the closure shall be possible in a cramped room, e.g. manholes.

Work with the closure shall be possible without bending the fibers below their minimum allowed bending radius at any stage of work.

Work with the closure shall not require extensive training.

Work with the closure shall be possible to be carried out by one man alone.

Work with the closure shall not involve any risk of injury to the working personnel.

The method of work shall be described in an easy to understand installation instruction or manual enclosed with each closure in English language.

All the parts of the splice closure, except for the materials required for jointing of the fibers, shall be packed in one package, with a clear marking of its contents if required. If the storage time is limited that shall be stated on the package.

8.4. Design

The contractor shall furnish and install fiber optic splice closures in locations as confirmed by Employer’s Representative through approval of installation plans. The fiber optic splice closure shall meet the following requirements:

- Shall provide a good mechanical protection.
- Shall incorporate a mechanical compression and/or mastic tape sealing system to maintain a barrier against water and moisture penetration.
- shall be reasonably resistant against unauthorized tampering, vibration and wear, as well as against biotic attack (rodents, termites, etc.).
- Shall be resistant against corrosion.
- Shall be resistant against UV-radiation.
- Shall be made of materials, which are mutually compatible.
- The size of the splice closure shall be in proportion to the number of cables, fibers in each cable and to the number of splices.
- It shall be easy to re-enter the splice closure and close it again several times. Also the closure shall be capable of accepting additional cables without removal of the sheath retention or strength member clamping hardware on previously installed cables or disturbing existing splices.
- The design of the closure must be such that the fibers are never bended below their minimum allowed bending radius during any phase of the splicing work.
- A splice closure, which shall be used for a branching joint, shall be possible to assemble without the necessity to cut all the fibers.
- The fiber optic closure shall be available in distinct sizes to accommodate a variety of cable entries. A fiber optic closure shall be capable of accommodating up to four cables in a butt or branch configuration.
- It shall be possible to split and branch groups of 6 fibers from the splice closure.
- Inside the splice closure there shall be space enough for an excess length of fiber of at least 2 meters. This length is based on expected future needs for maintenance or redistribution of fibers.
- The splice closure shall contain, or have the space for, fiber organizers for storage of fiber joints as well as the excess lengths on fibers.
- The fiber organizers shall provide good protection to the fibers and their joints, and have space for identification of each fiber.
- The splice closure together with the fiber organizer shall facilitate easy access to any optional fiber within the closure for work without affecting the service on the other fibers.
- In the splice closure it shall be possible to terminate any possible metallic conductor in the optical cable in such a way that they are easily accessible and possible to equip with over voltage protection devices.
- The splice closure shall be possible to use on cables with basically a circular cross-section and shall be adapted to the dimensions of the cables to be connected.
- The splice closure shall provide satisfactory anchorage of the jackets, armoring and strength members of the cables.
- The splice closure shall allow metallic parts of the cables, if any, to be bridged over so that a satisfactory electrical connection between them is achieved. It shall be possible to ground metal parts of the cable, and it shall also be possible to separate all the metal parts.
- It shall be possible to attach the splice closure to the pole by the means of attachment devices, all necessary materials for fixing shall be included in the scope of supply.
- This shall be designed with adequate mechanical strength, good air tight, anti-corrosive and shall allow easy operation, expansion, maintenance, repeat use. The box shall be cap-type and shall be made of fiber reinforced plastic metallic material.
- Sizes used shall depend on the number of fibers which shall either be 48, 96 or 144. The excess loss shall be less than 0.01dB and the bending radius shall be greater than or equal to 45mm.

- The Joint boxes shall operate normally under temperature conditions from 0deg to 80deg Celsius.
- Visual amenity shall be considered when selecting pole-mounted splice enclosures. All pole-mounted splice enclosures shall be UV stabilized.
- An IP68 rating shall be the minimum rating for all outdoor ADSS splice enclosures. Splice enclosures using a grommet and gland cable sealing system shall be used. Tape wrapping of the cable shall not be accepted.

9. AERIAL CABLE HARDWARE & SUPPORT ACCESSORIES

9.1. Introduction

This section describes fittings, hardware and support structures and accessories which may be adopted for the proposed ADSS network.

Detailed drawings of the fittings complete with the construction units are attached under *Annex 2*.

9.2. ADSS Fittings

The ADSS fittings are as described below:

9.2.1. ADSS Tangent Fitting

This shall be designed to connect ADSS cable to pole or tower in a straight line for an angle of deviation not exceeding 15degrees. The fitting shall be suitable for span lengths of up to 150m. These sets shall be fitted with structural reinforcing rods (one-armor rod) to protect the cable against dynamic stress of Aeolian vibration and bending stress. The general arrangement of the structure shall be as shown in *Figure 9-1*.

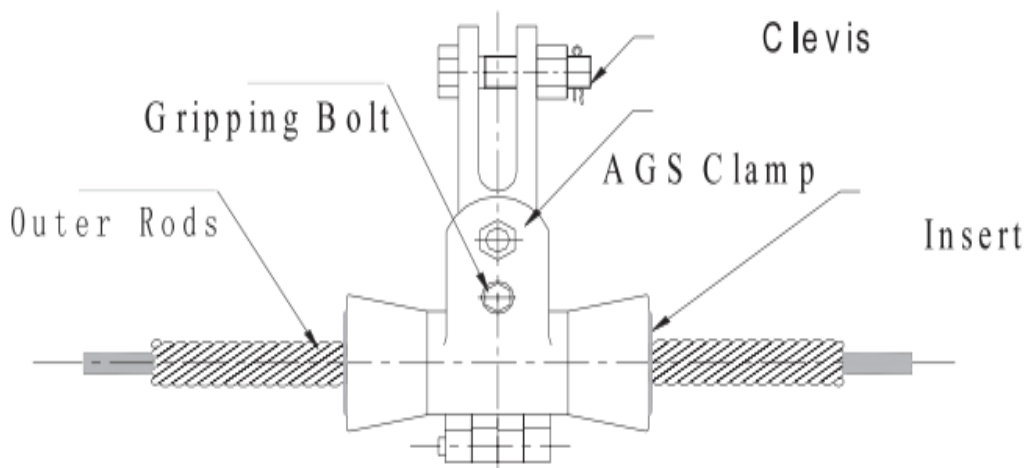


Figure 9-1 Sample ADSS Tangent Fitting

The Rated Tensile Stress (RTS) shall not be less than 40kN. The cable housing shall be made of Aluminium or Aluminium Alloy and the insert shall be made of synthetic rubber. The cable housing and anchor shackle shall be suitably adapted to the cable diameter for fiber optic cables from 2 fibers to 144fibers (8mm to 18mm).

9.2.2. ADSS Suspension Sets

This shall be designed to connect ADSS cable to pole for an angle of deviation not exceeding 25degrees. The angle of single side suspensions shall be 15-18degrees.

The fittings shall be designed to reduce static stress at the support point of ADSS cable as well as ensure the cable is cushioned against the dynamic stress of Aeolian vibration.

The grip strength of the clamp shall not be less than 15% of the rated tensile strength. The general arrangement of the structure shall be as shown in *Figure 9-2*.

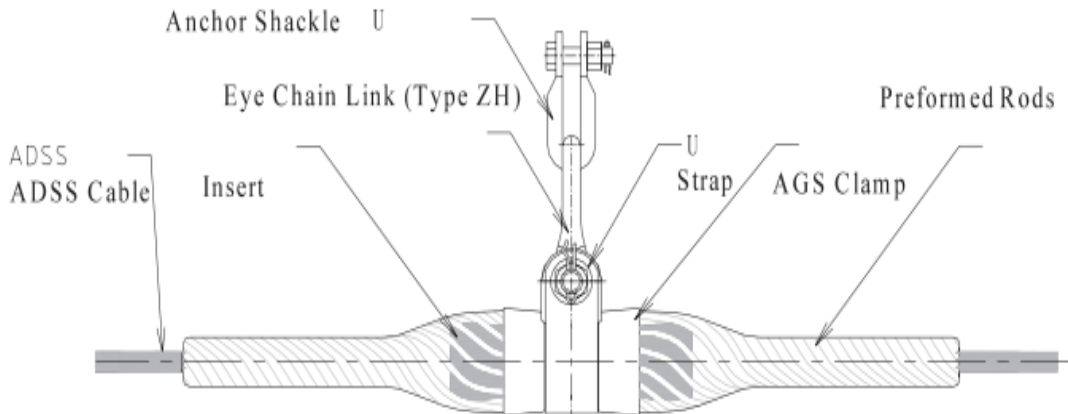


Figure 9-2 ADSS Suspension Fitting

This fitting shall be applied for pole-to-pole span lengths of up to 150m and shall be suitably adapted to cable of diameter from 8 to 18mm.

9.2.3. ADSS Tension Set

The tension sets shall be designed for short span length of up to 150m and shall be applied at a terminal pole/tower and at tension pole/tower. The fitting shall be suitably adapted for cable diameters of between 8.0 and 18mm. The general arrangement of the structure shall be as shown in *Figure 9-3*.

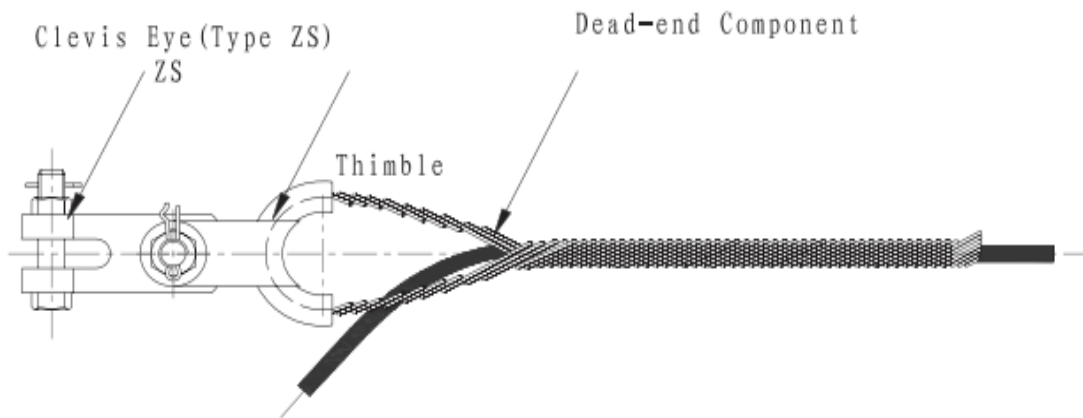


Figure 9-3 ADSS Short Span Tension Fitting

The fitting shall be adapted for deviation angles greater than 15degrees and shall have Rated Tensile Stress of not less than 20kN.

9.2.4. Vibration Dampers

Vibration dampers shall be installed for spans of more than 100m. Two different types of vibration dampers are available for use on fiber optic cables. i.e. spiral dampers and stock bridge vibration damper. The Contractor shall adopt either of the two for proposed ADSS network.

The general arrangement of the stock bridge vibration damper is as shown in *Figure 9.4*.

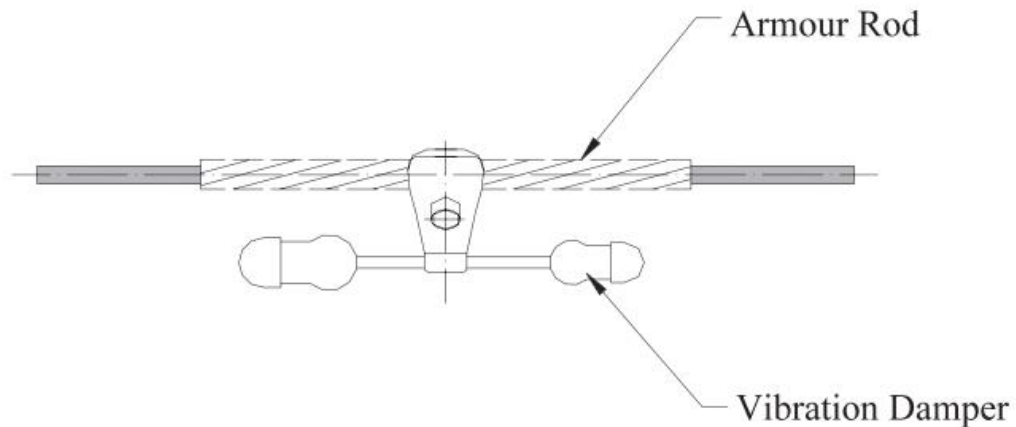


Figure 9-4 Stock Bridge Vibration Damper

The general arrangement of the spiral vibration damper is as shown in *Figure 8-7*.

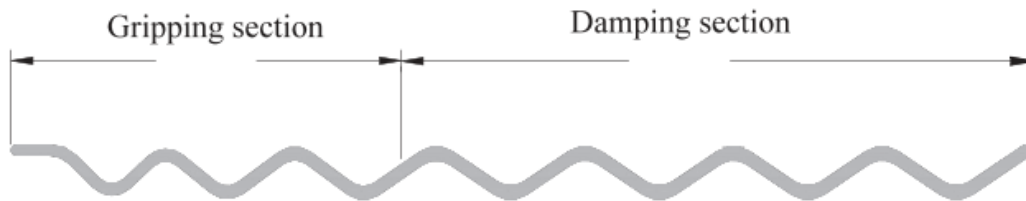


Figure 9-5 Spiral Vibration Damper

9.2.5. Fastening Clamp

This clamp shall be used to fasten suspension or tension clamps onto a pole or tower. The universal clamp used for power distribution networks applications may be adopted for this purpose. The general arrangement of the fastening clamp shall be as shown in *Figure 9-6*.

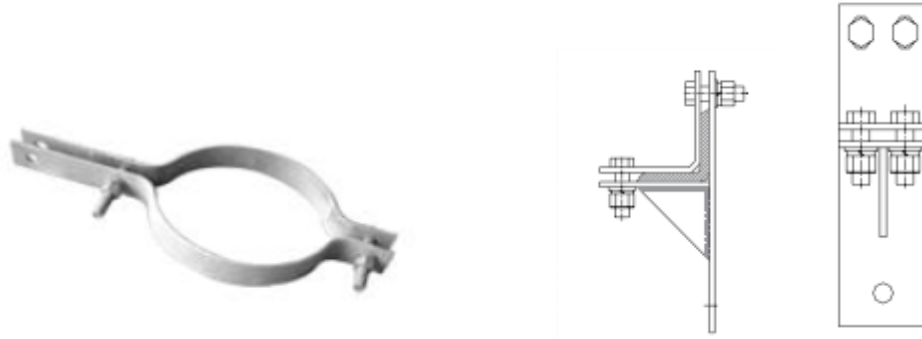


Figure 9-6 Fastening Clamp

9.2.7. Downlead Clamp

This clamp shall be used for fixing fiber optic cable when jumping and or down leading. The down lead clamp shall be made of ageing-resistant rubber, stainless steel strap, and aluminum alloy base. The clamps shall be installed at intervals of 1.5meters down the pole or tower. The general arrangement of the download clamp shall be as shown in *Figure 9-7*.

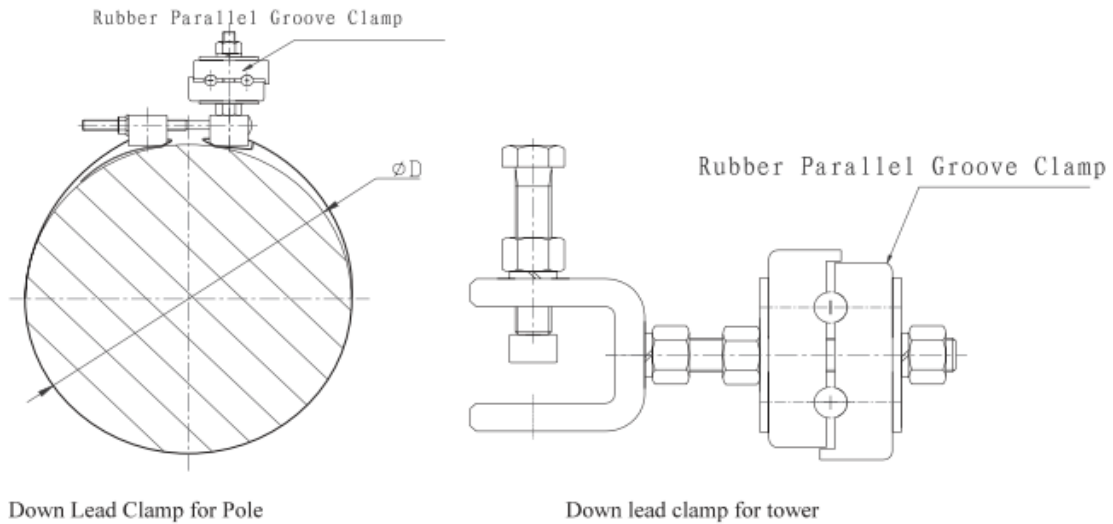


Figure 9-7 Downlead Clamps

9.2.8. Cable Storage Assembly

This assembly will be used to store cable to provide for future extensions on a poles. The general arrangement of cable storage shall be as shown in *Figure 9-8*.

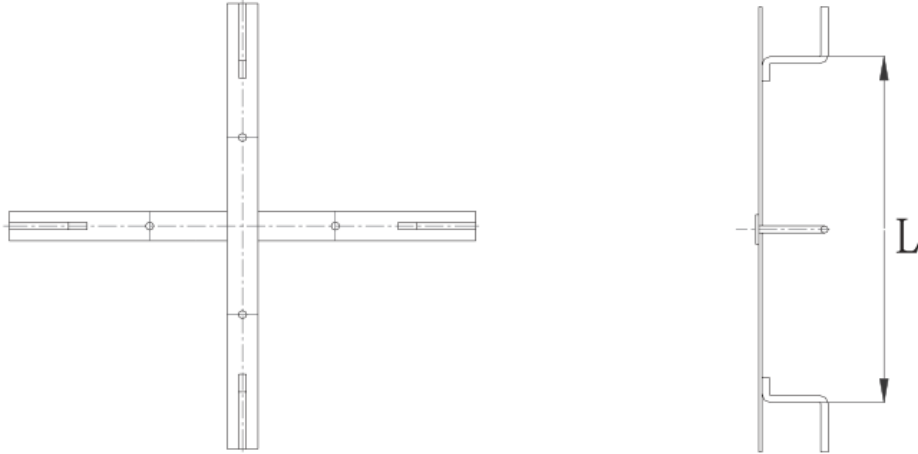


Figure 9-8 Cable Storage

The dimensioning of the storage shall be as shown in *Table 9-1*.

Table 9-1 Storage Dimensions

Dimension, L (m)	Cable Diameter	Cable Size
800	<14.8mm	12-96 core
1000	14.8-18.8mm	144 core

9.3. Power Poles and Fittings

Where poles and fittings are required to be installed within the existing power distribution network, this shall be done by the Client. However, the Contractor shall during detailed design establish and mark in design drawings all poles and fittings that are required to be replaced by the Employer prior to installation of the ADSS Fiber Optic network.

10. SPARES AND TOOLS

10.1. Tools for Service and Maintenance

As a part of the continuing maintenance concept, Contractor is required to supply the tools and plant for maintenance of the ADSS network as indicated in the prices schedule. However it must be noted that list of Tools and plant given in the price schedule is indicative only. The Contractor shall supply actual tools and plant required for the operation and maintenance by the Employer. The tools shall comprise mandatory tools as indicated in the schedule of prices and any other tools necessary for the normal operation of the plant supplied.

The Contractor shall also supply mandatory spare parts in such quantities as are indicated in the Schedule of Prices in *Volume 2* of the bid documents.

In addition to the mandatory spare parts and tools, the Contractor shall also provide a price list of any other tools and spare parts not listed among mandatory spare parts and tools but which the Contractor considers to be necessary for the maintenance of the plant. The list of such spare parts and tools shall be entered in Schedule no.6 of the Schedule of Prices (*Volume 2* of the bid documents).

Specifications for tools and plant to be supplied are described as follows:

10.1.2. Splicing kit

The splicing kit shall consist of the basic set of implements necessary to carry out a splicing exercise and shall include the following at the minimum; a fusion type splicing machine, cleavers, strippers, batteries and power cord. The splicing machine shall be a 4-fiber ribbon splicer with high versatility. It shall be well suited for FTTX applications and shall be of robust construction. Below are the features desired for the splicing machine:

- i. Rugged construction providing shock, dust and moisture resistance
- ii. Ability to withstand a 30" drop test.
- iii. Dual monitor position with automatic image orientation
- iv. Automatic arc calibration and ribbon fiber identification
- v. Auto-start tube heater
- vi. Color LCD display and anti-reflective coating for excellent visibility in bright sunlight
- vii. Simultaneous battery charge and splicer operation
- viii. Long life battery (up to 90 splice/heat cycles per charge)
- ix. Detachable work table incorporated into the transit case
- x. Data and video download software and splicer upgrade software to be included; software upgrades through PC application via the internet
- xi. Green friendly – RoHS& WEEE compliant

10.1.2. Termination Kit

The termination kit shall be a standard toolkit that contains a collection of essential tools needed for termination of Single Mode fiber optic cable of all connector styles (SC, LC & ST). The case should be a carry like briefcase that is rugged and compact. The case shall be lined with a foam-padding material that keeps the tools safe, neat and in proper working order.

10.1.3. Fault Locator

The fault locator shall be an easy to use device of portable construction. It shall be of high performance in optical fiber troubleshooting functionalities with capability of locating fiber breaks and high loss events over long distances. It should be able to detect the fiber break location and display the results on an LCD screen. Refer to the Guaranteed Technical Data Sheet for the minimum requirements for the desired Fault Locator.

10.2. Spare Parts

The Bidder shall quote for Mandatory Spares detailed as per the relevant schedule provided in the Price Schedule.

The mandatory spares shall be delivered not later than the date of receipt of the last shipment of the associated item of plant/equipment. All spares shall be interchangeable with the original parts. They shall be treated and packed for long term storage under the climatic conditions of site.

Each item shall be clearly and permanently labelled on the outside of its container with its description and purpose. When several items are packed in one case, a general description of the contents shall be given on the outside of the case. Spare parts shall not be shipped in the same cases as components which are used for erection. The cases shall be clearly labelled to indicate that they contain spare parts or tools and each tool or appliance shall be clearly marked with its size and purpose. All cases, containers, or other packages are liable to be opened for inspection and checking on site.

11. ADSS DESIGN & INSTALLATION REQUIREMENTS

11.1. General

This section describes Employer's requirements for design and installation of the ADSS cable along power distribution lines.

11.2. Network Design Requirements

Contractor must offer standard products and designs. It should be noted that preliminary design information and quantities specified in the price schedule are indicative only. The Contractor shall verify the design data during the site survey and detailed engineering and finalize the Bill of Quantities (BoQ) as required for ultimate design and system performance.

Contractor's proposal shall address all functional and performance requirements within this specification and shall include sufficient information and supporting documentation in order to determine compliance with this specification without further necessity for enquiries.

The scope of the work includes detailed survey during the Contract execution and the Contractor will be required to visit all sites. The site visit after Contract award shall include all necessary surveys to allow the contractor to perform the design and implementation. The site survey schedule should be informed to the Employer's Representative at least one (1) week prior to commencement of the survey.

After the site/route survey the Contractor shall submit to the Employer's Representative a survey report on each link and site. This report shall include but not limited to the following items.

- a) List of all span length and total link length for ADSS, underground armoured optical fiber and approach (underground) cable.
- b) Suitability for installation of ADSS cable on the present infrastructure, poles e.t.c including adequacy of electrical clearances.
- c) Identification of sites necessary for underground installation of armoured optical fibers.
- d) Proposed splice locations and service loops, locations and length of cable protection, cable drum schedules and types of in-line splice enclosure requirement at each location.
- e) Assessment of any strengthening requirements / additional support insertion / underground ADSS requirements, based on site conditions / clearance requirements / other relevant aspects.
- f) Proposed routing of the approach (underground) fiber cable from the substation communication room to be marked on the site layout drawing. The existing cable trenches/cable raceways proposed to be used shall be identified. In case suitable existing cable trenches/cable raceways are not available, suitable alternatives shall be suggested and provided by the contractor.
- g) The pole position of the outdoor type, pole mounted, and vandalism proof fiber optic distribution point (FDP) shall also be finalized during the survey and the same shall be indicated in the survey report.
- h) All calculations necessary to confirm adequacy of the proposed FTTX network.

The above list is only indicative. All necessary study of the power distribution infrastructure lines will have to be done to ensure full and effective Live Line installation of ADSS is completed. This project is of turnkey nature to achieve optical fiber connectivity and thus small/adhoc works not explicitly mentioned/envisaged in the tender document but necessary for achieving the full completion of the project are deemed to be included in the rates of the other items.

11.3. Design Documentation

*The Design shall be GIS based, preferably MapInfo to facilitate efficient documentation and retrieval.
The achievements targeted are:*

- *Maintain data accuracy*
- *Reduce manual entry*
- *Enable fast Searching and reporting*
- *Event and Impact Analysis*
- *Physical Resource Management*
- *Logical Resource Management*

Planning and designing the entire fiber infrastructure, from backbone to building connection for all variants of an FTTx network (P2P and PON technologies), inventory and resource management will have standardized templates. All relevant aspects of the physical network Objects; Poles, existing power infrastructure, cabinets and racks, connectivity/Utilization, splice-enclosures, cables, fibres, splitters, dwelling units/households/customers etc. will be taken into account.

Design for Pole Feeding will require record of all layers of the physical network which include:

a) Poles

- *Pole ID,*
- *Coordinates*
- *Materials used*
- *Height*
- *Status*
- *HV Line Presence*
- *Formation*
- *LV Line presence*
- *Transformer Capacity*
- *Stay Wire*
- *Fiber anchor height*
- *Loop storage*
- *Downward Clamps*

b) Closures

- *Closure ID*
- *Capacity*
- *Manufacturer*
- *Splice Plan*
- *Splitter Presence*
- *Closure height*

c) *Splitters*

- *Splitter ID*
- *Capacity*
- *Coordinates*
- *Splice Plan*
- *Manufacturer*

d) *Cable/Fibre*

- *Cable ID (based on nodes)*
- *Capacity*
- *Length*
- *Minimum clearance Height*
- *Core utilization (1-144)*

e) *FAT/ODF/FDP*

- *ID*
- *Capacity*
- *Location/Coordinates*
- *Manufacturer*
- *Port Utilization*

As Built documentation shall consist of:

- Updated MapInfo Design
- AutoCAD Design capturing the physical layout
- Fiber OTDR traces
- As built BOM derived from MapInfo

11.4. Installation Requirements

11.4.1. Installation Methodology

A detailed methodology proposed to be adopted for ADSS installation shall be submitted for the approval of the Employer's Representative prior to commencement of installation works. Methodology proposed by the Contractor shall be such that works shall be carried out without power outages.

The contractor shall carry out tensioning of the ADSS wherever required to maintain the adequate physical ground clearance, required as per the stipulations of these specifications. Where necessary, the Contractor is required to ensure that adequate measures are taken to ensure that the pole / infrastructure is not subjected to undue loadings without compensating counter-measures and such requirements are deemed to have been included in the Scope of the Contractor without any additional payment towards the same.

11.4.2. Live Line Installation

Except for a few sections like transformer stations, all of the ADSS fiber cable under this project shall be installed under live line (fully HOTLINE) condition i.e. with all the circuits of the line charged to their rated voltage. The ADSS cable shall be installed below the live conductor of the distribution poles rated at 11kV (12m pole), 11 kV (11 meter pole) and above 415V (10m and 9.8m poles).

The installation shall be generally in accordance with the latest version of IEEE Guide to the Installation of Overhead transmission Line Conductor with additional instructions and precautions for live line working and fibre optic cable handling.

The Contractor shall ensure that there shall be no outage of the distribution line during the live line stringing of ADSS cable and live line strengthening of the poles.

Any Interruptions required on the 415V network and selected sections of the 11kV network shall be facilitated by the employer upon the request of the Contractor and the same shall have been foreseen and included in the approved method statement for the works.

11.4.3. Training and Authorization of Contractor's Personnel

Prior to commencement of works, the Contractor's personnel shall be required to undertake a safety training and to be authorized for work on power distribution lines. The training shall be conducted at the KPLC Institute of Energy Studies and Research. The cost of this training is deemed to have been included in the Contract Price.

11.4.4. Optical Fiber Splices

All fibre splices shall be of the fusion type, except where demountable connectors are specified. Fusion splicing shall be carried by trained personnel using automatic fusion splicing equipment designed for the fibre type.

The accurate alignment of fibre cores, prior to splicing, shall be verified using a technique that monitors the optical power transmitted across the splice interface.

Fusion splice optical losses shall average 0.1db per splice. No single splice loss shall exceed 0.15 db. Splices shall be mechanically strengthened and protected from the environment by means of splice sleeves or enclosures. The finished splice shall be supported within the spliced box by means of suitable clips or restraints. It shall be possible to remove and replace the splice in the support device without risk of damage to the splice or fibre. Each fusion splice shall have a spare length of fibre of approximately 1 m associated with it. This excess fibre shall be coiled neatly and clipped (or otherwise retained) within the splice box.

The splicing shall be performed at ground level. Splice boxes conforming to IP 55 of shall be mounted on the poles at least 5 meters above the ground. The cable shall be fastened into the tower structure. In each splicing location at least 15 meters of free cable must be included for future splicing at ground level.

11.4.5. Service Loops

For purposes of this specification, cable and fiber service loops are defined as slack (extra) cable and fiber provided for facilitating the installation, maintenance and repair of the optical fiber cable plant.

- (a) Outdoor Cable Service Loops: FDPs and in-line splice enclosures installed outdoors and mounted on the utility poles, shall be installed with sufficient fiber optic cable service loops such that the recommended minimum bend radius is maintained while allowing for installation or maintenance of the cable to be performed in a controlled environment at ground level.
- (b) Fiber Units Service Loops: For all fiber optic cable splicing, the cable shall be stripped back a sufficient length such that the fan-out of fiber units shall provide for at least one (1) metre of fiber unit service loop between the stripped cable and the bare fiber fan-out.
- (c) Pigtail Service Loops: Connectorized pigtails spliced to bare fibers shall provide at least 0.5 metre of service loop installed in the FDP fiber organizer and at least one (1) metre of service loop to the couplings neatly stored behind the FDP coupling panels.
- (d) Fibre Service Loops: At least 0.5 metre of bare fibre service loop shall be provided on each side of all fibre splices. The bare fibre service loops shall be neatly and safely installed inside covered splice trays.

11.4.6. Cable Installation to FDPs and FATs

The Optical Fiber Cable Sheath shall be stripped off before entering FDP or FAT box. The jelly shall be removed so that it is not present at the entry to the FDP or FAT.

12. INSPECTIONS AND TESTS

12.1. Testing Requirements

All materials to be supplied and all work performed under this Contract shall be inspected and tested. Deliveries shall not be shipped until all required inspections and tests have been completed and all deficiencies have been corrected to comply with this specification and approved for shipment by the employer.

The Contractor shall furnish all man power and materials for tests, including testing facilities, power and instrumentation and replacement of damaged parts. The costs shall be borne by the Contractor and shall be included in the Contract Price.

The entire cost of testing for factory and site acceptance, routine tests, production tests and other test during the manufacture and site activities specified herein shall be included in the Contract Price .

Acceptance or waiver of tests will not relieve the contractor from the responsibilities to furnish material and works in accordance with the specifications and to employer's satisfaction.

All tests shall be witnessed by the employer unless employer authorizes testing to proceed without witness. The employer representatives shall sign the test form indicating approval of successful tests.

Contractor shall ensure to meet the specification failing which contractor has to replace or upgrade on their own expense. The employer reserve rights to require the Contractor expense any other reasonable test(s) at the contractor premises, on site or elsewhere in addition to the specified type, Acceptance, Routine or Manufacturing test to assure the specification compliance.

The plant will be inspected during manufacture and testing by the Employer. Every facility shall be provided by the Contractor to enable the Employer to carry out the necessary inspection of the plant and the cost of all tests during manufacture and preparation of test records shall be deemed to be included in the Contract Price. Apart from the tests specified here in below, other tests mentioned in the Specifications of individual components of the works shall also be performed to the satisfaction of the Employer. The passing of such inspection or test will not, however, prejudice the right of the Employer to reject the Plant and any or all of material, if it does not comply with the Specifications, or give complete satisfaction in service.

The Contractor shall inform the Employer in writing at least thirty (30) days before the equipment or material is planned for testing at manufacturer's works.

Unless otherwise specified in this Contract, selection of test samples, numbers of specimens and acceptance of results shall be in accordance with the terms of the relevant Standards and Codes. Where no terms exist, the Employer is to instruct details in advance of the inspection and tests in response to the request of the Contractor.

As a special requirement for this Project, the contractor should demonstrate and provide test reports to prove the ADSS installation is safe and secure even under direct contact with voltages as high as 11kV.

12.2. Type Tests

All the equipment offered by the Bidder shall have been type tested within the past five years (reckoned from the date of Bid Opening) and the Bidder shall submit copies of Type Tests Certificates for all relevant equipment / material offered. If the Type Test Certificates furnished refer to period earlier than five years as indicated above then the Employer reserves the right to seek for repetition of type tests for any / all equipment at his discretion and such testing shall be carried out at the cost of the Contractor.

12.3. Factory Acceptance Tests

Factory Acceptance Tests (FAT) shall be conducted as per relevant Standards and Codes on randomly selected final assemblies of all equipment to be supplied. These tests shall be carried out in the presence of the Employer's authorized representatives unless waiver for witnessing by Employer is intimated to the Contractor.

Unless testing is waived by the Employer, Factory Acceptance Testing shall be shall be carried out on the following:

- ADSS Fiber Optic Cable
- ADSS Fittings

Equipment shall not be shipped to the Employer until required factory tests are completed satisfactorily, all variances are resolved, and the Employer has issued Dispatch Clearance, which may be issued after completion of FAT by the Employer or his authorized representatives assigned to carry out the FAT. Successful completion of the factory tests and the Employer approval to ship shall in no way constitute final acceptance of the system or any portion thereof.

The Factory Acceptance Test (FAT) shall demonstrate the technical characteristics of the Fiber Optic cable & associated accessories in relation to this specifications and approved drawings and documents. The list of factory acceptance tests shall be supplemented by the Contractor's standard FAT testing program. In general the FAT for other items shall include at least: Physical verification, demonstration of technical characteristics, various operational modes, functional interfaces, alarms and diagnostics, performance, evidence of correct equipment configuration and manufacturer's final inspection certificate/report.

Prior to commencement of the tests, the Contractor shall submit an Inspection and Test Plan (ITP) document which shall detail the specific tests to be carried, test methods, test criteria and forms of reports to be prepared as a record of each test to be performed. The ITP shall be submitted at least 2 weeks prior to commencement of the tests.

The Contractor shall include the cost of witnessing the tests by three (3) of Employer's personnel in the Contract price. This shall include economy class return air tickets, at least three (3) star hotel accommodation and daily allowance of USD 200 per day for each personnel for a minimum period of 5 days for each trip.

12.4. Site Acceptance Tests

The Contractor shall be responsible for carrying out Site Acceptance Tests (SAT) and inspections for all equipment supplied under Contract as required by the Employer. All equipment shall be tested on site under the conditions in which it will normally operate.

The tests shall be exhaustive and shall demonstrate that the overall performance of the contract works satisfies every requirement specified. This testing shall be supplemented by the Contractor's standard installation testing program, which shall be in accordance with his quality plan(s) for Optical Fiber cable & Telecom equipment installation.

Prior to commencement of the tests, the Contractor shall submit an Inspection and Test Plan (ITP) document which shall detail the specific tests to be carried, test methods test criteria and forms of

reports to be prepared as a record of each test to be performed. The ITP shall be submitted at least 2 weeks prior to commencement of the tests.

As a minimum, the following inspections and tests shall be included in the ITP:

No.	Test Item	Tests
1.	Fiber Approach Cable Pre-Installation Testing	(a) Optical fiber continuity and fibre attenuation with OTDR at 1550/1310 nm. (b) Physical Inspection of the cable assembly for damage
2.	Fibre Optic Cable Splice Testing	(a) Per splice bi-directional average attenuation with OTDR (b) Physical inspection of splice box/enclosure for proper fibre routing techniques (c) Physical inspection of sealing techniques, weatherproofing, etc.
3.	Fiber Optic Cable Link Testing	(a) Fibre continuity and link attenuation (Bi-directional) between FDT connectors at two ends for each fibre at 1310 and 1550 nm by OTDR. (b) Fibre continuity and link attenuation (Bi-directional) between FDT connectors at two ends for each fibre at 1310 and 1550 nm by Power meter & Laser source. (c) Average fibre attenuation and average splice loss in the link including FDT. (d) Proper termination and labelling of fibre and fibre optic cables at FDT.

ANNEX 1-TECHNICAL DATA SHEETS

GUARANTEED TECHNICAL DATA SHEETS

DEFINITIONS AND ABBREVIATIONS

The following terms may be met in these Technical Schedules and shall be interpreted as follows:

Hz	shall mean hertz
kW	shall mean kilowatt
MW	shall mean megawatt
VA (kVA, MVA)	shall mean volt-ampere (kilo-, mega-)
A (kA)	shall mean ampere (kilo-)
V (kV)	shall mean volt (kilo-)
W/m	shall mean watt per metre
AC	shall mean alternating current
DC	shall mean direct current
IN	shall mean rated (nominal) current
UN	shall mean rated (nominal) voltage
Ah	shall mean ampere-hours
lm	shall mean lumen
lm/w	shall mean lumen per watt
min	shall mean minute
min.	shall mean minimum
(prefix)	shall mean micro
rms	shall mean root mean square
p.u.	shall mean per unit
p/p	shall mean peak to peak
T	shall mean Tesla
kg	shall mean kilogram
N	shall mean Newton
l	shall mean litre
s or sec.	shall mean second
No.	shall mean number
dB	shall mean decibel
Amp	shall mean amperes
F	shall mean Farad
°C	shall mean centigrade
K	shall mean degree Kelvin
m ²	shall mean square metre
m ³	shall mean cubic metre (mm ³ for millimetre, etc)
m ³ /s	shall mean cubic metres per second
m	shall mean metre
cm	shall mean centimetre
mm	shall mean millimetre
joules	shall mean joules per hour
tonne	shall mean metric tonne
%	shall mean percentage
Pascal 1 N/m ²	
cst	shall mean centistoke

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Table 1: 144 Core Metal Free ADSS Cables

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
1.	Manufacturer		(*)	
2.	Country of Origin		(*)	
3.	Reference Standard		ITU G.652D	
4.	Attenuation Coefficient			
	@ 1310nm	dB/km	0.4	
	@1550nm	dB/km	0.3	
5.	Attenuation Variation with Wavelength (+ 25nm) Temperature	dB/km	(*)	
6.	Attenuation at water peak (1383nm)	dB/km	0.4	
7.	Normal Mode Field Diameter			
	@1310nm	μm	9.2	
	@1550nm	μm	9.6	
8.	Mode field diameter deviation			
	@1310nm	μm	0.3	
	@1550nm	μm	0.6	
9.	Mode field non-circularity	%		
10.	Chromatic Dispersion Coefficient			
	@1310nm (1288-1339)nm	Ps/nm ² km	3.5	
	@1310nm (1271-1360)nm	Ps/nm ² km	5.3	
	@1550	Ps/nm ² km	18	
11.	Zero dispersion Wavelength	Nm	1302 - 1322	
12.	Zero dispersion slope	Ps/nm ² km	0.090	
13.	Polarization Mode Dispersion	Ps/nm ² km	≤0.06	
14.	Cut-off wavelength	Nm	1260	
15.	Refractive index		(*)	
16.	Refractive Index profile		(*)	
17.	Cladding Design		(*)	
18.	Numerical aperture		(*)	
19.	Bandwidth Distance Product	MHz.km	(*)	
20.	Bend Performance (37.5mm radius, 100turns)		(*)	
21.	Fibre Manufacturer(s)		(*)	
22.	Fibre production method		(*)	
23.	Core diameter (nominal + deviation)	μm	(*)	
24.	Core non-circularity	%	6	
25.	Cladding diameter (nominal + deviation)	μm	125±1	
26.	Core clad concentricity error	μm	0.6	
27.	Cladding non-circularity	%	1	
28.	Protective Coating type & material		(*)	

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
	Primary			
	Secondary			
39.	Protective Coating diameter (nominal + deviation)			
30.	Protective removal method			
31.	Coating Concentricity			
32.	Colour coding scheme compliant with EIA/TIA 598 or IEC 60304 or Bellcore GR-20			
33.	Colouring material complaint with technical specs?			
34.	No. of Fibres in cable			
35.	Type of Fiber			
36.	Cable Diameter			
	Nominal	Mm		
	Tolerance	mm		
37.	Cable Weight	kg/km		
38.	Max. Tensile Strength	kN		
39.	Max. Pulling Tension			
	During installation	kN		
	During service	kN		
40.	Minimum bending radius			
	During installation	mm		
	During service	mm		
41.	Maximum continuous length	km		
42.	Temperature range			
	Operation	°C		
	Installation	°C		
	Shipping & Storage	°C		
43.	Crush strength	kN/m ²		
44.	Impact Resistance			
45.	Torsion resistance			
46.	Outer jacket thickness			
	Nominal	mm		
	Tolerance	mm		
47.	Outer jacket material			
48.	Description of outer jacket coatings/additives			
49.	Inner jacket material			
50.	Inner jacket thickness	mm		
51.	Inner jacket coating/additives			
	Binder	mm		

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
	Wrapping tape	mm		
	Lay direction	mm		
53.	Central strength members description			
	Material	mm		
	Diameter	mm		
	Cylindrical or Slotted type			
54.	Peripheral strength member description.			
55.	Central Fiber optic unit	Y/N		
56.	Loose tube dia & material			
57.	Loose tube lay direction			
58.	No. of fibers per tube			
59.	Total No. of tubes and number of empty tubes.			
60.	Identification/numbering of individual tubs			
61.	Filling compound within tube			
62.	Filling compound in cable core Interstices.			
63.	Ripcord(s) provided?	Y/N		
64.	Cable design life	Years		
65.	Describe cable termite proofing measures			
66.	Describe cable anti-rodent measures			
67.	Cable construction drawing enclosed?	Yes/No		
68.	Cable drum construction	Type		
69.	Size of drum			
	Height			
	Width			
	Diameter			
70.	Weight of empty drum	Kg		
71.	Cable Drum drawing enclosed?	Yes/No		

Table 2: The 96 Core Metal Free ADSS Cables

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
1.	Manufacturer		(*)	
2.	Country of Origin		(*)	
3.	Reference Standard		ITU G.652D	
4.	Attenuation Coefficient			
	@ 1310nm	dB/km	0.4	
	@1550nm	dB/km	0.3	
5.	Attenuation Variation with Wavelength (+ 25nm) Temperature	dB/km	(*)	
6.	Attenuation at water peak (1383nm)	dB/km	0.4	
7.	Normal Mode Field Diameter			
	@1310nm	μm	9.2	
	@1550nm	μm	9.6	
8.	Mode field diameter deviation			
	@1310nm	μm	0.3	
	@1550nm	μm	0.6	
9.	Mode field non-circularity	%		
10.	Chromatic Dispersion Coefficient			
	@1310nm (1288-1339)nm	Ps/nm ² km	3.5	
	@1310nm (1271-1360)nm	Ps/nm ² km	5.3	
	@1550	Ps/nm ² km	18	
11.	Zero dispersion Wavelength	Nm	1302 - 1322	
12.	Zero dispersion slope	Ps/nm ² km	0.090	
13.	Polarization Mode Dispersion	Ps/nm ² km	≤0.06	
14.	Cutoff wavelength	Nm	1260	
15.	Refractive index		(*)	
16.	Refractive Index profile		(*)	
17.	Cladding Design		(*)	
18.	Numerical aperture		(*)	
19.	Bandwidth Distance Product	MHz.km	(*)	
20.	Bend Performance (37.5mm radius, 100turns)		(*)	
21.	Fibre Manufacturer(s)		(*)	
22.	Fibre production method		(*)	
23.	Core diameter (nominal + deviation)	μm	(*)	
24.	Core non-circularity	%	6	
25.	Cladding diameter (nominal + deviation)	μm	125±1	
26.	Core clad concentricity error	μm	0.6	
27.	Cladding non-circularity	%	1	
28.	Protective Coating type & material		(*)	

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
	Primary			
	Secondary			
39.	Protective Coating diameter (nominal + deviation)			
30.	Protective removal method			
31.	Coating Concentricity			
32.	Colour coding scheme compliant with EIA/TIA 598 or IEC 60304 or Bellcore GR-20			
33.	Colouring material complaint with technical specs?			
34.	No. of Fibres in cable			
35.	Type of Fiber			
36.	Cable Diameter			
	Nominal	Mm		
	Tolerance	mm		
37.	Cable Weight	kg/km		
38.	Max. Tensile Strength	kN		
39.	Max. Pulling Tension			
	During installation	kN		
	During service	kN		
40.	Minimum bending radius			
	During installation	mm		
	During service	mm		
41.	Maximum continuous length	km		
42.	Temperature range			
	Operation	°C		
	Installation	°C		
	Shipping & Storage	°C		
43.	Crush strength	kN/m ²		
44.	Impact Resistance			
45.	Torsion resistance			
46.	Outer jacket thickness			
	Nominal	mm		
	Tolerance	mm		
47.	Outer jacket material			
48.	Description of outer jacket coatings/additives			
49.	Inner jacket material			
50.	Inner jacket thickness	mm		
51.	Inner jacket coating/additives			
	Binder	mm		

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
	Wrapping tape	mm		
	Lay direction	mm		
53.	Central strength members description			
	Material	mm		
	Diameter	mm		
	Cylindrical or Slotted type			
54.	Peripheral strength member description.			
55.	Central Fiber optic unit	Y/N		
56.	Loose tube dia & material			
57.	Loose tube lay direction			
58.	No. of fibers per tube			
59.	Total No. of tubes and number of empty tubes.			
60.	Identification/numbering of individual tubs			
61.	Filling compound within tube			
62.	Filling compound in cable core Interstices.			
63.	Ripcord(s) provided?	Y/N		
64.	Cable design life	Years		
65.	Describe cable termite proofing measures			
66.	Describe cable anti-rodent measures			
67.	Cable construction drawing enclosed?	Yes/No		
68.	Cable drum construction	Type		
69.	Size of drum			
	Height			
	Width			
	Diameter			
70.	Weight of empty drum	Kg		
71.	Cable Drum drawing enclosed?	Yes/No		

Table 3: The 48 Core Metal Free ADSS Cables

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
1.	Manufacturer		(*)	
2.	Country of Origin		(*)	
3.	Reference Standard		ITU G.652D	
4.	Attenuation Coefficient			
	@ 1310nm	dB/km	0.4	
	@1550nm	dB/km	0.3	
5.	Attenuation Variation with Wavelength (+ 25nm) Temperature	dB/km	(*)	
6.	Attenuation at water peak (1383nm)	dB/km	0.4	
7.	Normal Mode Field Diameter			
	@1310nm	μm	9.2	
	@1550nm	μm	9.6	
8.	Mode field diameter deviation			
	@1310nm	μm	0.3	
	@1550nm	μm	0.6	
9.	Mode field non-circularity	%		
10.	Chromatic Dispersion Coefficient			
	@1310nm (1288-1339)nm	Ps/nm ² km	3.5	
	@1310nm (1271-1360)nm	Ps/nm ² km	5.3	
	@1550	Ps/nm ² km	18	
11.	Zero dispersion Wavelength	Nm	1302 - 1322	
12.	Zero dispersion slope	Ps/nm ² km	0.090	
13.	Polarization Mode Dispersion	Ps/nm ² km	≤0.06	
14.	Cutoff wavelength	Nm	1260	
15.	Refractive index		(*)	
16.	Refractive Index profile		(*)	
17.	Cladding Design		(*)	
18.	Numerical aperture		(*)	
19.	Bandwidth Distance Product	MHz.km	(*)	
20.	Bend Performance (37.5mm radius, 100turns)		(*)	
21.	Fibre Manufacturer(s)		(*)	
22.	Fibre production method		(*)	
23.	Core diameter (nominal + deviation)	μm	(*)	
24.	Core non-circularity	%	6	
25.	Cladding diameter (nominal + deviation)	μm	125±1	
26.	Core clad concentricity error	μm	0.6	
27.	Cladding non-circularity	%	1	
28.	Protective Coating type & material		(*)	

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
	Primary			
	Secondary			
39.	Protective Coating diameter (nominal + deviation)			
30.	Protective removal method			
31.	Coating Concentricity			
32.	Colour coding scheme compliant with EIA/TIA 598 or IEC 60304 or Bellcore GR-20			
33.	Colouring material complaint with technical specs?			
34.	No. of Fibres in cable			
35.	Type of Fiber			
36.	Cable Diameter			
	Nominal	Mm		
	Tolerance	mm		
37.	Cable Weight	kg/km		
38.	Max. Tensile Strength	kN		
39.	Max. Pulling Tension			
	During installation	kN		
	During service	kN		
40.	Minimum bending radius			
	During installation	mm		
	During service	mm		
41.	Maximum continuous length	km		
42.	Temperature range			
	Operation	°C		
	Installation	°C		
	Shipping & Storage	°C		
43.	Crush strength	kN/m ²		
44.	Impact Resistance			
45.	Torsion resistance			
46.	Outer jacket thickness			
	Nominal	mm		
	Tolerance	mm		
47.	Outer jacket material			
48.	Description of outer jacket coatings/additives			
49.	Inner jacket material			
50.	Inner jacket thickness	mm		
51.	Inner jacket coating/additives			
	Binder	mm		

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
	Wrapping tape	mm		
	Lay direction	mm		
53.	Central strength members description			
	Material	mm		
	Diameter	mm		
	Cylindrical or Slotted type			
54.	Peripheral strength member description.			
55.	Central Fiber optic unit	Y/N		
56.	Loose tube diameter & material			
57.	Loose tube lay direction			
58.	No. of fibers per tube			
59.	Total No. of tubes and number of empty tubes.			
60.	Identification/numbering of individual tubs			
61.	Filling compound within tube			
62.	Filling compound in cable core Interstices.			
63.	Ripcord(s) provided?	Y/N		
64.	Cable design life	Years		
65.	Describe cable termite proofing measures			
66.	Describe cable anti-rodent measures			
67.	Cable construction drawing enclosed?	Yes/No		
68.	Cable drum construction	Type		
69.	Size of drum			
	Height			
	Width			
	Diameter			
70.	Weight of empty drum	Kg		
71.	Cable Drum drawing enclosed?	Yes/No		

Table 4: The 12 Core Metal Free ADSS Cables

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
1.	Manufacturer		(*)	
2.	Country of Origin		(*)	
3.	Reference Standard		ITU G.652D	
4.	Attenuation Coefficient			
	@ 1310nm	dB/km	0.4	
	@1550nm	dB/km	0.3	
5.	Attenuation Variation with Wavelength (+ 25nm) Temperature	dB/km	(*)	
6.	Attenuation at water peak (1383nm)	dB/km	0.4	
7.	Normal Mode Field Diameter			
	@1310nm	μm	9.2	
	@1550nm	μm	9.6	
8.	Mode field diameter deviation			
	@1310nm	μm	0.3	
	@1550nm	μm	0.6	
9.	Mode field non-circularity	%		
10.	Chromatic Dispersion Coefficient			
	@1310nm (1288-1339)nm	Ps/nm ² km	3.5	
	@1310nm (1271-1360)nm	Ps/nm ² km	5.3	
	@1550	Ps/nm ² km	18	
11.	Zero dispersion Wavelength	Nm	1302 - 1322	
12.	Zero dispersion slope	Ps/nm ² km	0.090	
13.	Polarization Mode Dispersion	Ps/nm ² km	≤0.06	
14.	Cutoff wavelength	Nm	1260	
15.	Refractive index		(*)	
16.	Refractive Index profile		(*)	
17.	Cladding Design		(*)	
18.	Numerical aperture		(*)	
19.	Bandwidth Distance Product	MHz.km	(*)	
20.	Bend Performance (37.5mm radius, 100turns)		(*)	
21.	Fibre Manufacturer(s)		(*)	
22.	Fibre production method		(*)	
23.	Core diameter (nominal + deviation)	μm	(*)	
24.	Core non-circularity	%	6	
25.	Cladding diameter (nominal + deviation)	μm	125±1	
26.	Core clad concentricity error	μm	0.6	
27.	Cladding non-circularity	%	1	
28.	Protective Coating type & material		(*)	

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
	Primary			
	Secondary			
39.	Protective Coating diameter (nominal + deviation)			
30.	Protective removal method			
31.	Coating Concentricity			
32.	Colour coding scheme compliant with EIA/TIA 598 or IEC 60304 or Bellcore GR-20			
33.	Colouring material complaint with technical specs?			
34.	No. of Fibres in cable			
35.	Type of Fiber			
36.	Cable Diameter			
	Nominal	Mm		
	Tolerance	mm		
37.	Cable Weight	kg/km		
38.	Max. Tensile Strength	kN		
39.	Max. Pulling Tension			
	During installation	kN		
	During service	kN		
40.	Minimum bending radius			
	During installation	mm		
	During service	mm		
41.	Maximum continuous length	km		
42.	Temperature range			
	Operation	°C		
	Installation	°C		
	Shipping & Storage	°C		
43.	Crush strength	kN/m ²		
44.	Impact Resistance			
45.	Torsion resistance			
46.	Outer jacket thickness			
	Nominal	mm		
	Tolerance	mm		
47.	Outer jacket material			
48.	Description of outer jacket coatings/additives			
49.	Inner jacket material			
50.	Inner jacket thickness	mm		
51.	Inner jacket coating/additives			
	Binder	mm		

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
	Wrapping tape	mm		
	Lay direction	mm		
53.	Central strength members description			
	Material	mm		
	Diameter	mm		
	Cylindrical or Slotted type			
54.	Peripheral strength member description.			
55.	Central Fiber optic unit	Y/N		
56.	Loose tube dia & material			
57.	Loose tube lay direction			
58.	No. of fibers per tube			
59.	Total No. of tubes and number of empty tubes.			
60.	Identification/numbering of individual tubs			
61.	Filling compound within tube			
62.	Filling compound in cable core Interstices.			
63.	Ripcord(s) provided?	Y/N		
64.	Cable design life	Years		
65.	Describe cable termite proofing measures			
66.	Describe cable anti-rodent measures			
67.	Cable construction drawing enclosed?	Yes/No		
68.	Cable drum construction	Type		
69.	Size of drum			
	Height			
	Width			
	Diameter			
70.	Weight of empty drum	Kg		
71.	Cable Drum drawing enclosed?	Yes/No		

Table 5: 144 Core Armoured ADSS Cables

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
1.	Manufacturer		(*)	
2.	Model Number		(*)	
3.	Make		(*)	
4.	Weight	Kg/km	409	
5.	Diameter	cm	15.3	
6.	Tensile strength		2700N installation and 800N in service (both cases without messenger)	
7.	Construction materials and details	No.		
8.	Total number of fibre	No.	96	
9.	Number of tubes	No.	8	
10.	Number of fibre per tube	No.	12	
11.	Central strength member details		Epoxy/glass rod	
12.	Armouring details		Corrugated coated steel tape	
13.	Bending radius	mm	20 X OD— Installation 10 X OD—In- Service	

Table 6: 96 Core Armoured ADSS Cables

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
1.	Manufacturer		(*)	
2.	Model Number		(*)	
3.	Make		(*)	
4.	Weight	Kg/km	409	
5.	Diameter	cm	15.3	
6.	Tensile strength		2700N installation and 800N in service (both cases without messenger)	
7.	Construction materials and details	No.		
8.	Total number of fibre	No.	96	
9.	Number of tubes	No.	8	
10.	Number of fibre per tube	No.	12	
11.	Central strength member details		Epoxy/glass rod	
12.	Armouring details		Corrugated coated steel tape	
13.	Bending radius	mm	20 X OD— Installation 10 X OD— In-Service	

Table 7: The 48 Core Armoured ADSS Cables

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
1.	Manufacturer		(*)	
2.	Model Number		(*)	
3.	Make		(*)	
4.	Weight	Kg/km	409	
5.	Diameter	cm	15.3	
6.	Tensile strength		2700N installation and 800N in service (both cases without messenger)	
7.	Construction materials and details	No.		
8.	Total number of fibre	No.	96	
9.	Number of tubes	No.	8	
10.	Number of fibre per tube	No.	12	
11.	Central strength member details		Epoxy/glass rod	
12.	Armouring details		Corrugated coated steel tape	
13.	Bending radius	mm	20 X OD— Installation 10 X OD— In-Service	

Table 8: The 12 Core Armoured ADSS Cables

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
1.	Manufacturer		(*)	
2.	Model Number		(*)	
3.	Make		(*)	
4.	Weight	Kg/km	409	
5.	Diameter	cm	15.3	
6.	Tensile strength		2700N installation and 800N in service (both cases without messenger)	
7.	Construction materials and details	No.		
8.	Total number of fibre	No.	96	
9.	Number of tubes	No.	8	
10.	Number of fibre per tube	No.	12	
11.	Central strength member details		Epoxy/glass rod	
12.	Armouring details		Corrugated coated steel tape	
13.	Bending radius	mm	20 X OD— Installation 10 X OD— In-Service	

Table 9: Optical Fiber Joint Box

No.	Description	Minimum Requirements		Data Offered by Bidder
		Unit	Data	
1.	Manufacturer		(*)	
2.	Model Number		(*)	
3.	Dimension H*W*D	cm	(*)	
4.	Weight	kg	(*)	
5.	Colour and finish		(*)	
6.	Cable Glanding		(*)	
7.	Construction materials and gauge		(*)	
8.	Type		(*)	
9.	Total number of optical couplings	No.	(*)	
10.	Suitable for use in man-holes and direct tube	Y/N	(*)	
11.	Degree of protection	IP	IP68	
12.	Describe sealing method			
	Optical Fibre Cable Accommodation			
13.	Cable Glanding			
14.	Max. number of cables that can be accommodated	No.		
15.	Describe Cable entries			
	Cable Termination Splice Accommodation			
16.	Maximum number of splice trays	No.		
17.	Number of splice per tray	No.		

Table 10: Fiber Distribution Terminal

	Description	Minimum Requirements		Data offered by Bidder
		Unit	Data	
1.	Manufacturer		(*)	
2.	Model Number		(*)	
3.	Dimension H*W*D	cm	(*)	
4.	Weight	kg	(*)	
5.	Colour and finish		(*)	
6.	Cable Glanding		(*)	
7.	Construction materials and gauge		(*)	
8.	Locking arrangements		(*)	
9.	Installation Clearances		(*)	
	Front Access	cm	(*)	
	Rear Access	cm	(*)	
	Top*Bottom*Sides	cm	(*)	
10.	Total number of optical couplings	No.	(*)	
11.	Methods for mounting		(*)	
	Optical Fibre Cable Accommodation			
12.	Cable Glanding		(*)	
13.	Max. number of cables that can be accommodated	No.	(*)	
14.	Describe Cable entries		(*)	
	Cable Termination Splice Accommodation			
15.	Maximum number of splice trays	No.	(*)	
16.	Number of splice per tray	No.	(*)	

Table 11: Suspension Clamp Assembly

	Description	Minimum Requirements		Data offered by Bidder
		Unit	Data	
1.	Manufacturer		(*)	
2.	Model Number		(*)	
3.	Minimum Vertical strength	kN		
4.	Maximum slip strength	kN	40	
5.	Minimum Slip strength	kN	(*)	
6.	Length(nominal)	mm	(*)	
7.	Weight	kg	(*)	

Table 12: Suspension Clamp Assembly

No.	Description	Minimum Requirements		Data offered by Bidder
		Unit	Data	
1.	Manufacturer		(*)	
2.	Model Number		(*)	
3.	Minimum slip load	kN	(*)	
4.	Braking strength(minimum)	kN	20	

Table 13: Technical Specification for Splicing Kit

No.	Description	Minimum Requirements		Data offered by Bidder
		Unit	Data	
1.	Manufacturer		(*)	
2.	Country of Origin		(*)	
3.	Type		Fusion Splicer	
4.	Applicable Fibers		Single-mode ITU-T G.652D	
5.	Fiber Count		Single, 2, 4	
6.	Cladding Diameter		125µm	
7.	Coating Diameter		Ribbon: 0.25mm to 0.4mm; Single: 250µm and 900µm	
8.	Fiber Cleave Length		10mm	
9.	Typical Average Splice Loss		0.05dB with SM, measured by cut-back method relevant to ITU-T and IEC standards	
10.	Splicing Time		20 seconds with standard single-mode fiber	
11.	Arc Calibration Method		Automatic with option of manual arc calibration function	
12.	Splicing Modes		100 preset and user programmable modes	
13.	Storage of Splice Result		Last 2000 splice results	
14.	Fiber Display		Both X and Y simultaneously with option of rear monitor display with automatic image orientation	
15.	Magnification		≤ 90X	
16.	Viewing Method		Dual cameras with 4.1 inch TFT color LCD monitor with anti-reflective coating	
17.	Operating Condition		0 to 5,000m above sea level, 0 to 85% RH, -10 to 50°C respectively	
18.	Mechanical Proof Test		1.96 to 2.25N	

No.	Description	Minimum Requirements		Data offered by Bidder
		Unit	Data	
19.	Tube Heater		Built-in tube heater with 30 heating modes complete with auto-start function	
20.	Tube Heating Time		50 seconds with FP-5 sleeve, 40 seconds with FP3 (40	
21.	Protection Sleeve Length		60mm, 40mm, micro	
22.	Splice/Heat with Battery		90 cycles with power save functions activated	
23.	Power Supply		Auto voltage selection from 100 to 240V AC or 10 to 15V DC	
24.	Terminals		USB 2.0 (USB-B type) for PC communication	
25.	Wind Protection	m/s	≥ 50m/s.	
26.	Dimensions		(*)	
27.	Weight	kg	≤ 2.5kg	

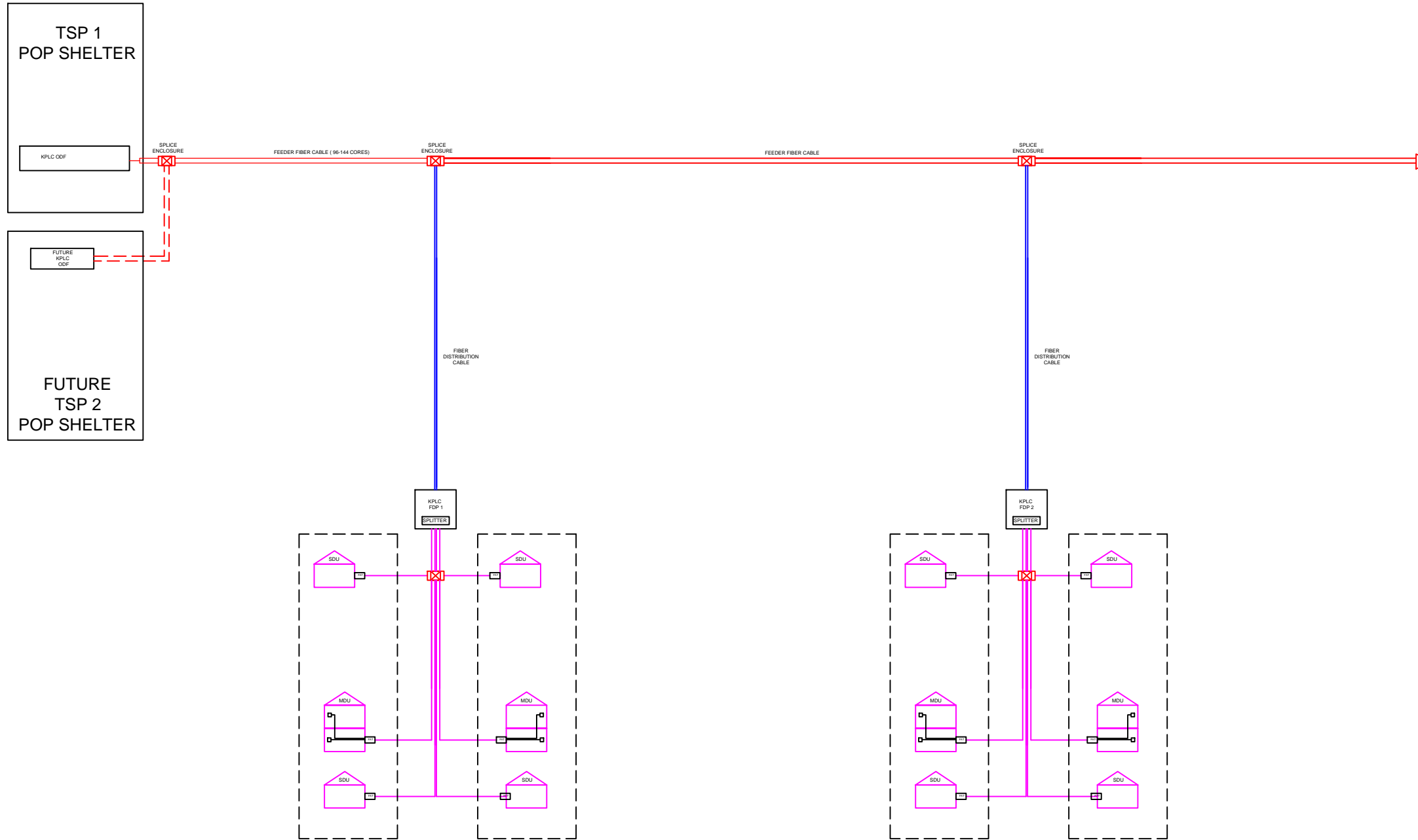
Table 14: Technical Specification for Fault Locator

No.	Description	Minimum Requirements		Data offered by Bidder
		Unit	Data	
1.	Fiber Type		9/125 μ m Single Mode	
2.	Wavelength	nm	1550 \pm 20	
3.	Emitter Type		LD	
4.	Connector Type		SC	
5.	Pulse Width (ns)		10/20/40/80/160/320/640/1280/2560/5120/12400/24800 (auto-switch)	
6.	Max Output Power	mW	\leq 100	
7.	Max Measurement Range	km	\geq 130	
8.	Distance Accuracy		+/- (0.8m + 0.001% x Distance)	
9.	Data Storage	measurements	999	
10.	Event Dead Zone	m	\leq 3	
11.	Power Supply		AC/DC adapter & Rechargeable NiHM Batteries	
12.	Battery Life	uses	15,000	
13.	Operating Temp.	$^{\circ}$ C	-10 to 55	
14.	Storage Temp	$^{\circ}$ C	-20 to 60	
15.	Humidity	%	<85 (non-condensing)	
16.	Communication Port	Type	USB/Serial	
17.	Dimension (mm)		(*)	
18.	Net Weight	g	\leq 250	

Table 15: Technical Specification for Vibration Damper

No.	Description	Minimum Requirements		Data offered by Bidder
		Unit	Data	
1.	Manufacturer		(*)	
2.	Type		Stockbridge	
3.	Total Weight (nominal)	kg	(*)	
4.	Weight of each damper		(*)	
5.	Material of damper weight		(*)	
6.	Clamp Material		(*)	
7.	Messenger Cable Material		(*)	
8.	No. of strands in messenger cable		(*)	
9.	Breaking Strength of Messenger Cable		(*)	
10.	Resonance Frequencies (nominal)			
	a) First Frequency	Hz	(*)	
	b) First Frequency	Hz	(*)	
	c) First Frequency	Hz	(*)	
	d) First Frequency	Hz	(*)	
	e) First Frequency	Hz	(*)	
11.	Minimum Slip Strength of Damper Clamp			
	a) Before fatigue test	kN	(*)	
	b) After fatigue test	kN	(*)	
12.	Clamp Tightening Torque (nominal)	Nm	(*)	

ANNEX 2- TENDER DRAWINGS

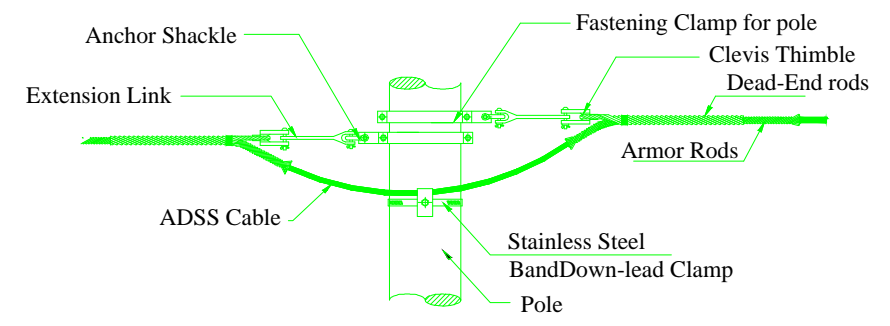
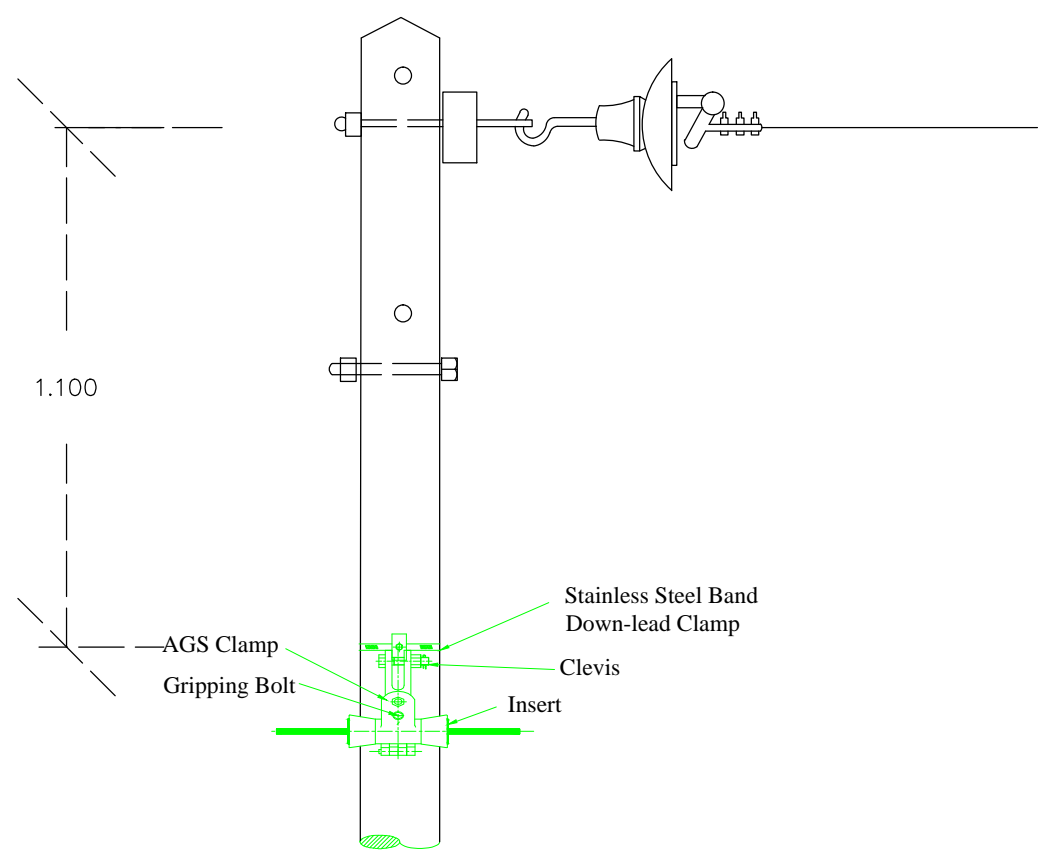
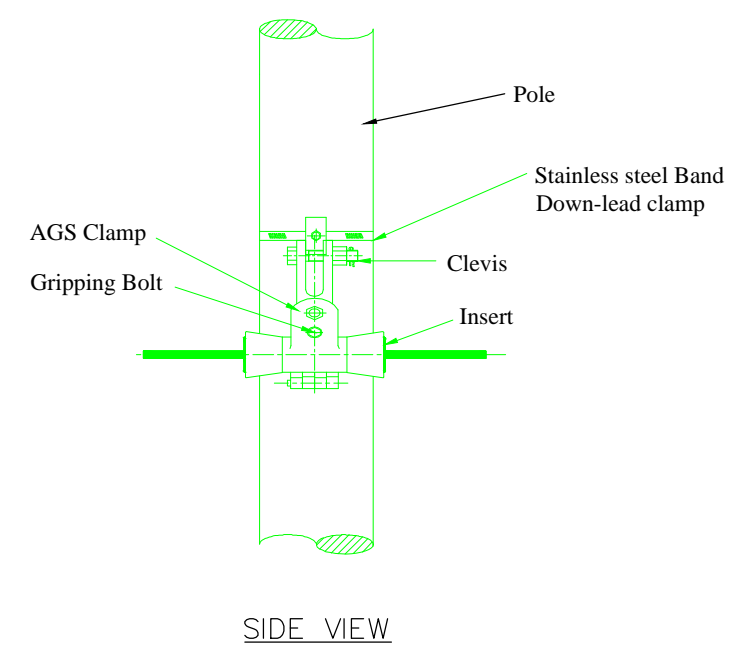
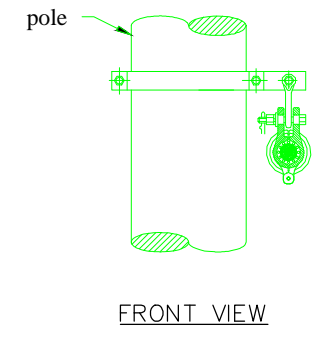
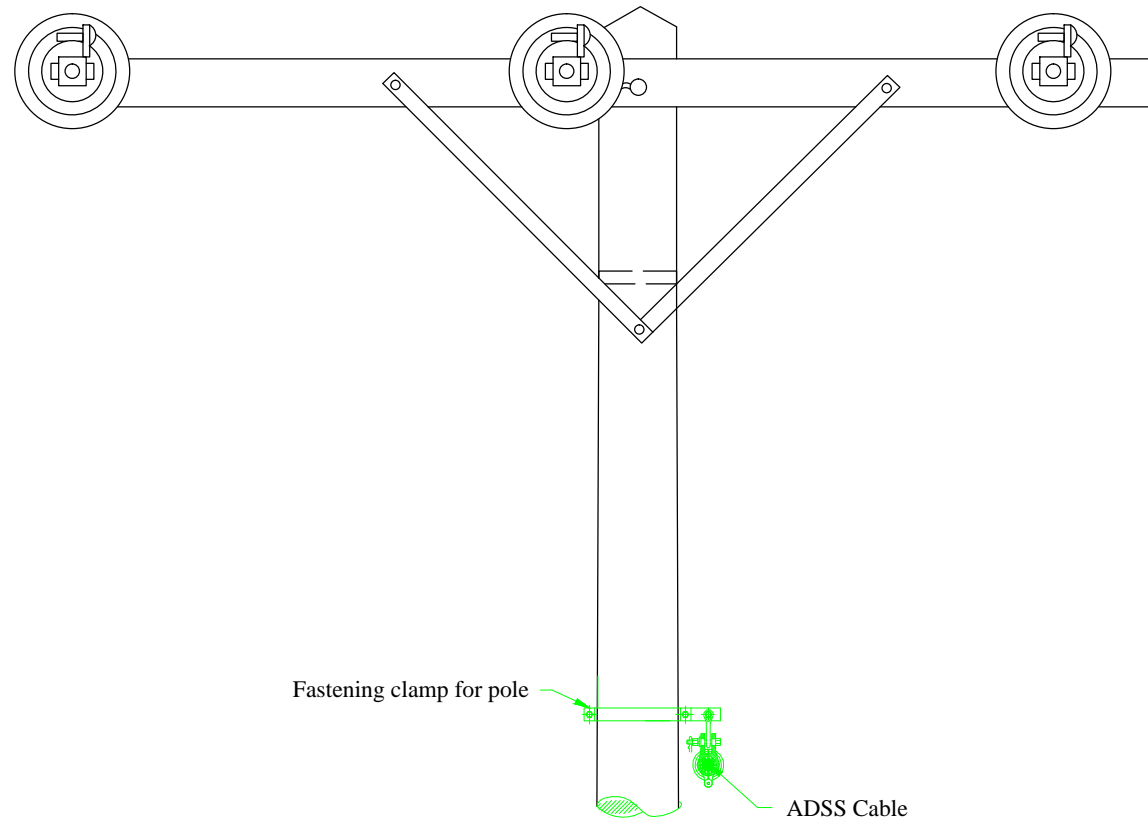


APPROVED	DATE	INITIALS	SDN

REV	REVISION	DATE	BY	DESCRIPTION

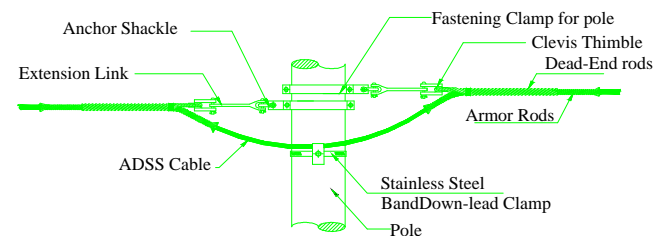
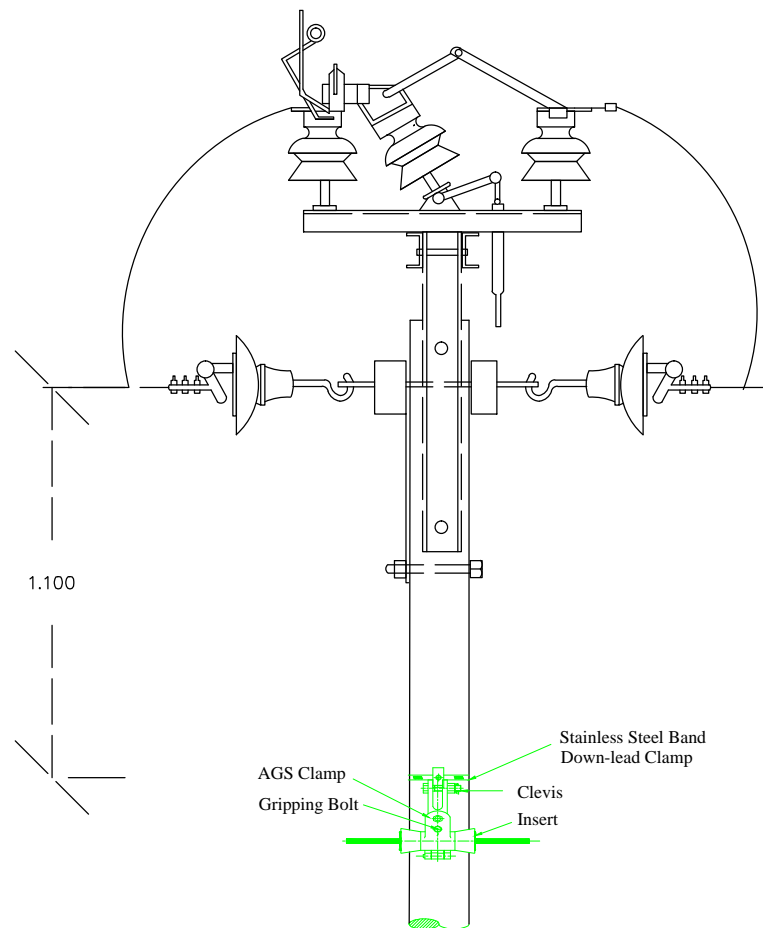
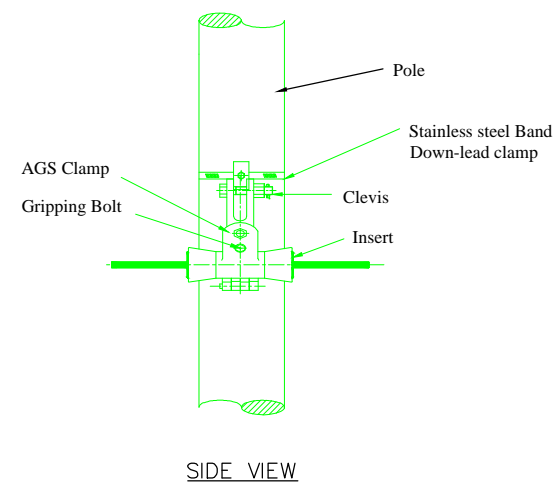
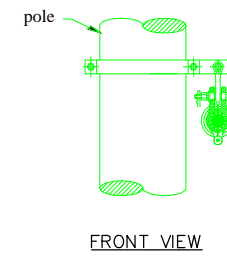
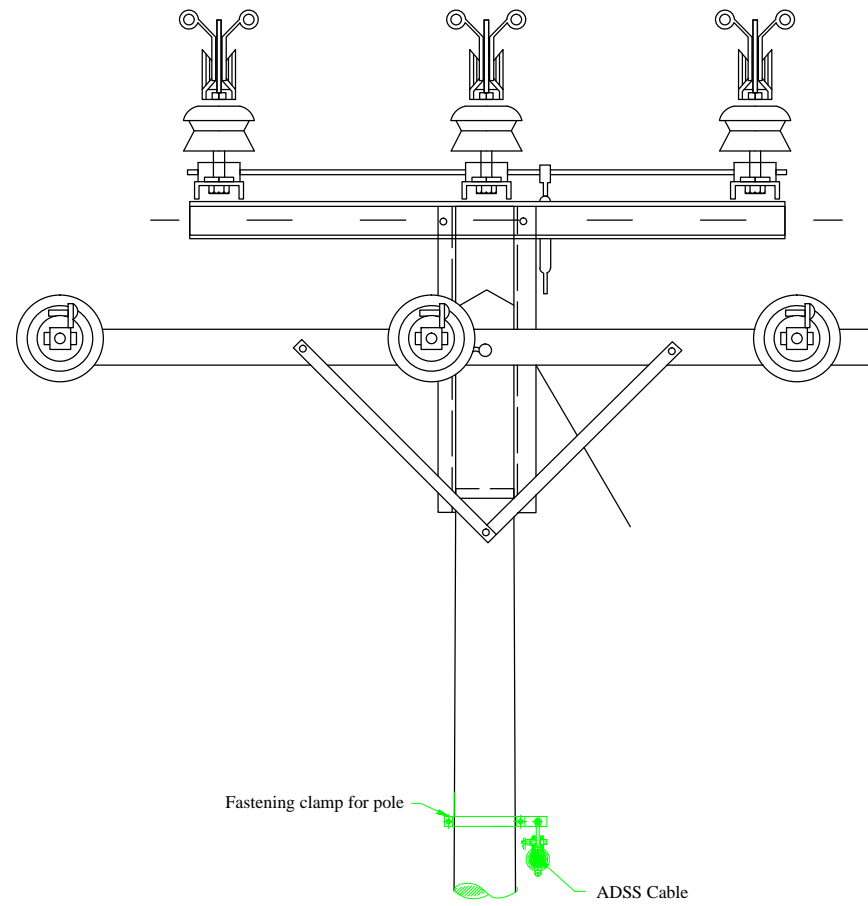
PROJECT	CLIENT	CONSULTANT	CONTRACTOR
KPLC FTTH PILOT PROJECT			

TITLE:	TYPICAL KPLC FTTH NETWORK SCHEMATIC				
UNITS	NA	DOC.NO:	MY-ELE-SLD-001	SHT	6



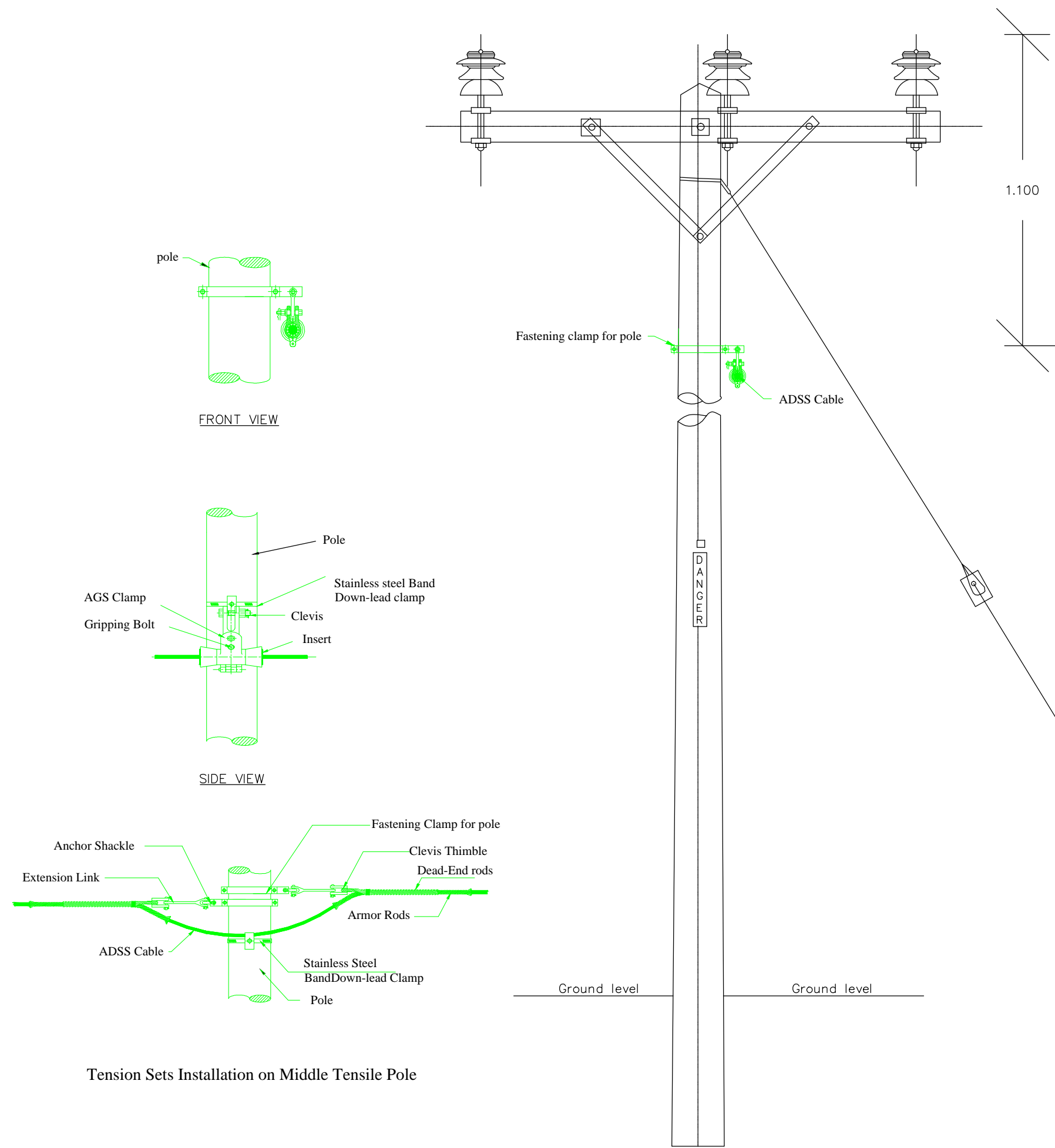
Tension Sets Installation on Middle Tensile Pole

Client:	
KENYA POWER & LIGHTING COMPANY LIMITED	
Consultant:	
Project:	
Title:	
11KV TERMINAL POLE COMPLETE WITH FIBER SUSPENSION AND TENSION SET	
Drawn: JK	Date: 6.6.2016
Designed: CM	Date: 6.6.2016
Checked: CM	Date: 6.6.2016
Approved: CM	Date: 6.6.2016
Drawing No. KPLC-001	Revision. A
Drawing Scale:	Sheet Size. A1
Drawing Status:	



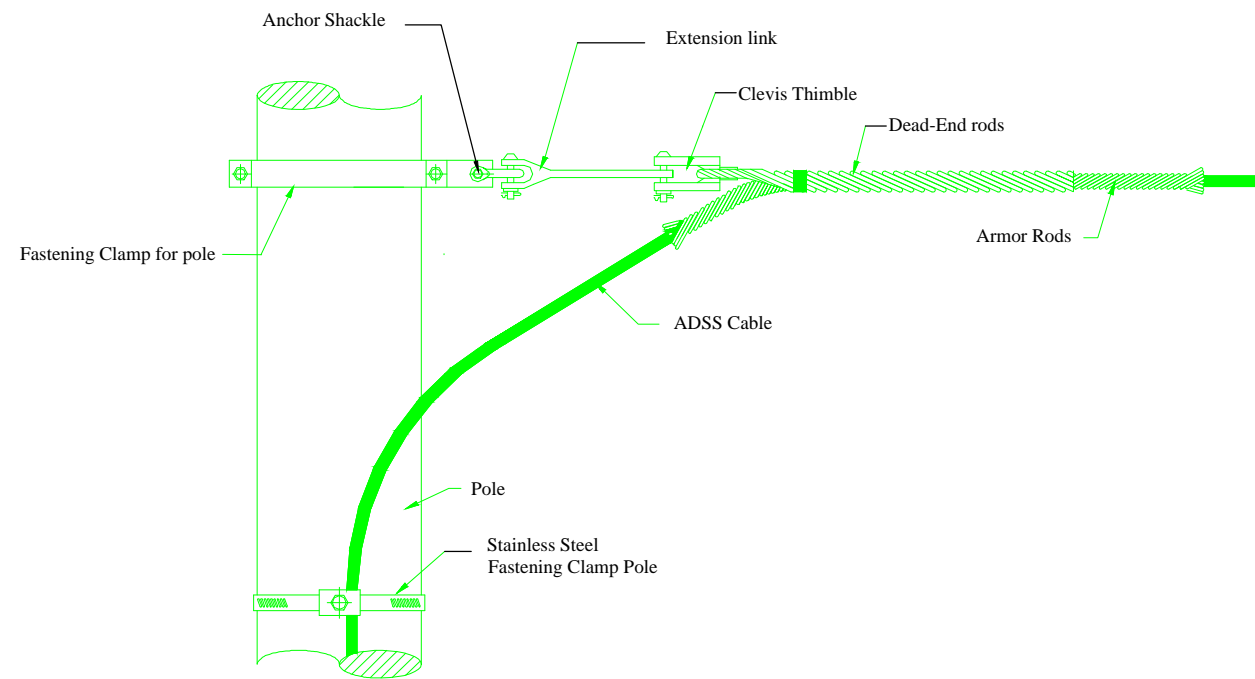
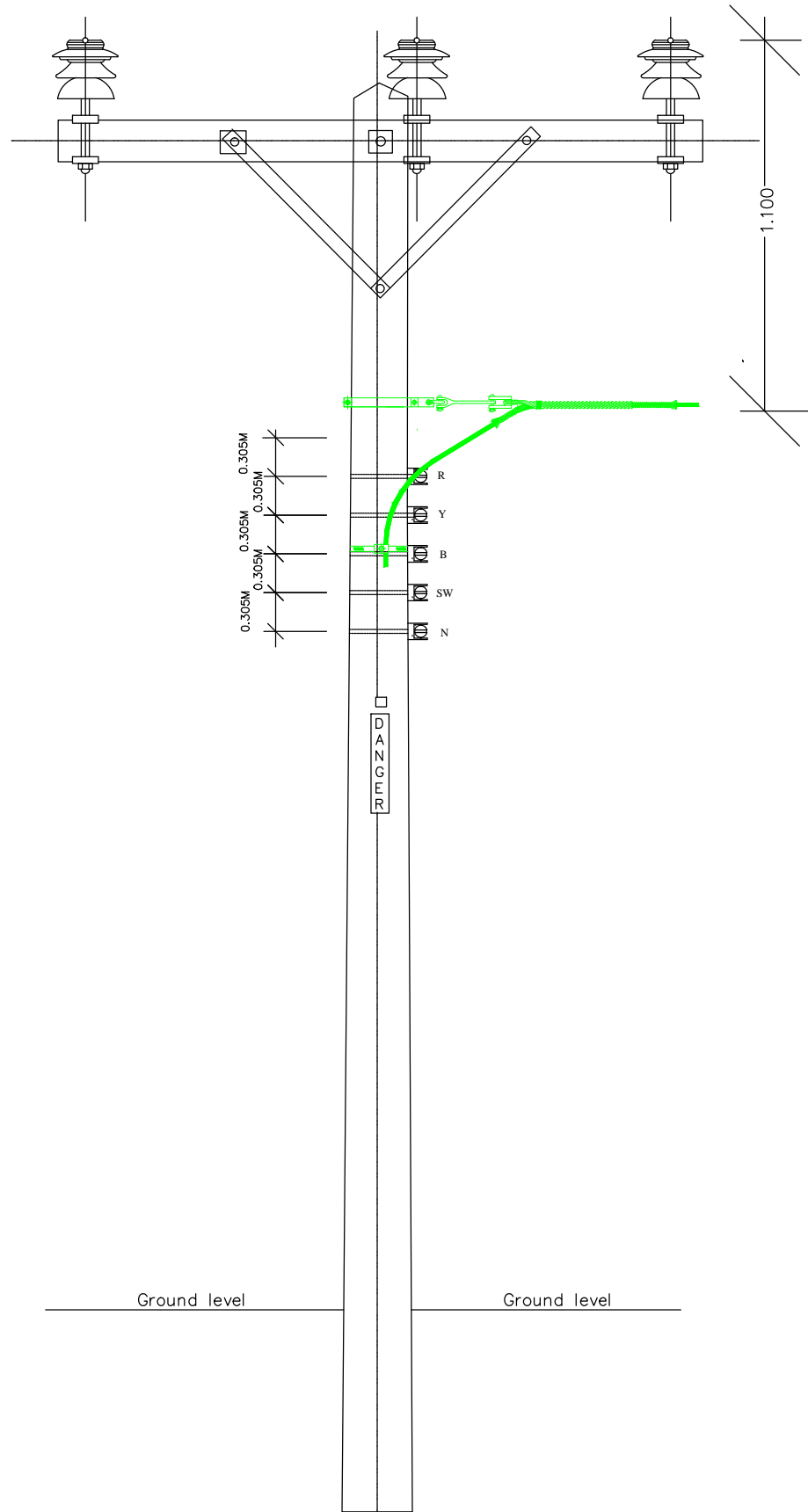
Tension Sets Installation on Middle Tensile Pole

Client:	
KENYA POWER & LIGHTING COMPANY LIMITED	
Consultant:	
Project:	
Title:	
11KV HORIZONTAL SECTION WITH ABS COMPLETE WITH FIBER SUSPENSION AND TENSION SET	
Drawn: JK	Date: 6.6.2016
Designed: CM	Date: 6.6.2016
Checked: CM	Date: 6.6.2016
Approved: CM	Date: 6.6.2016
Drawing No. KPLC-002	Revision. A
Drawing Scale:	Sheet Size. A1
Drawing Status:	

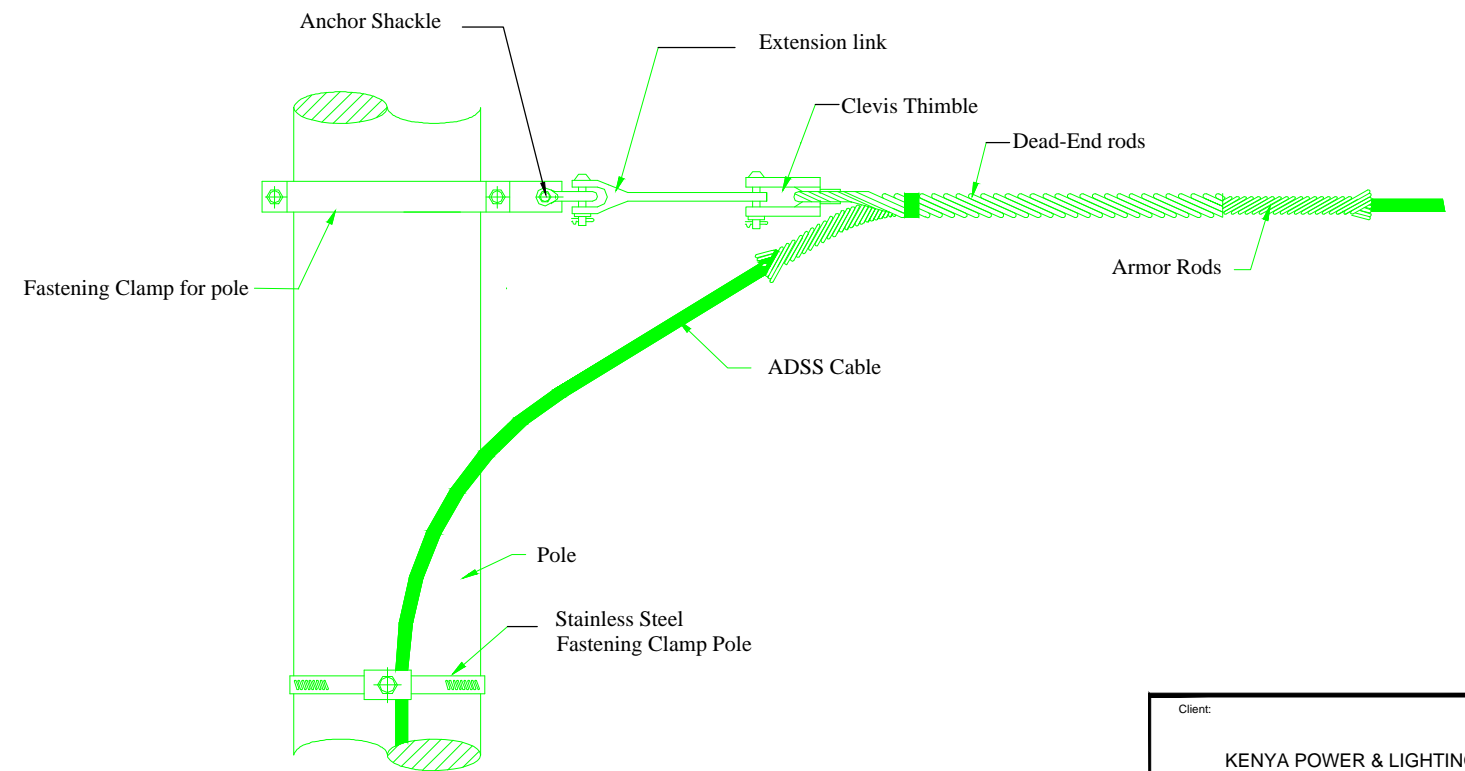
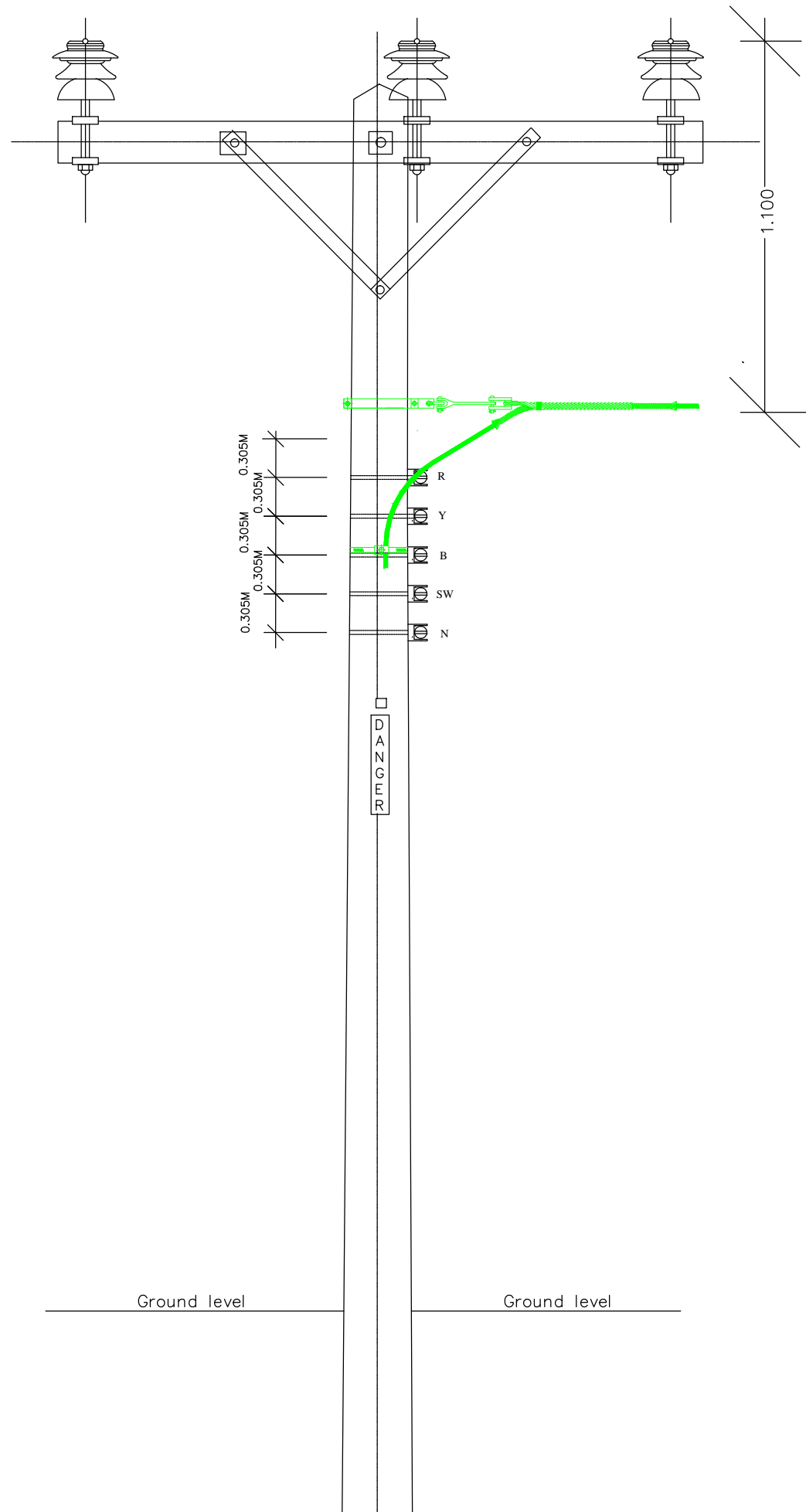


Tension Sets Installation on Middle Tensile Pole

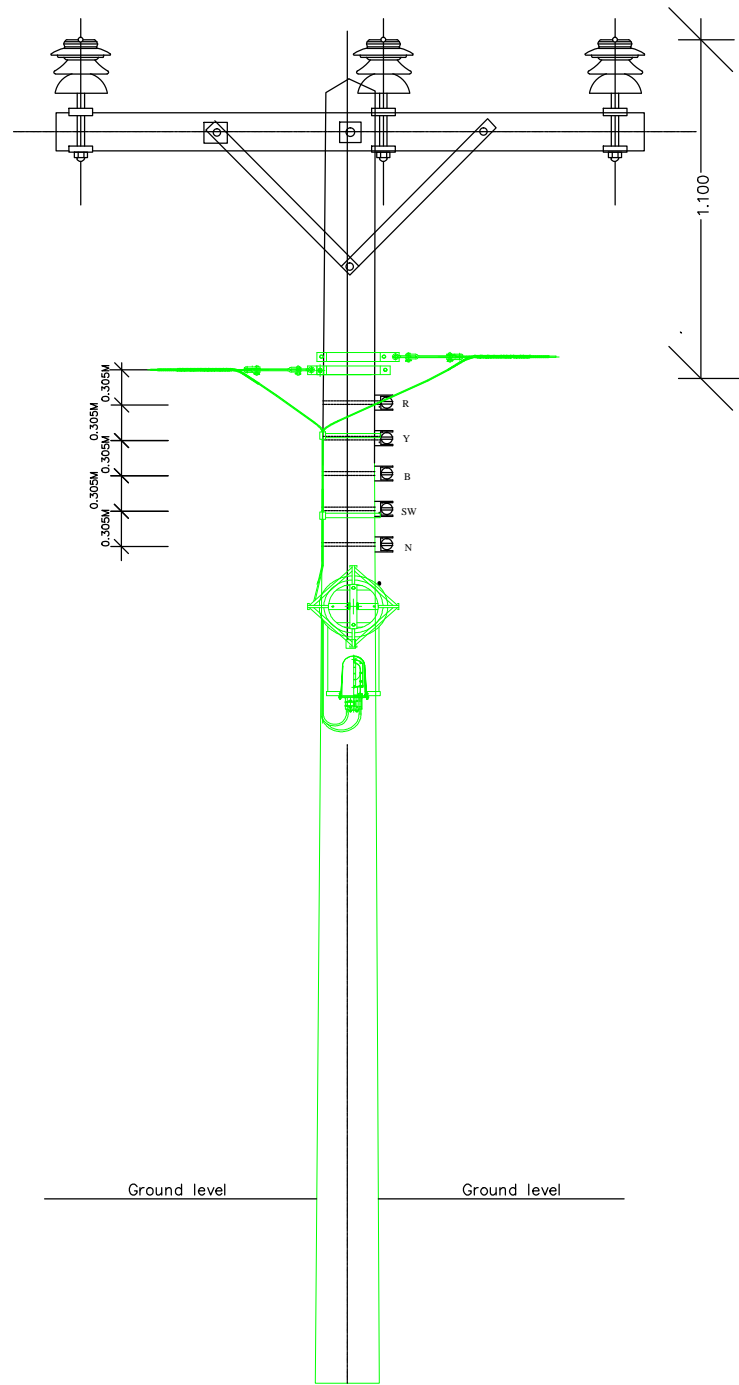
Client:	
KENYA POWER & LIGHTING COMPANY LIMITED	
Consultant:	
Project:	
Title:	
11KV INTERPOLE COMPLETE WITH FIBER SUSPENSION AND TENSION SETS	
Drawn: JK	Date: 6.6.2016
Designed: CM	Date: 6.6.2016
Checked: CM	Date: 6.6.2016
Approved: CM	Date: 6.6.2016
Revision No. KPLC-003	Revision. A
Drawing Scale:	Sheet Size. A1
Drawing Status:	



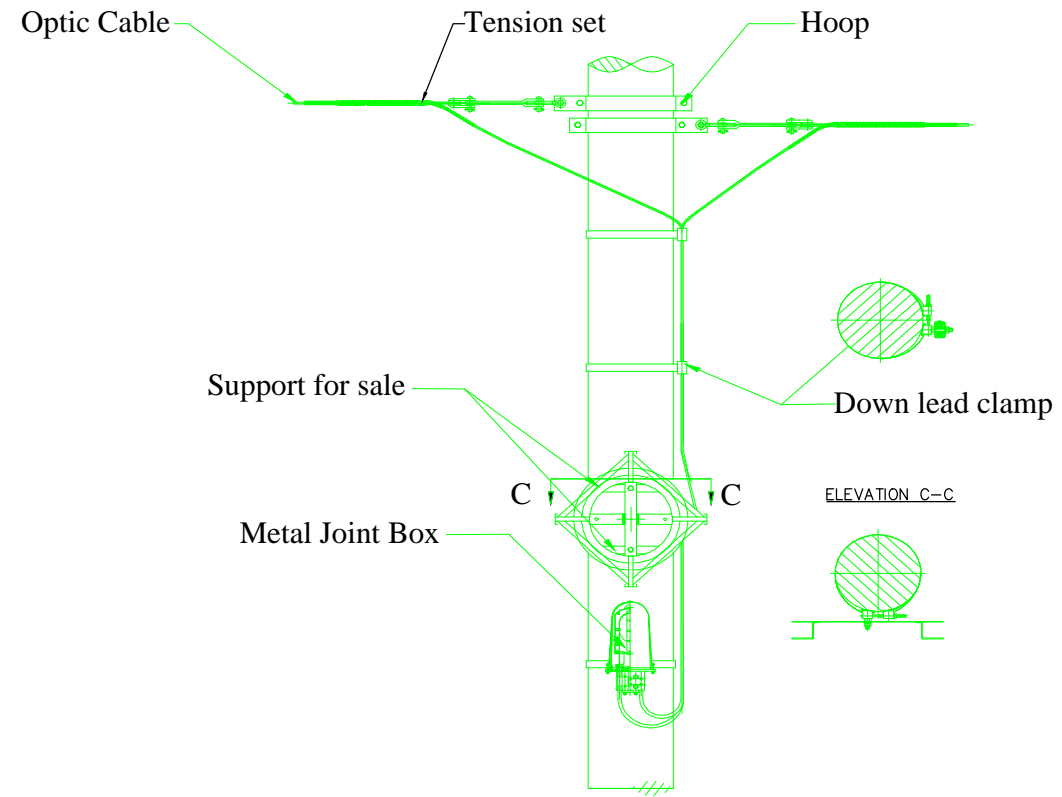
Client:	
KENYA POWER & LIGHTING COMPANY LIMITED	
Consultant:	
Project:	
Title:	
11KV INTER POLE WITH LV LINE COMPLETE WITH FIBER SUSPENSION AND/OR TENSION SETS	
Drawn: JK	Date: 6.6.2016
Designed: CM	Date: 6.6.2016
Checked: CM	Date: 6.6.2016
Approved: CM	Date: 6.6.2016
Drawing No. KPLC-004	Revision. A
Drawing Scale:	Sheet Size. A1
Drawing Status:	



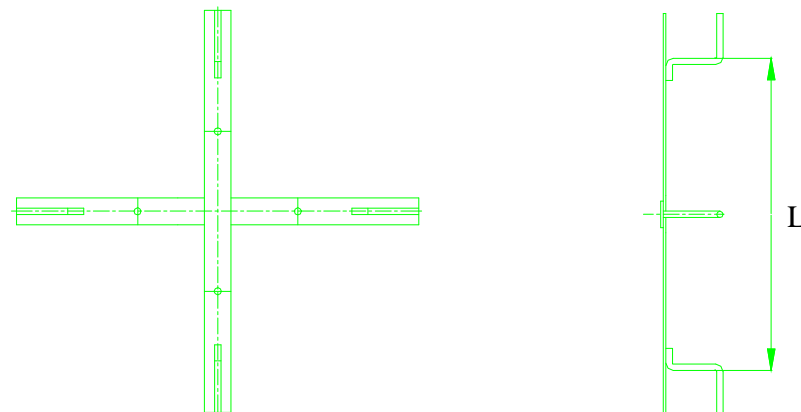
Client:	
KENYA POWER & LIGHTING COMPANY LIMITED	
Consultant:	
Project:	
Title:	
11KV INTER POLE WITH LV LINE COMPLETE WITH FIBER TENSION SETS	
Drawn: JK	Date: 6.6.2016
Designed: CM	Date: 6.6.2016
Checked: CM	Date: 6.6.2016
Approved: CM	Date: 6.6.2016
Drawing No. KPLC-005	Revision. A
Drawing Scale:	Sheet Size. A1
Drawing Status:	



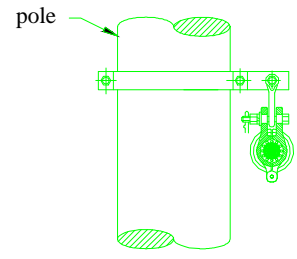
C. Joint Box Installation on the Pole



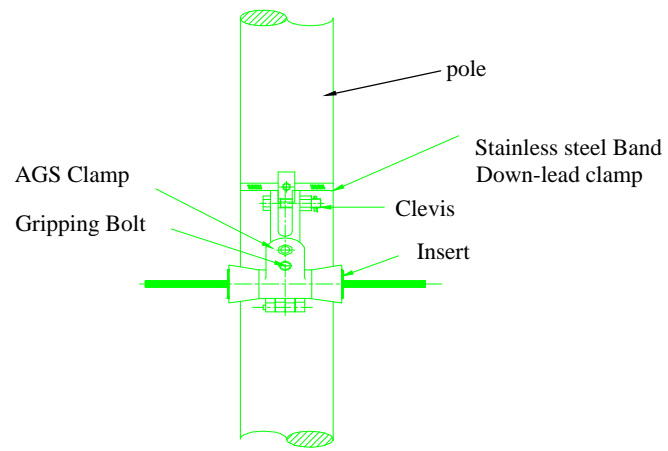
3.6 Cable Storage Assembly



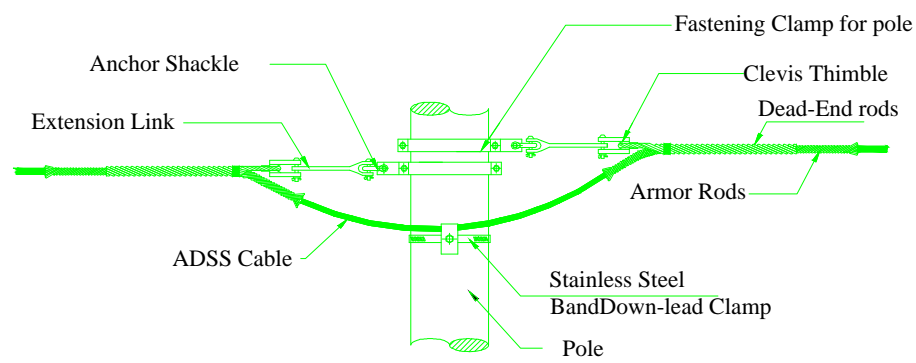
Client:	
KENYA POWER & LIGHTING COMPANY LIMITED	
Consultant:	
Project:	
Title:	
11KV INTER POLE COMPLETE WITH FIBER TENSION STORAGE AND JOINT BOX	
Drawn: JK	Date: 6.6.2016
Designed: CM	Date: 6.6.2016
Checked: CM	Date: 6.6.2016
Approved: CM	Date: 6.6.2016
Drawing No. KPLC-006	Revision. A
Drawing Scale:	Sheet Size. A1
Drawing Status:	



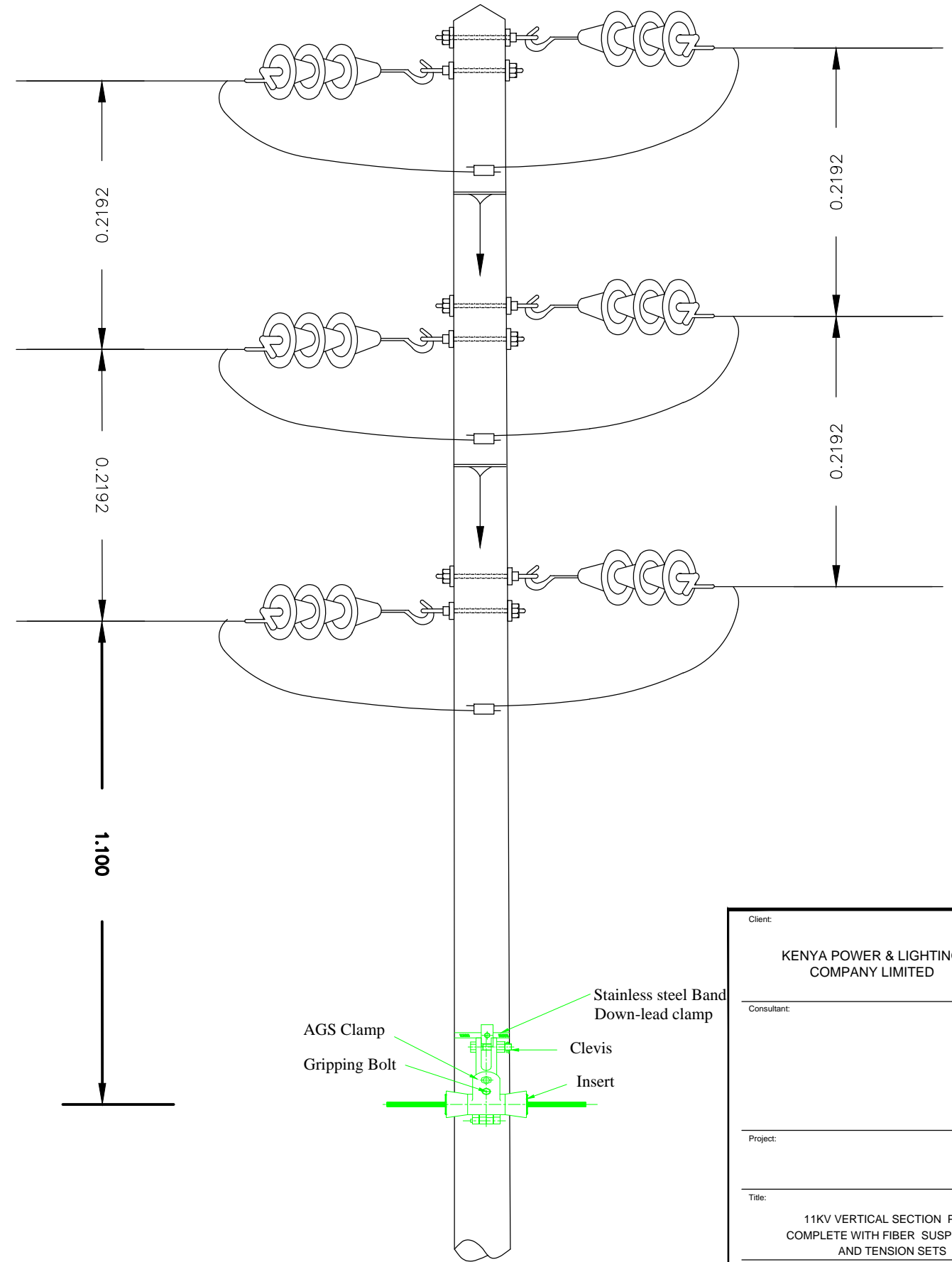
FRONT VIEW



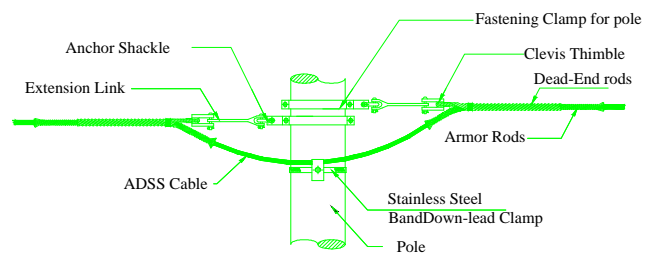
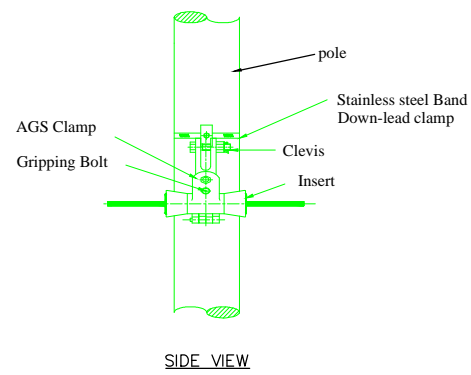
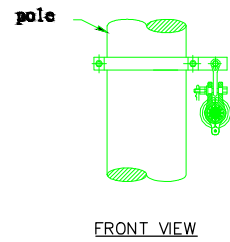
SIDE VIEW



Tension Sets Installation on Middle Tensile Pole

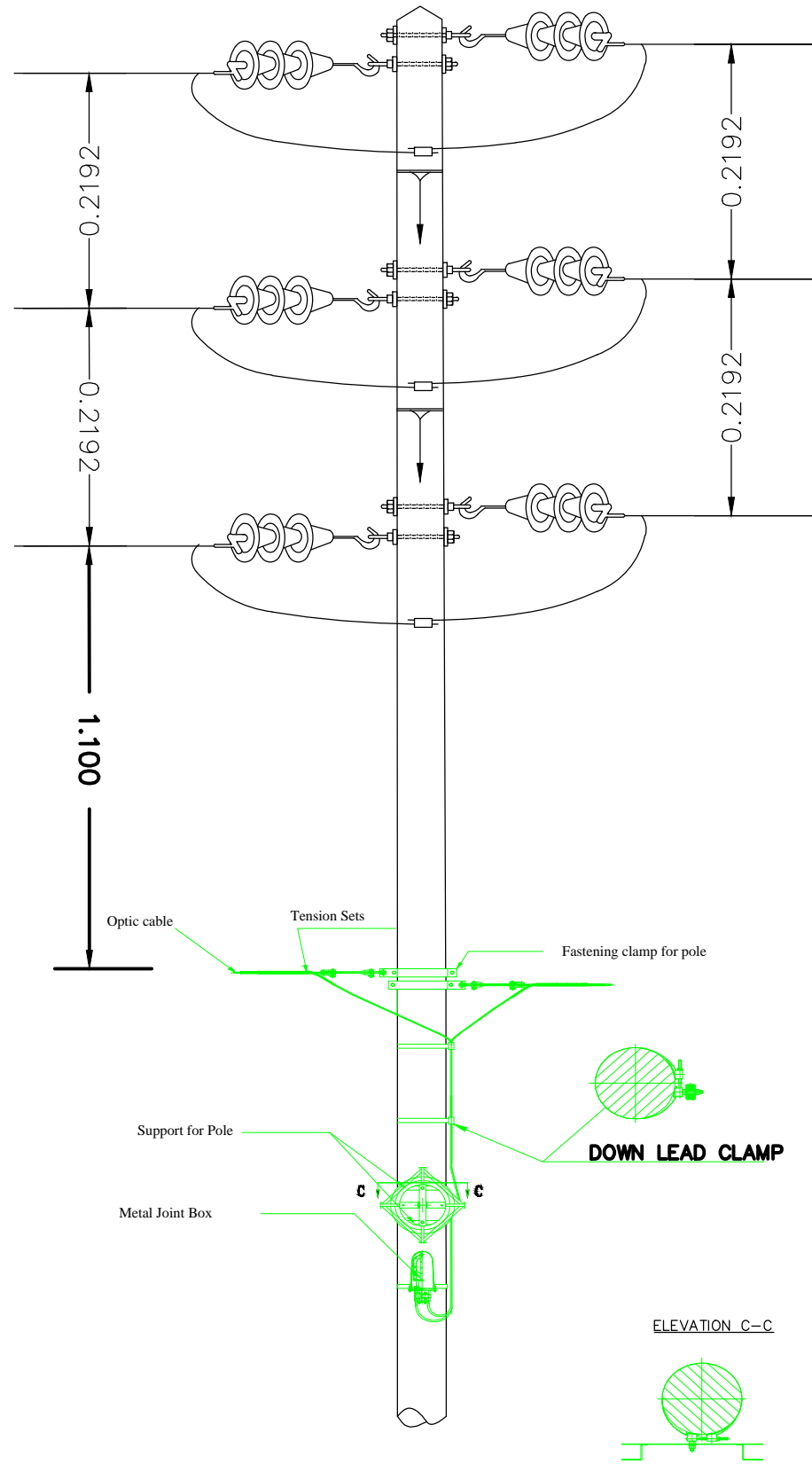
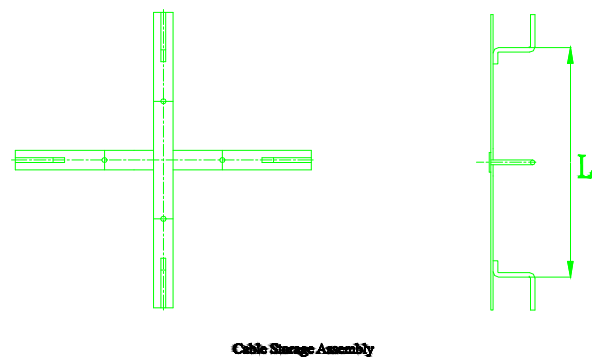


Client:	
KENYA POWER & LIGHTING COMPANY LIMITED	
Consultant:	
Project:	
Title:	
11KV VERTICAL SECTION POLE COMPLETE WITH FIBER SUSPENSION AND TENSION SETS	
Drawn: JK	Date: 6.6.2016
Designed: CM	Date: 6.6.2016
Checked: CM	Date: 6.6.2016
Approved: CM	Date: 6.6.2016
Drawing No. KPLC-007	Revision. A
Drawing Scale:	Sheet Size. A1
Drawing Status:	

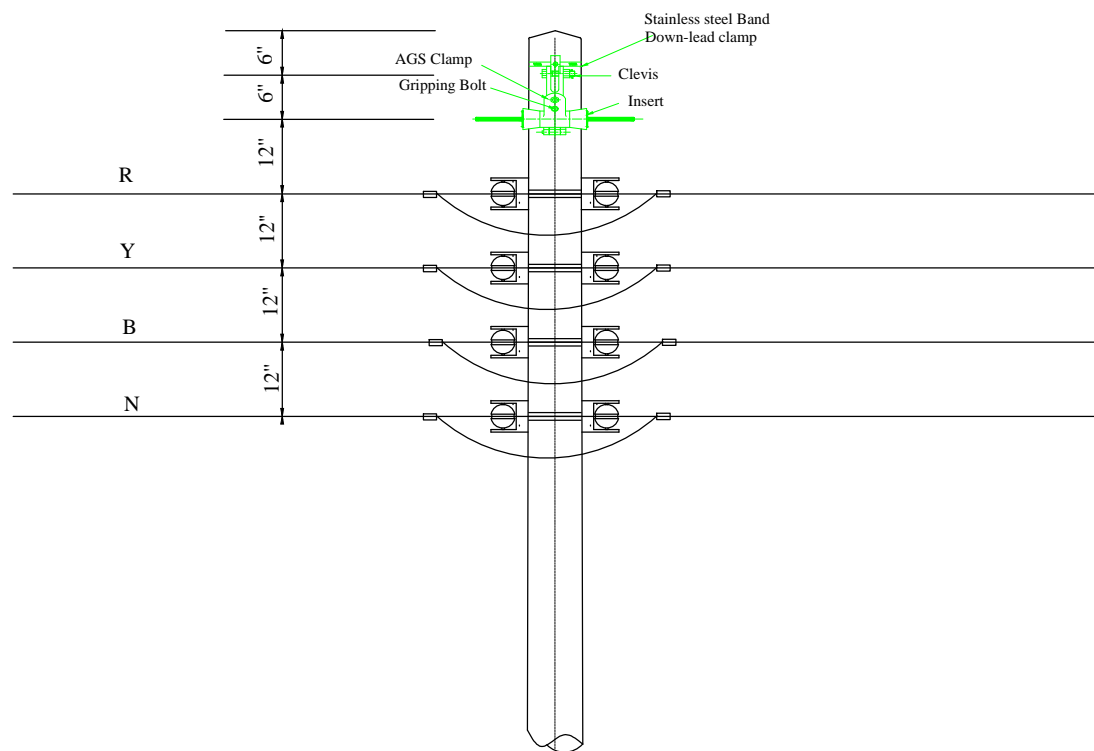
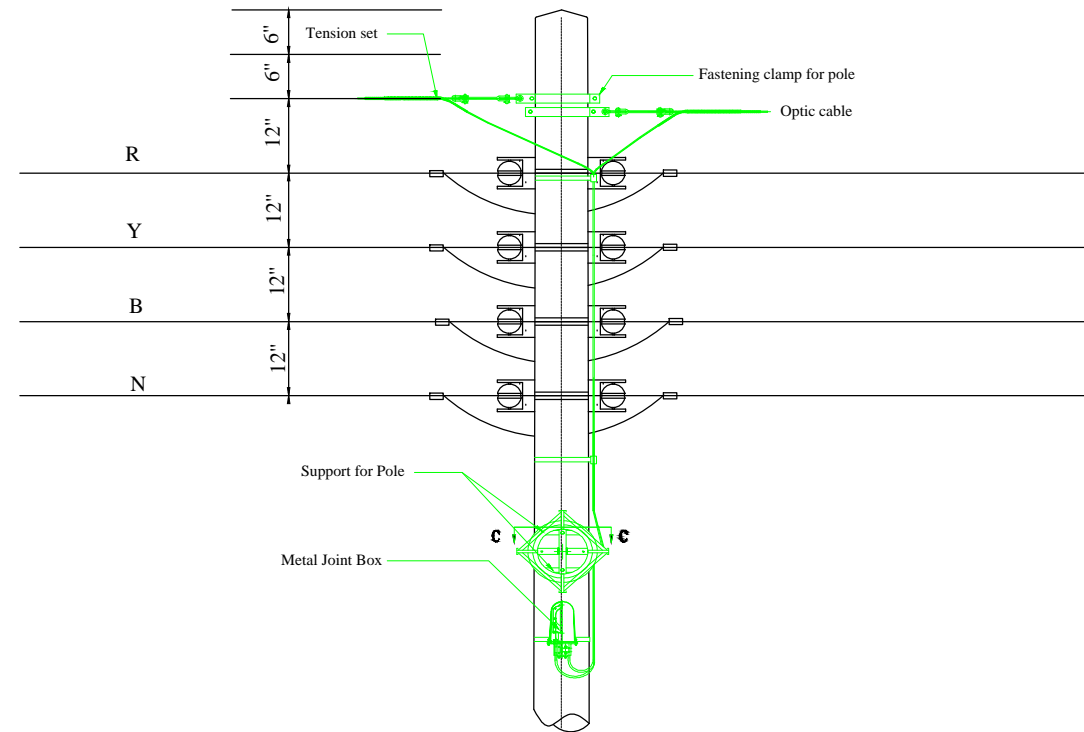
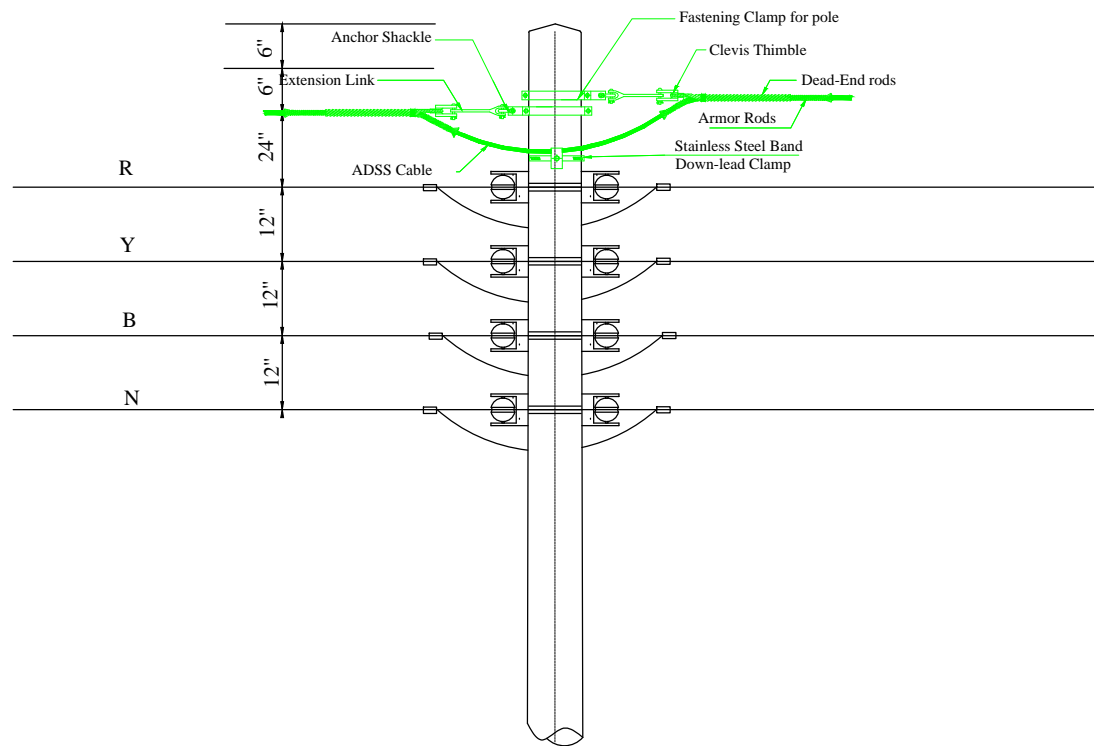


Tension Sets Installation on Middle Tensile Pole

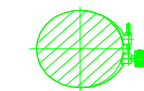
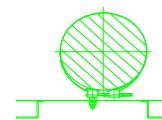
3.6 Cable Storage Assembly



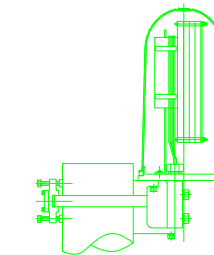
Client:	
KENYA POWER & LIGHTING COMPANY LIMITED	
Consultant:	
Project:	
Title:	
11KV VERTICAL SECTION POLE COMPLETE WITH FIBER SUSPENSION, TENSION, STORAGE AND JOINT BOX	
Drawn: JK	Date: 6.6.2016
Designed: CM	Date: 6.6.2016
Checked: CM	Date: 6.6.2016
Approved: CM	Date: 6.6.2016
Drawing No. KPLC-008	Revision. A
Drawing Scale:	Sheet Size. A1
Drawing Status:	



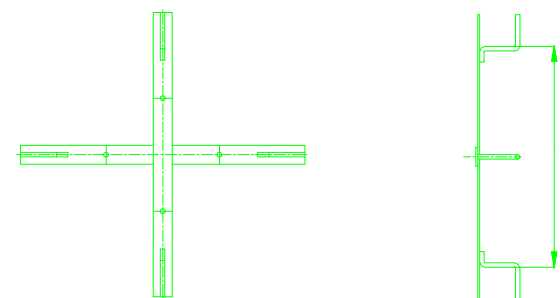
ELEVATION C-C



DOWN LEAD CLAMP



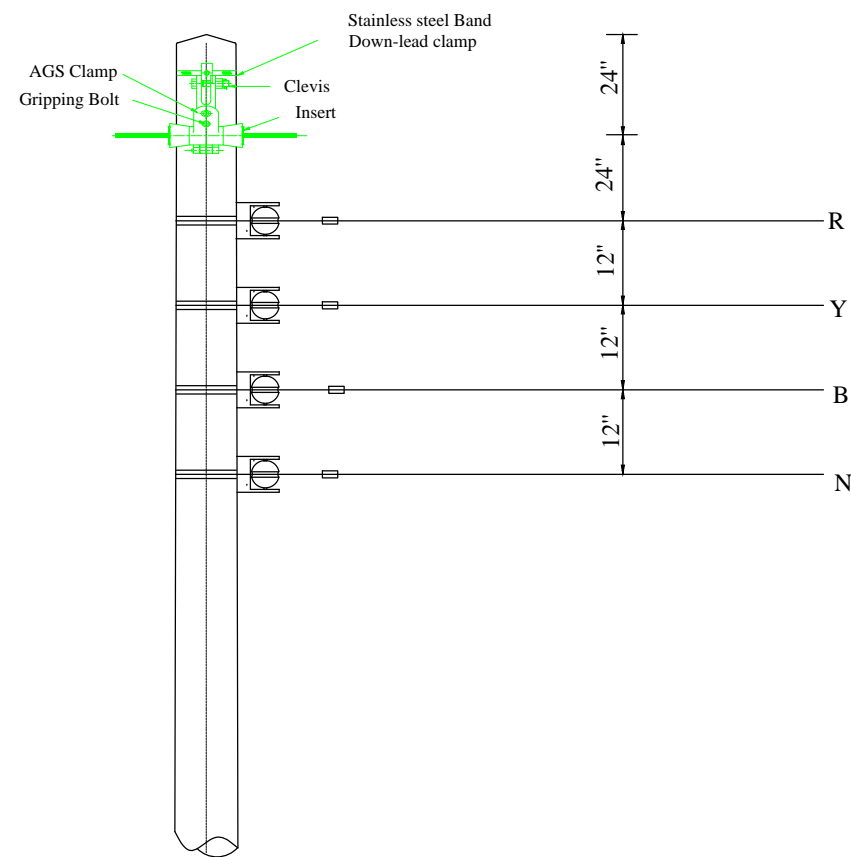
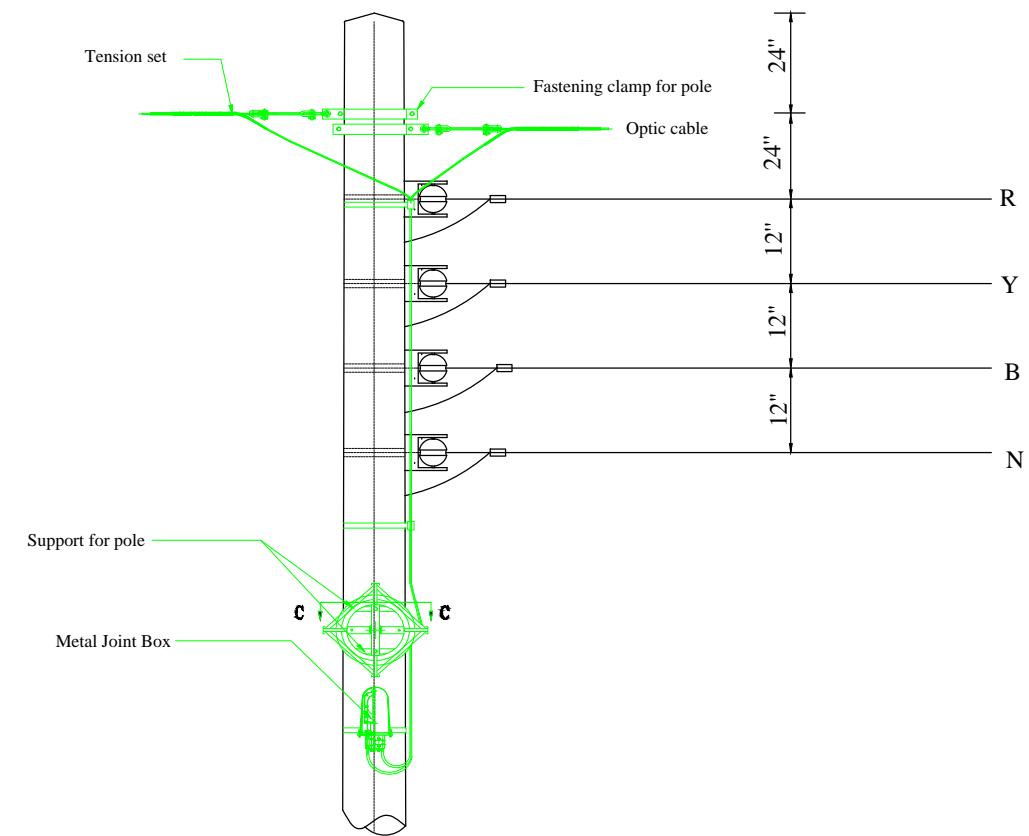
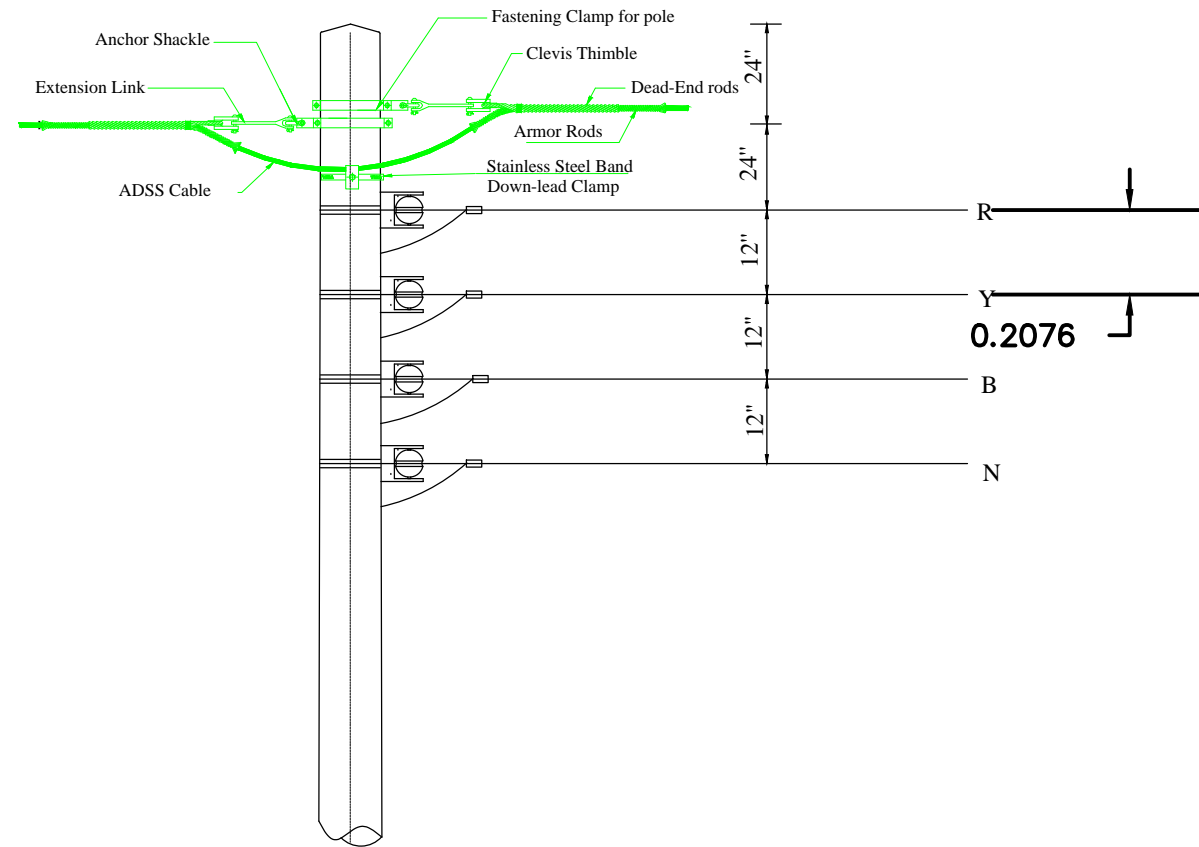
Cap type Metal Joint Box for Pole



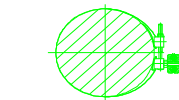
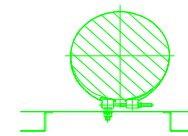
Cable Storage Assembly

THREE-PHASE LV POLE
COMPLETE WITH FIBER SUSPENSION, TENSION, STORAGE AND JOINT BOX

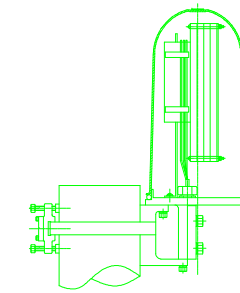
Client:	
KENYA POWER & LIGHTING COMPANY LIMITED	
Consultant:	
Project:	
Title:	
THREE-PHASE LV POLE COMPLETE WITH FIBER SUSPENSION, TENSION, STORAGE AND JOINT BOX	
Drawn: JK	Date: 6.6.2016
Designed: CM	Date: 6.6.2016
Checked: CM	Date: 6.6.2016
Approved: CM	Date: 6.6.2016
Drawing No. KPLC-009	Revision. A
Drawing Scale:	Sheet Size. A1
Drawing Status:	



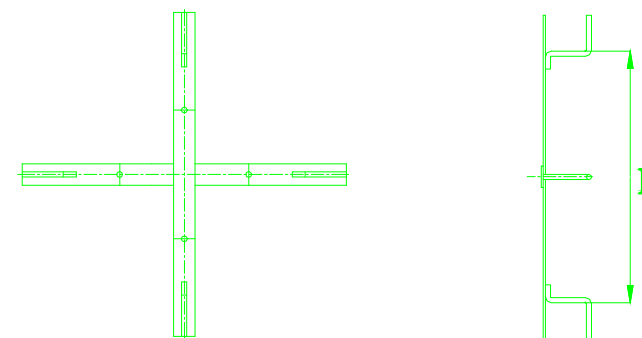
ELEVATION C-C



DOWN LEAD CLAMP

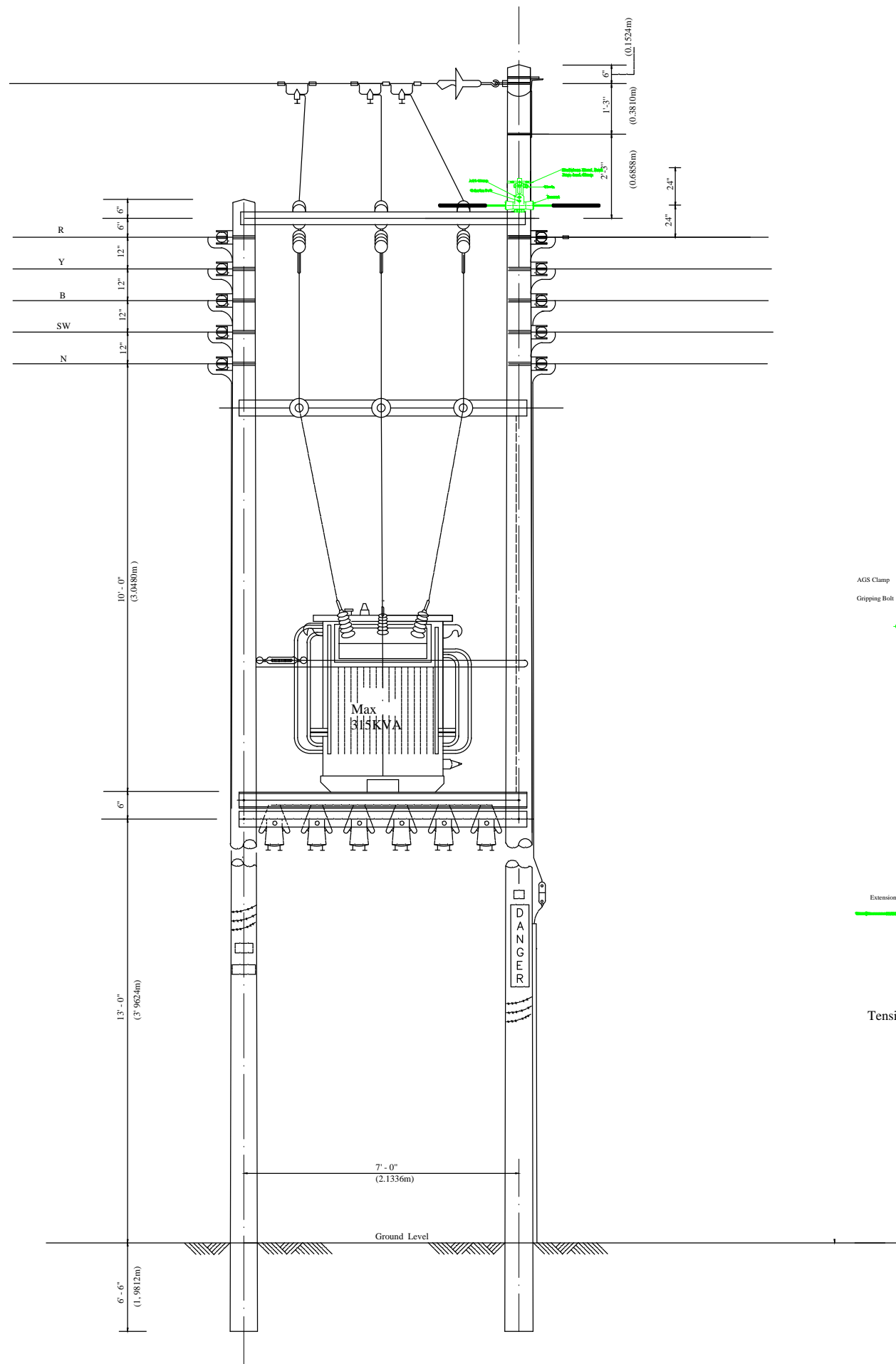


Cap type Metal Joint Box for Pole

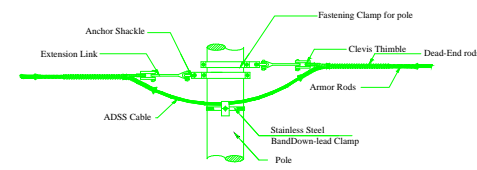
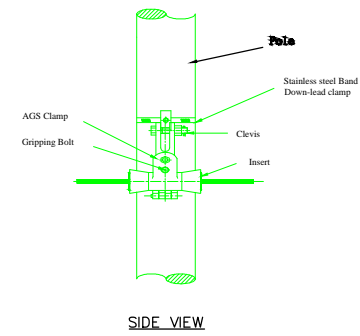
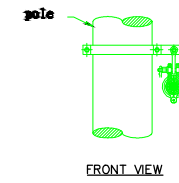


Cable Storage Assembly

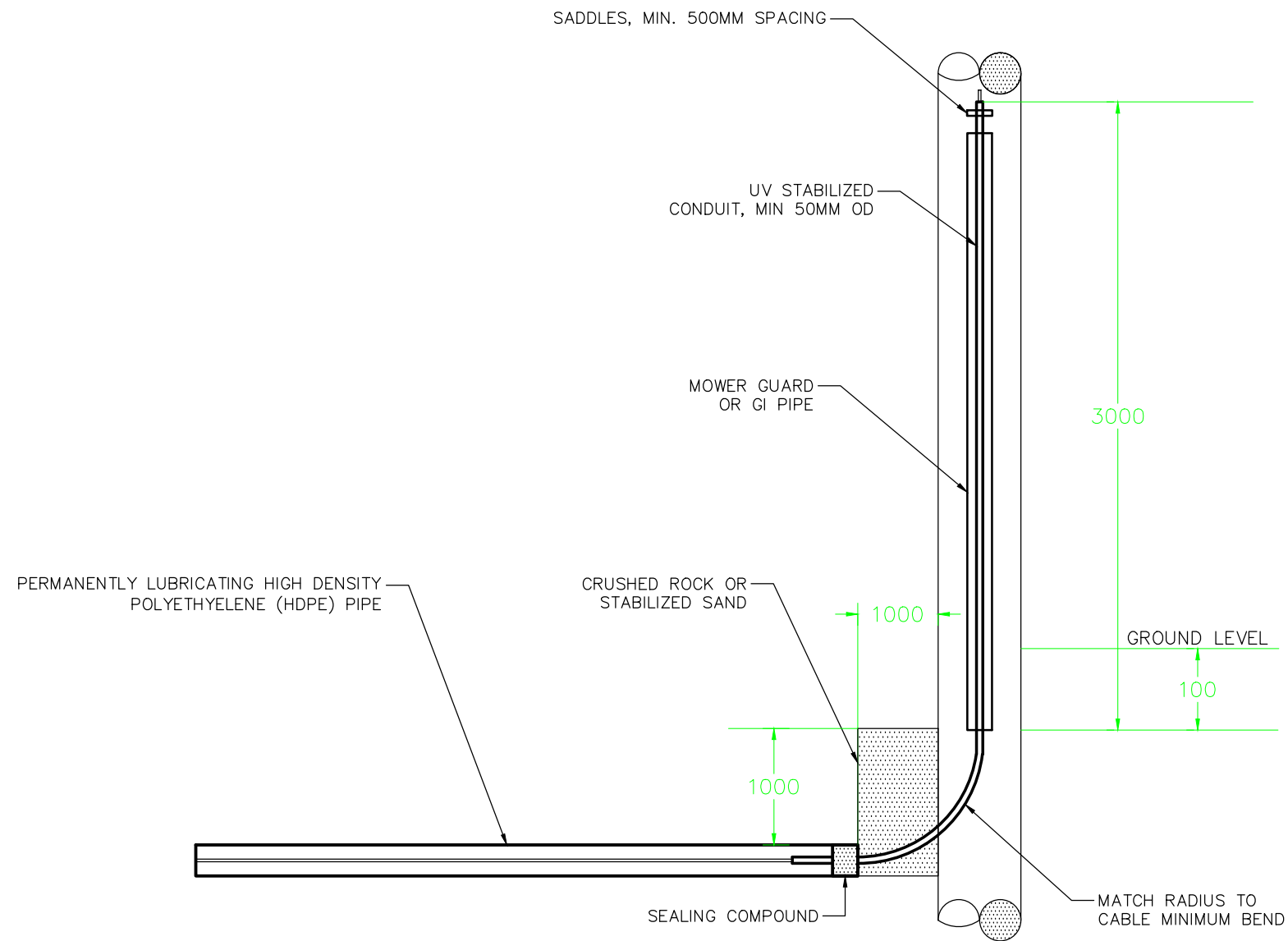
Client:	
KENYA POWER & LIGHTING COMPANY LIMITED	
Consultant:	
Project:	
Title:	
THREE- PHASE TERMINAL LV POLE COMPLETE WITH FIBER SUSPENSION, TENSION, STORAGE AND JOINT BOX	
Drawn: JK	Date: 6.6.2016
Designed: CM	Date: 6.6.2016
Checked: CM	Date: 6.6.2016
Approved: CM	Date: 6.6.2016
Drawing No. KPLC-010	Revision. A
Drawing Scale:	Sheet Size. A1
Drawing Status:	



COMPLETE WITH FIBER SUSPENSION AND TENSION SET



Client:	
KENYA POWER & LIGHTING COMPANY LIMITED	
Consultant:	
Project:	
Title:	
11KV SUBSTATION 'H' POLE MOUNTED TRANSFORMER COMPLETE WITH FIBER SUSPENSION AND TENSION SET	
Drawn: JK	Date: 6.6.2016
Designed: CM	Date: 6.6.2016
Checked: CM	Date: 6.6.2016
Approved: CM	Date: 6.6.2016
Drawing No. KPLC-011	Revision. A
Drawing Scale:	Sheet Size. A1
Drawing Status:	



Client:	
KENYA POWER & LIGHTING COMPANY LIMITED	
Consultant:	
Project:	
Title:	
TRANSITION OVERHEAD TO UNDERGROUND FOR ADSS CABLES	
Drawn: JK	Date: 6.6.2016
Designed: CM	Date: 6.6.2016
Checked: CM	Date: 6.6.2016
Approved: CM	Date: 6.6.2016
Drawing No. KPLC-015	Revision. A
Drawing Scale:	Sheet Size. A1
Drawing Status:	