



REPUBLIC OF KENYA

THE PARLIAMENTARY SERVICE COMMISSION

PROPOSED MULTI STOREY OFFICE BLOCK FOR THE KENYA NATIONAL ASSEMBLY.

W.P. ITEM NO. D29 NB/NB 901 –JOB NO. 7753C

TENDER NO. PJS/013/2019-2020

1. TECHNICAL TENDER DOCUMENT

SPECIFICATIONS
FOR
SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING
OF

**AUDIO VISUAL/MULTIMEDIA AND CONFERENCE
MANAGEMENT SYSTEMS INSTALLATIONS**

ARCHITECT

Chief Architect
Ministry of Transport, Infrastructure, Housing, Urban
Development and Public Works
P.O. Box 30743-00100
NAIROBI

QUANTITY SURVEYOR

Chief Quantity Surveyor
Ministry of Transport, Infrastructure, Housing, Urban Development and
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P.O. Box 30743-00100
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ENGINEER (STRUCTURAL)

Chief Engineer Structural
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ELECTRICAL ENGINEER

Chief Engineer (Electrical) (BS)
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MECHANICAL ENGINEER

Chief Engineer (Mechanical) (BS)
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PROJECT CONSULTANTS

CONSULTING ARCHITECT

Mutiso Menezes International
P.O. Box 44934 - 00100
NAIROBI.

CONSULTING QUANTITY SURVEYOR

Quantech Consultancy
P.O. Box 44660 – 00100
NAIROBI

CONSULTING ELECT. AND MECH. ENGINEER

Mecoy Consultants Ltd
P.O. Box 20198-00200
NAIROBI

CONSULTING STRUCTURAL & CIVIL ENGINEER.

Wanjohi Mutonyi Consult
P.O. Box 21714 - 00505
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CLIENT

The Parliamentary Service Commission

P.O. BOX 41842,
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DEFINITIONS

The following terms and expressions used in the contract document shall have the following meanings:

The Employer	Parliamentary Service Commission P.O. Box 41842 Nairobi.
Employer's Representative	Director General, P.O. Box 41842 Nairobi
Architect	Chief Architect, Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works. P.O. Box 30743-00100, Nairobi.
Electrical Engineer	Chief Engineer (Electrical), Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works. P.O. Box 41191-00100, Nairobi.
Mechanical Engineer	Chief Engineer (Mechanical), Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works. P.O. Box 41191-00100, Nairobi.
Quantity Surveyor	Chief Quantity Surveyor, Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works. P.O. Box 30743-00100, Nairobi.
Structural Engineer	Chief Engineer (Structural), Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works. P.O. Box 30743-00100, Nairobi.
Project Manager	The Works Secretary Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works. P.O. Box 30743 – 00100, Nairobi.
Contractor	The firm appointed to carry out the supply, delivery, installation, testing and commissioning of Audio Visual/Multimedia and Conference Management Systems Installations.
Site	Central Business District, Nairobi City.

PROJECT CONSULTANTS

Architect	Mutiso Menezes International, P.O. Box 44934 - 00100, <u>NAIROB</u>
Quantity Surveyor	Quantech Consultancy, P.O. Box 44660 - 00100, <u>NAIROBI</u>
Structural Engineer	Wanjohi Mutonyi Consult, P.O. Box 21714 - 00505, <u>NAIROBI</u>
Electrical and Mechanical Engineer	Mecoy Consultants Ltd, P.O. Box 20198 - 00200, <u>NAIROBI</u>

SPECIAL NOTES FOR ALL TENDERERS:

Important: *The site for the proposed works has a number of existing installations. The Sub-contractor will be required to ensure there's no interference with supply of services to neighbouring organizations. The sub-contractor will be required to take all precaution and care so that no damage will occur to the existing installations on site. The sub-contractor is also advised to secure all the necessary insurance policies as he will be solely held responsible for any damages to the existing system, injuries to persons resulting from his activities and/or interference with normal operations of the building that may result from his negligence, actions or otherwise.*

1. These notes shall form part of the Instructions to Tenderers and Conditions of Contract.
2. The Tenderer is required to check the number of pages in this document and should he find any missing, or in duplicate or indistinct he should inform the Mecoy consultant limited at once and have the same rectified.
3. The Tenderer shall not alter or otherwise qualify the text of this specification. Any alteration or qualification made without authority will be ignored and the text of the specification as printed will be adhered to.
4. The Tenderer shall be deemed to have made allowances in his unit prices generally to cover items of preliminaries or additions to Prime cost Sums or other items, if those have not been priced against the respective items.
5. The Tenderer's price shall include all government taxes including duties, V.A.T. etc. No claims whatsoever will be allowed in respect of duties, VAT etc if the tenderer fails to include them in his unit prices. It is also to be noted that VAT will be included in the unit rates and **NOT** worked out as a percentage of the total.
6. In no case will any expenses incurred by the tenderer in preparation of this tender be reimbursed.
7. The copyright of this specification is vested in the Engineers and no part thereof may be reproduced without their express permission, given in writing.
8. The specifications must be priced in Kenya Currency i.e. Shillings and Cents.
9. All the tenderers must make a declaration that they have not and will not make any payment to any person which can be perceived as an inducement to enable them to win this tender.
10. The works shall be carried out in accordance with provisions of the 18th Edition of IEE wiring Regulations, the most current Kenya Standards governing such works, and relevant provisions of the current KPLC by-laws.
11. The tender is a two tier process comprising of Technical and Financial bidding. Only Tenderers who qualify in the Technical bid evaluation will proceed to financial evaluation. The **Technical and Financial** bids must therefore be enclosed in separate sealed envelopes, and the two sealed envelopes enclosed and sealed in an outer envelope.
12. The bid security **must** be submitted with the Technical bid.
13. The Form of Tender **must** be submitted with the Financial bid.

Signed (As in Tender) **Date/Stamp**

FORM OF TENDER SECURITY (BANK)

WHEREAS (Hereinafter called “the Tenderer”) has submitted his tender dated For **THE SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF AUDIO VISUAL/MULTIMEDIA AND CONFERENCE MANAGEMENT SYSTEMS, AT THE PROPOSED MULTI STORIED OFFICE BLOCK FOR THE KENYA NATIONAL ASSEMBLY.**

NOW ALL PEOPLE by these presents that WE
Having our registered office at
(Hereinafter called “the Bank’), are bound unto
(Hereinafter called “the Employer”) in the sum of Kshs.....
for which payment well and truly to be made to the said Employer, the Bank binds itself, its successors and assigns by these presents sealed with the Common Seal of the said Bank thisDay of20

THE CONDITIONS of this obligation are:

1. If after tender opening the Tenderer withdraws his tender during the period of tender validity specified in the instructions to Tenderers
or
2. If the Tenderer, having been notified of the acceptance of his tender by the Employer during the period of tender validity:
 - (a) fails or refuses to execute the form of Agreement in accordance with the Instructions to Tenderers, if required; or
 - (b) fails or refuses to furnish the Performance Security, in accordance with the Instructions to Tenderers;

We undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by his is due to him, owing to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force for a minimum of One hundred and fifty (150) days from the date of tender opening, and any demand in respect thereof should reach the Bank not later than the said date.

.....
(date)

.....
(Witness)

.....
(Signature of the Bank)

.....
(Seal)

FORM OF TENDER SECURITY (INSURANCE)

WHEREAS (Hereinafter called “the Tenderer”) has submitted his tender dated For **THE SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF AUDIO VISUAL/MULTIMEDIA AND CONFERENCE MANAGEMENT SYSTEMS AT THE PROPOSED MULTI STORIED OFFICE BLOCK FOR KENYA NATIONAL ASSEMBLY.**

NOW ALL PEOPLE by these presents that WE

Having our registered office at
(Hereinafter called “the Insurance”), are bound unto
(Hereinafter called “the Employer”) in the sum of Kshs.....

for which payment well and truly to be made to the said Employer, the Insurance Company binds itself, its successors and assigns by these presents sealed with the Common Seal of the said Bank thisDay of20

THE CONDITIONS of this obligation are:

1. If after tender opening the Tenderer withdraws his tender during the period of tender validity specified in the instructions to Tenderers

or

2. If the Tenderer, having been notified of the acceptance of his tender by the Employer during the period of tender validity:
 - (a) fails or refuses to execute the form of Agreement in accordance with the Instructions to Tenderers, if required; or
 - (b) fails or refuses to furnish the Performance Security, in accordance with the Instructions to Tenderers;

We undertake to pay to the Employer up to the above amount upon receipt of his first written demand, without the Employer having to substantiate his demand, provided that in his demand the Employer will note that the amount claimed by his is due to him, owing to the occurrence of one or both of the two conditions, specifying the occurred condition or conditions.

This guarantee will remain in force for a minimum of One hundred and fifty (150) days from the date of tender opening, and any demand in respect thereof should reach the Insurance not later than the said date.

.....
(date)

.....
(Witness)

.....
(Signature of the Insurance)

.....
(Seal)

SECTION A:
INSTRUCTIONS TO TENDERERS

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INSTRUCTION TO TENDERERS

Note: The Tenderer must comply with the following conditions and instructions and failure to do so is liable to result in rejection of the tender.

GENERAL

1. Definitions

- (a) **“Tenderer”** means any person or persons partnership firm or company submitting a sum or sums in the Bills of Quantities in accordance with the Instructions to Tenderers, Conditions of Contract Parts I and II, Specifications, Drawings and Bills of Quantities for the work contemplated, acting directly or through a legally appointed representative.
- (b) **“Approved Tenderer”** means the Tenderer who is approved by the Employer.
- (c) Any noun or adjective derived from the word **“tender”** shall be read and construed to mean the corresponding form of the noun or adjective **“bid”**. Any conjugation of the verb “tender” shall be read and construed to mean the corresponding form of the verb “bid.”
- (d) **“Employer”** means a Central Government Ministry, Local Authority, State Corporation or any other Public Institution.

2. Eligibility and Qualification Requirements

- 2.1 This invitation to tender is open to all Tenderers who have been prequalified.
- 2.2 To be eligible for award of Contract, the Tenderer shall provide evidence satisfactory to the Employer of their eligibility under Sub clause 2.1 above and of their capability and adequacy of resources to effectively carry out the subject Contract. To this end, the Tenderer shall be required to update the following information already submitted during prequalification:-
 - (a) Details of experience and past performance of the Tenderer on the works of a similar nature within the past five years and details of current work on hand and other contractual commitments.
 - (b) The qualifications and experience of key personnel proposed for administration and execution of the contract, both on and off site.
 - (c) Major items of construction plant and equipment proposed for use in carrying out the Contract. Only reliable plant in good working order and suitable for the work required of it shall be shown on this schedule. The Tenderer will also indicate on this schedule when each item will be available on the Works. Included also should be a schedule of plant, equipment and material to be imported for the purpose of the Contract, giving details of make, type, origin and CIF value as appropriate.
 - (d) Details of subcontractors to whom it is proposed to sublet any portion of the Contract and for whom authority will be requested for such subletting in accordance with clause 4 of the Conditions of Contract.

- (e) A draft Program of Works in the form of a bar chart and Schedule of Payment which shall form part of the Contract if the tender is accepted. Any change in the Program or Schedule shall be subjected to the approval of the Engineer.
- (f) Details of any current litigation or arbitration proceedings in which the Tenderer is involved as one of the parties.

2.3 Joint Ventures

Tenders submitted by a joint venture of two or more firms as partners shall comply with the following requirements:-

- (a) The tender, and in case of a successful tender, the Form of Agreement, shall be signed so as to be legally binding on all partners.
- (b) One of the partners shall be nominated as being in charge; and this authorization shall be evidenced by submitting a power of attorney signed by legally authorized signatories of all the partners.
- (c) The partner in charge shall be authorized to incur liabilities and receive instructions for and on behalf of any and all partners of the joint venture and the entire execution of the Contract including payment shall be done exclusively with the partner in charge.
- (d) 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 under (b) above as well as in the Form of Tender and the Form of Agreement (in case of a successful tender).
- (e) A copy of the agreement entered into by the joint venture partners shall be submitted with the tender.

3. Cost of Tendering

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

4. Site Visit

4.1 The Tenderer is advised to visit and examine the Site and its surroundings and obtain for himself on his own responsibility, all information that may be necessary for preparing the tender and entering into a contract. The costs of visiting the Site shall be the Tenderer's own responsibility.

4.2 The Tenderer and any of his personnel or agents will be granted permission by the Employer to enter upon premises and lands for the purpose of such inspection, but only upon the express condition that the Tenderer, his personnel or agents, will release and indemnify the Employer from and against all liability in respect of, and will be responsible for personal injury (whether fatal or otherwise), loss of or damage to property and any other loss, damage, costs and expenses however caused, which but for the exercise of such permission, would not have arisen.

- 4.3 The Employer shall organize a site visit at a date to be notified. A representative of the Employer will be available to meet the intending Tenderers at the Site.

Tenderers must provide their own transport. The representative will not be available at any other time for site inspection visits.

Each Tenderer shall complete the Certificate of Tenderer's Visit to the Site, whether he in fact visits the Site at the time of the organized site visit or by himself at some other time.

TENDER DOCUMENTS

5. Tender Documents

- 5.1 The Tender documents comprise the documents listed herebelow and should be read together with any Addenda issued in accordance with Clause 7 of these instructions to Tenderers.

- a. Form of Invitation for Tenders
- b. Instructions to Tenderers
- c. Form of Tender
- d. Appendix to Form of Tender
- e. Form of Tender Surety
- f. Statement of Foreign Currency Requirements
- g. Form of Performance Security
- h. Form of Agreement
- i. Form of Advance payment Bank Guarantee
- j. Schedules of Supplementary Information
- k. General Conditions of Contract – Part I
- l. Conditions of Particular Application – Part II
- m. Specifications
- n. Bills of Quantities
- o. Drawings

- 5.2 The Tenderer is expected to examine carefully all instructions, conditions, forms, terms, specifications and drawings in the tender documents. Failure to comply with the requirements for tender submission will be at the Tenderer's own risk. Pursuant to clause 22 of Instructions to Tenderers, tenders which are not substantially responsive to the requirements of the tender documents will be rejected.

- 5.3 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".

6. Clarification of Tender Documents

- 6.1 A prospective Tenderer requiring any clarification of the tender documents may notify the Employer in writing or by telex, cable or facsimile at the Employer's mailing address indicated in the Invitation to Tender. The Employer will respond in writing to any request for clarification which he receives earlier than 5 days prior to the expiry of 28 days deadline for the submission of tenders. Written copies of the Employer's response (including the query but without identifying the source of the inquiry) will be sent to all prospective Tenderers who have purchased the tender documents.

7. Amendment of Tender Documents

- 7.1 At any time prior to the deadline for submission of tenders the Employer may, for any reason, whether at his own initiative or in response to a clarification requested by a prospective Tenderer, modify the tender documents by issuing Addenda.
- 7.2 Any Addendum will be notified in writing or by cable, telex or facsimile to all prospective Tenderers who have purchased the tender documents and will be binding upon them.
- 7.3 If during the period of tendering, any circular letters (tender notices) shall be issued to Tenderers by, or on behalf of, the Employer setting forth the interpretation to be placed on a part of the tender documents or to make any change in them, such circular letters will form part of the tender documents and it will be assumed that the Tenderer has taken account of them in preparing his tender. The Tenderer must promptly acknowledge any circular letters he may receive.
- 7.4 In order to allow prospective Tenderers reasonable time in which to take the Addendum into account in preparing their tenders, the Employer may, at his discretion, extend the deadline for the submission of tenders.

PREPARATION OF TENDERS

8. Language of Tender

- 8.1 The tender and all correspondence and documents relating to the tender exchanged between the Tenderer and the Employer shall be written in the English language. Supporting documents and printed literature furnished by the Tenderer with the tender may be in another language provided they are accompanied by an appropriate translation of pertinent passages in the above stated language. For the purpose of interpretation of the tender, the English language shall prevail.

9. Documents Comprising the Tender

- 9.1 The tender to be prepared by the Tenderer shall comprise: the Form of Tender and Appendix thereto, a Tender Surety, the Priced Bills of Quantities and Schedules, the information on eligibility and qualification, and any other materials required to be completed and submitted in accordance with the Instructions to Tenderers embodied in these tender documents. The Forms, Bills of Quantities and Schedules provided in the tender documents shall be used without exception (subject to extensions of the schedules in the same format and to the provisions of clause 13.2 regarding the alternative forms of Tender Surety).

10. Tender Prices

- 10.1 All the insertions made by the Tenderer shall be made in INK and the Tenderer shall clearly form the figures. The relevant space in the Form of Tender and Bills of Quantities shall be completed accordingly without interlineations or erasures except those necessary to correct errors made by the Tenderer in which case the erasures and interlineations shall be initialed by the person or persons signing the tender.
- 10.2 A price or rate shall be inserted by the Tenderer for every item in the Bills of Quantities whether the quantities are stated or not items against which no rate or price is entered by the Tenderer will not be paid for by the Employer when executed and shall be deemed covered by the rates for other items and prices in the Bills of Quantities.

The prices and unit rates in the Bills of Quantities are to be the full [all-inclusive] value of the work described under the items, including all costs and expenses which may be necessary and all general risks, liabilities and obligations set forth or implied in the documents on which the tender is based. All duties and taxes and other levies payable by the Contractor under the Contract or for any other cause as of the date 28 days prior to the deadline for the submission of tenders, shall be included in the rates and prices and the total tender prices submitted by the Tenderer.

Each price or unit rate inserted in the Bills of Quantities should be a realistic estimate for completing the activity or activities described under that particular item and the Tenderer is advised against inserting a price or rate against any item contrary to this instruction.

Every rate entered in the Bills of Quantities, whether or not such rate be associated with a quantity, shall form part of the Contract. The Employer shall have the right to call for any item of work contained in the Bills of Quantities, and such items of work to be paid for at the rate entered by the Tenderer and it is the intention of the Employer to take full advantage of unbalanced low rates.

- 10.3 Unless otherwise specified the Tenderer must enter the amounts representing 10% of the sub-total of the summary of the Bills of Quantities for Contingencies and Variation of Prices [V.O.P.] payments in the summary sheet and add them to the sub-total to arrive at the tender amount.
- 10.4 The Tenderer shall furnish with his tender written confirmation from his suppliers or manufacturers of unit rates for the supply of items listed in the Conditions of Contract clause 47 where appropriate.

The rates and prices quoted by the Tenderer are subject to adjustment during the performance of the Contract only in accordance with the provisions of the Conditions of Contract. The Tenderer shall complete the schedule of basic rates and shall submit with his tender such other supporting information as required under clause 47 of the Conditions of Contract Part II.

11. Currencies of Tender and Payment

- 11.1 Tenders shall be priced in Kenya Shillings and the tender sum shall be in Kenya Shillings.
- 11.2 Tenderers are required to indicate in the Statement of Foreign Currency Requirements, which forms part of the tender, the foreign currency required by them. Such currency should generally be the currency of the country of the Tenderer's main office. However, if a substantial portion of the Tenderer's expenditure under the Contract is expected to be in countries other than his country of origin, then he may state a corresponding portion of the contract price in the currency of those other countries. However, the foreign currency element is to be limited to two (2) different currencies and a maximum of 30% (thirty percent) of the Contract Price.
- 11.3 The rate of rates of exchange used for pricing the tender shall be selling rate or rates of the Central Bank ruling on the date thirty (30) days before the final date for the submission of tenders.
- 11.4 Tenderers must enclose with their tenders, a brief justification of the foreign currency requirements stated in their tenders.

12. Tender Validity

- 12.1 The tender shall remain valid and open for acceptance for a period of one hundred and twenty (120) days from the specified date of tender opening or from the extended date of tender opening (in accordance with clause 7.4 here above) whichever is the later.
- 12.2 In exceptional circumstances prior to expiry of the original tender validity period, the Employer may request the Tenderer for a specified extension of the period of validity. The request and the responses thereto shall be made in writing or by cable, telex or facsimile. A Tenderer may refuse the request without forfeiting his Tender Surety. A Tenderer agreeing to the request will not be required nor permitted to modify his tender, but will be required to extend the validity of his Tender Surety correspondingly.

13. Tender Surety

- 13.1 The Tenderer shall furnish as part of his tender, a Tender Surety in the amount stated in the Appendix to Instructions to Tenderers.
- 13.2 The unconditional Tender Surety shall be in Kenya Shillings and be in form of a certified cheque, a bank draft, an irrevocable letter of credit or a guarantee from a reputable Bank approved by the Employer located in the Republic of Kenya.

The format of the Surety shall be in accordance with the sample form of Tender Surety included in these tender documents; other formats may be permitted subject to the prior approval of the Employer. The Tender Surety shall be valid for twenty eight (28) days beyond the tender validity period.

- 13.3 Any tender not accompanied by an acceptable Tender Surety will be rejected by the Employer as non-responsive.

13.4 The Tender Sureties of unsuccessful Tenderers will be returned as promptly as possible but not later than twenty eight (28) days after concluding the Contract execution and after a Performance Security has been furnished by the successful Tenderer. The Tender Surety of the successful Tenderer will be returned upon the Tenderer executing the Contract and furnishing the required Performance Security.

13.5 The Tender Surety may be forfeited:

- (a) if a Tenderer withdraws his tender during the period of tender validity: or
- (b) in the case of a successful Tenderer, if he fails
 - (i) to sign the Agreement, or
 - (ii) to furnish the necessary Performance Security
- (c) if a Tenderer does not accept the correction of his tender price pursuant to clause 23.

14. No Alternative Offers

14.1 The Tenderer shall submit an offer which complies fully with the requirements of the tender documents.

Only one tender may be submitted by each Tenderer either by himself or as partner in a joint venture.

14.2 The Tenderer shall not attach any conditions of his own to his tender. The tender price must be based on the tender documents. The Tenderer is not required to present alternative construction options and he shall use without exception, the Bills of Quantities as provided, with the amendments as notified in tender notices, if any, for the calculation of his tender price.

Any Tenderer who fails to comply with this clause will be disqualified.

15. Pre-Tender Meeting

15.1 The Tenderer's designated representative is invited to attend a pre-tender meeting, which if convened, will take place at the venue and time stated in the Invitation to Tender. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.

- 15.2 The Tenderer is requested as far as possible to submit any questions in writing or by cable, to reach the Employer not later than seven days before the meeting. It may not be practicable at the meeting to answer questions received late, but questions and responses will be transmitted in accordance with the following:
- (a) Minutes of the meeting, including the text of the questions raised and the responses given together with any responses prepared after the meeting, will be transmitted without delay to all purchasers of the tender documents. Any modification of the tender documents listed in --Clause 9 which may become necessary as a result of the pre-tender meeting shall be made by the Employer exclusively through the issue of a tender notice pursuant to Clause 7 and not through the minutes of the pre-tender meeting.
 - (b) Non-attendance at the pre-tender meeting will not be cause for disqualification of a bidder.

16. Format and Signing of Tenders

- 16.1 The Tenderer shall prepare his tender as outlined in clause 9 above and mark appropriately one set "ORIGINAL" and the other "COPY".
- 16.2 The copy of the tender and Bills of Quantities shall be typed or written in indelible ink and shall be signed by a person or persons duly authorized to sign on behalf of the Tenderer. Proof of authorization shall be furnished in the form of the written power of attorney which shall accompany the tender. All pages of the tender where amendments have been made shall be initialed by the person or persons signing the tender.
- 16.3 The complete tender shall be without alterations, interlineations or erasures, except as necessary to correct errors made by the Tenderer, in which case such corrections shall be initialed by the person of persons signing the tender.

SUBMISSION OF TENDERS

17. Sealing and Marking of Tenders

- 17.1 The Tenderer shall seal the original and copy of the tender in separated envelopes, duly marking the envelopes as "ORIGINAL" and "COPY". The envelopes shall then be sealed in an outer envelope.
- 17.2 The inner and outer envelopes shall be addressed to the Employer at the address stated in the Appendix to Instructions to Tenderers and bear the name and identification of the Contract stated in the said Appendix with a warning not to open before the date and time for opening of tenders stated in the said Appendix.
- 17.3 The inner envelopes shall each indicated the name and address of the Tenderer to enable the tender to be returned unopened in case it is declared "late", while the outer envelope shall bear no mark indicating the identity of the Tenderer.

- 17.4 If the outer envelope is not sealed and marked as instructed above, the Employer will assume no responsibility for the misplacement or premature opening of the tender. A tender opened prematurely for this cause will be rejected by the Employer and returned to the Tenderer.

18 Deadline for Submission of Tenders

- 18.1 Tenders must be received by the Employer at the address specified in clause 17.2 and on the date and time specified in the Letter of Invitation, subject to the provisions of clause 7.4, 18.2 and 18.3.

Tenders delivered by hand must be placed in the “tender box” provided in the office of the Employer.

Proof of posting will not be accepted as proof of delivery and any tender delivered after the above stipulated time, from whatever cause arising will not be considered.

- 18.2 The Employer may, at his discretion, extend the deadline for the submission of tenders through the issue of an Addendum in accordance with clause 7, in which case all rights and obligations of the Employer and the Tenderers previously subject to the original deadline shall thereafter be subject to the new deadline as extended.
- 18.3 Any tender received by the Employer after the prescribed deadline for submission of tender will be returned unopened to the Tenderer.

19 Modification and Withdrawal of Tenders

- 19.1 The Tenderer may modify or withdraw his tender after tender submission, provided that written notice of the modification or withdrawal is received by the Employer prior to prescribed deadline for submission of tenders.

The Tenderer’s modification or withdrawal notice shall be prepared, sealed, marked and dispatched in accordance with the provisions for the submission of tenders, with the inner and outer envelopes additionally marked “MODIFICATION” or “WITHDRAWAL” as appropriate.

- 19.2 No tender may be modified subsequent to the deadline for submission of tenders.
- 19.3 No tender may be withdrawn in the interval between the deadline for submission of tenders and the period of tender validity specified on the tender form. Withdrawal of a tender during this interval will result in the forfeiture of the Tender Surety.
- 19.4 Subsequent to the expiration of the period of tender validity prescribed by the Employer, and the Tenderer having not been notified by the Employer of the award of the Contract or the Tenderer does not intend to conform with the request of the Employer to extend the prior of tender validity, the Tenderer may withdraw his tender without risk of forfeiture of the Tender Surety.

TENDER OPENING AND EVALUATION

20 Tender Opening

- 20.1 The Employer will open the tenders in the presence of the Tenderers' representatives who choose to attend at the time and location indicated in the Letter of Invitation to Tender. The Tenderers' representatives who are present shall sign a register evidencing their attendance.
- 20.2 Tenders for which an acceptable notice of withdrawal has been submitted, pursuant to clause 19, will not be opened. The Employer will examine the tenders to determine whether they are complete, whether the requisite Tender Sureties have been furnished, whether the documents have been properly signed and whether the tenders are generally in order.
- 20.3 At the tender opening, the Employer will announce the Tenderer's names, total tender price, tender price modifications and tender withdrawals, if any, the presence of the requisite Tender Surety and such other details as the Employer, at his discretion, may consider appropriate. No tender shall be rejected at the tender opening except for late tenders.
- 20.4 The Employer shall prepare minutes of the tender opening including the information disclosed to those present.
- 20.5 Tenders not opened and read out a tender opening shall not be considered further for evaluation, irrespective of the circumstances.

21 Process to be Confidential

- 21.1 After the public opening of tenders, information relating to the examination, clarification, evaluation and comparisons of tenders and recommendations concerning the award of Contract shall not be disclosed to Tenderers or other persons not officially concerned with such process until the award of Contract is announced.
- 21.2 Any effort by a Tenderer to influence the Employer in the process of examination, evaluation and comparison of tenders and decisions concerning award of Contract may result in the rejection of the Tenderer's tender.

22 Clarification of Tenders

- 22.1 To assist in the examination, evaluation and comparison of tenders, the Employer may ask Tenderers individually for clarification of their tenders, including breakdown of unit prices. The request for clarification and the response shall be in writing or by cable, facsimile or telex, but no change in the price or substance of the tender shall be sought, offered or permitted except as required to confirm the correction of arithmetical errors discovered by the employer during the evaluation of the tenders in accordance with clause 24.
- 22.2 No Tenderer shall contact the Employer on any matter relating to his tender from the time of the tender opening to the time the Contract is awarded. If the Tenderer wishes to bring additional information to the notice of the Employer, he shall do so in writing.

23 Determination of Responsiveness

- 23.1 Prior to the detailed evaluation of tenders, the Employer will determine whether each tender is substantially responsive to the requirements of the tender documents.
- 23.2 For the purpose of this clause, a substantially responsive tender is one which conforms to all the terms, conditions and specifications of the tender documents without material deviation or reservation and has a valid bank guarantee. A material deviation or reservation is one which affects in any substantial way the scope, quality, completion timing or administration of the Works to be undertaken by the Tenderer under the Contract, or which limits in any substantial way, inconsistent with the tender documents, the Employer's rights or the Tenderers obligations under the Contract and the rectification of which would affect unfairly the competitive position of other Tenderers who have presented substantially responsive tenders.
- 23.3 Each price or unit rate inserted in the Bills of Quantities shall be a realistic estimate of the cost of completing the works described under the particular item including allowance for overheads, profits and the like. Should a tender be seriously unbalanced in relation to the Employer's estimate of the works to be performed under any item or groups of items, the tender shall be deemed not responsive.
- 23.4 A tender determined to be not substantially responsive will be rejected by the Employer and may not subsequently be made responsive by the Tenderer by correction of the non-conforming deviation or reservation.

24 Correction of Errors

- 24.1 Tenders determined to be substantially responsive shall be checked by the Employer for any arithmetic errors in the computations and summations. Errors will be corrected by the Employer as follows:
- (a) Where there is a discrepancy between the amount in figures and the amount in words, the amount in words will govern.
 - (b) Where there is a discrepancy between the unit rate and the line item total resulting from multiplying the unit rate by the quantity, the unit rate as quoted will prevail, unless in the opinion of the Employer, there is an obvious typographical error, in which case adjustment will be made to the entry containing that error.
 - (c) The amount stated in the tender will be adjusted in accordance with the above procedure for the correction of errors and, with concurrence of the Tenderer, shall be considered as binding upon the Tenderer. If the Tenderer does not accept the corrected amount, the tender may be rejected and the Tender Security may be forfeited in accordance with clause 13.

25 Conversion to Single Currency

- 25.1 For compensation of tenders, the tender price shall first be broken down into the respective amounts payable in various currencies by using the selling rate or rates of the Central Bank of Kenya ruling on the date twenty eight (28) days before the final date for the submission of tenders.
- 25.2 The Employer will convert the amounts in various currencies in which the tender is payable (excluding provisional sums but including Dayworks where priced competitively) to Kenya Shillings at the selling rates stated in clause 25.1.

26 Evaluation and Comparison of Tenders

- 26.1 The Employer will evaluate only tenders determined to be substantially responsive to the requirements of the tender documents in accordance with clause 23.
- 26.2 In evaluating tenders, the Employer will determine for each tender the evaluated tender price by adjusting the tender price as follows:
- (a) Making any correction for errors pursuant to clause 24.
 - (b) Excluding Provisional Sums and provision, if any, for Contingencies in the Bills of Quantities, but including Day works where priced competitively.
- 26.3 The Employer reserves the right to accept any variation, deviation or alternative offer. Variations, deviations, alternative offers and other factors which are in excess of the requirements of the tender documents or otherwise result in the accrual of unsolicited benefits to the Employer, shall not be taken into account in tender evaluation.
- 26.4 Price adjustment provisions in the Conditions of Contract applied over the period of execution of the Contract shall not be taken into account in tender evaluation.
- 26.5 If the lowest evaluated tender is seriously unbalanced or front loaded in relation to the Employer's estimate of the items of work to be performed under the Contract, the Employer may require the Tenderer to produce detailed price analyses for any or all items of the Bills of Quantities, to demonstrate the relationship between those prices, proposed construction methods and schedules. After evaluation of the price analyses, the Employer may require that the amount of the Performance Security set forth in clause 29 be increased at the expense of the successful Tenderer to a level sufficient to protect the Employer against financial loss in the event of subsequent default of the successful Tenderer under the Contract.
- 26.6 Firms incorporated in Kenya where indigenous Kenyans own 51% or more of the share capital shall be allowed a 10% preferential bias provided that they do not sub-contract work valued at more than 50% of the Contract Price excluding Provisional Sums to a non-indigenous sub-contractor.

AWARD OF CONTRACT

27 Award

- 27.1 Subject to clause 27.2, the Employer will award the Contract to the Tenderer whose tender is determined to be substantially responsive to the tender documents and who has offered the lowest evaluated tender price subject to possessing the capability and resources to effectively carry out the Contract Works.
- 27.2 The Employer reserves the right to accept or reject any tender, and to annul the tendering process and reject all tenders, at any time prior to award of Contract, without thereby incurring any liability to the affected Tenderers or any obligation to inform the affected Tenderers of the grounds for the Employer's action.

28 Notification of Award

- 28.1 Prior to the expiration of the period of tender validity prescribed by the Employer, the Employer will notify the successful Tenderer by cable, telefax or telex and confirmed in writing by registered letter that his tender has been accepted. This letter (hereinafter and in all Contract documents called "Letter of Acceptance") shall name the sum (hereinafter and in all Contract documents called "the Contract Price") which the Employer will pay to the Contractor in consideration of the execution and completion of the Works as prescribed by the Contract.
- 28.2 Notification of award will constitute the formation of the Contract.
- 28.3 Upon the furnishing of a Performance Security by the successful Tenderer, the unsuccessful Tenderers will promptly be notified that their tenders have been unsuccessful.
- 28.4 Within twenty eight [28] days of receipt of the form of Contract Agreement from the Employer, the successful Tenderer shall sign the form and return it to the Employer together with the required Performance Security.

29 Performance Guarantee

- 29.1 Within twenty eight [28] days of receipt of the notification of award from the Employer, the successful Tenderer shall furnish the Employer with a Performance Security in an amount stated in the Appendix to Instructions to Tenderers.
- 29.2 The Performance Security to be provided by the successful Tenderer shall be an unconditional Bank Guarantee issued at the Tenderer's option by an established and a reputable Bank approved by the Employer and located in the Republic of Kenya and shall be divided into two elements namely, a performance security payable in foreign currencies (based upon the exchange rates determined in accordance with clause 35.4 of the Conditions of Contract) and a performance security payable in Kenya Shillings. The value of the two securities shall be in the same proportions of foreign and local currencies as requested in the form of foreign currency requirements.
- 29.3 Failure of the successful Tenderer to lodge the required Performance Security shall constitute a breach of Contract and sufficient grounds for the annulment of the award and forfeiture of the Tender Security and any other remedy under the Contract the Employer may award the Contract to the next ranked Tenderer.

30 Advance Payment

- 30.1 An advance payment, if approved by the Employer, shall be made under the Contract, if requested by the Contractor, in accordance with clause 23.7 of the Conditions of Contract. The Advance Payment Guarantee shall be denominated in the proportion and currencies named in the form of foreign currency requirements. For each currency, a separate guarantee shall be issued. The guarantee shall be issued by a bank located in the Republic of Kenya, or a foreign bank through a correspondent bank located in the Republic of Kenya, in either case subject to the approval of the Employer.

APPENDIX TO INSTRUCTIONS TO TENDERERS

1. CLAUSE 2.1

Change to read “This invitation to tender is “open to all eligible Tenderers as per the tender invitation notice”

2. OMIT

Clauses 5.1 (a), (d), (f), (i), (j), 10.3, 10.4, 11.2, 11.4, 15, 25, 26.6

3. MODIFY CLAUSE 11

This clause shall not be applicable

4. ADD TO CLAUSE 13.1

Amount of tender surety shall be **Kshs. 1,000,000.00**

5. ADD TO CLAUSE 13.2

The tender surety can also be an Insurance Bond from an Insurance Company in the current list of Authorised Insurance Companies’ issued by the Public Procurement Regulatory Authority (PPRA) or from a reputable bank approved by Central Bank of Kenya. Tender surety shall be valid for 150 days from the date of tender opening.

6. CLAUSE 15.

The pre-tender meeting shall be held on Friday, 15th May, 2020 at 11.00 am in the 2nd floor boardroom Protection House

7. MODIFY CLAUSE 16.1 AND 17.

Original and a copy of the tender document shall be submitted.

8. MODIFY CLAUSE 17.2

The name and address of the Employer’s representative for the purpose of submission of tenders shall be as per the tender invitation notice.

9. ADD TO CLAUSE 20

The tender opening date and time is **Friday, 29th May, 2020 at 11.00am.**

10. MODIFY CLAUSE 28.4

Replace “twenty eight (28)” with twenty one (21).

11. MODIFY CLAUSE 29.1

Replace “twenty eight (28) with twenty one. Amount of performance security shall be five per cent (5%).

12. ADD TO CLAUSE 29.2

Performance security shall not be divided in two elements and shall be payable in Kenya Shillings Only.

13. ADD TO CLAUSE 24

- (i) In the event of a discrepancy between the tender amount as stated in the form of Tender and the corrected tender figure in the Main summary of the Bills of Quantities, the amount as stated in the Form of Tender shall prevail
- (ii) The Error correction factor shall be computed by expressing the difference between the amount and the corrected tender sum as a percentage of the corrected contract works (i.e. corrected tender sum less P.C; and Provisional Sums)
- (iii) The Error correction factor shall be applied to all contract works (as a rebate or addition as the case may be) for the purposes of valuations for Interim Certificates and valuation of variations.

14. MODIFY CLAUSE 30

No advance payment shall be granted

15. ADD TO CLAUSE 26

The evaluation criteria here below shall form part of the evaluation.

16. ADD TO CLAUSE ON DETERMINATION OF CORRECTED TENDER SUM

Section 82 of the Public Procurement and Disposal Regulations, 2015 Act, provides that there should be no correction of errors

TENDER EVALUATION CRITERIA

After tender opening, the tenders will be evaluated in 3 stages, namely:

1. Preliminary Evaluation;
2. Technical Evaluation;
3. Financial Evaluation;

STAGE 1: PRELIMINARY EVALUATION

This stage of evaluation shall involve examination of the mandatory requirements as set out in the Tender Advertisement Notice or Letter of Invitation to Tender and any other conditions stated in the bid document.

These conditions shall include the following:

S/No	MANDATORY REQUIREMENTS(MR)
MR1	Valid Copy of certificate of incorporation/ Registration - If Joint Venture, from each member of the Joint Venture.
MR2	Valid Current Tax Compliance Certificate and PIN certificate - If Joint Venture, from each member of the Joint Venture.
MR3	Valid National Construction Authority NCA2 and above (Public Address and Conference System) and have license from Communications Authority of Kenya.
MR4	Dully filled, signed and stamped tender questionnaire
MR5	Dully filled and signed Confidential business questionnaire - If Joint Venture, each member of the Joint Venture shall fill.
MR6	Dully filled and signed Anticorruption declaration
MR7	Submission of original and (1) copy of tender document.
MR8	The original and (1) copy of tender documents should be properly Tape Bound and paginated in the correct sequence and all pages must be initialled/signed/stamped. NB: Spiral Binding and use of Spring or Box Files will not be allowed and will result in automatic disqualification.
MR9	Valid Copy of Single Business permit – for the year 2020
MR10	The Tender Security of Kshs.1,000,000 (One Million) valid for 150 days in form of Bank Guarantee from a reputable bank recognized by the Central Bank of Kenya. Or an Insurance Company approved by PPRA
MR11	Submission of valid CR12 form showing the list directors /shareholding (issued within the last 1 year) or National Identity Card for Sole Proprietor
MR12	Current annual contractors practicing license from National Construction Authority (NCA)
MR13	Provide proof of Power of attorney (of Tender Signatory)
MR 14	Details of any current litigation or arbitration proceedings in which the bidder is involved as one of the parties
MR 15	Letter of authority to seek references from the Tenderer’s bankers.
MR 16	Submit a copy of certified Audited accounts for the last three (3) years (2016, 2017, 2018 and 2019 if available) with a turnover of at least Kshs. 100 Million or its equivalent per year.
MR 17	Non debarment form duly filled and signed.
MR 18	Foreign and international bidders shall provide a declaration that they source at least 40% of their supplies and labour from citizen contractors.
MR19	Dully Signed Statement of Compliance
MR20	The bidder must provide a Manufacturer Authorisation letter for the Audio Visual/ Multimedia & Conference System Solution being offered.

Bid Document submitted without ANY of the above-mentioned Mandatory requirements shall be rejected by the Parliamentary Service Commission’s Evaluation Committee and will therefore not proceed to the technical and financial Evaluation.

N.B

The employer may seek further clarification/confirmation if necessary, to confirm authenticity/compliance of any condition of the tender.

Note:

- a) The bid security shall be in accordance with clauses 13 and 23.2 of Instruction to Tenderers which states as follows:
- **Clause 13.1** of Instruction to Tenderers, “the tenderers shall furnish as part of his tenders a Bid surety in the amount stated in the tender document in the Appendix to Instructions to Tenderers”.
 - **Clause 13.2** of Instruction to Tenderers, “the unconditional Tender surety shall be in Kenya shillings and be in form of a certified cheque, bank draft, an irrevocable letter of credit or a guarantee from a reputable Bank/ Insurance approved by PPRA located in the Republic of Kenya. The format of the surety shall be in accordance with the sample form included in the tender documents and the tender surety shall be valid for 150 days from the date of tender opening”.
 - **Clause 23.2** of Instruction to Tenderers: “For the purposes of this clause, a substantially responsive tender is one which conforms to all terms and condition and specifications of the tender document without material deviation or reservation and has a valid Bank/Insurance guarantee”.
- b) The employer/procuring entity may seek further clarification/confirmation if necessary, to confirm authenticity/compliance of any condition of the tender. Further, in case of a discrepancy between the amounts stated in the appendix to Instructions to Tenderers in Section A of this tender document and the one stated in the tender advertisement or invitation letter; the bid security shall be taken as the amount in the tender advertisement/ letter of invitation.

The tenderers who do not satisfy any of the above mandatory requirements shall be considered Non-Responsive and their tenders will not be evaluated further.

STAGE 2: TECHNICAL EVALUATION

The tender document shall be examined based on clause 2.2 of the Instruction to Tenderers which states as follows:

In accordance with clause 2.2 of Instruction to Tenderers, the tenderers will be required to provide evidence for eligibility of the award of the tender by satisfying the employer of their eligibility under sub clause 2.1 of Instructions to Tenderers and their capability and adequacy of resources to effectively carry out the subject contract.

In order to comply with provisions of clause 2.2 of Instruction to Tenderers, the tenderers shall be required;

- a. *To fill the Standard Forms provided in the bid document for the purposes of providing the required information. The tenderers may also attach the required information if they so desire;*

b) *On compliance with Technical Specifications, bidders shall supply equipment/items which comply with the technical specifications set out in the bid document. In this regard, the bidders will be required to submit relevant technical brochures/catalogues with the tender document, highlighting (using a mark-pen or highlighter) the Catalogue Number/model of the proposed items. Such brochures/catalogues should indicate comprehensive relevant data of the proposed equipment/items which should include but not limited to the following:*

- (i) Standards of manufacture;*
- (ii) Performance ratings/characteristics;*
- (iii) Material of manufacture;*
- (iv) Electrical power ratings; and*
- (v) All other requirements as indicated in the technical specifications of the bid.*

The bid will then be analysed, using the information in the technical brochures, to determine compliance with key technical specifications for the works/items as indicated in the tender document. Bidders not complying with **any** of the key technical specifications shall be awarded **0 marks** while those meeting all the key technical specifications shall be awarded **40 marks (evaluation committee may add more key requirements from the bid technical specifications)**.

The tenderer shall also fill in the Technical Schedule as specified in the tender document for Equipment and Items indicating the Country of Origin, Model/Make/Manufacturer and catalogue numbers of the Items/Equipment they propose to supply.

The award of points considered in this section shall be as shown below:

<u>PARAMETER</u>	<u>MAXIMUM POINTS</u>
i. Compliance with Technical Specifications-----	40
ii. Tender Questionnaire -----	3
iii. Key personnel -----	12
iv. Contract Completed in the last Five (5) years -----	9
v. Schedules of on-going projects -----	4
vi. Schedules of contractors' equipment -----	12
vii. Audited Financial Report for the last 3 years -----	6
viii. Evidence of Financial Resources -----	9
ix. Name, Address and Telephone of Banks (Contractor to provide) -	3
x. Litigation History -----	2
TOTAL	<u>100</u>

The pass-mark under the Technical Evaluation is 70 percent.

The detailed scoring plan shall be as shown in Table 1.

TABLE 1: Technical Evaluation

Item	Description	Points Scored	Max. Point
1	<p>Compliance with Technical Specifications</p> <ul style="list-style-type: none"> • Compliant -----40 • Non-compliant-----0 <p><i>(Note: Tender Evaluation Committee to carryout analysis showing how decision on this requirement has been arrived at)</i></p>		40
2	<p>Tender Questionnaire Form</p> <ul style="list-style-type: none"> • Completely filled -----3 • Not filled -----0 		3
3	<p>Key Personnel (Attach evidence)</p>		
	<p>Director of the firm</p> <ul style="list-style-type: none"> •Holder of degree in relevant Engineering field -----4 •Holder of diploma in relevant Engineering field -----3 •Holder of certificate in relevant Engineering field-----2 •Holder of trade test certificate in relevant Engineering field----1 •No relevant certificate -----0 		4
	<p>At least 1No. degree/diploma holder of key personnel in relevant field</p> <ul style="list-style-type: none"> • With over 10 years relevant experience -----4 • With over 5 years relevant experience-----2 • With under 5 years relevant experience -----1 		4
	<p>At least 1No certificate holder of key personnel in relevant field</p> <ul style="list-style-type: none"> • With over 10 years relevant experience-----2 • With over 5 years relevant experience -----1 • With under 5 years relevant experience -----0.5 		2
	<p>At least 2No artisan (trade test certificate in relevant field)</p> <ul style="list-style-type: none"> • Artisan with over 10 years relevant experience -----2 • Artisan with under 10 years relevant experience -----1 • Non skilled worker with over 10 years relevant experience ----0 		2
			12

Item	Description	Points Scored	Max. Point	
4	Contracts completed in the last five (5) years (Max of 3No. Projects)- Provide Evidence <ul style="list-style-type: none"> • Project of similar nature, complexity or magnitude -----3 • Project of similar nature but of lower value than the one in consideration -----2 • No completed project of similar nature -----0 		9	
5	On-going projects – Provide Evidence <ul style="list-style-type: none"> • No Project of similar nature, complexity and magnitude -----4 • Three and below Projects of similar, nature complexity and magnitude -----3 • Four and above Projects of similar nature, complexity and magnitude -----2 		4	
6	Schedule of contractor’s equipment and transport (proof or evidence of ownership/Lease)		6	12
	a) Relevant Transport <ul style="list-style-type: none"> • Means of transport (Vehicle) -----6 • No means of transport -----0 			
	b) Relevant Equipment <ul style="list-style-type: none"> • Has relevant equipment for work being tendered -----6 • No relevant equipment for work being tendered -----0 		6	
7	Financial report		6	
	a) Audited financial report (last three (3) years) <ul style="list-style-type: none"> • Average Annual Turn-over equal to or greater than the cost of the project -----6 • Average Annual Turn-over above 50% but below 100% of the cost of the project -----3 • Average Annual Turn-over below 50% of the cost of the project -----1 			

Item	Description	Points Scored	Max. Point
	b) Evidence of Financial Resources (cash in hand, lines of credit, over draft facility etc) <ul style="list-style-type: none"> • Has financial resources to finance the projected monthly cash flow* for three months -----9 • Has financial resources equal to the projected monthly cash flow*-----6 • Has financial resources less the projected monthly cash flow*-----3 • Has not indicated sources of financial resources ----- 0 		9
8	Name, Address and Telephone of Banks (Contractor to provide) <ul style="list-style-type: none"> • Information Provided-----3 • No Information Provided-----0 		3
9	Litigation History <ul style="list-style-type: none"> • Duly Filled -----2 • Not filled -----0 		2
TOTAL			

Any bidder who scores 70 points and above shall be considered for further evaluation.

**Monthly Cash Flow = Tender Sum/Contract Period*

STAGE 3 - FINANCIAL EVALUATION

Upon completion of the technical evaluation a detailed financial evaluation shall follow.

The evaluation shall be in **three stages**

- a) Determination of Arithmetic errors
- b) Comparison of Rates; and
- c) Consistency of the Rates.

A. Determination of Arithmetic Errors

Arithmetic Errors will be corrected by the Procuring Entity as follows:

- i) In the event of a discrepancy between the tender amount as stated in the form of Tender and the corrected tender figure in the Main summary of the Bills of Quantities, the amount as stated in the Form of Tender shall prevail. Pursuant to Section 82 of the Public Procurement and Asset Disposal Act

2015, the tender sum as submitted and read out during the tender opening shall be absolute and final and shall not be the subject of correction, adjustment or amendment in any way by any person or entity;

- ii) Error correction factor shall be computed by expressing the difference between the amount and the corrected tender sum as a percentage of the corrected contract works (i.e. corrected tender sum less P.C; and Provisional Sums);
- iii) The Error correction factor shall be applied to all contract works (as a rebate or addition as the case may be) for the purposes of valuations for Interim Certificates and valuation of variations.

B. Comparison of rates

Items that are under-priced or overpriced may indicate potential for non-delivery and front loading respectively. The committee shall promptly write to the tenderer asking for detailed breakdown of costs for any of the quoted items, relationship between those prices, proposed construction/installation methods and schedules.

The evaluation committee shall evaluate the responses and make an appropriate recommendation to the procuring entity giving necessary evidence. Such recommendations may include but not limited to:

- (i) Recommend no adverse action to the tenderer after a convincing response;
- (ii) Employer requiring that the amount of the performance bond be raised at the expense of the successful tenderer to a level sufficient to protect the employer against potential financial losses;
- (iii) Recommend non-award based on the response provided and the available demonstrable evidence that the scope, quality, completion timing, administration of works to be undertaken by the tenderer, would adversely be affected or the rights of the employer or the tenderers obligations would be limited in a substantial way.

C. Consistency of the Rates

The evaluation committee will compare the consistency of rates for similar items and note all inconsistencies of the rates for similar items.

STAGE 4 - RECOMMENDATION FOR AWARD

The successful bidder shall be the tenderer with the lowest evaluated tender price.

SECTION B:

CONDITIONS OF CONTRACT

CONDITIONS OF CONTRACT

1.0 Definitions

1.1 In this contract, except where context otherwise requires, the following terms shall be interpreted as indicated;

“Bills of quantities” means the priced and completed bill of quantities forming part of the tender.

“Compensation Events” are those defined in clause 24 hereunder

“Completion date” means the date of completion of the works as certified by the Project Manager, in accordance with Clause 31.

“The Contract” Means the agreement entered into between the Employer and the Contactor as recorded in the Agreement Form and signed by the parties including all attachments and appendices thereto and all documents incorporated by reference therein to execute, complete, and maintain the Works,

“The Contractor” refers to the person or corporate body whose tender to carry out the Works has been accepted by the Employer.

“The Contractor’s Tender” is the completed tendering document submitted by the Contactor to the Employer.

“The Contract Price” is the price stated in the Letter of Acceptance and thereafter as adjusted in accordance with the provisions of the Contract.

“Days” are calendar days; **“months”** are calendar months.

“Defects” is any piece of work not completed in accordance with the Contract.

“The Defects Liability Certificate” is the certificate issued by project Manager upon correction of defects by the Contractor.

“The Defects Liability Period” is the period named in the Contract Data and calculated from the Completion Date.

“Drawings” include calculations and other information provided or approved by the Project Manager for the execution of the Contract.

“Dayworks” are Work inputs subject to payment on a time basis for labour and the associated materials and plant.

“Employer” or the **“procuring entity”** as defined in the Public Procurement Regulations (i.e. Central or Local Government administration, Universities, Public Institutions and Corporations, etc) is the party who employs the Contractor to carry out the Works.

“Equipment” is the Contractor’s machinery and vehicles brought temporarily to the Site for the execution of the Works.

“The intended completion date” is the date on which it is intended that the Contractor shall complete the works. The intended Completion Date may be revised only by the Project manager by issuing an extension of time or acceleration in the Works.

“Materials” are all supplies, including consumables, used by the Contractor for incorporation in order.

“Plant” is any integral part of the Works that shall have a mechanical, electrical, chemical or biological function.

“Project Manager” is the person named in the Appendix to Conditions of Contract (or any other competent person appointed by the Employer and notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract and shall be an “Architect” or a “Quantity Surveyor registered under the Architects and Quantity Surveyors Act Cap 525 or an “Engineer” registered under Engineers Registration Act Cap 530.

“Site” means the place or places where the permanent Works are to be carried out including workshops where the same is being prepared.

“Site Investigation Reports” are those reports that may be included in the tendering documents which are factual and interpretative about the surface and subsurface conditions at the Site.

“Specifications” means the Specification of the Works included in the Contract and any modification or addition made or approved by the Project Manager.

“Start Date” is the date when the Contractor shall commence execution of the Works.

“A Sub-contractor” is a person or corporate body who has a Contract with the Contractor to carry out a part of the Work in the Contract, which includes work on the Site.

“Temporary works” are works designed, constructed, installed, and removed by the Contractor which are needed for construction or installation of the Works.

“Employer’s Representative” is the person appointed by the Employer and notified to the Contractor for the purpose of supervision of the Works.

“A Variation” is an instruction given by the Employer’s Representative which varies the Works.

“The Works” are what the Contract requires the Contractor to construct, install, and turnover to the Employer.

2. Interpretation

- 2.1 In interpreting the Conditions of Contract, singular also means plural, male also means female or neuter, and the other way around. Headings have no significance. Words have their normal meaning in English Language unless specifically defined. The Project Manager will provide instructions clarifying queries about these Conditions of Contract.
- 2.2 If sectional completion is specified in the Appendix to Conditions of Contract, reference in the Conditions of Contract to the Works, the Completion Date and the Intended Completion Date apply to any section of the Works (other than references to the Intended Completion Date for the whole of the Works).
- 2.3 The following documents shall constitute the Contract documents and shall be interpreted in the following order of priority;
- (1) Agreement,
 - (2) Letter of acceptance,
 - (3) Contractor's Tender,
 - (4) Appendix to Conditions of Contract,
 - (5) Conditions of Contract,
 - (6) Specifications,
 - (7) Drawings,
 - (8) Bills of Quantities,
 - (9) Any other documents listed in the Appendix to Conditions of Contract as forming part of the contract.

Immediately after the execution of the contract, the Project Manager shall furnish both the Employer and the Contractor with two copies each of all the Contract documents. Further, as and when necessary the Project manager shall furnish the Contractor {always with a copy to the Employer) with three ({3} copies of such further drawings or details or descriptive schedules as are reasonably necessary either to explain or amplify the Contract drawings or to enable the Contractor to carry out and complete the Works in accordance with these Conditions.

3. Language and Law

- 3.1 Language of Contract and the law governing the Contract shall be English language and the Laws of Kenya respective unless otherwise stated.

4. Project Manager's Decisions

- 4.1 Except where otherwise specifically stated, the Project Manager will decide contractual matters between the Employer and the Contract in the role representing the Employer.

5. Delegation

5.1 The Project manager may delegate any of his duties and responsibilities to others after notifying the Contractor.

6. Communications

6.1 Communication between parties shall be effective only when in writing. A notice shall be effective only when it is delivered.

7. Subcontracting

7.1 The Contractor may subcontract with the approval of the Project Manager, but may not assign the Contract without the approval of the Employer in writing. Subcontracting shall not alter the Contractor's obligations.

8. Other Contractors

8.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities etc. as listed in the Appendix to Conditions of Contract and also with the Employer, as per the directions of the Project Manager. The Contractor shall also provide facilities and services for them. The employer may modify the said List of Other Contractors etc., and shall notify the Contractor of any such modification.

9. Personnel

9.1 The Contractor shall employ the key personnel named in the Qualification Information, to carry out the functions stated in the said information or other personnel approved by the Project Manager. The Project Manager will approve any proposed replacement of key personnel only if their relevant qualifications and abilities are substantially equal to or better than those of the personnel listed in the Qualification Information. If the Project Manager asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within Seven days and has no further connection with the Work in the Contract.

10. Works

10.1 The Contractor shall construct and install the works in accordance with the Specifications and Drawings. The Works may commence on the Start Date and shall be carried out in accordance with the Program submitted by the Contractor, as updated with the approval of the Project Manager, and complete them by the Intended Completion Date.

11. Safety and Temporary Works

- 11.1 The Contractor shall be responsible for the design of temporary works. However before erecting the same, he shall submit his designs including specifications and drawings to the Project Manager and to any other relevant third parties for their approval. No erection of temporary works shall be done until such approvals are obtained.
- 11.2 The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary works and all drawings prepared by the Contractor for the execution of the temporary or permanent works, shall be subject to prior approval by the Project Manager before they can be used.
- 11.3 The Contractor shall be responsible for the safety of all activities on the Site.

12. Discoveries

- 12.1 Anything of historical or other interest or of significant value unexpectedly discovered on Site shall be the property of the Employer. The Contractor shall notify the Project Manager of such discoveries and carry out the Project manager's instructions for dealing with them.

13. Work Program

- 13.1 Within the time stated in the appendix to Conditions of Contract, the Contractor shall submit to the Project Manager for approval a program showing the general methods, arrangements, order, and timing for all the activities in the Works. An update of the program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.

The Contractor shall submit to the Project Manager for approval an updated program at intervals no longer than the period stated in the Appendix to Conditions of Contract. If the Contractor does not submit an updated program within this period, the Project Manager may withhold the amount stated in the said Appendix from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue program has been submitted. The Project Manager's approval of the program shall not alter the Contractor's obligations. The Contractor may revise the program and submit it to the Project Manager again at any time. A revised program shall show the effect of Variations and Compensation Events.

14. Possession of Site

14.1 The Employer shall give possession of all parts of the Site to the Contractor. If possession of a part is not given by the date stated in the Appendix to Conditions of Contract, the Employer will be deemed to have delayed the start of the relevant activities, and this will be Compensation Event.

15. Access to Site

15.1 The Contractor shall allow the Project manager and any other person authorized by the Project Manager, access to the Site and to any place where work in connection with the Contract is being carried out or is intended to be carried out.

16. Instructions

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

17. Extension of Acceleration of Completion Date

17.1 The Project manager shall extend the Intended Completion Date if a Compensation Event occurs or a variation is issued which makes it impossible for completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work, which would cause the Contractor to incur additional cost. The Project Manager shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Project Manager in writing for a decision upon the effect of a Compensation Event or variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay caused by such failure shall not be considered in assessing the new (extended) Completion Date.

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

18. Management Meetings

18.1 A Contractor management meeting shall be held monthly and attended by the Project Manager and the Contractor. Its business shall be to review the plans for the remaining Work and to deal with matters raised in accordance with the early warning procedure. The Project manager shall record the minutes of management meetings and provide copies of the same to those attending the meeting and the Employer. The responsibility of the parties for actions to be taken shall be decided by the Project manager either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

19. Early Warning

- 19.1 The Contractor shall warn the Project at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the Work increase the Contract Price or delay the execution of the Works. The Project Manager may required the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be provided by the Contractor as soon as reasonably possible.
- 19.2 The Contractor shall cooperate with the Project Manager in making and considering proposals on how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the Work and in carrying out any resulting instruction of the Project Manager.

20. Defects

- 20.1 The Project Manager shall inspect the Contractor's work and notify the Contractor of any defects that are found. Such inspection shall not affect the Contractor's responsibilities. The Project Manager may instruct the Contractor to search for a defect and to uncover and test any work that the Project manager considers may have defects. Should the defect be found, the cost of uncovering and making good shall be borne by the Contractor. However, if there is no defect found, the cost of uncovering and making good shall be treated as a variation and added to the Contract Price.
- 20.2 The Project Manager shall give notice to the Contractor of any defects before the end of the Defect Liability Period, which begins at completion, and is defined in the Appendix to Conditions of contract. The Defects Liability Period shall be extended for as long as defects remain to be corrected.
- 20.3 Every time notice of a defect is given, the Contractor shall correct the notified defect within the length of time specified by the Project Manager's notice. If the Contractor has not corrected a defect within the time specified in the Project Manager's notice, the Project Manager will assess the cost of having the defect corrected by other parties and such cost shall be treated as a variation and be deducted from the Contract Price.

21. Bills of Quantities

- 21.1 The Bills of Quantities shall contain items for the construction, installation, testing and commissioning of the work to be done by the Contractor. The Contractor will be paid for the quantity of the work done at the rate in the Bills of Quantities for each item.

- 21.2 If the final quantity of the work done differs from the quantity in the Bills of Quantities for the particular item by more than 25 percent and provided the change exceeds 1 percent of the Initial Contractor price, the Project Manager shall adjust the rate to allow for the change.
- 21.3 If requested by the Project Manager, the Contractor shall provide the Project manager with a detailed cost breakdown of any rate in the Bills of Quantities.

22. Variations

- 22.1 All variations shall be included in updated programs produced by the Contractor.
- 22.2 The Contractor shall provide the Project Manager with a quotation for carrying out the variations when requested to do so. The Project Manager shall assess the quotation, which shall be given within seven days of the request or within any longer period as may be stated by the Project Manager and before the Variation is ordered.
- 22.3 If the work in the variation corresponds with an item description in the Bills of Quantities and if in the opinion of the Project Manager, the quantity of work is not above the limit stated in Clause 21.2 or the timing of its execution does not cause the cost per unit of quantity to change, the rate in the Bills of Quantities shall be used to calculate the value of the variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the variation doe not correspond with items in the Bills of Quantities, the quotation by the contractor shall be in the form of new rates for the relevant items of work.
- 22.4 If the Contractor's quotation is unreasonable, the Project manager may order the variation and make a change to the Contract Price, which shall be based on the Project Manager's own forecast of the effects of the variation on the Contractor's cost
- 22.5 If the Project Manager decides that the urgency of varying the work would prevent a quotation being given and considered without delaying the works, no quotation shall be given and the variation shall be treated as a Compensation Event.
- 22.6 The Contractor shall not be entitled to additional payment for cost that could have been avoided by giving early warning.
- 22.7 When the Program is updated, the Contractor shall provide the Project Manager with an updated cash flow forecast.

23. Payment Certificates, Currency of Payments and Advance Payments

- 23.1 The Contractor shall submit to the Project Manager monthly applications for payment giving sufficient details of the Work done and materials on Site and the amounts which the Contractor considers himself to be entitled to. The Project Manager shall check the monthly application and certify the amount to be paid to the Contractor within 14 days. The value of work executed and payable shall be determined by the Project Manager.
- 23.2 The value of work executed shall comprise the value of the quantities of the items in the Bills of Quantities completed, materials delivered on site, variations and compensation events. Such materials shall become the property of the Employer once the Employer has paid the Contractor for their value. Thereafter, they shall not be removed from site without the Project Manager's instructions except for use upon the works.
- 23.3 Payments shall be adjusted for deductions for retention. The Employer shall pay the Contractor the amounts certified by the Project Manager within 60 days of the date of issue of each certificate. If the Employer makes a late payment, the Contractor shall be paid simple interest on the late payment in the next payment. Interest shall be calculated on the basis of number of days delayed at a rate three percentage points above the Central Bank of Kenya's average rate for base lending prevailing as of the first day the payment becomes overdue.
- 23.4 If an amount certified is increased in a later certificate of a result of an award by an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.
- 23.5 Items of the works for which no rate or price has been entered in will not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.
- 23.6 The Contract Price shall be stated in Kenya Shillings. All payments to the contractor shall be made in Kenya Shillings and foreign currency in the proportion indicated in the tender, or agreed prior to the execution of the Contract Agreement and indicated therein. The rate of exchange for the calculation of the amount of foreign currency payment shall be the rate of exchange indicated in the Appendix to Conditions of Contract. If the contractor indicated foreign currencies for payment other than the currencies of the countries of origin of related goods and services. The Employer reserves the right to pay the equivalent at the time of payment in the currencies of the countries of such goods and services.

The Employer and the Project manager shall be notified promptly by the Contractor of an changes in the expected foreign currency requirements of the Contractor during the execution of the works as indicated in the Schedule of Foreign Currency Requirements and the foreign and local currency portions of the balance of the Contract Price shall then be amended by agreement between Employer and the Contractor in order to reflect appropriately such changes.

23.7 In the event that an advance payment is granted, the following shall apply:-

- a) On signature of the Contract, the Contractor shall at his request, and without furnishing proof of expenditure, be entitled to an advance of 10% (ten percent) of the original amount of the contract. The advance shall not be subject to retention money.
- b) No advance payment may be made before the Contractor has submitted proof of the establishment of deposit or a directly liable guarantee satisfactory to the Employer in the amount of the advance payment. The guarantee shall be in the same currency as the advance.
- c) Reimbursement of the lump sum advance shall be made by deductions from the Interim payments and where applicable from the balance owing to the contractor. Reimbursement shall begin when the amount of the sums due under the Contract reaches 20% of the original amount of the contract. It shall have been completed by the time 80% of this amount is reached.

The amount to be repaid by way of successive deductions shall be calculated by means of the formula:

$$R = \frac{A(X^1 - X^{11})}{80 - 20}$$

Where:

R = the amount to be reimbursed

A = the amount of the advance which has been granted

X¹ = the amount of proposed cumulative payments as a percentage of the original amount of the Contract. This will exceed 20% but not exceed 80%.

X¹¹ = the amount of the previous cumulative payments as a percentage of the original amount of the Contract. This figure will be below 80% but not less than 20%.

- d) With each reimbursement the counterpart of the directly liable guarantee may be reduced accordingly.

24. Compensation Events

24.1 The following issues shall constitute Compensation Events.

- a) The Employer does not give access to a part of the site by the Site Possession Date stated in the Appendix to Conditions of Contract.
- b) The Employer modifies the List of Other Contractors, etc., in a way that affects the Work of the Contractor under the Contract.
- c) The Project Manager orders a delay or does not issue drawings, specifications or instructions required for execution of the works on time.
- d) The Project Manager instructs the contractor to uncover or to carry out additional tests upon the work, which is then found to have no defects.
- e) The Project Manager unreasonably does not approve a subcontract to be let.
- f) Ground conditions are substantially more³ adverse than could reasonably have been assumed before issuance of the Letter of Acceptance from the information issued to tenderers (including the site investigation reports), from information available publicly and from a visual inspection of the site.
- g) The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Employer or additional works required for safety or other reasons.
- h) Other contractors, public authorities, utilities, or the Employer does not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.
- i) The effects on the Contractor of any of the Employer's risks.
- j) The Project Manager unreasonably delays issuing a Certificate of Completion.
- k) Other compensation events described in the Contract or determined by the Project manager shall apply

24.2 If a compensation event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.

24.3 As soon as information demonstrating the effect of each compensation event upon the Contractor's forecast cost has been provided by the Contract, it shall be assessed by the Project Manager, and the Contract Price shall be adjusted accordingly.

If the Contractor's forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager's own forecast. The Project Manager will assume that the Contractor will react competently and promptly to the event.

24.4 The Contractor shall not be entitled to compensation to the extent that the Employer's interests are adversely affected by the Contractor not having given early warning or not having co-operated with the Project Manager.

24.5 Prices shall be adjusted for fluctuations in the cost of inputs only if provided for in the Appendix to Conditions of Contract.

24.6 The Contractor shall give written notice to the Project Manager of his intention to make a claim within thirty days after the event giving rise to the claim has first arisen. The claim shall be submitted within thirty days thereafter.

Provided always that should the event giving rise to the claim of continuing effect, the Contractor shall submit an interim claim within the said thirty days and a final claim within thirty days of the end of the event giving rise to the claim.

25. Price Adjustment

25.1 The Project Manager shall adjust the Contract Price if taxes, duties and other levies are changed between the date 30 days before the submission of tenders for the Contract and the date of Completion. The adjustment shall be the change in the amount of tax payable by the Contractor.

25.2 The Contract Price shall be deemed to be based on exchange rates current at the date of tender submission in calculating the cost to the Contractor of materials to be specifically imported (by express provision in the Contract Bills of Quantities or Specifications) for permanent incorporation in the Works.

Unless otherwise stated in the Contract, if any time during the period of the Contract exchange rates shall be varied and this shall affect the cost to the Contractor of such materials, then the Project Manager shall assess the net difference in the cost of such materials. Any amount from time to time so assessed shall be added to or deducted from the Contract Price, as the case may be.

- 25.3 Unless otherwise stated in the Contract, the Contract Price shall be deemed to have been calculated in the manner set out below and in sub-clauses 25.4 and 25.5 and shall be subject to adjustment in the events specified thereunder;
- i) The price contained in the Contract Bills of Quantities shall be deemed to be based upon the rates of wages and other emoluments and expenses as determined by the Joint Building Council of Kenya (J.B.C.) and set out in the schedule of basic rates issued 30 days before the date for submission of tenders. A copy of the schedule used by the Contractor in his pricing shall be attached in the Appendix to Conditions of Contract.
 - ii) Upon J.B.C. determining that any of the said rates of wages or other emoluments and expenses are increased or decreased, then the Contract Price shall be increased or decreased by the amount assessed by the Project Manager based upon the difference, expressed as a percentage, between the rate set out in the schedule of basic rates issued 30 days before the date for submission of tenders and the rate published by the J.B.C. and applied to the quantum of labour incorporated within the amount of work remaining to be executed at the date of publication of such increase or decrease.
 - iii) No adjustment shall be made in respect of changes in the rates of wages and other emoluments and expenses which occur after the date of Completion except during such other period as may be granted as an extension of time under clause 17.0 of these Conditions.
- 25.4 The price contained in the Contract Bills of Quantities shall be deemed to be based upon the basic prices of materials to be permanently of basic rates issued 30 days before the date for submission of tenders. A copy of the schedule used by the Contractor in his pricing shall be attached in the Appendix to Conditions of Contract.
- 25.5 Upon the J.B.C. determining that any of the said basic prices are increased or decreased then the Contract Price shall be increased or decreased by the amount to be assessed by the Project Manager based upon the difference between the price set out in the schedule of basic rates issued 30 days before the date for submission of tenders and the rate published by the J.B.C. and applied to the quantum of the relevant materials which have not been taken into account in arriving at the amount of any interim certificate under clause 23 of these Conditions issued before the date of publication of such increase or decrease.
- 25.6 No adjustment shall be made in respect of changes in basic prices of materials which occur after the date for Completion except during such other period as may be granted as an extension of time under clause 17.0 of these Conditions.

25.7 The provisions of sub-clause 25.1 to 25.2 herein shall not apply in respect of any materials included in the schedule of basic rate.

26. Retention

26.1 The Employer shall retain from the payment due to the Contractor the proportion stated in the Appendix to Conditions of Contract until Completion of the whole of the works. On Completion of the whole of the works, half the total amount retained shall be repaid to the Contractor and the remaining half when the Defects Liability Period has passed and the Project manager has certified that all defects notified to the Contractor before the end of this period have been corrected.

27. Liquidate Damages

27.1 The Contractor shall pay liquidated damages to the Employer at the rate stated in the Appendix to Conditions of Contract for each day that the actual Completion Date is later than the Intended Completion Date. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not alter the Contractor's liabilities.

27.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rate specified in Clause 23.30.

28. Securities

28.1 The Performance Security shall be provided to the Employer not later than the date specified in the Letter of Acceptance and shall be issued in an amount and form and by a reputable bank acceptable to the Employer, and denominated in Kenya shillings. The Performance Security shall be valid until a date 30 days beyond the date of issue of the Certificate of Completion.

29. Dayworks

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

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

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

30. Liability and Insurance

- 30.1 From the Start Date until the Defects Correction Certificate has been issued, the following are the Employer's risks:
- a) The risk of personal injury, death or loss of or damage to property (excluding the works, plant, materials and equipment), which are due to:
 - i) use or occupation of the site by the works or for the purpose of the works, which is the unavoidable result of the works, or
 - ii) negligence, breach of statutory duty or interference with any legal right by the Employer or by any person employed by or contracted to him except the Contractor.
 - b) The risk of damage to the works, plant, materials, and equipment to the extent that it is due to a fault of the Employer or in Employer's design, or due to war or radioactive contamination directly affecting the place where the works are being executed.
- 30.2 From the Completion Date until the Defects Correction Certificate has been issued, the risk of loss of or damage to the works, plant, and materials is the Employer's risk except loss or damage due to:
- a) a defect which existed on or before the Completion Date.
 - b) An event occurring before the Completion Date, which was not itself the Employer's risk.
 - c) The activities of the Contractor on the Site after the Completion Date.
- 30.3 From the Start Date until the Defects Correction Certificate has been issued, the risks of personal injury, death and loss of or damage to property (including, without limitation, the works, plant, materials, and equipment) which are not Employer's risk are contractor's risks.
- The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts stated in the Appendix to Conditions of Contract for the following events;
- a) loss of or damage to the works, plant and materials;
 - b) loss of or damage to Equipment;
 - c) loss of or damage to property (except the works, plant materials, and equipment) in connection with the Contract, and
 - d) personal injury or death.
- 30.4 Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager's approval before the Start Date. All such insurance shall provide for compensation required to rectify the loss or damage incurred.

- 30.5 If the Contractor does not provide any of the policies and certificates required, the Employer may effect the insurance which the Contractor should have provided and recover the premiums from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.
- 30.6 Alterations to the terms of insurance shall not be made without the approval of the Project Manager. Both parties shall comply with any conditions of insurance policies.

31. Completion and Taking over

- 31.1 Upon deciding that the works are complete, the Contractor shall issue a written request to the Project Manager to issue a Certificate of Completion of the works. The Employer shall take over the site and the works within seven (7) days of the Project manager's issuing a Certificate of Completion.

32. Final Account

The Contractor shall issue the Project Manager with a detailed account of the total amount that the Contractor considers payable to him by the Employer under Contract before the end of the Defects Liability Period. The Project Manager shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 30 days of receiving the Contractor's account if it is correct and complete.

If it is not, the Project Manager shall issue within 30 days a schedule that states the scope of the corrections or additions that are necessary. If the final account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a Payment Certificate.

The Employer shall pay the Contractor the amount due in the Final certificate within 60 days.

33. Termination

- 33.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract. These fundamental breaches of Contract shall include, but shall not be limited to, the following;
- a) The Contractor stops work for 30 days when no stoppage of work is shown on the current program and the stoppage has not been authorized by the Project Manager.
 - b) The Project Manager instructs the Contractor to delay the progress of the works, and the instruction is not withdrawn within 30 days.

- c) The Contractor is declared bankrupt or goes into liquidation other than for a reconstruction or amalgamation.
 - d) A payment certified by the Project Manager is not paid by the Employer to the Contractor within 30 days (for Interim Certificate) or 60 days (for Final Certificate) of issue.
 - e) the Project Manager gives notice that failure to correct a particular defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Project Manager.
 - f) the Contractor does not maintain a security, which is required.
- 33.2 When either party to the contract gives notice of Contract to the Project Manager for a cause other than those listed under Clause 33.1 above, the Project Manager shall decide whether the breach is fundamental or not.
- 33.3 Notwithstanding the above, the Employer may terminate the Contract for convenience.
- 33.4 If the Contractor is terminated, the contractor shall stop work immediately, make the site safe and secure, and leave the site as soon as reasonably possible.

The Project Manager shall immediately thereafter arrange for a meeting for the purpose of taking record of the works executed and materials, goods, equipment and temporary buildings on site.

34. Payment Upon Termination

- 34.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Project Manager shall issue a certificate for the value of the work done and materials ordered and delivered to site up to the issue of the certificate. Additional liquidated damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor, the difference shall be a debt payable by the contractor.
- 34.2 If the contract is terminated for the Employer's convenience or because of a fundamental breach of contract by the Employer, the Project Manager shall issue a certificate for the value of the work done, materials ordered, the reasonable cost of removal of equipment, repatriation of the Contractor's personnel employed solely on the works, and the Contractor's costs of protecting and securing the works.
- 34.3 The Employer may employ and pay other persons to carry out and complete the works and to rectify and defects and may enter upon the works and use all materials on the site, plant, equipment and temporary works.

34.4 The contractor shall, during the execution or after the completion of the works under this clause remove from the site as and when required, within such reasonable time as the Project Manager may in writing specify, any temporary building, plant, machinery, appliances, goods or materials belonging to or hired by him, and in default the Employer may (without being responsible for any loss or damage) remove and sell any such property of the Contractor, hold the proceeds less all costs incurred to the credit of the Contractor.

Until after completion of the works under this clause the Employer shall not be bound by any other provision of this Contract to make any payment to the Contractor, but upon such completion as aforesaid and the verification within a reasonable time of the accounts therefore the Project Manager shall certify the amount of expenses properly incurred by the Employer and, if such amount added to the money paid to the Contractor before such determination exceeds the total amount which would have been payable on due completion in accordance with this Contract the difference shall be a debt payable to the Employer by the Contractor; and if the said amount added to the said money be less than the said total amount, the difference shall be a debt payable by the Employer to the Contractor.

35. Release from Performance

35.1 If the Contract is frustrated by the outbreak of war or by any other event entirely outside the control of either the Employer or the Contractor, the Project Manager shall certify that the Contract has been frustrated. The Contractor shall make the site safe and stop work as quickly as possible after receiving this certificate and shall be paid for all work carried out before receiving it.

36. Corrupt gifts and Payment of Commission

The Contractor shall not;

- a) Offer or give or agree to give to any person in the service of the Employer any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or for having done or forborne to do any act in relation to the obtaining or execution of this or any other Contract for the Employer or for showing or forbearing to show favour or disfavour to any person in relation to this or any other contract for the Employer.
- b) Enter into this or any other contract with the Employer in connection with which commission has been paid or agreed to be paid by him or on his behalf or to his knowledge, unless before the Contract is made particulars of any such commission and of the terms and conditions of any agreement for the payment thereof have been disclosed in writing to the Employer.

Any breach of this Condition by the Contractor or by anyone employed by him or acting on his behalf (whether with or without the knowledge of the Contractor) shall be an offence under the provisions of the Public Procurement Regulations issued under the Exchequer and Audit Act Cap 412 of the Laws of Kenya.

37. Settlement of Disputes

37.1 In case any dispute or difference shall arise between the Employer or the Project Manager on his behalf and the Contractor, either during the progress or after the completion or termination of the works, such dispute shall be notified in writing by either party to the other with a request to submit it to arbitration and to concur in the appointment of an Arbitrator within thirty days of the notice. The dispute shall be referred to the arbitration and final decision of a person to be agreed between the parties. Failing agreement to concur in the appointment of an Arbitrator, the Arbitrator shall be appointed by the Chairman or Vice Chairman of any of the following professional institutions;

- (i) Architectural Association of Kenya
- (ii) Institute of Quantity Surveyors of Kenya
- (iii) Association of Consulting Engineers of Kenya
- (iv) Chartered Institute of Arbitrators (Kenya Branch)
- (v) Institute of Engineers of Kenya

On the request of the applying party, the institution written to first by the aggrieved party shall take precedence over all other institutions.

37.2 The arbitration may be on the construction of this Contract or on any matter or thing of whatsoever nature arising hereunder or in connection therewith, including any matter or thing left by this Contract to the discretion of the Project Manager, or the withholding by the Project Manager of any certificate to which the Contractor may claim to be entitled to or the measurement and valuation referred to in clause 23.0 of these conditions, or the rights and liabilities of the parties subsequent to the termination of Contract.

37.3 Provided that no arbitration proceedings shall be commenced on any dispute or difference where notice of a dispute or difference has not been given by the applying party within ninety days of the occurrence or discovery of the matter or issue giving rise to the dispute.

37.4 Notwithstanding the issue of a notice as stated above, the arbitration of such a dispute or difference shall not commence unless an attempt has in the first instance been made by the parties to settle such dispute or difference amicably with or without the assistance of third parties. Proof of such attempt shall be required.

37.5 Notwithstanding anything stated herein the following matters may be referred to arbitration before the practical completion of the works or abandonment of the works or termination of the Contract by either part:

37.5.1 The appointment of a replacement Project Manager upon the said person ceasing to act.

- 37.5.2 Whether or not the issue of an instruction by the Project Manager is empowered by these Conditions.
 - 37.5.3 Whether or not a certificate has been improperly withheld or is not in accordance with these Conditions.
 - 37.5.4 Any dispute or difference arising in respect of war risks or war damage.
- 37.6. All other matter shall only be referred to arbitration after the completion or alleged completion of the works or termination or alleged termination of the Contract, unless the Employer and the Contractor agree otherwise in writing.
- 37.7. The Arbitrator shall, without prejudice to the generality of his powers, have powers to direct such measurements, computations, tests or valuations as may in his opinion be decision, requirement or notice and to determine all matters in dispute which shall be submitted to him in the same manner as if no such certificate, opinion, decision requirement or notice had been given.
- 37.8. The award of such Arbitrator shall be final and binding upon the parties.

APPENDIX TO CONDITIONS OF CONTRACT

SECTION VI – APPENDIX TO CONDITIONS OF CONTRACT	
<p>THE PROJECT MANAGER IS</p> <p>Name: The Works Secretary, Ministry of Transport, Infrastructure, Housing, Urban Development and Public Works Address: P.O. Box 30743-00100, Nairobi</p>	
<p>The name (and identification number) of the Contract for THE PROPOSED MULTI - STOREY OFFICE BLOCK FOR THE KENYA NATIONAL ASSEMBLY: WP ITEM No. BD29NB/NB901/JOB No. 7753C</p> <p>The Works consist of: THE SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING OF AUDIO VISUAL/MULTIMEDIA AND CONFERENCE MANAGEMENT SYSTEMS.</p>	
<p>Other contractors, utilities etc to be engaged by the Employer on the site include those for the execution of; NONE</p>	Clause 8.1
<p>The Start Date shall be AGREED WITH THE CLIENT</p> <p>The Intended Completion Date for the whole of the Works shall be AGREED WITH THE CLIENT</p> <p>The Contractor shall submit a program for the Works within 14 days of delivery of the Letter of Acceptance.</p>	Clause 10
<p>The period between Program updates is 14 days. The amount to be withheld for late submission of an updated Program is WHOLE CERTIFICATE</p>	Clause 13
<p>The Site Possession Date shall be AGREED WITH THE CLIENT</p> <p>The Site is located at CENTRAL BUSINESS DISTRICT - NAIROBI COUNTY.</p>	Clause 14
<p>The Defects Liability period is 6 months.</p>	Clause 20
<p>Variations shall be in accordance with the Public Procurement and Asset Disposal Act (2015)</p>	Clause 22
<p>The payments shall be settled within 45 days from the date of receipt of the interim certificates by the Client</p> <p>Percentage of certified value retained : 10%</p> <p>Limit of certified value retained : 5%</p> <p>Period between program updates is 14 days</p>	Clause 23.1
<p>There shall be no payment of interest on delayed payments</p>	Clause 23.3
<p>There shall be no payment in foreign currency. All payments shall be made in Kenya Shillings</p>	Clause 23.6
<p>There shall be no payment in advance</p>	Clause 23.7

Not Applicable	Clause 25
The proportion of payments retained is 10 percent.	Clause 26
The liquidated damages for the whole of the Works is Kshs. 200,000.00 per week or part thereof	Clause 27.1
The Performance Security shall be five percent (5%) of the contract sum from a reputable bank recognised by the Central Bank of Kenya	Clause 28
<p>The minimum insurance covers shall be;</p> <p>. The minimum cover for insurance of the Works and of Plant and Materials in respect of the Contractor's liability is Contractors All Risk policy</p> <p>. The minimum cover for loss or damage to Equipment is NIL</p> <p>. Insurance to cover third party risks</p> <p>. The minimum for insurance of other property is KShs 1,000,000.00</p> <p>. The minimum cover for personal injury or death insurance</p> <ul style="list-style-type: none"> o For the Contractor's employees is AS PER LAWS APPLICABLE o And for other people is AS PER LAWS APPLICABLE 	Clause 30
<p>The Completion Period for the Works is 12 MONTHS.</p> <p>The schedule of basic rates used in pricing by the Contractor is as attached [CONTRACTOR TO ATTACH].</p>	Clause 31
<p>Disputes to be settled as per the Arbitration Laws of Kenya</p> <p>Any dispute arising out of the contract that cannot be amicably resolved between the parties shall be referred by either party to the arbitration and a final decision by a panel of a person to be agreed between the parties. Failing agreement on the appointment of an Arbitrator, the Arbitrator shall be appointed by the chairperson of the Chartered Institute of Arbitrators –Kenya branch on the request of the applying party. The seat of arbitration shall be in Kenya.</p>	Clause 37.1

SECTION C

CONTRACT PRELIMINARIES

AND

GENERAL CONDITIONS

CONTRACT PRELIMINARIES AND GENERAL CONDITIONS

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SECTION C

CONTRACT PRELIMINARIES AND GENERAL CONDITIONS

1.01 Examination of Tender Documents

The tenderer is required to check the number of pages of this document and should he find any missing or indistinct, he must inform the Engineer at once and have the same rectified.

All tenderers shall be deemed to have carefully examined the following:

- a) Work detailed in the Specification and in the Contract Drawings.
- b) The Republic of Kenya Document “General Conditions of Contract for Electrical and Mechanical Works”.
- c) Other documents to which reference is made.

He shall also be deemed to have included for any expenditure which may be incurred in conforming with the above items (a), (b), (c) and observe this expense as being attached to the contract placed for the whole or any part of the work.

The tenderer shall ensure that all ambiguities, doubts or obscure points of detail, are clarified with the Engineer before submission of his tender, as no claims for alleged deficiencies in the information given shall be considered after this date.

1.02 Discrepancies

The contractor shall include all work either shown on the Contract Drawings or detailed in the specification. No claim or extra cost shall be considered for works which has been shown on the drawings or in the specification alone.

Should the drawing and the specification appear to conflict, the contractor shall query the points at the time of tendering and satisfy himself that he has included for the work intended, as no claim for extra payment on this account shall be considered after the contract is awarded.

1.03 Conditions of Contract Agreement

The contractor shall be required to enter into a contract with the Employer.

The Conditions of the Contract between the Contractor and the Employer as hereinafter defined shall be the latest edition of the Agreement and Schedule of Conditions of Kenya Association of Building and Civil Engineering Contractors as particularly modified and amended hereinafter.

For the purpose of this contract the Agreement and Schedule of Conditions and any such modifications and amendments shall read and construed together. In any event of discrepancy the modifications and amendments shall prevail.

1.04 **Payment**

Payment will be made through certificates to the Contractor. All payments will be less retention as specified in the Contract. No payment will become due until materials are delivered to site.

1.05 **Definition of Terms**

Throughout these contract documents units of measurements, terms and expressions are abbreviated and wherever used hereinafter and in all other documents they shall be interpreted as follows:

- i) **Employer:** The term “**Employer**” shall mean **The Director General, Parliamentary Service Commission, P. O. Box 41842, Nairobi**
- ii) **Architect:** The term “**Architect**” shall mean **Mutiso Menezes International, P.O. Box 44934 – 00100, NAIROBI**
- iii) **Quantity Surveyor:** The term “**Quantity Surveyor**” shall mean **Quantech Consultancy, P.O. Box 44660 – 00100, NAIROBI**
- iv) **Civil/Structural Engineers:** The term “**Civil/Structural Engineers**” shall mean **Wanjohi Mutonyi Consult, P.O. Box 21714 – 00505, NAIROBI**
- v) **Engineer:** The term “**Engineer**” shall mean **Mecoy Consultants Ltd, P.O. Box 20198 – 00200, NAIROBI**
- vi) **Contractor:** The term “**Contractor**” shall mean the firm or company appointed to carry out the Lift Installation works and shall include his or their heir, executors, assigns, administrators, successors, and duly appointed representatives.
- vii) **Contract Works:** The term “**contract Works**” shall mean all or any portion of the work, materials and articles, whether the same are being manufactured or prepared, which are to be used in the execution of this contract and whether the same may be on site or not.

- viii) **Contract Drawings:** The term “**Contract Drawings**” shall mean those drawings required or referred to herein and forming part of the Bills of Quantities.
- ix) **Working Drawings:** The term “**Working Drawings**” shall mean those drawings required to be prepared by the contractor as hereinafter described.
- x) **Record Drawings:** The term “**Record Drawings**” shall mean those drawings required to be prepared by the contractor showing “as installed” and other records for the contract Works.
- xi) **Abbreviations:**

CM shall mean **Cubic Metre**

SM shall mean **Square Metre**

LM shall mean **Linear Metre**

LS shall mean **Lump Sum**

mm shall mean **Millimetres**

No. shall mean **Number**

Kg. shall mean **Kilogramme**

KEBS shall mean **Kenya Bureau of Standards**

BS shall mean. **Current standard British Standard Specification published by the British Standard Institution, 2 Park Street, London W1, England**

“**Ditto**” shall mean the whole of the preceding description in which it occurs. Where it occurs in description of succeeding item it shall mean the same as in the first description of the series in which it occurs except as qualified in the description concerned. Where it occurs in brackets it shall mean the whole of the preceding description which is contained within the appropriate brackets.

1.06 **Site Location**

The site of the Contract Works is situated at **KNA Tower Building, Nairobi Central Business District.**

The Tenderer is recommended to visit the site and shall be deemed to have satisfied himself with regard to access, possible conditions, the risk of injury or damage to property on/or adjacent to the site, and the conditions under which the contract Works shall have to be carried out and no claims for extras will be considered on account of lack of knowledge in this respect.

1.07 **Duration of Contract**

The Contractor shall be required to phase his work in accordance with the works programme (or its revision). The programme is to be agreed with the Project Manager.

1.08 **Scope of Contract Works**

The contractor shall supply, deliver, unload, hoist, fix, test, commission and hand-over in satisfactory working order the complete installations specified hereinafter and/or as shown on the Contract Drawings attached hereto, including the provision of labour, transport and plant for unloading material and storage, and handling into position and fixing, also the supply of ladders, scaffolding the other mechanical devices to plant, installation, painting, testing, setting to work, the removal from site from time to time of all superfluous material and rubbish caused by the works.

The contractor shall supply all accessories, whether of items or equipment supplied but to be fixed and commissioned under this contract.

The Contractor shall also make entrance openings on the shaft walling at every floor, supply and install all architraves, and make good all builders works related to these installations.

1.09 **Extent of the contractor's Duties**

At the commencement of the works, the contractor shall investigate and report to the Engineer if all materials and equipment to be used in the work and not specified as supplied by the others are available locally. If these materials and equipment are not available locally, the contractor shall at this stage place orders for the materials in question and copy the orders to the Engineer. Failure to do so shall in no way relieve the contractor from supplying the specified materials and equipment in time.

Materials supplied by others for installation and/or connection by
The contractor shall be carefully examined in the presence of the Supplier before installation and connection. Any defects noted shall immediately be reported to the Engineer.

The contractor shall be responsible for verifying all dimensions relative to his work by actual measurements taken on site.

The contractor shall mark accurately on one set of drawings and indicate all alterations and/or modifications carried out to the designed system during the construction period. This information must be made available on site for inspection by the Engineer.

1.10 **Execution of the Works**

The works shall be carried out strictly in accordance with:

- a) All relevant Kenya Bureau of Standards Specifications.

- b) All relevant British Standard Specifications and Codes of Practice (hereinafter referred to as B.S. and C.P. respectively).
- c) This Specification.
- d) The Contract Drawings.
- e) The Bye-laws of the Local Authority.
- f) The Engineer's Instructions.

The Contract Drawings and Specifications to be read and construed together.

1.11 **Validity of Tender**

The tender shall remain valid for acceptance within 120 days from the final date of submission of the tender, and this has to be confirmed by signing the Tender Bond. The tenderer shall be exempted from this Bond if the tender was previously withdrawn in writing to the Employer before the official opening.

1.12 **Firm – Price contract**

Unless specifically stated in the documents or the invitation to tender, this is a firm-price Contract and the contractor must allow in his tender for the increase in the cost of labour and/or materials during the duration of the contract. No claims will be allowed for increased costs arising from the fluctuations in duties and/or day to day currency fluctuations. The contractor will be deemed to have allowed in his tender for any increase in the cost of materials which may arise as a result of currency fluctuation during the contract period.

1.13 **Variation**

No alteration to the contract Works shall be carried out until receipt by the contractor of written instructions from the Project Manager.

Any variation from the contract price in respect of any extra work, alteration or omission requested or sanctioned by the Architect or Engineer shall be agreed and confirmed in writing at the same time such variations are decided and shall not affect the validity of the Contract. Schedule of Unit Rates shall be used to assess the value of such variations. No allowance shall be made for loss of profit on omitted works.

Where the Project Manager requires additional work to be performed, the contractor, if he considers it necessary, will give notice within seven (7) days to the Project Manager of the length of time he (the contractor) requires over and above that allotted for completion of the contract.

If the contractor fails to give such notice he will be deemed responsible for the claims arising from the delay occasioned by reason of such extension of time.

1.14 **Prime Cost and Provisional Sums**

A specialist Contractor may be nominated by the Project Manager to supply and/or install any equipment covered by the Prime Cost or Provisional Sums contained within the Contract documents.

The work covered by Prime Cost and Provisional Sums may or may not be carried out at the discretion of the Project Manager.

The whole or any part of these sums utilised by the contractor shall be deducted from the value of the contract price when calculating the final account.

1.15 **Bond**

The tenderer must submit with his tender the name of one Surety who must be an established Bank only who will be willing to be bound to the Employer for an amount equal to 7½ % of the contract amount as Clause 31 of the Main Contract.

1.16 **Government Legislation and Regulations**

The contractor's attention is called to the provision of the Factory Act 1972 and subsequent amendments and revisions, and allowance must be made in his tender for compliance therewith, in so far as they are applicable.

The contractor must also make himself acquainted with current legislation and any Government regulations regarding the movement, housing, security and control of labour, labour camps, passes for transport, etc.

The contractor shall allow for providing holidays and transport for work people, and for complying with Legislation, Regulations and Union Agreements.

1.17 **Import Duty and Value Added Tax**

The contractor will be required to pay full Import Duty and Value Added Tax on all items of equipment, fittings and plant, whether imported or locally manufactured. The tenderer shall make full allowance in his tender for all such taxes.

1.18 **Insurance Company Fees**

Attention is drawn to the tenderers to allow for all necessary fees, where known, that may be payable in respect of any fees imposed by Insurance Companies or statutory authorities for testing or inspection.

No allowance shall be made to the contractor with respect to fees should these have been omitted by the tenderer due to his negligence in this respect.

1.19 **Provision of Services by the Contractor**

Contractor shall make the following facilities available for his use:

- a) Attendance and the carrying out of all work affecting the structure of the building which may be necessary, including all chasing, cutting away and making good brickwork, all plugging for fixing, fittings, machinery, fan ducting, etc., and all drilling and tapping of steel work. Any purpose made fixing brackets shall not constitute Builder's Work and shall be provided and installed by the contractor unless stated hereinafter otherwise.
- b) The provision of temporary water, lighting and power: All these services utilised shall be paid for by the Contractor
- c) Fixing of anchorage and pipe supports in the shuttering, anchorage with fully dimensioned drawings detailing the exact locations.
- d)
 - i) Provision of scaffolding, cranes, etc. but only in so far as it is required for the Contract Works
 - ii) Any specialist scaffolding, cranes, etc. to be used by any Contractor for his own exclusive use shall be paid for by the specialist Contractor.

1.20 **Suppliers**

The contractor shall submit names of any supplier for the materials to be incorporated, to the Engineer for approval. The information regarding the names of the suppliers may be submitted at different times, as may be convenient, but no sources of supply will be changed without prior approval.

Each supplier must be willing to admit the Engineer or his representative to his premises during working hours for the purpose of examining or obtaining samples of the materials in question.

1.21 **Samples and Materials Generally**

The contractor shall, when required, provide for approval at no extra cost, samples of all materials to be incorporated in the works. Such samples, when approved, shall be retained by the Engineer and shall form the standard for all such materials incorporated.

1.22 **Administrative Procedure and Contractual Responsibility**

The Contractor is entirely responsible to the Employer for the whole of the works including any Contract Works and shall deal direct with the Employer or Engineer.

1.23 **Bills of Quantities**

The Bills of Quantities have been prepared in accordance with the standard method of measurement of Building Works for East Africa, first Edition, Metric, 1970. All the Quantities are based on the Contract Drawings and are provisional and they shall not be held to gauge or to limit the amount or description of the work to be executed by the contractor but the value thereof shall be deducted from the Contract Sum and the value of the work ordered by the Engineer and executed thereunder shall be measured and valued by the Engineer in accordance with the conditions of the contract.

All work liable to adjustment under this contract shall be left uncovered for a reasonable time to allow measurements needed for such adjustment to be taken by the Quantity Surveyor or Engineer. Immediately the work is ready for measuring the Contractor shall give notice to the Quantity Surveyor or Engineer to carry out measurements before covering up. If the contractor shall make default in these respects he shall, if the Project Manager so directs, uncover the work to enable the necessary measurements to be taken and afterwards reinstate at his own expense.

1.24 **Contractor's Office in Kenya**

The contractor shall maintain (after first establishing if necessary) in Kenya an office staffed with competent manager and such supporting technical and clerical staff as necessary to control and coordinate the execution and completion of the contract Works.

The Manager and his staff shall be empowered by the contractor to represent him at meetings and in discussions with the Employer, the Engineer and other parties who may be concerned and any liaison with the contractor's Head Office on matters relating to the design, execution and completion of the contract Works shall be effected through his office in Kenya.

It shall be the contractor's responsibility to procure work permits, entry permits, licenses, registration, etc., in respect of all expatriate staff.

The Contractor shall prepare a substantial proportion of his Working Drawings at his office in Kenya. No reasons for delays in the preparation or submission for approval or otherwise of such drawings or proposals will be accepted on the grounds that the contractor's Head Office is remote from his office in Nairobi or the site of the contract Works or otherwise.

1.25 **Builder's Work**

All chasing, cutting away and making good will be done by the Contractor. The contractor shall also mark out in and be responsible for accuracy of the size and position of all holes and chases required.

The contractor shall drill and plug holes in floors, walls, ceiling and roof for securing services and equipment requiring screw or bolt fixings.

The contractor shall also provide and install any purpose made fixing brackets.

1.26 **Structural Provision for the Works**

Preliminary major structural provision has been made for the contract works based on outline information ascertained during the preparation of the Specification.

The preliminary major structural provision made will be deemed as adequate unless the contractor stated otherwise when submitting his tender.

Any major structural provision or alteration to major structural provisions required by the Contractor shall be shown on Working Drawings to be submitted to the Engineer within 30 days of being appointed.

No requests for alterations to preliminary major structural provisions will be approved except where they are considered unavoidable by the Engineer. In no case will they be approved if building work is so far advanced as to cause additional costs or delays in the work of the contractor.

1.27 Position of Services, Plant, Equipment, Fittings and Apparatus

The Contract Drawings give a general indication of the intended layout. The position of the equipment and apparatus, and also the exact routes of the ducts, main and distribution pipework shall be confirmed before installation is commenced. The exact sitting of appliances, pipework, etc., may vary from that indicated.

The routes of services and positions of apparatus shall be determined by the approved dimensions detailed in the Working Drawings or on site by the Engineer in consultation with the contractor .

Services throughout the ducts shall be arranged to allow maximum access along the ducts and the services shall be readily accessible for maintenance. Any work which has to be re-done due to negligence in this respect shall be the contractor's responsibility.

The contractor shall be deemed to have allowed in his contract sum for locating terminal points of services (e.g. lighting, switches, socket outlets, lighting points, control switches, thermostats and other initiating devices, taps, stop cocks) in positions plus or minus 1.2m horizontally and vertically from the locations shown on Contract Drawings. Within these limits no variations in the Contract Sum will be made unless the work has already been executed in accordance with previously approved Working Drawings and with the approval of the Engineer.

1.28 Checking of Work.

The Contractor shall satisfy himself to the correctness of the connections he makes to all items of equipment supplied under the contract agreement and equipment supplied under other contracts before it is put into operation. Details of operation, working pressures, temperatures, voltages, phases, power rating, etc., shall be confirmed to others and confirmation received before the system is first operated.

1.29 Setting to Work and Regulating System.

The contractor shall carry out such tests of the contract Works as required by British Standard Specifications, or equal and approved codes as specified hereinafter and as customary.

No testing or commissioning shall be undertaken except in the presence of and to the satisfaction of the Engineer unless otherwise stated by him (Contractor's own preliminary and proving tests accepted).

It will be deemed that the contractor has included in the contract Sum for the costs of all fuel, power, water and the like, for testing and commissioning as required as part of the contract Works. He shall submit for approval to the Engineer a suitable programme for testing and commissioning. The Engineer and Employer shall be given ample warning in writing, as to the date on which testing and commissioning will take place.

The contractor shall commission the contract Works and provide attendance during the commissioning of all services, plant and apparatus connected under the contract Agreement or other Contract Agreements, related to the project.

Each system shall be properly balanced, graded and regulated to ensure that correct distribution is achieved and where existing installations are affected, the Contractor shall also regulate these systems to ensure that their performance is maintained.

The proving of any system of plant or equipment as to compliance with the Specification shall not be approved by the Engineer, except at his discretion, until tests have been carried out under operating conditions pertaining to the most onerous conditions specified except where the time taken to obtain such conditions is unreasonable or exceeds 12 months after practical completion of the contract Works.

1.30 **Identification of Plant Components**

The contractor shall supply and fix identification labels to all plant, starters, switches and items of control equipment including valves, with white traffolyte or equal labels engraved in red lettering denoting its name, function and section controlled. The labels shall be mounted on equipment and in the most convenient positions. Care shall be taken to ensure the labels can be read without difficulty. This requirement shall apply also to major components of items of control equipment.

Details of the lettering of the labels and the method of mounting or supporting shall be forwarded to the Engineer for approval prior to manufacture.

1.31 **Contract Drawings**

The Contract Drawings when read in conjunction with the text of the Specification, have been completed in such detail as was considered necessary to enable competitive tenders to be obtained for the execution and completion of the contract works.

The Contract Drawings are not intended to be Working Drawings and shall not be used unless exceptionally they are released for this purpose.

1.32 **Working Drawings**

The contractor shall prepare such Working Drawings as may be necessary. The Working Drawings shall be complete in such detail not only that the contract Works can be executed on site but also that the Engineer can approve the contractor's proposals, detailed designs and intentions in the execution of the contract Works.

If the contractor requires any further instructions, details, Contract Drawings or information drawings to enable him to prepare his Working Drawings or proposals, the Contractor shall accept at his own cost, the risk that any work, commenced or which he intends to commence at site may be rejected.

The Engineer, in giving his approval to the Working Drawings, will presume that any necessary action has been, or shall be taken by the contractor to ensure that the installations shown on the Working Drawings have been cleared with the Project Manager and any other Contractors whose installations and works might be affected.

If the contractor submits his Working Drawings to the Engineer without first liaising and obtaining clearance for his installations from the Project Manager and other Contractors whose installations and works might be affected, then he shall be liable to pay for any alterations or modification to his own, the Contractor's or other Contractor's installations and works, which are incurred, notwithstanding any technical or other approval received from the Engineer.

Working Drawings to be prepared by the contractor shall include but not be restricted to the following:

- a) Any drawings required by the Contractor, or Engineer to enable structural provisions to be made including Builder's Working Drawings or Schedules and those for the detailing of holes, fixings, foundations, cables and paperwork ducting below or above ground or in or outside or below buildings.
- b) General Arrangement Drawings of all plant, control boards, fittings and apparatus or any part thereof and of installation layout arrangement of such plant and apparatus.
- c) Schematic Layout Drawings of services and of control equipment.
- d) Layout Drawings of all embedded and non-embedded paperwork, ducts and electrical conduits.

- e) Complete circuit drawings of the equipment, together with associated circuit description.
- f) Such other drawings as are called for in the text of the Specification or Schedules or as the Engineer may reasonably require.

Three copies of all Working Drawings shall be submitted to the Engineer for approval. One copy of the Working Drawings submitted to the Engineer for approval shall be returned to the Contractor indicating approval or amendment therein.

Six copies of the approved Working Drawings shall be given to the employer by the contractor for information and distribution to other Contractors carrying out work associated with or in close proximity to or which might be affected by the contract Works.

Approved Working Drawings shall not be departed from except as may be approved or directed by the Engineer.

Approval by the Engineer of Working Drawings shall neither relieve the contractor of any of his obligations under the contract nor relieve him from correcting any errors found subsequently in the Approved Working Drawings or other Working Drawings and in the contract Works on site or elsewhere associated therewith.

The contractor shall ensure that the Working Drawings are submitted to the Architect for approval at a time not unreasonably close to the date when such approval is required. Late submission of his Working Drawings will not relieve the contractor of his obligation to complete the contract Works within the agreed Contract Period and in a manner that would receive the approval of the Project Manager.

1.33 **Record Drawings (As Installed) and Instructions**

During the execution of the contract Works the contractor shall, in a manner approved by the Engineer record on Working or other Drawings at site all information necessary for preparing Record Drawings of the installed contract Works. Marked-up Working or other Drawings and other documents shall be made available to the Engineer as he may require for inspection and checking.

Record Drawings, may, subject to the approval of the Engineer, include approved Working Drawings adjusted as necessary and certified by the contractor as a correct record of the installation of the contract Works.

They shall include but not restricted to the following drawings or information:

- a) Working Drawings amended as necessary but titled "Record Drawings" and certified as a true record of the "As Installed" Contract Works. Subject to the approval of the Engineer such Working Drawings as may be inappropriate may be omitted.

- b) Fully dimensioned drawings of all plant and apparatus.
- c) General arrangement drawings of equipment, other areas containing plant forming part of the Contract Works and the like, indicating the accurate size and location of the plant and apparatus suitability cross-referenced to the drawings mentioned in (b) above and hereinafter.
- d) Routes, types, sizes and arrangement of all pipework and ductwork including dates of installation of underground pipework.
- e) Relay adjustment charts and manuals.
- f) Routes, types, sizes and arrangement of all electric cables, conduits, ducts and wiring including the dates of installation of buried works.
- g) System schematic and trunking diagrams showing all salient information relating to control and instrumentation.
- h) Grading Charts.
- i) Valve schedules and locations suitability cross-referenced.
- j) Wiring and piping diagrams of plant and apparatus.
- k) Schematic diagrams of individual plant, apparatus and switch and control boards. These diagrams to include those peculiar to individual plant or apparatus and also those applicable to system operation as a whole.
- l) Operating Instruction

Schematic and wiring diagrams shall not be manufacturer's multipurpose general issue drawings. They shall be prepared specially for the contract Works and shall contain no spurious or irrelevant information.

Marked-up drawings of the installation of the contract Works shall be kept to date and completed by the date of practical or section completion. Two copies of the Record Drawings of contract Works and two sets of the relay adjustment and grading charts and schematic diagrams on stiff backing shall be provided not later than one month later.

The contractor shall supply for fixing in sub-stations, switch-rooms, boiler houses, plant rooms, pump houses, the office of the Maintenance Engineer and other places, suitable valve and instructions charts, schematic diagrams of instrumentation and of the electrical reticulation as may be requested by the Engineer providing that the charts, diagrams, etc., relate to installations forming part of the Contract Works. All such charts and diagrams shall be of suitable plastic material on a stiff backing and must be approved by the Engineer before final printing.

Notwithstanding the contractor's obligations referred to above, if the contractor fails to produce to the Engineer's approval, either:-

- a) The Marked-up Drawings during the execution of the contract Works or
- b) The Record Drawings, etc., within one month of the Section or Practical Completion

The Engineer shall have these drawings produced by others. The cost of obtaining the necessary information and preparing such drawings, etc., will be recovered from the contractor.

1.34 **Maintenance Manual**

Upon Practical Completion of the contract Works, the contractor shall furnish the Engineer four copies of a Maintenance Manual relating to the installation forming part of the entire contract Works.

The manual shall be loose-leaf type, International A4 size with stiff covers and cloth bound. It may be in several volumes and shall be sub-divided into sections, each section covering one Engineering service system. It shall have a ready means of reference and a detailed index.

There shall be a separate volume dealing with Air Conditioning and Mechanical Ventilation installation where such installations are included in the Contract Works.

The manual shall contain full operating and maintenance instructions for each item of equipment, plant and apparatus set out in a form dealing systematically with each system. It shall include as may be applicable to the contract Works the following and any other items listed in the text of the Specifications:

- a) System Description.
- b) Plant
- c) Valve Operation
- d) Switch Operation
- e) Procedure of Fault Finding
- f) Emergency Procedures
- g) Lubrication Requirements
- h) Maintenance and Servicing Periods and Procedures
- i) Colour Coding Legend for all Services

- j) Schematic and Writing Diagrams of Plant and Apparatus
- k) Record Drawings, true to scale, folded to International A4 size
- l) Lists of Primary and Secondary Spares.

The manual is to be specially prepared for the contract Works and manufacturer's standard descriptive literature and plant operating instruction cards will not be accepted for inclusion unless exceptionally approved by the Engineer. The contractor shall, however, affix such cards, if suitable, adjacent to plant and apparatus. One spare set of all such cards shall be furnished to the Engineer.

1.35 **Hand-over**

The contract Works shall be considered complete and the Maintenance and Defects Liability Period shall commence only when the contract Works and supporting services have been tested, commissioned and operated to the satisfaction of the Engineer and officially approved and accepted by the Employer, provided always that the handing over of the contract Works shall be coincident with the handing over of the sub- Contract Works.

The procedure to be followed will be as follows:

- a) On the completion of the contract Works to the satisfaction of the Engineer and the Employer, the contractor shall request the Engineer, at site to arrange for handing over.
- b) The Engineer shall arrange a Hand-over Meeting or a series thereof, at site.
- c) The contractor shall arrange with the Engineer and Employer for a complete demonstration of each and every service to be carried out and for instruction to be given to the relevant operation staff and other representatives of the Employer.
- d) In the presence of the Employer and the Engineer, Hand-over will take place, subject to Agreement of the Hand-over Certificates and associated check lists.

1.36 **Painting**

It will be deemed that the contractor allowed for all protective and finish painting in the contract Sum for the contract Works, including colour coding of service pipework to the approval of the Engineer. Any special requirements are described in the text of the Specifications.

1.37 **Spares**

The contractor shall supply and deliver such spares suitably protected and boxed to the Engineer's approval as are called for in the Specifications or in the Price Schedules.

1.38 **Testing and Inspection – Manufactured Plant**

The Engineer reserves the right to inspect and test or witness of all manufactured plant equipment and materials.

The right of the Engineer relating to the inspection, examination and testing of plant during manufacture shall be applicable to Insurance companies and inspection authorities so nominated by the Engineer.

The contractor shall give two week's notice to the Engineer of his intention to carry out any inspection or tests and the Engineer or his representative shall be entitled to witness such tests and inspections.

Six copies of all test certificates and performance curves shall be submitted as soon as possible after the completion of such tests, to the Engineer for his approval.

Plant or equipment which is shipped before the relevant test certificate has been approved by the Engineer shall be shipped at the contractor's own risk and should the test certificate not be approved new tests may be ordered by the Engineer at the contractor's expense.

The foregoing provisions relate to tests at manufacturer's works and as appropriate to those carried out at site.

1.39 **Testing and Inspection -Installation**

Allow for testing each section of the contract Works installation as described hereinafter to the satisfaction of the Engineer.

1.40 **Labour Camps**

The contractor shall provide the necessary temporary workshop and mess-room in position to be approved by the Architect.

The work people employed by the contractor shall occupy or be about only that part of the site necessary for the performance of the work and the contractor shall instruct his employees accordingly.

If practicable, W.C. accommodation shall be allocated for the sole use of the contractor's workmen and the contractor will be required to keep the same clean and disinfected, to make good any damage thereto and leave in good condition.

1.41 **Storage of Materials**

Space for storage and provision of any lock-up sheds or stores required will be provided by the contractor

Nominated Contractors are to be made liable for the cost of any storage accommodation provided specially for their use. No materials shall be stored or stacked on suspended slabs without the prior approval of the Project manager.

1.42 **Initial Maintenance**

The contractor shall make routine maintenance once a month during the liability for the Defects Period and shall carry out all necessary adjustments and repairs, cleaning and oiling of moving parts. A monthly report of the inspection and any works done upon the installation shall be supplied to the Engineer.

The contractor shall also provide a 24 -hour break-down service to attend to faults on or malfunctioning of the installation between the routine visits of inspection.

The contractor shall allow in the contract Sum of the initial maintenance, inspection and break-down service and shall provide for all tools, instruments, plant and scaffolding and the transportation thereof, as required for the correct and full execution of these obligations and the provision, use or installation of all materials as oils, greases, sandpaper, etc., or parts which are periodically renewed such as brake linings etc., or parts which are faulty for any reason whatsoever excepting always Acts of God such as storm, tempest, flood, earthquake and civil revolt, acts of war and vandalism.

1.43 **Maintenance and Servicing After Completion of the Initial Maintenance**

The contractor shall, if required, enter into a maintenance and service agreement with the employer for the installation for a period of up to five years from the day following the last day of the liability for Defects Period which offers the same facilities as specified in Clause 1.42 (Initial Maintenance).

The terms of any such agreement shall not be less beneficial to the employer than the terms of Agreements for either similar installation.

The contractor shall submit with his tender for the works, where called upon a firm quotation for the maintenance and service of the installation as specified herein, which shall be based upon the present day costs and may be varied only to take into account increases in material and labour unit rate costs between the time of tendering and the signing of the formal maintenance

and service agreement and which shall remain valid and open for acceptance by the Employer to and including the last day of the fifth complete calendar month following the end of the liability for Defects Period.

1.44 **Trade Names**

Where trade names of manufacturer's catalogue numbers are mentioned in the Specification or the Bills of Quantities, the reference is intended as a guide to the type of article or quality of material required. Alternate brands of equal and approved quality will be acceptable.

1.45 **Water and Electricity for the Works**

These will be made available by the Contractor who shall be liable for the cost of any water or electric current used and for any installation provided for their own use.

1.46 **Protection**

The contractor shall adequately cover up and protect his own work to prevent injury and also to cover up and protect from damage all parts of the building or premises where work is performed by him under the Contract.

1.47 **Defects After Completion**

The defects liability period will be 12 months from the date of completion of the Contract as certified by the Engineer.

1.48 **Damages for Delay**

Liquidated and Ascertained damages as stated in the Contract Agreement will be claimed against the Contractor for any unauthorised delay in completion. The contractor shall be held liable for the whole or a portion of these damages should he cause delay in completion.

1.49 **Clear Away on Completion**

The contractor shall, upon completion of the works, at his own expense, remove and clear away all plant, equipment, rubbish and unused materials, and shall leave the whole of the works in a clean and tidy state, to the satisfaction of the Engineer. On completion, the whole of the works shall be delivered up clean, complete and perfect in every respect to the satisfaction of the Engineer.

1.50 **Final Account**

On completion of the works the contractor shall agree with the Engineer the value of any variations outstanding and as soon as possible thereafter submit to the Engineer his final statement of account showing the total sum claimed sub-divided as follows:

- Statement A - detailing the tender amounts less the Prime Cost and Provisional Sums, included therein.
- Statement B - detailing all the variation orders issued on the contract.
- Statement C - Summarising statement A and B giving the net grand total due to the Contractor for the execution of the Contract.

1.51 **Fair Wages**

The contractor shall in respect of all persons employed anywhere by him in the execution of the contract, in every factory, workshop or place occupied or used by him for execution of the Contract, observe and fulfil the following conditions:

- a) The contractor shall pay rates of the wages and observe hours and conditions of labour not less favourable than those established for the trade or industry in the district where work is carried out.
- b) In the absence of any rates of wages, hours or conditions of labour so established the contractor shall pay rates and observe hours and conditions of labour are not less favourable than the general level of wages, hours and conditions observed by other employers whose general circumstances in the trade or industry in which the Contractor is engaged are similar.

1.52 **Supervision**

During the progress of the works, the contractor shall provide and keep constantly available for consultation on site an experienced English - speaking Supervisor and shall provide reasonable office facilities, attendance, etc., for the Supervisor.

In addition, during the whole of the time the works are under construction, the contractor shall maintain on site one experienced foreman or charge-hand and an adequate number of fitters, etc., for the work covered by the Specification. The number of this staff shall not be reduced without the prior written approval of the Project manager or Engineer.

Any instructions given to the Supervisor on site shall be deemed to have been given to the contractor.

One copy of this Specification and one copy of each of the Contract Drawings (latest issue) must be retained on site at all times, and available for reference by the Engineer or contractor.

1.53 **Test Certificates**

The contractor shall provide the Engineer with three copies of all test reports or certificates that are or may be required by this Specification.

1.54 **Labour**

The contractor shall provide skilled and unskilled labour as may be necessary for completion of the contract.

1.55 **Discount to the Employer**

No discount to the Employer will be included in the tender for this installation.

1.56 **Guarantee**

The whole of the work will be guaranteed for a period of 12 months from the date of the Engineer's certification of completion and under such guarantee the contractor shall remedy at his expense all defects in materials and apparatus due to faulty design, construction or workmanship which may develop in that period.

1.57 **Direct Contracts**

Notwithstanding the foregoing conditions, the Government reserves the right to place a "Direct Contract" for any goods or services required in the works which are covered by a P.C Sum in the Bills of Quantities and to pay for the same direct. In any such instance, profit relative to the P.C Sum in the priced Bills of Quantities will be adjusted as deserved for P.C Sum allowed.

1.58 **Attendance Upon the Tradesmen etc**

The Contractor shall allow for the attendance of trade upon trade and shall afford any tradesmen or other persons employed for the execution of any work not included in this contract every facility for carrying out their work and also for the use of ordinary scaffolding. The contractor however, shall not be required to erect any special scaffolding for them.

1.59 **Trade Unions**

The contractor shall recognize the freedom of his work people to be members of trade unions.

1.60 Local and other Authorities notices and fees

The contractor shall comply with and give all notices required by any Regulations, Act or by Law of any Local Authority or of any Public Service, Company or Authority who have any jurisdiction with regard to the works or with those systems the same are or will be connected and he shall pay and indemnify the Government against any fees or charges legally demandable under any regulation or by-law in respect of the works; provided that the said fees and charges if not expressly included in the contract sum or stated by way of provisional sum shall be added to the contract sum.

The contractor before making any variation from the contract drawings or specification necessitated by such compliance shall give the Project Manager written notice specifying and giving the reason for such variation and applying for instructions in reference thereto. If the contractor within seven days of having applied for the same does not receive such instructions, he shall proceed with the works in conforming to the provision regulation or by-law in question and any variation thereby necessitated shall be deemed to be a variation in accordance to the conditions of contract.

1.61 Assignment or subletting

The contractor shall not without the written consent of the Project Manager assign this contract or sublet any portion of the works, provided that such consent shall not be unreasonably withheld to the prejudice of the contractor.

1.62 Partial Completion

If the Government shall take over any part or parts works, apparatus, equipment etc. then within seven days from the date on which the Government shall have taken possession of the relevant part, the Project Manager shall issue a Certificate stating his estimate of the approximate total value of the works which shall be the total value of that part and practical completion of the relevant part shall be deemed to have occurred, and the Defects Liability Period in respect of the relevant part be deemed to have commenced on the date Government shall have taken possession thereof.

The contractor shall make good any defects or other faults in the relevant part that had been deemed complete.

The contractor shall reduce the value of insurance by the full value of the relevant part

The contractor shall be paid for the part of works taken possession by the Government

1.63 Temporary Works

Where temporary works shall be deemed necessary, such as Temporary lighting, the contractor shall take precaution to prevent damage to such works.

The contractor shall include for the cost of and make necessary arrangements with the Project Manager for such temporary works. For temporary lighting, electricity shall be metered and paid for by the contractor.

1.64 Patent Rights

The contractor shall fully indemnify the Government of Kenya; against any action, claim or proceeding relating to infringement of any patent or design rights, and pay any royalties which may be payable in respect of any article or any part thereof, which shall have been supplied by the contractor to the Project Manager. In like manner the Government of Kenya shall fully indemnify the contractor against any such action, claim or proceedings for infringement under the works, the design thereof of which shall have been supplied by the Project Manager to the contractor, but this indemnify shall apply to the works only, and any permission or request to manufacture to the order of the Project Manager shall not relieve the contractor from liability should he manufacture for supply to other buyers.

1.65 Mobilization and Demobilization

The contractor shall mobilize labour plant and equipment to site according to his programme and schedule of work He shall ensure optimum presence and utilization of labour, plant and equipment. He should not pay and maintain unnecessary labour force or maintain and service idle plant and equipment. Where necessary he shall demobilize and mobilize the labour, plant and equipment, as he deems fit to ensure optimum progress of the works and this shall be considered to be a continuous process as works progress. He shall make provision for this item in his tender. No claim will be entertained where the contractor has not made any provision for mobilization and demobilization of labour, plant and equipment in the preliminary bills of quantities or elsewhere in this tender.

1.66 Extended Preliminaries

Where it shall be necessary to extend the contract period by the Project manager the contractor shall still ensure availability on site, optimum labour, materials, plant and equipment. The contractor shall make provision for extended preliminaries, should the contract period be extended and this shall be in a form of a percentage of the proportion of the Contract works remaining as at that time of extension. Where called upon in the Appendix to these Preliminaries the Contractor shall insert his percentage per month for extended preliminaries that shall form basis for compensation.

Lack of inserting the percentage shall mean that the contractor has provided for this requirement elsewhere in the Bills of Quantities.

1.67 Supervision by Engineer and Site Meetings

A competent Project Engineer appointed by the Engineer as his representative shall supervise the Contract works. The Project Engineer shall be responsible for issuing all the site instructions in any variations to the works and these shall be delivered through the Contractor with the authority of the Project Manager. Any instructions given verbal shall be confirmed in writing.

The project engineer and (or) the Engineer shall attend management meetings arranged by the Project Manager and for which the Contractor or his representative shall also attend. For the purpose of supervising the project, provisional sums are provided to cover for transport and allowances. The Contractor shall in his tender allow for the provision of management meetings and site inspections, as instructed by the Engineer, and also profit an attendance on these funds. The funds shall be expended according to Project Manager's instructions to the contractor.

• 1.68 Amendment to Scope of Contract Works

No amendment to scope of Contract works is expected and in case of amendment or modification to scope of work, these shall be communicated to all tenderers in sufficient time before the deadline of the tender submission. However during the contract period and as the works progress the Project Manager may vary the works as per conditions of contract by issuing site instructions.

No claims shall be entertained on account of variation to scope of works either to increase the works (pre-financing) or reduction of works (loss of profit-see clause 1.69)

1.69 Contractors Obligation and Employers Obligation

The Contractor will finance all activities as part of his obligation to this contract. The employer shall pay interim payment for materials and work completed on site as his obligation in this contract, as the works progresses. No claims will be entertained for pre-financing of the project by the Contractor, or for loss of profit (expectation loss) in case of premature termination, reduction or increase of works as the Contractor shall be deemed to have taken adequate measures in programming his works and expenditure and taken necessary financial precaution while executing the works. No interest shall be payable to the Contractor, except as relates to late payment as in the conditions of contract clause 23.3. The contractor shall where called upon, insert his price to compensate for any of the occurrence stated here (premature termination, reduction or increase of works), as a percentage of the contract sum in the Appendix to this section.

1.70 APPENDIX TO CONTRACT PRELIMINARIES AND GENERAL CONDITIONS

1. ADD TO CLAUSE 1.13

Section 139(3) of the Act, 2015 provides that no contract price shall be varied upwards within twelve (12) months from the date of signing the contract.

2. ADD TO CLAUSE 1.40

There is no labour camp.

2. MODIFY CLAUSE 1.66

Percentage of extended preliminaries shall be inserted in Schedule No.1 page G/5 section G. However, this amount of the extended preliminaries **SHALL NOT** exceed the Liquidated and Ascertained Damages indicated on page **B-23** of Section B of this tender document

3. ADD TO CLAUSE 1.17

Prices quoted shall include **VAT, withholding tax** and all other taxes applicable at the time of tender.

In accordance with Government policy, the **VAT and withholding tax** shall be deducted from all payments made to the contractor, and the same shall subsequently be forwarded to the Kenya Revenue Authority (KRA).

4. OMIT CLAUSE 1.12

SECTION D

GENERAL SPECIFICATIONS OF MATERIALS AND WORKS

GENERAL SPECIFICATIONS OF MATERIALS AND WORKS

- 1.1 General
- 1.2 Standard of Materials
- 1.3 Workmanship
- 1.4 Procurement of Materials
- 1.5 Shop Drawings
- 1.6 Record Drawings
- 1.7 Regulations and Standards
- 1.8 Setting out Works
- 1.9 Factory Inspection
- 1.10 Testing on Site

1.1 GENERAL

This specification is to be read in conjunction with any other information herein issued with it. Bills of quantities and schedule of unit rates shall be the basis of all additions and omissions during the progress of the works.

1.2 STANDARD OF MATERIALS

Where the material and equipment are specifically described and named in the Specification followed by approved equal, they are so named or described for the purpose of establishing a standard to which the contractor shall adhere.

Should the contractor install any material not specified herein before receiving approval from the proper authorities, the Engineer shall direct the contractor to remove the material in question immediately. The fact that this material has been installed shall have no bearing or influence on the decision by the Engineer.

All materials condemned by the Engineer as not approved for use, are to be removed from the premises and suitable materials delivered and installed in their place at the expense of the Sub-contractor. All materials required for the works shall be from branded manufacturers, and shall be new and the best of the respective kind and shall be of a uniform pattern.

1.3 WORKMANSHIP

The workmanship and method of installation shall conform to the best standard practice. All work shall be performed by a skilled tradesman and to the satisfaction of the Engineer. Helpers shall have qualified supervision.

Any work that does not in the opinion of the Engineer conform to the best standard practice will be removed and reinstated at the contractor's expense.

Permits, Certificates or Licences must be held by all tradesmen for the type of work; in which they are involved where such permits, certificates or licences exist under Government legislation.

1.4 PROCUREMENT OF MATERIALS

The contractor is advised that no assistance can be given in the procurement or allotment of any materials or products to be used in and necessary for the construction and completion of the work.

Contractors are warned that they must make their own arrangements for the supply of materials and/or products specified or required.

1.5 SHOP DRAWINGS

Before manufacture or fabrication or supply/delivery of any equipment to site is commenced, the contractor shall submit two copies of detailed drawings (if required in this contract) and coloured brochures of all materials /equipments / components showing all pertinent information including sizes, capacities, construction details, technical specifications and literature etc, as may be required to determine the suitability of the equipment for the approval of the Engineer. Approval of the foregoing shall not relieve the contractor of the full responsibility of errors or the necessity of checking all the details himself or of furnishing the materials and equipment and performing the work required by the plans or specifications.

1.6 RECORD DRAWINGS

These diagrams and drawings shall show the completed installation including sizes, runs and arrangements of the installation. The drawings shall be to scale not less than 1 :50 and shall include plan views and section.

The drawings shall include all the details which may be useful in the operation, maintenance or subsequent modifications or extensions to the installation.

Three sets of diagrams and drawings shall be provided, all to the approval of the Engineer.

One coloured set of line diagrams relating to operating and maintenance instructions shall be framed and, mounted in a suitable location.

1.7 REGULATIONS AND STANDARDS

All work executed by the contractor shall comply with the current edition of the “Regulations” for the Electrical Equipment of Buildings, issued by the Institution of Electrical Engineers, Electric Power Act, Kenya Bureau of Standards (KBS), Institution of Electrical Engineers (I.E.E) Wiring Regulations, Current recommendation of CCITT and CCIR, and with the Regulations of the Local Electricity Authority and the Communications Authority of Kenya (CA)

Where the sets of regulations appear to conflict, they shall be clarified with the Engineer.

1.8 SETTING OUT WORK

The contractor, at his own expenses, is to set out works and take all measurements and dimensions required for the erection of his materials on site; making any modifications in details as may be found necessary during the progress of the works, submitting any such modifications or alterations in detail to the Engineer before proceeding and must allow in his tender for all such modifications and for the provision of any such sketches or drawings related thereto.

1.9 FACTORY INSPECTION

The employer shall be entitled to have the quantity and quality of the imported equipment/materials inspected by two number (2 No.) engineers appointed by the Project Manager, and one (1 No.) representative for the employer.

The said inspection shall be carried out at the factory of manufacture of the equipment/materials during normal working hours

The Engineer shall be given adequate notice in writing of the date and time that the equipment/materials are ready for inspection and given all reasonable facilities for his own tests during the course of the inspection.

Travel (including ground, air travel and airport passage taxes) and full board accommodation expenses in at least a three (3) star hotel incurred by the engineers appointed by the Project Manager, and the employer's representative shall be borne by the contractor. The sub-contractor shall also meet out of pocket expenses for the officers at Government of Kenya rates for the duration of the factory inspection. The costs incurred shall be re-imbursed to the sub-contractor from the provisional sum allowed in page (K/24) of the Bills of Quantities.

The inspection period shall be five (5) working days excluding travelling time.

If as a result of the inspection any of the equipment/materials are found to be defective, the Sub-contractor shall replace the defective materials and determine a new date as when a new inspection shall be performed at the expense of the Sub-contractor.

The Sub-contractor shall only ship the equipment/materials after the said factory inspection.

1.10 TESTING ON SITE

The contractor shall conduct during and at the completion of the installation and, if required, again at the expiration of the maintenance period, tests in accordance with the relevant section of the current edition of the Regulations for the electrical equipment of buildings issued by the I.E.E of Great Britain, the Government Electrical Specifications No. 1 and No.2, Electric Supply Company's By-Laws, Communications Authority of Kenya (CAK) requirements or any other supplementary Regulations as may be produced by the engineer.

Any faults, defects or omissions or faulty workmanship, incorrectly positioned or installed parts of the installation shall be rectified by the contractor at his own expense.

SECTION E

SCOPE OF WORK, GENERAL AND PARTICULAR SPECIFICATIONS FOR AUDIO VISUAL CONFERENCING SYSTEM

I) **SCOPE OF WORK & DESCRIPTION OF PROPOSED SYSTEM**

II) **GENERAL SPECIFICATIONS OF PROPOSED SYSTEM**

1.0 General Requirements and Conditions

2.0 General Technical Requirements

III) **PARTICULAR SPECIFICATIONS OF PROPOSED SYSTEM**

1.0 Equipment Integration

2.0 Schematic Block Diagram

3.0 Schematic Design

4.0 Description of the System

5.0 Technical Specification

I. SCOPE OF WORK AND DESCRIPTION OF PROPOSED SYSTEM

This section contains details of the proposed Video/Audio Conferencing system that will provide for live transmission (Broadcasting), recording and also distribution of the various independent activities in the committee rooms within the office block.

The system includes integration of the equipment into a central control room to allow monitoring, recording, editing, external signal reception, use of an interpretation system with various language options, and provides for external connection for live streaming.

The activities that will be conducted from various conference rooms will include;

- (i) Meetings and Conferences
- (ii) Interviews between the host and the guest

The system setup shall provide the capability for;

- (i) Video/Audio Coverage of the above activities and distribution of the content within an office block
- (ii) Interconnection of various committee rooms
- (iii) Monitoring of various activities from a central control room
- (iv) Interpretation to various languages in some designated committee rooms
- (v) Video conferencing in some designated committee rooms

The project design system should be capable of combining Audio and Video technology with industry-leading IT technology. This is to provide a powerful content creation tool for live event programming, comprised of high-quality AV integration, streaming encoder and a server.

Also to accommodate today's growing needs to integrate video, audio, and a variety of PC input sources in live events; the system to provide a comprehensive set of AV and IT inputs. These to include HDMI, SDI, analogue composite, DV Input, balanced analogue and digital audio input from integration of delegate system committee microphones and the simultaneous interpreting systems, computer inputs, e.tc.

The unique processing of the system will be required to allow live switching between these video and computer sources without the use of external line converters and without degrading picture quality. When it comes to AV delivery, straight from the system, the user should be able to feed programs to recorders and large venue display, store input sources and output to external network storage sources, stream the AV, or even edit the stored A/V files on a PC.

II. GENERAL SPECIFICATIONS

1. GENERAL REQUIREMENTS AND CONDITIONS

The scope of works under this sub-contract shall include; Supply, installation and commissioning of all the conference equipment to deliver a complete system. The contractor is however supposed to consider the following in coming up with the proposal for the system;

- Floor plan layout and sitting configuration shall be as per the Architect's specifications.
- The contractor must derive the appropriate distribution equipment and ensure that all signals are distributed at the correct levels to the points required.
- The contractor shall supply and install the AV equipment based on the latest technology in the market and that the technology shall be scalable.
- The contractor shall supply and install system equipment that meets Building Management System (BMS) standard and ensure that the system configures well to the BMS.
- A detailed technical proposal comprising detailed drawings and all layouts and schematic diagrams of the proposed system including wiring and interconnection diagrams must be submitted with the bid documents.
- All equipment must be provided with the necessary optional boards to achieve proper functionality.
- A list of all required spare parts and annual licenses must be provided separately.
- The contractor shall be required to provide experienced training personnel who must demonstrate their experience and manufacturer training and certification.
- The contractor shall ensure that all the works carried out on site conforms to the current relevant safety regulations.
- Equipment supplied must conform to the latest PAL and DVB-T standards - the broadcast standards applicable in Kenya.
- All equipment MUST be tropicalized and those components prone to rust coated or treated with rust proof coatings.

2. GENERAL TECHNICAL REQUIREMENTS

2.1 Cable and Equipment Identification

- The contractor must supply all cables required and connectors.
- All cables except short mains shall be labelled at both ends.

2.2 Equipment Racks

- Rack mounted equipment shall be neatly wired and the following to be included with the equipment racks;
 - a) Powder-coated cable tray on either side.
 - b) Suitable slotted trunking mounted on the cable tray/conduits to house all audio, video and data cabling.
- The rack sizes shall be sufficient to provide floor or access spaces.
- All racks are to include removable front, rear or side doors

2.3 Power amplifiers

- These shall be mounted within the rack in such a way that the power amplifiers do not overheat during normal operations.

2.4 Loudspeakers and display systems

- Brackets-steelwork and suspension systems. The Contractor shall ensure that these are properly designed and engineered.

2.5 Quality of workmanship

- The Engineer will closely monitor the quality of workmanship during execution and ensure that the specifications are adhered to.

2.6 System Setup and Alignment

- The contractor shall ensure that the systems installed are correctly programmed, tuned and setup to achieve a high level of audio-visual quality acceptable by the Engineer.

2.7 Schematic drawings

- The contractor shall be required to provide system schematic diagrams, rack layout drawings for the control room and scale drawings indicating the positions of all equipment and cable routing. The drawings and system literature shall be included.

2.8 Users Manuals and As Installed Drawings

- After system commissioning, the contractor shall provide all equipment Operation and Maintenance manuals, and the As Installed drawings for the system.
- In addition, the contractor shall also furnish all system designs, literature and applications software.

2.9 Electrical Power Requirements

- All the equipment to be Supplied must conform to the Kenya standards of 240/415 V, three pin BNC, 50 Hz.

III. PARTICULAR SPECIFICATIONS

1. EQUIPMENT INTEGRATION

To achieve the system capabilities, integration of the following equipment shall be required.

1.1 Committee Rooms Equipment

a) Video equipment

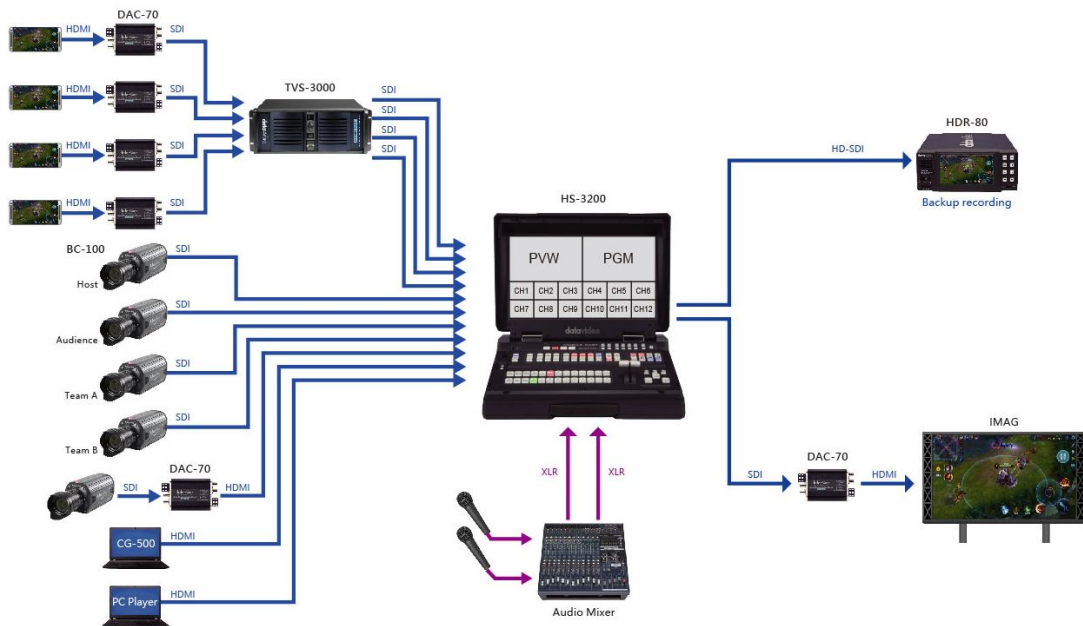
Video equipment in these rooms will provide for visual capturing allowing interconnection through a medium to a central control and monitoring equipment. These shall include;

- Cameras

It shall be possible to use an automatic camera control system to ensure that the camera zooms to capture the image of the speaking delegates. The system shall be controlled by the microphone activity of the delegate- and chairman units. The system shall allow camera control by means of fixed or moveable cameras with zoom lenses, pan and tilt heads and prepositions.

There shall be video outputs for connecting at least one operator monitor and other displays. It shall be possible to display the names of speaking delegates in the video picture with one or two text lines comprising 16 characters each. An automatic camera control software application shall be availed to configure and control the system.

Committee room Video system integration



b) Audio equipment

The audio equipment's main objective is to facilitate efficient meetings with interactive audience participation ideal for Conferences, Discussion Panels and allow for all audio Recordings.

The delegate microphones in the system will operate in push-to-talk mode. This requires the use of conference microphone system to achieve the above objective and the whole system equipment includes;

- A central processing unit
- Delegate units
- Chairman's units
- Conference Management System
- All connector cables
- All necessary software and licenses for proper operation
- Output Speakers(loudspeakers)
- Voting capability and voting cards

c) **Presentation System**

Each of the rooms will be equipped with an audio-visual presentation system. This will include a projection smart TV Screen and wireless presentation system.

1.2 Control Room Equipment

This room will hold equipment required for central interconnection, control and for audio visual monitoring. It will also include other equipment for recording and for signal amplification. The room will have a double glass window for visual view of the conference room.

The particular equipment to be located in the control room shall include:

- Video/Audio switcher
- Audio Power Amplifier
- Audio Mixer
- Central Control Unit- conference discussion system
- Audio speakers
- LED TV
- Recording facilities
- Analogue and DVB-T2 TV receivers
- Control Unit for Interpretation
- Equipment Racks
- Furniture
- Etc.

1.3 Interpreter Equipment

This equipment will be required to achieve conference interpreting, frequently referred to as simultaneous interpreting or UN-style interpreting.

Like normal interpreting, it involves transforming verbal communication from one language to another language in real time or concurrently with the original speech.

An interpreter listens to a speaker through headphones using an isolated audio feed and then verbally translates into the target language using a separate audio output linked by microphone to a **transmitter** and from there to conference **receivers** - wired.

1.4 Editing room Equipment (Room Dimensions - 4 by 3 m)

This will include computer based editing facility with necessary software and hardware for uploading and down loading materials for editing or edited into or out of the computer. It will include the following;

- Recording Machine
- Final Cut edit stations
- Monitors (video and audio)
- SSD dock
- Etc.



Editing Suite

1.5 Main control room equipment

The equipment in this room will be required to achieve overall signal distribution for the;

- Various independent activities in the rooms to all offices in the office block as well as to all committee and to the public area display systems.
- Allow any AV feeds from the committee for press use.
- Receive external signal sources and distribute to committee rooms, public area displays and all the offices in the office block.

This will involve use of *digital signal distribution (e.g. Digital signage) and network streaming equipment*.

1.6 Integration with Public Area Display System and Public Address System

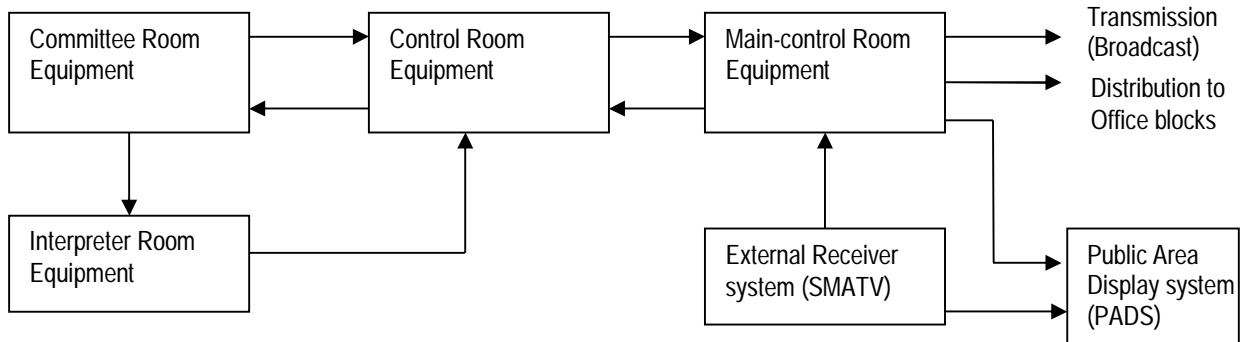
This will include the provision for the streaming of audio-visual material to all LED panels and Speakers that will be installed in the public areas within the building complex.

1.7 System Software

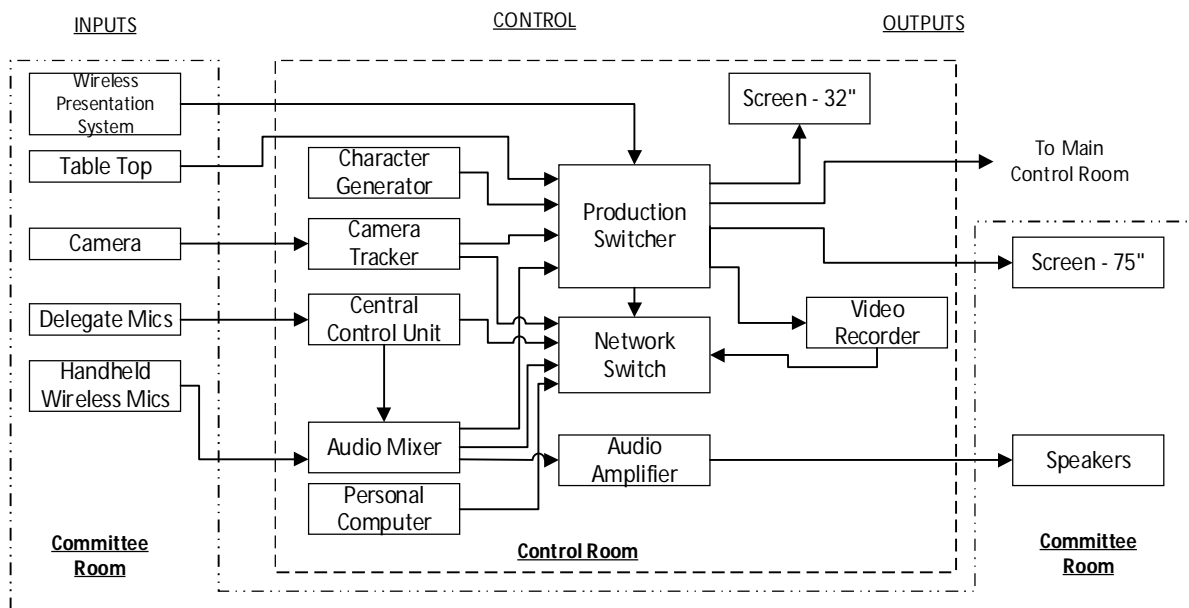
These are all software's that are required to run, operate and manage all applications and equipment required in each category above (for instance editing, content management, play out, control etc).

2. SCHEMATIC BLOCK DIAGRAM

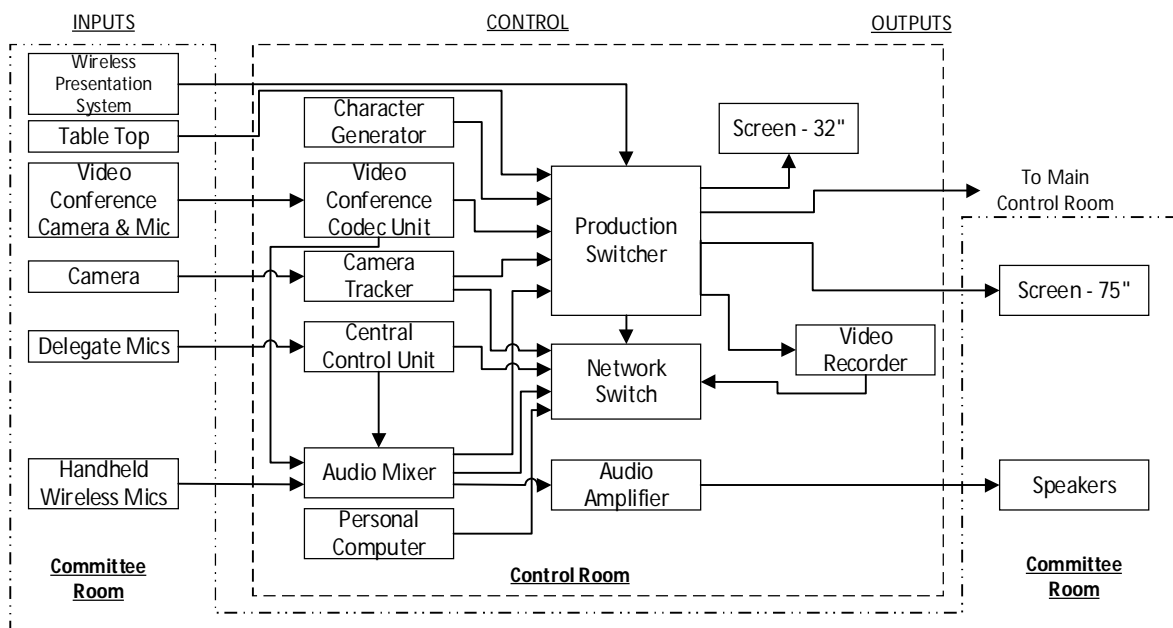
The following is a schematic block diagram for system set-up.



General Block Diagram

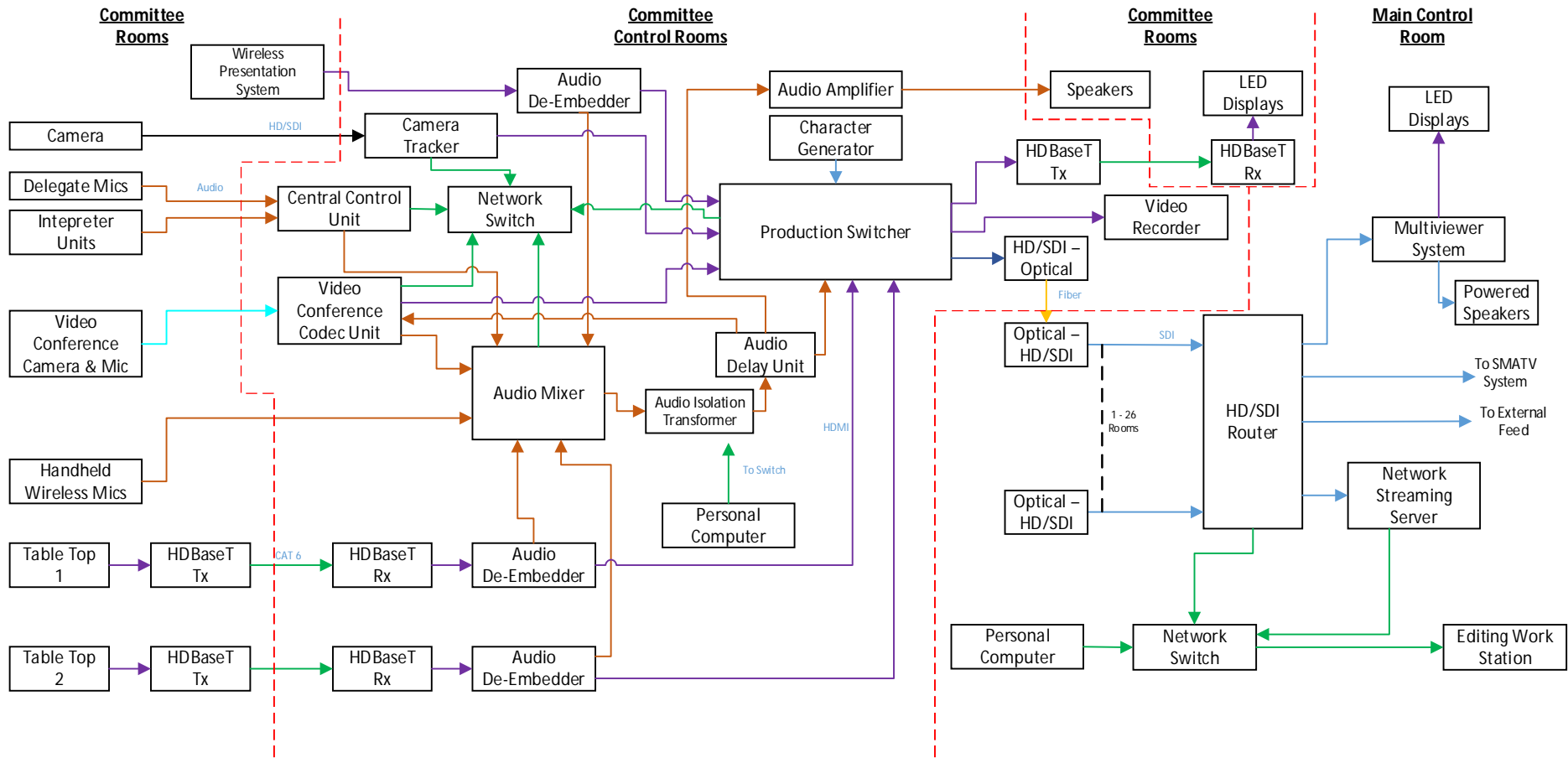


Typical Committee Room Block Diagram



Typical Committee Room with Video Conference System Block Diagram

3. SCHEMATIC DESIGN - ANALOGUE/DIGITAL SYSTEM CONFIGURATION



4. BRIEF TECHNICAL DESCRIPTION OF THE SYSTEM EQUIPMENT

4.1. COMMITTEE/CONFERENCE ROOMS

The conference room will house;

i) Video Equipment

a) Video Cameras

- The primary purpose is to capture the video signal in the Conference room or the auditorium and feed it to the Audio/Video mixer.
- Fixed dome cameras with pan/tilt/Zoom heads and controls.
- Equipped with all the accessories, controls and cables.
- It shall be possible to use an automatic camera control system to ensure that the camera automatically focusses on the speaking delegates are automatically displayed on designated displays or monitors. The system shall be controlled by the microphone activity of the delegate- and chair-man units. The system shall allow camera control by means of fixed or moveable cameras with zoom lenses, pan and tilt heads and prepositions.
- There shall be video outputs for connecting at least one operator monitor and other displays. It shall be possible to display the names of speaking delegates in the video picture with one or two text lines comprising 16 characters each. An automatic camera control software application shall be available to configure and control the system.

b) Portable day light equipment

- To be used to provide adequate light for the camera picture.
- Provided with control equipment, i.e. the console

c) LED Smart 4K TVs

It is to be used for;

- Presentations
- To receive TV channels with DVB-T2 capability
- To view proceedings in other conference rooms including auditorium and external sources when needed.

ii) Audio Equipment

a) Conference microphone system

In this room, the system equipment will include;

1) Goose microphones

- The goose microphones (delegate units) to promote interactive discussions among conference attendees.
- Microphones that operate in push-to-talk mode to be used and be connected to a central control unit.
- They shall have the capability for voting and channel selection
- They shall have capability for identification

2) Chair person's Microphone

- This is to enable the chair person to monitor and control the flow of the meeting/conference.
- It has a priority button that is used to override all the delegate units.
- It shall have the capability for voting and channel selection
- They shall have capability for identification

b) Wireless Microphones

To be used where microphone mobility is required for easier participation among conference attendees where goose microphones are not installed.

They shall include desktop stands.

c) Public Address System

These are the amplifiers and external audio speakers (active) to allow public address.

iii) Presentation Equipment

a) Table Tops

It is to be used for;

- Presentations

b) Wireless Presenter

It is to be used for;

- Presentations

4.2. COMMITTEE/CONFERENCE CONTROL ROOM

The control room will have a double glass window to allow visual view of the Conference room. It will house the following equipment:

(i) **Video Production switcher**

- The switcher to provide inputs for the cameras as well as the audio from the conference room microphone system.
- It should also have a connection to LED screen to view/monitor the cameras from the conference room for mixings
- Provide a SDI and HDMI signal for transmission, routing, streaming and distribution for two primary purpose:
 - a) Internal reproduction
 - b) External destinations

(ii) **Camera Control/Tracking**

- This shall be used for controlling the camera inside the committee rooms. It shall allow for automating focusing of the delegate speaking.

(iii) **Audio Delay Mixer**

- Support up to 3 sec audio delay adjustment for each input channel
- Audio level adjustment of each input

(iv) **Central Control Unit- conference discussion system**

- This is the Central Unit for the conference discussion system microphones.
- All the microphones in the conference rooms will be interconnected.

(v) **Power Amplifier**

- This is to amplify line level audio signal from the mixer and output sufficient power to drive speakers in the committee (for the PA system).

(vi) **Audio Mixer**

- This is to select between which audio is switched between various sources of audio signals.

(vii) **Audio speakers**

- This is to allow audio monitoring in the control rooms.

(viii) **LED TV**

- A multi display (multiview) screen is proposed
- To receive TV channels with DVB-T2 capability
- To be used by the control room personnel to:
 - View the recorder/player signal output
 - View any proceedings from other rooms

(ix) **Recording facilities**

- To be used to record the mixer output signals
- Playback any other material for presentation.
- It will be composed of Hard Drive Video Recorder

(x) **Computer**

- The purpose of this computer is to host softwares for conference system management.
- It shall also be used for other functionalities relating to control room of committee rooms.

(xi) **Audio Delay**

- This shall be used to adjusting the levels of audio and for delaying the audio for effective audio and video synchronization.

(xii) **Audio Isolation Transformer**

- This shall be used to removing the unwanted noise like hamming that can lead to unclear signal.

(xiii) **Equipment Racks**

- These are the structures for holding equipment to be placed in this room.

(xiv) **Furniture/Accessories**

- This includes equipment furniture and accessories like mixer tables, speaker holders, microphone stands etc.

4.3. EDITING ROOM

This will be a common shared room for editing and will house the following equipment:

(i) **Editing workstation**

- Computer based editing facility with necessary software for uploading and down loading materials for editing or edited into the computer
- It should be installed in with editing software, relevant video/audio cards and external speakers.

(ii) **Recording/player machine**

- This equipment shall be a file-based deck that features the same functionality and control of professional tape decks used for recording on Two 2.5" SSDs.
- It can be used for playing any materials for viewing

(iii) **LED TV**

- This shall be a multi display (multiview) screen used to view any material from recording machine or any other signal within the interpreter's desk and operations.
- It shall be able to receive TV channels with DVB-T2 capability

(iv) **SSD dock**

- This shall be a super-fast rack mount 4 slot USB-C disk dock lets you edit directly from your media disks
- Allows access to 4 separate SSDs via a single high speed 10 Gb/s USB-C connection.

(v) **Equipment Racks**

- These are the structures for holdings equipment to be placed in this room

(vi) **Equipment Furniture**

- For the editing equipment

4.4. INTERPRETERS' ROOM

This room (often a **soundproof booth**) will be used by the interpreters and will house the following equipment;

- (i) **Interpreters' headset (microphone/earpiece)**
 - Allows the interpreter to listen and translate.

- (ii) **Interpreters' Furniture/Booth**
 - Necessary for the equipment and the interpreter working areas

4.5. MAIN CONTROL ROOM

This room will house all the equipment that will be used to achieve the overall signal distribution within the office block. It will interconnect all the control rooms and external signal sources for distribution. It should allow monitoring and restriction of signal distribution. Some of the equipment in this room are;

- (i) **Multiviewer system**
 - This unit will allow the viewing of all signals from all committee rooms in one location using screen splitting technology.
 - This is a system that allows monitoring of completely independent SDI video sources on a single HD or Ultra HD display. It shall provide for full frame re-synchronization on every input, monitor any combination of SD, HD and Ultra HD formats and frame rates all at the same time, on the same display.
 - It shall have controls on the front panel, along with the LCD and spin knob, for setting adjustment, routing sources to different views, as well as adding overlays and more.
 - Shall allow screen splitting as 2x2, 3x3 or 4x4 grid, and you can even SOLO any source full screen.

- (ii) **Multiview 40 Channel HD/SDI Router**
 - The router shall provide for routing of all the committee rooms live feed to external connection for streaming. Any of the inputs can be rerouted to a specific output.

(iii) **Network Video storage server**

The purpose of the storage server will be;

- Recording of up to 30 independent channels simultaneously.
- Receive several AV inputs
- It should have the capability of streaming to the individual office computers through the computer network.
- Storage of the video materials for later download for editing.

(iv) **Network switches**

- These switches will be used for interconnecting individual equipment in control room into the network.

(v) **LED TV**

- A multi display (multiview) screen is proposed
- To receive TV channels with DVB-T2 capability
- To be used by the control room personnel to:
 - View the recorder/player signal output
 - View any proceedings from other rooms

(vi) **Computer**

- The purpose of this computer is to host softwares for conference system management.
- It shall also be used for other functionalities relating to control room of committee rooms.

(vii) **HD/SDI to Fiber Optic Converter**

- These are used as transmitters/receivers between all the committee control rooms and the main control room. The signals shall be carried via optical cables and later converted back to SDI.

(viii) **HD/SDI Splitter**

- The purpose of this splitter is to split the single SDI input into a number for different connections.

(ix) **Equipment Racks**

- These are the structures for holding equipment to be placed in this room.

(x) **Equipment Furniture**

- This will be furniture for the equipment.

4.6. VIDEO CONFERENCING SYSTEM

This video conference system shall be used for point to point and point to multipoint communication with parties in a different site/location. It shall provide for multipoint people + content through licensing. Also, the system shall provide for secure professional desktop/tablet video conferencing through the use of video conferencing system server that can allow sessions between various parties using Skype for business, Teams, or any other desktop/laptop or mobile application and with the necessary licenses for upto 500 users. Some of the equipment in this system are;

(i) Video Conferencing (VC) unit (Codec, Eagle Eye 4x camera, Microphone, Remote, Camera Mount)

- This conferencing unit shall be installed in some designated committee rooms and shall be used for carrying out video communications with parties on a remote site.
- It shall have Full HD capabilities and other features specified in equipment technical specification section below.

(ii) Ceiling Microphone Array

- This shall be a high quality microphone to be mounted in the ceiling and to be used with the video conferee system described above.

(iii) Eagle eye camera extender

- The VC decoder shall be placed in the committee control room. This means that the camera extender shall be required to extend the cable to the camera position inside the committee room.

(iv) Multipoint control unit Collaboration Server + System controller

- This shall be used to provide access for desktop/tablet video conferencing for upto 500 users within the network and outside

5. EQUIPMENT TECHNICAL SPECIFICATIONS

5.1 CONFERENCE ROOMS

(a) Video Equipment

(i) **Video Cameras**

The HD Conference Dome shall be an extremely compact and easy to install PTZ camera with an industry standard HD-SDI output for superb HD quality video.

The camera shall provide complete network-based control of all dome functionality including pan/tilt/zoom operation, pre-sets as well as web-based configuration of all dome settings.

The product shall have the following Features and Benefits

- HD 1080p and 720p resolutions
- 160x zoom (10x optical, 16x digital) autofocus camera and the latest digital imaging technology
- With 64 user-defined pre-sets the HD Conference Dome is not small on feature.
- Industry standard HD-SDI output
- Control and configuration via Ethernet
- Screen line option for displaying delegate names up to 16 characters
- 1/2.5-inch progressive scan CMOS sensor. With up to 1080p resolution and sensitivity to below 1.0 lux.
- Pan and tilt preset repeatability shall be accurate to within ± 0.1 degrees to ensure that the correct scene is captured every time.
- The HD Conference Dome shall deliver variable pan/tilt speeds from a crawl speed of only 1 degree per second up to an ultra-quick 120 degrees per second. The dome shall be capable of pan speeds of 360 degrees per second and tilt speeds of 100 degrees per second between prepositions.
- The HD Conference Dome shall provide a tilt range of 0 to 94 degrees, and a pan range of up to 360 degrees continuous rotation.
- It shall contain AutoScaling (proportional zoom) and AutoPivot (automatically rotates and flips the camera) features to ensure optimal control.
- It shall deliver three H.264 streams together with an M-JPEG stream in full

NB: * Inclusive of all accessories

(ii) 85" 4K LED Smart TV

- Screen Size
- Technology:
- TV Style:
- Aspect Ratio:
- Resolution:
- Picture Engine
- DTV Capability:
- Video formats supported
- Audio format
- Speakers:
- Other features
- Inputs supported:
- Outputs Supported:
- Wall mountable
- Operating system
- Wireless network
- Ethernet Connection
- Energy efficiency class
- Operating Power consumption
- 85"
- LCD-LED 4K Smart TV
- Flat screen, Flat panel
- 16:9 or 16:10
- 3,840 x 2,160 Pixels or better
- UHD Mastering Engine
- DVB-T (terrestrial digital TV), DVB-C (digital cable tv), DVB-S (satellite TV), DVB-T2 (terrestrial digital TV, 2nd gen.), DVB-S2
- 2160p (4K Ultra HD)
- Dolby Digital Plus
- Two built-in stereo speakers
- Picture-in-Picture (PIP), Bluetooth, Support for HbbTV
- Component (1), Composite Video (1), HDMI (3), USB (2), Stereo Audio
- Digital optical output (S/PDIF), HDMI. Stereo Audio
- Yes
- Tizen OS
- Wi-Fi
- Enabled
- A+
- 215W max

(b) **Delegate Conference System**

Note: Some of these equipment shall be found in the committee rooms and other in the control rooms

(i) **Chairman and Delegate units**

To be used for conferences, meetings and discussions.

Delegate Units

They shall enable delegates to speak, register a request-to-speak, register a response request, and listen to the speaker and vote. It shall have low susceptibility to interference from mobile phones. A socket shall be provided to connect the pluggable microphones. The flat-panel loudspeaker shall offer superior acoustics with minimal feedback, thus increasing intelligibility. It shall automatically be muted when the microphone is activated. It shall be possible to fold down the loudspeaker. There shall be five voting buttons for all kind of voting.

Chairman Unit

Chairman Unit includes a microphone priority button. When pressed, the priority button causes all currently active delegate microphones to be temporarily or permanently switched off, allowing the chairman to take control of the meeting. The chairman unit can also be used to start, stop or suspend voting, cancel a request-to-speak, turn off all active microphones and recall messages for display. There shall be five voting buttons for all kind of voting.

The units shall have the following **Features and Benefits**

- Long gooseneck microphones
- Chairman buttons for the chairman units
- Low susceptibility to mobile phones
- Compact, attractive delegate unit
- Built-in fold-away flat-panel loudspeaker
- Five voting buttons
- Language selection and multi-lingual user instructions
- Cable connections located underneath the unit
- External present and fraud contact
- Headphones
- Request-to-speak information and confirmation
- Public and personal messages
- Card reader capability

- Tri-color indicator above the microphone button:
 - Red microphone on indicator
 - Green ‘Request-to-speak’ confirmation indicator
 - Yellow ‘VIP’ indicator. ‘VIP’ is lit when the delegate unit is part of the notebook, which is only available when PC control software is used

System components:

1. *Goosenecks (480mm Stem Length)*

2. *Microphone Stations*

Chair and Delegate Microphone Stations for permanent installation or mobile use

3. *Connecting Cables*

Headphone connection

- | | |
|----------------------|--------------------|
| • Frequency response | • 30 Hz to 20 kHz |
| • Load impedance | • >32 ohm |
| • Output power | • 2 x 15 mW/32 ohm |

Headset connection

- | | |
|-----------------------------------|--|
| • Nominal microphone input level | • 7 mVrms |
| • Overload microphone input level | • >124 mVrms |
| • Element | • Electret condenser |
| • Polar pattern | • Omni directional |
| • Operating voltage | • 5 VDC |
| • Sensitivity | • 62 dB at 1200 ohm (0 dB = 1 V/mbar at 1 kHz) |

(ii) **Central Control Unit System**

The Central Control Unit (CCU) includes features for controlling wired delegate microphones, distributing simultaneous interpretation and conducting voting sessions, all without an operator. It shall be combined with a PC to make more features possible. Also, it shall be possible for users to access an extensive range of software modules, each with a specific function in controlling and monitoring a conference.

In the event of PC failure, this Central Control Unit shall revert to its stand-alone operation mode, enabling the conference to proceed.

It shall allow connection of all the delegate + chairman units and the interpreters. Wiring to the delegates' and interpreters' positions shall be via a special 4-core cable with purpose-designed 6-pole connectors. The connectors shall have a pole configuration that conforms to the DIN specifications for 6-pole connectors. It shall use series cabling (loop-through or series-connected branch topology) for interconnection of the contribution equipment. The contribution equipment shall be free standing (table-top units) or built-in to furnishings (flush-mounted units). The modular principle of system configuration and the loop-through interconnection technique shall remain the same for both types of equipment.

- The conference rooms to have a PC based management system to control all facilities specific to a room as follows;
- Control of microphones so as that delegates can continue in an orderly fashion.
- Graphic image of the room indicating the sitting layout
- Switching off units that are not in use remotely
- Priority control and override facility for the Chairperson
- Control of speech time
- Speaker queue list
- Configuration of CCU and system via a display and a single rotary push button
- Basic voting control for parliamentary voting procedure.
- Delegates can register 'Present', 'Yes', 'No' and 'Abstain'.
- Distribution of up to 31 language channels plus floor to Integrus receivers, DCN wired channel selectors
- Stand-alone automatic camera control.

The softwares and licenses to be supplied by this unit shall provide for the following among others,

- Delegate system control softwares.
- Management of the sitting arrangement based on delegate identification cards,
- Voting system and tallying. It shall also provide complete analysis of the vote

among other voting features.

- It shall have database management softwares and licenses that can be used for various analysis and displays.
- Allow for seat identification based on identification cards.
- It shall also provide for camera control and management software and licenses.

In summary, the software and licenses to be supplied with this system are;

- PC Control Software
- System Installation
- Microphone Management
- Delegate Database
- Among others

The above softwares and licenses shall be supplied as a unit with the central control unit for proper operation as described above. They shall be installed in the PC to be housed in each committee control room.

NB

*** some of these components are to be housed in control room (see control room equipment)**

The product shall have the following Technical Specifications

Electrical

- Supply voltage 115/230 V +/- 10 %
- Power consumption 200 W
- DCN system supply 40 VDC, max 65 W per DCN socket
- Optical network supply 40 VDC, max 65 W
- Total supply power 130 W
- RS-232 connection 2 x nine-pole Sub-D female socket
- Frequency response 30Hz – 20 kHz (-3dB at nominal level)
- THD at nominal level < 0.5 %
- Cross talk attenuation > 85 dB at 1 kHz
- Dynamic range > 90 dB
- Signal-to-noise ratio > 87 dBA

Audio inputs

- XLR nominal input 12 dBV (+/- 6dB)
- XLR maximum input +12 dBV
- Cinch nominal input 24 dBV (+/- 6dB)
- Cinch maximum input +0 dBV

Audio outputs

- XLR nominal output 12 dBV (+6/- 24 dB)
- XLR maximum output +12 dBV
- Cinch nominal output 24 dBV (+6/- 24 dB)
- Cinch maximum output +0 dBV

(iii) **Interpreter Units**

The system shall include provision for simultaneous interpretation facilities on up to 31 language channels, with a maximum of six interpreter desks able to be connected in each booth.

The interpretation system shall provide control facilities for the routing of floor and relay languages to the interpreters, and for the distribution of interpretation and floor languages to delegates.

System operator

The interpretation system shall include pre-setting facilities for language channel allocation, routing and interlocks under control of the system operator. This shall be carried out from the install mode of the Interpreter Desk.

It shall be possible for the interpreter to allocate the interpretation languages freely to the 31 interpretation channels, and to edit these language allocations whenever required.

Each Interpreter Desk shall have two language channels, A and B. Channel A shall normally be used for output languages directly interpreted from the floor language, and channel B shall be used for an output language for relay interpretation.

Each interpreter shall be able to pre-set and edit the language channel routings on both A and B channels on his/her Interpreter Desk. The interpreter shall be able to assign free selection of output language channel number on interpretation channel B. Three microphone interlock settings for between booths shall be available on Interpreter Desks. These settings shall determine whether microphones have to be switched off before other microphones can become active, or whether an override facility can be implemented, or neither.

The product shall have the following Features and Benefits

- Low susceptibility to mobile phones
- Up to 31 interpretation channels and the original floor language with an audio bandwidth of 20 kHz
- A graphic LCD with backlighting for bright information display under low light level conditions
- 5 pre-select keys for relay languages with activation indication at the display

- Microphone push button with a red or green illuminated ring
- Light- or dark-colored base
- Built-in loudspeaker with language channel selector
- Speech timer to indicate elapsed time of interpretation
- Help request to an operator or usher
- Booth telephone and intercom indicator
- Goosenecks (480mm Stem Length) + Headphones
- Automatic headset selection when headset connected
- Easy programming via menus on the display after entering the programming mode
- Mute key
- Help key
- Slow (speak slowly) key
- LCD with backlighting, showing selected relay language with channel numbers, abbreviated names and quality indicators. Also the selected loudspeaker channel with abbreviated name is shown

The product shall have the following Technical Specifications

Electrical

Headphone connection

- | | |
|----------------------|------------------|
| • Frequency response | 30 Hz – 20 kHz |
| • Load impedance | > 32 ohm |
| • Output power | 2 x 30 mW/32 ohm |

Headset connection

- | | |
|-----------------------------------|----------------|
| • Frequency response | 30 Hz – 20 kHz |
| • Load impedance | > 32 ohm |
| • Output power | 60 mW / 32 ohm |
| • Nominal microphone input level | 7 mVrms |
| • Overload microphone input level | >124 mVrms |

(iv) **ID Card Encoder**

ID card encoder shall be used in combination with the ID Card Encoder software. The ID card encoder shall encode delegate ID cards

The product shall be or similar to: DCN-IDENC ID Card Encoder (USB) and shall be used with (DCN-IDENC) and DCN-SW Conference Software. It is used in combination with the following Conference software modules: ID Card Encoder, Delegate Database and Conference Software Main module.

The product shall have the following Technical Specifications

Electrical

- Power supply Through USB bus
- Indication on top of unit One dual state green LED
- Operating System XP, Server2003, Vista
- ID card supported DCN-IDCRD

Mechanical

- Dimensions 90x 70 x 16.5 mm
- Weight 145 g

(v) **ID Cards**

IC cards shall be standard credit-card format ID cards. The ID cards shall be used by delegates to identify them to the conference system.

The product shall have the following Features and Benefits

- Attractive design
- Ample space for a name or other delegate personal information.
- Clear instructions showing how to insert the card into a reader.

The product shall have the following Technical Specifications

Mechanical

Dimensions (HxW) 85 x 54 mm

The product shall be or similar to: Bosch DCN-IDCRD ID Card

Other Audio Equipment in the Committee rooms

(vi) **Wireless Handheld Microphone**

It shall be a high quality dynamic Vocal Microphone to be used in the committee rooms for participants without the delegate systems. It shall be supplied with the desktop stands. It shall have a tailored frequency response is smooth and extended and should be less susceptible to feedback in high volume settings.

It shall have the following features among others;

- Microphone Type: Dynamic (moving coil)
- Polar Pattern: Cardioid (unidirectional)
- Frequency Response: 60 to 15,000 Hz
- Polarity: Positive pressure on diaphragm produces positive voltage on pin 2 relative to pin 3 of microphone output

	connector
Output Impedance:	(at 1000 Hz) 300 ohms
Sensitivity:	(at 1000 Hz) -53 dBV/Pa, (2.2 mV), 1 Pascal=94 dB SPL
Electromagnetic Hum Sensitivity:	26 dB equivalent SPL in a 1 millioersted field (60 Hz)
Switch:	Built-in On/Off switch
Connector:	Three-pin professional audio connector (male XLR type)
Environmental Conditions:	A temperature range of -29 to 57 degrees Celsius (-20 to 135 degrees Fahrenheit), and at a relative humidity of 0 to 95%.

(vii) **Column Speakers**

The speakers shall be column/wall mounted to provide less feedback to the delegate microphone systems. It shall be white in color with the minimums specifications as follows;

Frequency response	150 Hz - 16 kHz
Sensitivity (1 W, 1 m) (combined)	90 dB
Speaker component	10 cm cone-type x 2
Rated input	20 W
Tappings	100V line: 20W (500Ω), 10W (1KΩ), 5W (2KΩ), 2.5W (4KΩ) 70V line: 10W (500Ω), 5W (1KΩ), 2.5W (2KΩ), 1.3W (4KΩ)
Rated impedance	70 V, 100 V
Dimensions (W x H x D)	135 x 250 x 128 mm
Dimensions (ø x D)	x 128 mm
Finish	HIPS resin, paint, off-white (RAL 9010 or equivalent)
Operating temperature	-10°C to +50°C

C Presentation Equipment

(i) **Table Top**

This Table Mount Modular Multi-Connection Solution shall feature a black anodized aluminium, manually retractable lid. A complete TBUS system requires the enclosure, an inner frame, a power socket, inserts, and a power cord.

It shall be consist of;

- Table Top enclosure & Inner frame

- Dual Power Outlets
- HDMI Ports
- RJ45

Physical

- Cutout Size: 110mm diameter

Accessories

- Included: enclosure, cut-out template, template screws, self-locking ties
- Optional: Inner frames, passive wall plates and interfaces, power socket kits, power cord, inserts

Product Dimension

- 26.00cm x 17.20cm x 15.13cm (10.24" x 6.77" x 5.96") W, D, H

Product Weight

- 2.0kg (4.4lbs) approx.

(ii) **HDMI - CAT6 Transmitter**

The transmitter shall be used to convert HDMI signals to be transmitted via HDBaseT twisted pair cable. It shall be have a maximum Data Rate of 10.2Gbps (3.4Gbps per graphic channel) and HDTV Compatible. It shall be HDMI Support - Deep Color, x.v.Color™, Lip Sync, HDMI Uncompressed Audio Channels, Dolby TrueHD, DTS-HD,CEC with 2K & 4K Support.

The transmitter shall be Bidirectional RS-232 & IR Interface. - Commands and data can flow in both directions via the RS-232 interface, allowing status requests and remote control of the destination unit. Is shall have System Range - Up to 130m (430ft) normal mode; up to 180m (590ft) ultra-mode (1080p @60Hz @24bpp) when using BC-HDKat6a cables.

It shall have the following specifications;

Inputs:	1 HDMI Connector.
Outputs:	1 HDBaset Twisted Pair RJ-45 Connector.
Ports:	1 IR On A 3.5mm Mini Jack, 1 RS-232 On A 9-Pin
Max. Data Rate:	10.2gbps (3.4gbps Per Graphic Channel).
RS-232 Baud Rate:	115200.
Compliance With HDMI Standard:	Supports HDMI and HDCP.
Power Consumption:	12v DC, 295ma.
Operating Temperature:	0° To 40°C (32° To 104°F).
Storage Temperature:	-40° To +70°C (-40° To 158°F).
Humidity:	10% To 90%, RHL Non-Condensing.

(iii) **CAT6 – HDMI Receiver**

The transmitter shall be used to receive HDBaseT twisted pair signal from the transmitter and convert it back into HDMI. It shall have a maximum Data Rate of 10.2Gbps (3.4Gbps per graphic channel) and HDTV Compatible. It shall support - Deep Color, x.v.Color™, Lip Sync, HDMI Uncompressed Audio Channels, Dolby TrueHD, DTS-HD,CEC with 2K & 4K Support.

The transmitter shall be Bidirectional RS-232 & IR Interface. - Commands and data can flow in both directions via the RS-232 interface, allowing status requests and remote control of the destination unit. It shall have System Range - Up to 130m (430ft) normal mode; up to 180m (590ft) ultra mode (1080p @60Hz @24bpp) when using BC-HDKat6a cables.

It shall have the following specifications;

Inputs:	1 HDBaseT twisted pair RJ-45 connector.
Outputs:	1 HDMI connector.
Ports:	1 IR on a 3.5mm mini jack, 1 RS-232 on a 9-pin D-sub connector.
Max. Data Rate:	10.2Gbps (3.4Gbps per graphic channel).
RS-232 Baud Rate:	115200.
Compliance With HDMI Standard:	Supports HDMI and HDCP.
Power Consumption:	12V DC, 500mA.
Operating Temperature:	0° to 40°C (32° to 104°F).
Storage Temperature:	-40° to +70°C (-40° to 158°F).
Humidity:	10% to 90%, RHL non-condensing.

(iv) **Wireless presentation system**

This equipment shall be used for connecting the source of the presentation to the display wirelessly. It shall be able to provide easy connection where users simply plug a USB-powered device wireless device into their PC or Mac and click the button to get the content from their laptop on the large meeting room screen. It shall have the following features;

- Wireless connection to central screen
- Up to 2 users on-screen
- Share from laptop, tablet or smartphone
- Enhanced security features
- Touch back support
- Central management

It shall have the following specifications;

- Power supply Standard
 - Power consumption
 - Operation:
 - Standby:
 - Operating system
 - Video outputs
 - Google Cast Support
 - Frame rate
 - Output resolution
 - Noise Level
 - Number of sources simultaneous on screen
 - Number of simultaneous connections
 - Audio
 - iPad, iPhone and Android compatibility
 - Authentication protocol
 - Wireless transmission
 - Frequency band
 - Connections
 - Temperature range
- 110/220 V AC plug or Power over Ethernet (PoE Plus)
 - 6W (typical) / 18W (max)
 - 2.6W (ECO standby) / 0.4W (Deep standby)
 - Windows 7/8/8.1/10 32 & 64 bit
 - macOS 10.12/10.13/10.14 (Mojave)
 - Android v7 & v8 & 8.1 (ClickShare app)
 - iOS 10, 11 & 12 (ClickShare app)
 - 1x HDMI
 - Android 9
 - Up to 30 fps
 - 1920x1080
 - Fanless
 - 2
 - 16
 - Via HDMI, analog via Audio Jack 3.5mm, S/PDIF
 - Sharing of documents, browser, camera for both Android and iOS devices via ClickShare app
 - WPA2-PSK in standalone mode
 - WPA2-PSK or IEEE 802.1X in network integration mode
 - protocol IEEE 802.11 a/g/n
 - 2.4 GHZ and 5 GHz (DFS channels not supported)
 - 1x Ethernet LAN 100Mbit
 - 2x (back) + 1x (front) USB
 - Audio analog line out on mini jack socket (3.5mm), digital S/PDIF
 - Operating: 0°C to +40°C (+32°F to +104°F)
 - Max: 35°C (95°F) at 3000m
 - Storage: -20°C to +60°C (-4°F to +140°F)

5.2. CONFERENCE/COMMITTEE CONTROL ROOM

A Video Equipment

(i) Production digital video switcher

This item shall be a 12 channel professional switcher with real Full 1080p/60 (3G) High Definition support, featuring at least 12 digital inputs including 8 SDI and 4 HDMI inputs with embedded audio, 5 SDI and 1 HDMI outputs for connecting HD recorder, external monitors and etc.

It shall be used for live events and TV programs that need to mix a variety of video and audio sources with easy-to-use effects, including Chroma / Luma Key, DSK, PIP, Wipe Generator, Still stores, logo insertion and built-in title overlay system. It shall consist of a 17.3-inch Full HD 1080p video monitor and shall offer an easy-to-use video streaming and recording device for professional video producers for simultaneous streaming of a live committee room events and record the master quality version for post-event editing.

It shall have a minimum of the following features;

Summary of all features

- 12 channel 1080p video switching, recording and streaming
- 12 Total Video input interfaces (8 x SDI, 4 x HDMI)
- Broadcast quality H.264 media streaming over RTMP(S), RTSP, TS, HLS and SRT for sending videos to broadcast platforms like Facebook, Youtube
- Record on SD Card for post-production
- Pre-saved multiple sets of animation files and background pictures
- 9 Video Output: 5 x SDI + 1 HDMI + 3 x HDMI (Program OUT only)
- 4 Upstream Keyers, supporting Chroma key & Linear / Luma key
- 4 PIP (assignable to any of keyers)
- DSK, supporting Linear & Luma Key Modes
- Logo insertion (Animation logo, X/Y size)
- Wipe, Mix, DVE, Cut and Stinger Transitions
- 32 Wipe patterns including Circle & Heart, and Borders & Softness Control
- Clip player (150 Frames) Stinger Transitions function
- Any Input (1-12) can be used as a Frame store (Stills Store)
- Video and Audio Crosspoint Assignments (XPT)
- 4 x XLR Analogue Audio Inputs
- 2 x XLR De-embedded Analogue Audio Outputs
- Tally output
- USB Port for FW upgrade

(ii) **Character Generator**

This item shall be windows-based character generator designed for live production and post-production. It shall provide for different functions assignment to different sub-programs. It shall be equipped with a Decklink HD Extreme 4K Card to work as a downstream keyer, upstream keyer, or as key and fill sources, and it shall be supplied with necessary softwares for proper operation

It shall support the following features;

DSK: Supports both downstream keying (DSK) and key & fill.

Characters: Anti-aliased characters with leading, kerning and tracking, with two edge and three shadow styles for each character.

Color Support: 32-bit color support (with transparency). Color can be selected by adjusting RGB or HLS levels.

Shapes: Up to 32 shapes per page. Each shape can be set to a solid color, semi-transparent color, a color gradient, or a texture. The shapes can be edged, colored, sized, italicized and rotated just like text characters.

Logos: Up to 16 full-color logos can be fine-positioned, overlapped, sized, etc. just like characters. Compatible with DeckLink HD Extreme 4K.

Banner Crawl & Snypers: Continuously-rolling text crawls, corner graphics and animations over your outgoing program.

Gradient Support: Create smooth gradients between any 2 colors in the characters, edges, shadows and shapes.

Custom Texture Support: Character attributes can be drawn with custom textures (marble, wood grain, etc). (Up to 16 textures per page)

1000 Layers: Text, logos and shapes can be placed on multiple layers, each independent of the others. Layers can be named.

Many Formats Supported: Support for BMP, JPG, GIF, PCX, TIF and TGA images.

Text-Style Gallery: Text Style Gallery - One button access to your 64 user-defined text styles.

True Type: Typefaces - each page can use up to 25 True type different typefaces.

Independent Lettering: Character height, width, angle and rotation all customizable and independent from letter to letter.

Variable Blurring: Variable character and edge blurs, independent of each other.

It shall have the following specifications;

- Resolution
- Blackmagic Decklink HD Extreme 4K Card
- 320x240 to 1080i HD
- Video Inputs: 2x HD/SD-SDI
- Video Outputs: 2x HD/SD-SDI, 1x HDMI
- Supported Formats: NTSC, PAL, 720p, 1080i, 1080p

- Video Signal
- Compatible Video Keyer
- RSS Feed
- Remote Control
- HD and SD
- T200 or Decklink
- Via API
- RSS232 or IP

(iii) Desktop Computer

This items shall be used in each control room for running AV System control related softwares and performing other necessary computer related operations within the control rooms. It shall comprise of a CPU, 19” LCD display, Keyboard, Mouse, latest operating system, and any other accessory for proper operations.

It shall have the following specifications

- Processor: Intel® Core™ i7-6700
- Front I/O: 2 USB 3.0, 1 USB 2.0, 1 USB 2.0 Charging Data Port, 1 Headphone, and 1 Microphone.
- Internal I/O: 1 USB 3.0 and 3 USB 2.0 ports available as 2 separate 2x10 (3.0 x1, 2.0 x1) and 2x5 (2.0 x2) header:
- Supports: 1 HP Internal USB 2.0 Port Kit and 1 USB 3.0 Media Card Reader.
- Rear I/O: 1 DVI-I Single Link and 2 DisplayPort (DP 1.2) outputs from Intel® HD graphics (available on specific processors only); 4 USB 3.0 ports, 2 USB 2.0 ports, 1 serial port (optional), 1 parallel port (optional), 2 PS/2, RJ-45 (LoM), 1 Audio Line-in, and 1 Audio Line-out, Microphone; 2 IEEE 1394b ports (optio
- Temperature Operating: 40° to 95°F (5° to 35°C)
- Temperature Non-operating: -40° to 140°F (-40° to 60°C)
- Chipset: Intel® C236 chipset
- Memory: 4 DIMM slots, supporting up to 64GB ECC/non-ECC, DDR4 2133 MT/s
- Monitors / Displays: 21.5-inch IPS LED Backlit Monitor
- Hard Drives: 2.0TB SATA 7200 rpm 6Gb/s 3.5" HDD
- PCIe SSDs: HP Z Turbo Drive G2 512GB SSD
- Memory: HP 8GB DDR4-2133 ECC RAM
- Integrated Graphics: Intel® HD Graphics 530 (on Core i3/i5/i7-6xxx processors); Intel® Integrated Graphics for Xeon processors
- Operating Voltage Range: 90-269 VAC
- Rated Voltage Range: 100-240 VAC
- Rated Line Frequency: 50-60 Hz

Operating Line Frequency Range: 47-66 Hz

Rated Input Current: 6A @ 100-240V

(iv) 32" LED Smart TV

- Screen Size
- Technology:
- TV Style:
- Aspect Ratio:
- Resolution:
- Picture Engine
- Processor
- DTV Capability:
- Data Broadcasting
- Audio format
- Speakers:
- Other features
- Inputs supported:
- Outputs Supported:
- Wall mountable
- Operating system
- Wireless network
- Ethernet Connection
- Energy efficiency class
- 32"
- LED FHD Smart TV
- Flat screen, Flat panel
- 16:9
- 1920 x 1080 Pixels or better
- HyperReal
- Quad Core
- DVB-T2/C/S2
- HbbTV(CZ,SK,PL,DE,AT,CH,-
FR,PT,ES,BE,NL,LU,HU)
- MHEG 5 (GB,IS,UK)
- Dolby Digital Plus
- 20W Two built-in stereo speakers
- Picture-in-Picture (PIP), Bluetooth, Support for HbbTV
- Component (1), Composite Video (1), HDMI (3), USB (2), Stereo Audio
- Digital optical output (S/PDIF), HDMI. Stereo Audio
- Yes
- Tizen OS
- Wi-Fi
- Enabled
- A+

(v) Hard Drive Video Recorder

This shall be a 2.5" hard disk video recorder and player, with a removable drive enclosure to be used for recording captured content from the committee rooms. It record in standard and high definition video equipment via SDI, with a convenient loop thru output. RS-422 and 232 remote control interfaces are standard. It shall supports 1080p, 1080i, 720p, 576i, 480i video formats and provides a choice of recording in MPEG-II Long-GOP or intra-frame (i-frame) with 4:2:2 color sampling.

It shall have the following minimum features

- HD/SD-SDI HDD Recorder with two removable HDD Enclosure for SATA HDD/SSD solid state device
- Video resolutions: -1920x1080 50i/59.94i/60i, 1920x1080 24p/23,96p
-1280x720 50P/59.94P/60P
-720x576i or 720x480i
- Support NTFS format, no 2GB/4GB file limitation
- HD/SDI input, output and loop thru with embedded audio
- HDMI output with embedded audio
- 2-CH balanced audio inputs, support embedded Audio
2x Balanced XLR (Stereo pair)
- 2-CH balanced audio outputs: 2x Balanced XLR (Stereo pair)
- Audio level indicators, earphone interface for audio monitoring with volume control
- External Gen-Lock input and loop thru (B.B or tri-level)
- Time code(TC) input and loop thru
- RS-232/422 and GPI remote interface
- SD mode recording:
 - Selectable 8, 15, 30 or 50 Mbps Long GOP 4:2:0 or 4:2:2
 - 25 or 50 Mbps i-frame only 8-bit 4:2:2
- HD mode recording:
 - Selectable 10, 25, 35, 65 or 100 Mbps Long GOP 4:2:0 or 4:2:2
 - 100/125 Mbps i-frame 8-bit 4:2:2
- Recording file formats: MXF/OP1A, MOV quick time* (*. MOV quick time by future firmware upgrade)
- Recording Media: Removable Hard Drive / SSD, transfer data via USB2.0
- Video Recording Bit Rate / Color Sampling
MPEG2 Long GOP HD:
 1. 10Mbps 4:2:0 1440x1080/1280x720,
 2. 25Mbps 4:2:0 1440x1080/1280x720,
 3. 35Mbps 4:2:2 1920x1080/1280x720,
 4. 50Mbps 4:2:2 1920x1080/1280x720,
 5. 65Mbps 4:2:2 1920x1080/1280x720,
 6. 120Mbps 4:2:2 1920x1080/1280x720,MPEG2 Long GOP SD
 1. 8Mbps 4:2:0 720x480/720x576
 2. 15Mbps 4:2:2 720x480/720x576
 3. 30Mbps 4:2:2 720x480/720x576

4. 50Mbps 4:2:2 720x480/720x576

MPEG2 I-Frame Only HD

1. 80Mbps 4:2:2 1920x1080/128

- Power: DC 12 Volt, 16 watt

(vi) **HD Camera control/Tracking**

This shall be a versatile, high – performance multiviewer for 3G HD–SDI video signals for connecting and controlling the committee cameras. The device can display up to six inputs in any combination and output the image in SDI, HDMI and CV formats.

It shall have the following features

- Max. Data Rate — 3Gbps.
- HDTV Compatible.
- Multi–Standard Operation — SDI (SMPTE 259M), HD–SDI (SMPTE 292M) and 3G HD–SDI (SMPTE 424M).
- Re–Clocking Looping Inputs.
- Multi–Video Output Formats — 3G HD–SDI (SMPTE 424M), HDMI and composite, scaling, refresh rate and video standard conversion.
- Front Panel Preview Screen — 16:9 4.3in color LCD displaying the output of the unit.
- Text Overlay — A text label/icon can be added inside each window. Each label has text/background color, alignment, size, etc settings.
- Screen Handling Buttons — Freeze, size, position, and 4 pre–programmed and 2 user–definable layouts.
- Flexible Control Options — Front panel with 2–row LCD, OSD, Ethernet & RS–232 (supplied with PC control software).
- Worldwide Power Supply — 100–240V AC.
-

It shall have the following specifications

- Inputs: 6 SD/HD/3G HD-SDI on BNC connectors
- Outputs: 1 HDMI, 1 CV on a BNC connector (for 720p @ 50 Hz and 1920p @ 50 Hz, the output is PAL; for 720p @ 59.94/60 Hz and 1920p @ 59.94/60 Hz, the output is NTSC)
1 SD/HD/3G HD-SDI on a BNC connector
- Maximum Level: Input & Output: 800 mVpp/75 Ω
- Maximum Data Rate: Up to 2.97 Gbps
- Controls: Front panel, RS-232, and Ethernet
- LCD Front Panel Display: 4.3" (10.92 cm) TFT color LCD panel

- Power Consumption: Universal 100 to 240 VAC, 50/60 Hz, 35 VA
- Operating Temperature: 32 to 131°F (0 to 55°C)
- Storage Temperature: -49 to 162°F (-45 to 72°C)
- Humidity: 10 to 90% RH (non-condensing)
- Mounting: Rack mountable (2U)

(vii) 24 port floor edge POE switch

This shall be a POE switch with the ability to deliver data, voice, and video services, equipped with 28 Gigabit network ports, including two GbE combo ports supporting fiber connectivity and two SFP slots. The non-fiber ports are also PoE+ compliant supporting the 802.3af and 802.3at PoE network standards with a maximum PoE power budget of up to 382W.

It shall have the following features

Ports:	24 x 10/100/1000 Mb/s Gigabit Ethernet (RJ45) PoE+ 2 x 10/100/1000 Mb/s Gigabit Combo (Ethernet/SFP) 2 x SFP
Layer Services Supported:	Layer 2 Support, Layer 3 Support
Supported Protocols:	Auto-VoIP, Head-of-Line (HOL) Blocking IGMP Snooping IPv6 Link Aggregation
Queuing:	Strict Priority, Weighted Round Robin (WRR)
Jumbo Frames Support:	9216 Bytes
MAC Address Table Size:	16K
Multicast Groups:	1000
VLAN Groups:	4096

B Audio Equipment

(i) Audio mixer

This shall be used for mixing and processing various audio signals from different sources and relaying it to an audio amplifier for amplification. It shall be an eight-channel modular mixer/preamplifier that delivers professional-quality audio with a wide frequency response, low noise, and low distortion for accurate reproduction. The balanced, transformer-isolated terminal block output connector shall have a selectable impedance for a wider variety of output options.

It shall have a master volume and individual volume control for each input

It shall have the following features among others;

- Output Power • +4 dBm, +20 dBm (Max)
- Power Bandwidth • 30Hz - 20kHz, +20 dBm 0.5% THD
250Hz - 20kHz, +18 dBm 0.5% THD
- Frequency Response • 20Hz - 20kHz
- Total Harmonic Distortion (THD) • 0.01%
- Inputs • 8 x Module Slots, Each Accepts Any Input Module
1 x Bridging In/Out RCA Jack
- Input Sensitivity • Module Slots: 100mV
Bridging In/Out: 100mV
- Input Impedance • Module Slots: 10 k ohms
Bridging In/Out: 3.3 k ohms
- Outputs • Main: Balanced Terminal Block, 150/600 ohms
Aux: Unbalanced RCA Jack, 10 k ohms
- Output Regulation • Less than 1.5dB
- Dynamic Range • 90dB @ Min. Volume
77dB @ Max. Volume
- Tone Control • +/-10dB Bass and Treble
- Indicators • LEDs for Power, Peak, Protect, Signal, and Normal
- Protection • Self-Protection with Internal AC Fuses
- Power Consumption • 18W
- Temperature Range • 12 to 140°F (-10 to +60°C)

(ii) Audio Amplifier

This item shall be used to amplify the audio power of signals from mixer. It shall be rated 120w and shall be used to connect the speakers inside the committee rooms. It shall be rack mounted and with the following features among others

- Wide Frequency Response
- Low Noise and Distortion
- 25V, 70V, and 8 ohm transformer-isolated outputs
- Direct input for connection of an audio source
- Direct low-impedance output mode for non-transformer operation
- Selectable Input Sensitivity
- Protection circuitry for overload, short circuit and overheating
- Turn-on delay disconnects output at power-up
- Master volume control

- Status indicators for normal, clip, power, protect, and signal
- Volume control security knob

It shall have the following specifications

- | | |
|-----------------------------------|---|
| • Output Power | • 120 watt |
| • Input Sensitivity | • 100 mV or 1000 mV (Switchable) |
| • Input Impedance | • 10 k ohms |
| • Dynamic Range | • 108 dB (0 dBV, 1000 mV)
90 dB (-20 dBV, 100 mV) |
| • Frequency Response | • 20Hz - 20kHz |
| • Total Harmonic Distortion (THD) | • 0.01% |
| • Input Connections | • 1 x Direct Input
1 x Module Slot (Optional Modules Include XLR, 1/4", etc) |
| • Output Connectors | • Rear Panel Barrier Strip |
| • Controls Front Panel | • Power Switch, Volume Control |
| • Controls (Rear) | • Input Sensitivity Switch, Direct/Transformer Switch, Low Cut Switch |
| • Indicators | • Front-Panel LEDs for Normal, Clip, Power, Protect, and Signal |
| • Power Consumption | • 180W |

(iii) Powered Speakers/Audio monitors

These shall be standalone audio system that shall be used inside the control room to monitors the audio from the systems within the control room. Is shall comprise of powered speakers to be connected to computer on any system that need audio monitoring within the control rooms. It shall consist of two monitor where each monitor speaker produces a frequency response of 80 Hz to 20 kHz via a 3.5" Kevlar woofer and a 1" silk dome tweeter powered by a 25W class AB amplifier. The monitors can handle 100 dB maximum peak SPL. A rear bass-reflex port provides enhanced low-frequency range.

It shall have at least the following Specifications

Speakers

- | | |
|-------------|--------------------------------|
| • LF Driver | • 3.5" / 89 mm Kevlar speaker |
| • HF Driver | • 1" / 25 mm silk dome tweeter |

I/O

- Inputs
 - 2 x balanced 1/4" TRS
 - 2 x unbalanced RCA (L/R pair)
 - 1 x 1/8" (3.5 mm) TRS stereo mini-jack
- Outputs
 - 1 x 1/8" (3.5 mm) TRS stereo mini-jack

Performance

- Frequency Response
 - 80 Hz to 20 kHz
- Crossover Frequency
 - 2.8 kHz
- Amplifier Power
 - 25 W per speaker
- Maximum SPL
 - At 1 m: 100 dB (peak)
- Input Impedance
 - 10 kOhms

User Controls

- Volume Management
 - A-type taper
- Mid Frequency Driver
 - Control: variable (-6 to +6 dB, center @ 100 Hz)
- High Frequency Driver
 - Control: variable (-6 to +6 dB, center @ 10 kHz)
- Protection
 - RF interference
 - Output-current limiting
 - Over-temperature
 - Turn on/off transient
 - Subsonic filter
 - External mains fuse

Power

- Power Requirements
 - 100 to 120 VAC at 50/60 Hz, or 220 to 240 VAC at 50/60 Hz

(iv) Central Control Unit

Discussed in B(ii) of the committee rooms above

(v) HDMI Audio De-embedder

This item shall be a high-performance HDMI audio de-embedder to be used to de-embed audio from the HDMI input or from the HDMI output Audio Return channel to S/PDIF, TOSLINK® and analog audio outputs simultaneously. It shall be used in the control room and connected to the mixer. It shall have the following minimum features

- Max. Data Rate — 6.75Gbps (2.25Gbps per graphic channel).
- HDCP Compliant.
- HDTV Compatible.
- EDID Pass-through — Pass-through algorithm ensures Plug and Play operation for

HDMI source and display systems.

- Kramer re-Klocking™ and Equalization Technology — Rebuilds the digital signal to travel longer distances.
- HDMI Support — ARC and HDMI Uncompressed Audio Channels.
- Auto Format Detection — Digital RGB or YPbPr.

It shall have the following specifications

- Inputs
 - 1x HDMI connector
- Outputs
 - 1x HDMI connector
 - 1x TOSLINK digital audio
 - 1x S/PDIF digital audio on an RCA connector
 - 1x 3.5mm unbalanced stereo analog audio
- Maximum Data Rate
 - Supports up to 6.75 Gb/s (2.25 Gb/s per graphic channel), 1080p @60Hz, 36-bit deep color
- Compliance With HDMI Standard
 - Supports HDMI and HDCP 1.4
- Controls
 - Audio source select button
- Indicators
 - ON, Input, Output
- Power Consumption
 - 5 VDC, 600 mA

(vi) Audio Isolation Transformer

This item shall be used to remove hum and buzz created by ground loops. This unwanted noise made of small AC power currents flowing in the shield of audio cables is caused by normal voltage differences in the system grounding points between different pieces of equipment. This shall be easy to use system used to eliminate audio noise caused by ground loops. It shall have low signal loss and low distortion and be a passive device (No power required).

It shall have the following specifications

- Impedance
 - 600 Ohm $\pm 10\%$ (input & output)
- Bandwidth
 - 20 Hz - 20 kHz ± 0.3 dB
- THD
 - 1 kHz: $<0.015\%$ @ 4 dBu
 - 20 Hz: 0.05% @ 4 dBu
- Insertion Loss
 - <0.5 dB
- Turns Ratio
 - 1:1
- Inputs
 - 2 x XLR (ch1 and ch2)
- Outputs
 - 2 x XLR (ch1 and ch2)

(vii) Audio Delay/Mixer

This shall be 1U rack mounted 6 Channel Audio Delay/Mixer with Level Adjustment for synchronizing the audio with the image at the multiviewer system. It shall have the following features

- 4 Channel balanced audio inputs and 4 channel balanced audio outputs
- 2 Channel AUX inputs selectable of Mic/Line level and 2 channel unbalanced-audio outputs
- 6 Channel audio mixer and matrix router to 4 channel audio outputs
- Support up to 3sec audio delay adjustment for each input channel
- Audio level adjustment of each input

It shall have the following specifications

AUX Section

- | | |
|-------------------------|------------------------|
| • Impedance | • 2 kOhms / 3 kOhms |
| • Connector | • 2 x 3-pin XLR Female |
| • Mic Gain Range | • 40 dB / 60 dB |
| • Line Gain Range | • off to 12 ±3 dB |
| • THD+N | • 0.01 % |
| • Signal to Noise Ratio | • 80 min dB |
| • Frequency Response | • 20 Hz - 20 kHz ±3 dB |

Audio Input

- | | |
|-------------------------|---|
| • Connectors | • 4 x 3-pin XLR female
2 x RCA, unbalanced (L/R) |
| • Input Impedance | • 25 kOhms |
| • Gain Range | • off to 12 ±3 dB |
| • THD+N | • 0.01 % |
| • Frequency Response | • 20 Hz - 20 kHz ±3 dB |
| • Signal to Noise Ratio | • 80 dB |
| • Impedance | • 15 kOhms |

Audio Output

- | | |
|----------------|---|
| • Connectors | • 4 x 3-pin XLR female
2 x RCA, unbalanced (L/R) |
| • Impedance | • 65 Ohms |
| • Gain Range | • off to 12 dB |
| • Output Level | • 23 dBu |

Headphones

- Connector
- Signal to Noise Ratio
- THD+N
- Frequency Response
- 3.5 mm phone jack
- 75 dB
- 0.01 %
- 20 Hz - 20 kHz (± 3 dB)

General

- Audio Delay
- Connectors
- Phantom Power
- Power Consumption
- 0-3 sec for audio inputs
- Main Unit:
 - 15-pin Sub-D, Front panel
 - 9-pin Sub-D, RS232 remote
 - 3.5 mm phone jack, audio output
- Control Unit:
 - 15-pin Sub-D, Front panel
 - 3.5 mm phone jack, audio input
- 48 VDC
- 12 V / 19 W

5.3. MAIN CONTROL ROOM

A Video Equipment

(i) Multiviewer system

This shall be a multiviewer with sixteen 10-bit 6G-SDI inputs for monitoring SD, HD, or 4K sources in any combination on Ultra HD monitors or TVs. It shall allow for 4, 9, or 19 views to be selected, with each input fully re-synchronized. It shall have at least Two HD-SDI, two 6G-SDI, and one HDMI multi-view outputs, as well as a loop output for each 6G-SDI input for passing the signals to additional devices. It shall be controlled using the illuminated buttons, spin knob, and 1.5" LCD screen on the front panel, or with the included control software via the Ethernet port. It shall have the following features

- Native Ultra HD multi-view output
- 16x 6G-SDI inputs; accepts SD, HD, and Ultra HD resolutions
- Supports Ultra HD 4K (3840x2160) up to 30p; DCI 4K (4096x2160) at 24p
- 2x 6G-SDI, 2x HD-SDI, and 1x HDMI multi-view outputs
- 16x SDI loop outputs
- 2x2, 3x3, and 4x4 multi-view configurations
- SOLO button for instant full screen of single source
- 2-channel audio meters for each view
- 16x9 SD support

- Tally support with ATEM switchers
- 1RU machined aluminum chassis
- Front panel control using illuminated buttons, spin knob, and 1.5" LCD screen
- Software control over Ethernet; supports Videohub router protocol
- Built-in 90 to 240VAC power supply

It shall have the following specifications

Connections

- | | |
|----------------------|--|
| • SDI Video Input | • 16 x 10-bit SD/HD/6G-SDI |
| • SDI Video Output | • 16 x 10-bit SD/HD/6G-SDI loop outputs |
| • Multi-View Outputs | • 2 x 10-bit 6G-SDI
2 x 10-bit HD-SDI
1 x HDMI, type A (supports EDID of the monitor) |
| • Reference Input | • Blackburst and TriSync for SD, HD, and 4K |
| • Multi-Rate Support | • Auto detection of SD, HD, or 6G-SDI.
Simultaneous viewing of 4K, HD, and SD video. |
| • Updates | • USB 2.0 high speed (480 Mb/s) interface or via Ethernet |
| • Control | • 16 buttons
5 buttons and scroll wheel for control of LCD display
1 x RJ45 Ethernet
1 x RS-422 input (for configuration layouts) |
| • Configuration | • Via front panel LCD or use either RJ45 Ethernet or USB 2.0 for firmware updates and IP address setting |
| • Reclocking | • On all SDI outputs; auto switching between SD, HD, or 6G-SDI video |

Standards

- Format Support
 - **SD Format Support**
 - 625/25 PAL
 - 525/29.97 NTSC
 - **HD Format Support**
 - 720p 50/59.94/60
 - 1080i 50/59.94/60
 - 1080PsF 23.98/24/25/29.97/30
 - 1080p 23.98/24/25/29.97/30/50/59.94/60
 - **2K Format Support**
 - 2048x1080p 23.98/24/25
 - 2048x1080PsF 23.98/24/25
 - **4K Format Support**
 - 3840x2160p 23.98/24/25/29.97/30
 - 4096x2160p 24
- SDI Compliance
 - SMPTE 259M, SMPTE 292M, SMPTE 296M, SMPTE 310M, SMPTE 425M-B, ITU-R BT.656, and ITU-R BT.601
- SDI Video Rates
 - SD-SDI: 270 Mb/s
 - HD-SDI: 1.5 Gb/s
 - 3G-SDI: 3 Gb/s
 - 6G-SDI: 6 Gb/s
- SDI Video Sampling
 - 4:2:2 and 4:4:4
- SDI Color Precision
 - 4:2:2 and 4:4:4 10-bit
- SDI Color Space
 - YUV or RGB
- SDI Audio Sampling
 - 48 kHz and 24-bit
- SDI Metadata Support
 - Video payload identification ancillary data as per SMPTE 352M

Software

- Software Control
 - Multi-view control software included free for Windows and Mac OS X
- Internal Software Upgrade
 - Via included updater application

General

- Display
 - 1.5" (3.81 cm) LCD (for menu settings)
- Power Supply
 - IEC power cable required
 - 90 to 240 VAC input
- Power Fail Protection
 - Settings preserved and restored instantly at

power on

- Operating Temperature • 32 to 104°F (0 to 40°C)
- Storage Temperature • -4 to 113°F (-20 to 45°C)
- Relative Humidity • 0 to 90% non-condensing

(ii) Multiview 40 Channel HD/SDI Router

This shall be a 40 x 40 6G-SDI from mixed format router with 40 6G-SDI inputs and 40 6G-SDI outputs for routing any combination of SD, HD, Ultra HD 4K, and DCI 4K video. It shall supports 4:2:2 and 4:4:4 color sampling and 10-bit processing for smoother gradations. It shall be 2U rack mounted with a built-in LCD for viewing the sources directly on the router itself, with simple push buttons and spin knob provided for control. Routing can also be controlled using dedicated remote panels or over Ethernet using the included software for Mac OS X and Windows. You can even use the available iPad app to change routing over your wireless network. It shall be used for routing the signals and for connecting to the external feed for live air. It shall be able to route any of the committee rooms feed to external connection. Some of the features is shall have include;

- 40x 6G-SDI inputs / 40x 6G-SDI outputs
- Auto-detects between SD, HD, Ultra HD 4K, and DCI 4K and instantly switches standards
- Built-in SDI reclocking on every SDI input
- Supports 8-bit, 10-bit, and 12-bit 4:2:2 and 4:4:4 signals
- 4:2:2 or 4:4:4 color sampling with 10-bit processing
- UHD 4K (3840 x 2160) up to 30p
- Supports DCI 4K (4096 x 2160) at 24p
- HD Video Resolutions up to 1080p60
- Supports 16 channels of embedded audio on each SDI signal
- Genlock
- Reference input compatible with black burst and tri-sync
- Built-in video monitoring and spin knob control
- Push buttons on front panel
- Videohub control software included for control over Ethernet
- Ethernet control allows direct connection to the computer network and is compatible with Videohub Smart Control and Videohub Master Control panels
- Apple iPad control panel app available
- Create your own custom router control with free software developer kit

It shall have the following specifications

Connections

- SDI Video Input
- SDI Video Output
- Reference Input
- Multi-Rate Support
- Updates
- Control
- Configuration
- Reclocking
- 40 x 10-bit SD/HD/6G-SDI
- 40 x 10-bit SD/HD/6G-SDI
- Blackburst and TriSync for SD, HD and UHD 4K
- Auto detection of SD, HD, or 6G-SDI. Simultaneous routing of 4K, HD, SD video and DVB-ASI
- USB 2.0 high speed (480 Mb/s) interface or via Ethernet
- 40 buttons for local control of Videohub
6 buttons and scroll wheel for control of LCD display
1 x RJ45 Ethernet
1 x RS-422 input for controlling router crosspoint switching
- Via front panel LCD or use either RJ45 Ethernet USB 2.0 for setting IP address only
- On all SDI outputs, auto switching between SD, HD, or 6G-SDI video

Standards

- Format Support
- **SD Format Support**
625/25 PAL
525/29.97 NTSC
525/29.98 NTSC
- **HD Format Support**
720p 50/59.94/60
1080i 50/59.94/60
1080PsF 23.98/24/25/29.97/30
1080p 23.98/24/25/29.97/30/50/59.94/60
- **2K Format Support**
2048x1080p 23.98/24/25
2048x1080PsF 23.98/24/25
- **4K Format Support**
3840x2160p 23.98/24/25/29.97/30
4096x2160p 24
- SDI Compliance
- SMPTE 259M, SMPTE 292M, SMPTE 296M, SMPTE 310M, SMPTE 425M Level B, ITU-R

BT.656, and ITU-R BT.601

- SDI Video Rates
 - SD-SDI: 270 Mb/s
 - HD-SDI: 1.5 Gb/s
 - 3G-SDI: 3 Gb/s
 - 6G-SDI: 6 Gb/s
- SDI Video Sampling
 - 4:2:2 and 4:4:4
- SDI Color Precision
 - 4:2:2 and 4:4:4 10-bit
- SDI Audio Sampling
 - 48 kHz and 24-bit
- SDI Color Space
 - YUV or RGB
- SDI Metadata Support
 - Video payload identification ancillary data as per SMPTE 352M

Software

- Software Control
 - Router control included free for Windows and Mac OS X
- Internal Software Upgrade
 - Via included updater application

General

- Display
 - 5" (12.7 cm) LCD for video and menu settings
- Power Supply
 - IEC power cables required
 - 2 x 90 to 240 VAC input (for redundancy)
- Power Fail Protection
 - Router connections preserved and restored instantly at power on
- Operating Temperature
 - 32 to 104°F (0 to 40°C)
- Storage Temperature
 - -4 to 113°F (-20 to 45°C)
- Relative Humidity
 - 0 to 90% non-condensing

(iii) HD/SDI network video server

This shall be a rack server to be used for streaming all the content from the committee rooms in a network. It shall consist of Quad2 interface cards and EMS Multichannel Ingest Software, streaming software with 30 licenses for streaming all the content from all the committee rooms. Its shall have the following feature

- Storage network video server that will provide advanced multiple recording capabilities and multiple channel playout features for Mpeg-2 transport streams.
- Supports SD and HD content with MPEG-2 or MPEG-4 video
- Recording of up to 10 independent channels simultaneously.
- Frame-accurate capture and ingest
- Frame-accurate and seamless multi-channel playout

- Superior re-multiplexing capabilities
- Support for in-band (SCTE35) or out-of-band (GPI) triggers
- Advanced asset management, including clip import/export, editing, trimming, and merging
- Interfaces with most popular automation systems
- Scalable storage (SAS) with RAID security
- SNMP support for monitoring

Applications support:

- Multi-channel playout
- Video on-demand capture and media archival
- Time delay
- Near video on demand (nVOD)
- Store and forward
- Ad insertion
- Ingest

ASI Interfaces

- Up to 4 I/O pairs
- Connector: BNC F, 75Ω
- Up to 84 Mb/s per interface
- Data format: burst, packet
- Packet length: 188, 204

Gigabit Ethernet/IP Interfaces

- 2 input ports (basic NIC)
- 2 output ports (GES option)
- Up to 84 Mb/s input
- Up to 344 Mb/s output
- Unicast and multicast
- Data format: UDP, RTP

Stream Processing

- Recording: up to 32 streams and 172 Mb/s transport stream bandwidth
- Playout: up to 32 streams and 172 Mb/s transport stream bandwidth, depending on video processing modes
- MPEG stream monitoring and visualization
- Multiplexing, de-multiplexing
- Continuous or event-based capture
- Program translating
- Playlist management

- Cue-tone injection

Supported Formats

- DVB and ATSC signaling
- MPEG-2 and MPEG-4 video (4:2:0, 4:2:2, frame, field)
- MPEG-1, AAC, AC3 audio

Management

- Client/server GUI
- FTP import, export
- Hot-folder mechanisms
- SNMP v2 agent
- VDCP interfaces
- GPI inputs
- **Physical Characteristics**
- 3 RU chassis
- CPU: at least 3 GHz quad core
- RAM: at least 8 GB
- Internal storage: SAS, 4 TB (RAID-5)
- Possible external storage, about a total of 4 drive bays for future expansion.
- Redundant power supply, AC: 240VAC

Channel

- Record (per stream to record)
- Playout channel
- Time delay (per stream to delay)

(iv) 40" Full HD LED Smart TV

- | | |
|---------------------|--|
| • Screen Size | • 40" |
| • Technology: | • LED FHD Smart TV |
| • TV Style: | • Flat screen, Flat panel |
| • Aspect Ratio: | • 16:9 |
| • Resolution: | • 1920 x 1080 Pixels or better |
| • Picture Engine | • HyperReal |
| • Processor | • Quad Core |
| • DTV Capability: | • DVB-T2/C/S2 |
| • Data Broadcasting | • HbbTV(CZ,SK,PL,DE,AT,CH,-
FR,PT,ES,BE,NL,LU,HU) |
| | • MHEG 5 (GB,IS,UK) |
| • Audio format | • Dolby Digital Plus |

- Speakers:
- Other features
- Inputs supported:
- Outputs Supported:
- Wall mountable
- Operating system
- Wireless network
- Ethernet Connection
- Energy efficiency class
- 20W Two built-in stereo speakers
- Picture-in-Picture (PIP), Bluetooth, Support for HbbTV
- Component (1), Composite Video (1), HDMI (3), USB (2), Stereo Audio
- Digital optical output (S/PDIF), HDMI. Stereo Audio
- Yes
- Tizen OS
- Wi-Fi
- Enabled
- A+

(v) **A processing Work Station**

This items shall be a tower workstation for use in the main control room. It shall consist of the main CPU, 21” LCD Screen, Decklink Studio 4k Video Interface Cards, keyboard, and mouse among other necessary accessories for proper operation.

It shall have the following specifications

Processor Options: Two Intel® Xeon® processor Scalable family CPUs with up to 28 cores per processor and Intel Advanced Vector Extensions, Intel Trusted Execution Technology, Intel AES New instructions, Optimized Intel Turbo Boost and optional Intel vPro™ technology

Operating System: Windows 10 Pro for Workstations (4 Cores Plus)

Chipset: Intel® C621 (Lewisburg)

Video Card: Support for 4 PCI Express® x16 Gen 3 graphics cards, 1 - up to 750W with maximum of 3 x 250W double width graphics cards in 3 slots (dual CPU configuration) and up to 2 x 375W cards 220VAC input supply recommended for 750W configurations and some restrictions apply.

Decklink Studio 4k Video Interface Cards

Memory: 32 GB RAM

Hard Drive: 1 TB SATA HDD/SSDs

Ports

Front Ports

- USB 3.1 Type A
- USB 3.1 Type C
- 1 Universal Audio Jack

- Up to 4 PCIe slots in PCIe enabled chassis for M.2 and U.2 (future) PCIe SSDs

Internal Ports

- 1 USB 2.0
- 1 USB 2.0 header. (requires 3rd party splitter cable to support 2 x USB 2.0 Type A ports)
- 8 SATA @6Gb/s plus 1 SATA for optical

Rear Ports

- 6 USB 3.1 Type A
- 1 Serial
- RJ45 Network
- PS2
- 1 Audio Line out
- 1 Audio Line in/Microphone

(vi) 48 Port Floor Edge POE Switch

This shall be a POE switch with the ability to deliver data, voice, and video services, equipped with Gigabit network ports, including two GbE combo ports supporting fiber connectivity and two SFP slots. The non-fiber ports are also PoE+ compliant supporting the 802.3af and 802.3at PoE network standards with a maximum PoE power budget of up to 382W.

It shall have the following features

Ports:	48 x 10/100/1000 Mb/s Gigabit Ethernet (RJ45) PoE+
	2 x 10/100/1000 Mb/s Gigabit Combo (Ethernet/SFP)
	2 x SFP
Layer Services Supported:	Layer 2 Support, Layer 3 Support
Supported Protocols:	Auto-VoIP,
	Head-of-Line (HOL) Blocking
	IGMP Snooping
	IPv6
	Link Aggregation
Queuing:	Strict Priority, Weighted Round Robin (WRR)
Jumbo Frames Support:	9216 Bytes
MAC Address Table Size:	16K
Multicast Groups:	1000
VLAN Groups:	4096

(vii) HD/SDI to Fiber Optic Converter Transmitter/Receiver

This item shall be used to provide multi-rate SDI to optical fiber and optical fiber to SDI

conversion supporting up to DCI 4K25 and UHD 4K60 signals. This shall be used to connect the output of a multiviewer on committee control rooms to the main control room using fiber connection. It shall have among the following features;

- Bidirectional, multi-rate SDI to optical fiber conversion
- Supports video signals up to DCI 4K25 and UHD 4K60
- Automatic signal detection
- Supports up to 16-channel embedded audio
- Change settings with function switches or the macOS/Windows-compatible software
- Universal power supply with locking connector
- Rugged, compact metal housing
- One SMPTE optical fiber SFP socket (requires separate module)
- 12G/6G/3G-SDI input and output

It shall have the following specifications

Input

- | | |
|--|--|
| <ul style="list-style-type: none"> • Video Input Connectors • Input Video Format | <ul style="list-style-type: none"> • 1 x BNC (12G-SDI) • SDI (4:4:4/4:2:2 RGB, YUV)
DCI 4K: 23.98/24/25 fps
UHD 4K: 23.98/24/25/29.97/30/50/59.94/60 fps
DCI 2K: 23.98/24/25 fps
DCI 2KPsF: 23.98/24/25 fps
1080p: 23.98/24/25/29.97/30/50/59.94/60 fps
1080PsF: 23.98/24/25/29.97/30 fps
1080i: 50/59.94/60 fps • Embedded Audio Input |
| | <ul style="list-style-type: none"> • SDI: 16-Channel |

Output

- | | |
|--|--|
| <ul style="list-style-type: none"> • Video Output Connectors • Output Video Format | <ul style="list-style-type: none"> • 1 x BNC (12G-SDI / 3G-SDI / 6G-SDI) • SDI (10-Bit 4:4:4/4:2:2 RGB, YUV)
DCI 4K: 23.98/24/25 fps
UHD 4K: 23.98/24/25/29.97/30/50/59.94/60 fps
DCI 2K: 23.98/24/25 fps
DCI 2KPsF: 23.98/24/25 fps
1080p: 23.98/24/25/29.97/30/50/59.94/60 fps
1080PsF: 23.98/24/25/29.97/30 fps
1080i: 50/59.94/60 fps • Embedded Audio Output |
| | <ul style="list-style-type: none"> • SDI: 16-Channel |

Standards

- Video Standard Compliance
- SMPTE 259M/292M/296M/297M/424M-B/425M/ST-2081
- ITU -R BT.601

Connectivity

- Expansion Slots
- 1 x SFP Slot

Power

- Power Connector
- 1 x Barrel (6 to 36 VDC) Input
- Power Consumption
- Power Supply: 2 W

Environmental

- Operating Temperature
- 32 to 104°F / 0 to 40°C
- Storage Temperature
- -4 to 113°F / -20 to 45°C
- Operating Humidity
- 0 to 90%

(viii) 4-way HD/SDI Splitter

)

This shall be four-output distribution amplifier for multi-rate SDI digital video signals. It shall supports all common serial digital video data rates up to 11.88 Gbps, while passing HDR, up to 16 channels of embedded audio, and other ancillary data allowed by the SMPTE and ITU standards. It shall be used to split the SDI signal at the main control room. It shall have among other the following features;

- Automatically adapts to SMPTE and ITU digital video standards for SDI signals up to a 12G-SDI data rate
- Supports data rates from 270 Mbps to 11.88 Gbps
- Support for HDR – High Dynamic Range video
- Automatic input equalization
- Automatic output reclocking
- Passes HDR, up to 16 channels of embedded audio, and other ancillary data, including closed caption and time code

It shall have the following specifications

- Frame rate: 24, 25, 30, 50, or 60 fps
- Chroma sampling: 4:4:4, 4:2:2, and 4:2:0
- Color bit depth: 8 or 10 bits per color
- Signal type: 6G-SDI, 12G-SDI
- Max. video data rate: 11.88 Gbps per 12G-SDI connection

Video

- Signal type
 - SDI, HD-SDI, 3G-SDI, 6G-SDI, and 12G-SDI digital video
- Gain
 - Unity
- Resolution
 - 8 or 10 bits, automatic
- Operation standards
 - SMPTE-259M, SMPTE-292M, SMPTE-424M, SMPTE-372M, SMPTE ST-2081, SMPTE 2082, ITU-RBT.601, ITU-RBT.1120
- Auto data rate lock
 - Yes
- Latency
 - 10 ns
- Level mapping
 - Supports both level A and level B mapping (3G-SDI and 6G-SDI)
- Bit depth
 - Supports up to 10 bits
- 12G-SDI
 - Supports up to 10 bits
- 6G-SDI
 - Supports up to 12 bits
- 3G-SDI
 - Supports up to 12 bits
- HD-SDI
 - Supports up to 12 bits
- SDI
 - Supports up to 12 bits

Video input

- Number/signal type
 - 1 single link SDI, HD-SDI, 3G-SDI, 6G-SDI, 12G-SDI digital component video
- Connectors
 - 1 female BNC
- Nominal level
 - 0.8 Vp-p
- Minimum/maximum levels
 - 0.5 Vp-p to 1 Vp-p with no offset
- Impedance
 - 75 ohms
- Return loss
 - ≥ 15 dB @ 5 MHz to 2.97 GHz
- DC offset (max. allowable)
 - 5 V
- Input coupling
 - AC
- Equalization
 - Automatic for up to -30 dB of cable loss
- 12G-SDI
 - 70 meters (230 feet)
- 6G-SDI
 - 90 meters (295 feet)
- 3G-SDI
 - 180 meters (590 feet)
- HD-SDI
 - 240 meters (787 feet)
- SDI
 - 300 meters (984 feet)

Video output

- Number/signal type
 - 4 single link SDI, HD-SDI, 3G-SDI, 6G-SDI,

- Connectors
 - Re-clocking
 - Nominal level
 - Minimum/maximum levels
 - Impedance
 - Return loss
 - DC offset
 -
- 12G-SDI digital component video
 - 4 female BNC
 - Automatic for 270 Mbps, 1.485 Gbps, 2.97 Gbps, 5.94 Gbps, and 11.88 Gbps (bypassed for other rates)
 - 0.8 Vp-p
 - 0.5 Vp-p to 1 Vp-p
 - 75 ohms
 - ≤ 25 dB @ 100 MHz
 - ± 5 mV with input at 0 offset

Audio

- Audio channels
- Supports up to 16 channels

5.4. INTERPRETERS' ROOM EQUIPMENT

(i) Interpreters Console Units

This shall be interpreter units that will be used with the conference system for interpretation of the conference proceedings in real time. It shall have long stem (480mm) pluggable microphone, Speech timer to indicate elapsed time of interpretation, speak slowly facility, as well as the provision of channel number, language names and quality level indicated at the display.

Main features;

- The language channels are to be capable of independent and simultaneous operation.
- Each interpreters room to be equipped with interpretation consoles
- Up to 31 interpretation channels and the original floor language with an audio bandwidth of 20 kHz
- A graphic LCD with backlighting for bright information display in dark conditions
- 5 pre-select keys for relay languages with activation indication at the display
- Distribution of the interpreted languages to delegate stations and shall be through hard wire but wireless option can be provided
- Multichannel selection facilities are to be provided in chief interpreter's room
- All interpreters room to be equipped with an external red light to indicate that interpretation is in progress
- Automatic headset selection when headset connected

- Floor/auto-relay key with green LED indicators
- Either light or dark base
- The system equipment in this room to include
 - **Interpreters' headset (microphone/earpiece)**
 - **Interpreters' console**

Technical specification

Headphone connection

- Frequency response 30 Hz - 20 kHz
- Load impedance > 32 ohm
- Output power 2 x 30 mW/32 ohm

Headset connection

- Frequency response 30 Hz - 20 kHz
- Load impedance > 32 ohm
- Output power 60 mW/32 ohm
- Nominal microphone input level: 7 mVrms
- Overload microphone input level: 124 mVrms

(ii) Interpreters Booth

This shall be the structure where the interpreters shall be placed. It shall be sound proof and with a transparent window for use by the interpretation personnel.

5.5. EDITING/RECORDING ROOM EQUIPMENT AND SOFTWARES

(i) Recording Machine

This shall a file-based deck that features the same functionality and control of professional tape decks that shall be used for recording edited videos. It shall be able to record uncompressed video with 4:2:2 color sampling at 10-bit in .mov format, and also records video using either ProRes or DNxHD codecs. It shall have two SSD slots for automatic recording of the second SSD once the first is full.

Main Features

File-Based Recording: Record to uncompressed Quicktime at 10-bit with 4:2:2 color sampling. It also records to ProRes 422(HQ), ProRes 422, ProRes 422 (LT), ProRes 422 (Proxy), as well as Avid DNxHD and Avid DNxHD MXF.

Two SSD Bays: Two 2.5" SSD slots, that allow you to record almost endlessly as recording seamlessly switches from one SSD to the other as the first one fills up.

Thunderbolt: The built-in Thunderbolt port allows you to connect the unit to a computer, and it is independent of the SSD drives.

Video Signals: should 2 supports SD, HD, and 3G signals over SDI and HDMI. In addition to NTSC and PAL signals, 720 x 480p and 720 x 576p signals are supported over HDMI, while 4K video is supported via 6G-SDI and HDMI.

VTR Style Controls: VTR style front panel controls for record and playback. With illuminated buttons, for working in dim locations or settings, while a built-in jog/shuttle wheel provides analog style control over your playback.

Built-In LCD Monitor: built-in LCD screen at the front panel that allows you to monitor input or playback video as well as timecode, format, and audio levels.

Software: all the necessary software for proper operation should be included.

Technical Specifications

Video Input

Digital Video

3 x SDI (10-bit SD/HD/3G switchable)

1 x SDI (10-bit SD/HD/3g/6G Ultra HD switchable)

1 x HDMI 1.4 type A (supports Ultra HD 4K)

Analog Video

1 x Component YUV (3 x BNC) SD/HD

Video Output

Digital Video

3 x SDI (10-bit SD/HD/3G switchable)

1 x SDI (10-bit SD/HD/3G/6G Ultra HD switchable)

1 x SDI Monitor Output (10-bit SD/HD/3G switchable)

1 x HDMI 1.4 type A (supports Ultra HD 4K)

Analog Video

1 x Component YUV (3 x BNC) SD/HD

Audio Input

Analog

2 x 3-pin XLR balanced connectors

2 x RCA jacks for unbalanced audio

Digital

SDI

16 x channels embedded in SD and HD in QuickTime files.

2 x channels in Avid DNxHD MXF files.

HDMI

8 x channels embedded in SD and HD in QuickTime files.

2 x channels in Avid DNxHD MXF files.

Audio Output	<p>Analog</p> <p>2 x 3-pin XLR balanced connectors</p> <p>Digital</p> <p>SDI</p> <p>16 x channels embedded in SD and HD in QuickTime files. 2 x channels in Avid DNxHD MXF files.</p> <p>HDMI</p> <p>8 x channels embedded in SD and HD in QuickTime files. 2 x channels in Avid DNxHD MXF files.</p>
Computer Interface	<p>1 x Thunderbolt (for video/audio)</p> <p>1 x USB 2.0 mini B-type for initial setup, software updates and HyperDeck Utility software control</p>
SSD Interface	2 x 2.5" SATA 3Gb/s
Sync Input	Blackburst or Tri-Sync
Device Control	Sony compatible RS-422 deck control port
Recorder	<p>Recorder control:</p> <p>12 buttons and jog wheel for local control / or use either RJ45 Ethernet or USB 2.0 high speed interface</p> <p>Recorder configuration:</p> <p>use USB 2.0 high speed interface</p>
Format Support	<p>SD</p> <p>NTSC/PAL</p> <p>525 29.97 / 625 25 (525 59.94i / 625 50i)</p> <p>480p60 and 576p50 via HDMI only</p> <p>HD</p> <p>720p 50/59.94/60</p> <p>1080i 50/59.94/60</p> <p>1080PsF 23.98/24/25/29.97/30</p> <p>1080p 23.98/24/25/29.97/30/50/59.94/60</p> <p>4K</p> <p>3840 x 2160p 23.98/24/25/29.97/30</p>
SDI Compliance	SMPTE 259M, SMPTE 292M, SMPTE 296M, SMPTE 425M
SDI Metadata Support	HD RP188 and closed captioning
Sampling	Video: 4:2:2 Audio: 48kHz/24-bit

Color Precision	10-bit
Color Space	REC 601 REC 709
Multiple Rate Support	SDI and HDMI switchable between SD, HD and Ultra HD. SDI switches between 270 Mb/s standard definition SDI, 1.5G-SDI HD, 3G-SDI and 6G-SDI. Analog SD/HD
Copy Protection	HDMI input is unable to capture from copy protected HDMI sources. Always confirm copyright ownership before capture or distribution of content.
Codecs Supported	Uncompressed QuickTime Apple ProRes 422 (HQ) QuickTime ProRes 422 QuickTime ProRes 422 (LT) QuickTime ProRes 422 (Proxy) QuickTime Avid DNxHD QuickTime Avid DNxHD MXF
Display	Built-in LCD for video, audio and timecode monitoring
Rack Size	1RU

(ii) Final Cut Editing Workstations

General Features

- **21.5" IPS Display:** Full HD 1080p with 1920 x 1080 screen resolution and a 16:9 aspect ratio with integrated Intel Iris Plus Graphics 640.
- **7th-Gen Kaby Lake Dual-Core Intel Core Performance:** 7th-Gen Kaby Lake Intel Core i5 Dual-Core processor with a stock speed of 2.3 GHz and that can be overclocked up to 3.6 GHz, with Intel Turbo Boost 2.0 technology. It has 8GB, 2133 MHz DDR4 RAM for multitasking quickly and efficiently.
- 802.11ac Wi-Fi & Bluetooth 4.2
- Gigabit Ethernet
- Thunderbolt 3: Two Thunderbolt 3 (USB Type-C) ports each delivering up data transfer speeds of up to 40 Gb/s external drives and cameras, plus twice the bandwidth for video and display connectivity. It should have and support 10 Gb/s USB 3.1 and DisplayPort 1.2. Thunderbolt 2, HDMI, DVI.
- USB 3.0: Four 5 Gb/s USB 3.0 Type-A ports for faster transfer of large files and for connecting USB-compatible devices, including your iPhone, iPad, iPod or digital camera.
- FaceTime HD Camera: should have a built-in FaceTime HD camera

- Operating system: Should have a working licensed operating system

Technical Specifications

- Operating System
- macOS

Performance

- CPU
- 2.3 GHz Intel Core i5 Dual-Core
- Maximum Boost Speed
- 3.6 GHz
- Memory Type
- 2133 MHz DDR4
- Total Installed Memory
- 8 GB
- Maximum Memory Capacity
- 8 GB
- Graphics Type
- Integrated
- GPU
- Intel Iris Plus Graphics 640

Display

- Panel Type
- IPS
- Size
- 21.5"
- Aspect Ratio
- 16:9
- Resolution
- 1920 x 1080
- Finish
- Glossy
- Refresh Rate
- 60 Hz

Storage and Expansion

- Total Installed Capacity
- 1 TB
- Hard Disk Storage
- 1 x 1 TB 2.5" SATA (5400 rpm)

I/O

- Ports
- 4 x USB Type-A (USB 3.1 Gen 1)
- USB Type-C Ports
- 2 x Thunderbolt 3 (Supports DisplayPort)
- Audio
- 1 x 1/8" / 3.5 mm Headphone Output
- Built-In Speakers
- 2
- Built-In Microphones
- 1
- Media Card Slots
- 1 x SDXC

Communications

- Ethernet
- 1 x RJ45 (Gigabit)
- Wi-Fi
- Wi-Fi 5 (802.11ac); Dual-Band (2.4 & 5 GHz)
- Bluetooth
- 4.2
- Webcam
- User-Facing: 720p

General

- Security
- AC Input Power
- Dimensions
- Weight
- Kensington Lock Slot
- 100 to 240 VAC, 50 / 60 Hz
- 20.8 x 17.7 x 6.9" / 52.8 x 45 x 17.5 cm
- 12.5 lb / 5.7 kg

(iii) 32" LED Smart TV

- Screen Size
- Technology:
- TV Style:
- Aspect Ratio:
- Resolution:
- Picture Engine
- Processor
- DTV Capability:
- Data Broadcasting
- Audio format
- Speakers:
- Other features
- Inputs supported:
- Outputs Supported:
- Wall mountable
- Operating system
- Wireless network
- Ethernet Connection
- Energy efficiency class
- 32"
- LED FHD Smart TV
- Flat screen, Flat panel
- 16:9
- 1920 x 1080 Pixels or better
- HyperReal
- Quad Core
- DVB-T2/C/S2
- HbbTV(CZ,SK,PL,DE,AT,CH,-
FR,PT,ES,BE,NL,LU,HU)
- MHEG 5 (GB,IS,UK)
- Dolby Digital Plus
- 20W Two built-in stereo speakers
- Picture-in-Picture (PIP), Bluetooth, Support for HbbTV
- Component (1), Composite Video (1), HDMI (3), USB (2), Stereo Audio
- Digital optical output (S/PDIF), HDMI. Stereo Audio
- Yes
- Tizen OS
- Wi-Fi
- Enabled
- A+

(iv) Speakers/Audio Monitors + Subwoofer

These shall be standalone audio system that shall be used inside the control room to monitors the audio from the systems within the control room. Is shall comprise of powered speakers to be connected to computer on any system that need audio monitoring within the control rooms. It

shall consist of two monitor where each monitor speaker produces a frequency response of 80 Hz to 20 kHz via a 3.5" Kevlar woofer and a 1" silk dome tweeter powered by a 25W class AB amplifier. The monitors can handle 100 dB maximum peak SPL. A rear bass-reflex port provides enhanced low-frequency range.

It shall have at least the following Specifications

Speakers

- LF Driver
- HF Driver
- 3.5" / 89 mm Kevlar speaker
- 1" / 25 mm silk dome tweeter

I/O

- Inputs
 - 2 x balanced 1/4" TRS
 - 2 x unbalanced RCA (L/R pair)
 - 1 x 1/8" (3.5 mm) TRS stereo mini-jack
- Outputs
 - 1 x 1/8" (3.5 mm) TRS stereo mini-jack

Performance

- Frequency Response
- Crossover Frequency
- Amplifier Power
- Maximum SPL
- Input Impedance
- 80 Hz to 20 kHz
- 2.8 kHz
- 25 W per speaker
- At 1 m: 100 dB (peak)
- 10 kOhms

User Controls

- Volume Management
- Mid Frequency Driver
- High Frequency Driver
- Protection
- A-type taper
- Control: variable (-6 to +6 dB, center @ 100 Hz)
- Control: variable (-6 to +6 dB, center @ 10 kHz)
- RF interference
- Output-current limiting
- Over-temperature
- Turn on/off transient
- Subsonic filter
- External mains fuse

Power

- Power Requirements
- 100 to 120 VAC at 50/60 Hz, or 220 to 240 VAC at 50/60 Hz

(v) Headphones

This shall be a low impedance headphones to be used in the editing room.

Features

- Circumaural closed-back stereo headphone
- 40mm diameter drive units deliver deeper bass, lower distortion, and wider dynamic range
- Neodymium magnets for maximum energy and minimum size
- Coiled cable allows for better mobility and reach, while also preventing snags from tugging the headphones right off your ears
- OFC cable and gold plated Unimatch plug provides both 1/8" mini-jack and 1/4" TRS phono connectivity

Technical Specifications

Headphone

- Design
- Earcup Style
- Over-Ear (Circumaural)
- Closed-Back

General

- Frequency Response
- Sensitivity
- Impedance
- Maximum Power Handling
- 10 Hz to 20 kHz
- 104 dB
- 63 Ohms
- 1000 mW

Connectivity

- Audio Connector
- Adapter (Included)
- 1/8" / 3.5 mm TRS
- 1/4" TRS

Cable

- Cable Length
- 9.8 to 9.8' / 2.99 to 2.99 m (Coiled)

Physical

- Weight
- 7.8 oz / 221.1 g

(vi) Editing Software

This shall be the professional non-linear video editing application published by Apple Inc for editing and adding various features to high quality videos. It shall be Apple Final Cut Pro X or the latest series. It shall have the following features among others;

- Import, edit, and share 360° video from equirectangular images stitched together from a wide variety of cameras.
- Support for standard Rec. 709 Standard Dynamic Range (SDR) and Rec. 2020 High Dynamic Range (HDR) in libraries and projects from camera import to delivery.

- Full-screen, real-time preview playback of SD, HD, 2K, 4K, 5K, and larger-frame-size media
- Editing and Timeline features like 360° viewer allows navigation in 360° while also viewing the equirectangular file side by side
- Trimming features like roll rim between two adjacent connected clips
- Effects features like High-quality, drag-and-drop noise reduction effect reduces or eliminates grain and video noise and 360° titles, generators, and effects including the 360° Patch and Tiny Planet effects
- Adjust audio using effects plug-ins from Logic Pro X with redesigned, resizable interfaces
- Among others;

(vii) SSD dock

This shall be a fast 4-slot SSD dock that can be used to edit directly from your media disks. Up to four 2.5" disks can be accessed over a single 10 Gb/s USB Type-C interface, while an independent SATA driver chip on each disk slot ensures fast transfer speeds. It can be connected directly to a Mac or Windows computer that has a USB Type-C port, and no software needs to be installed and used in the process. It should be able to work with Final Cut Pro X that shall be used in the editing room. It shall be rack mountable.

Technical Specifications

- | | |
|-------------------------------|--|
| • SSD Interface | • 4 x 2.5" SATA 3 6 Gb/s |
| • Computer Interface | • 2 x USB Type-C 3.1 Gen 2 (Up to 10 Gb/s) |
| • Power Supply | • 1 x Internal 100-240 VAC |
| • Supported Operating Systems | • Mac 10.13 High Sierra, 10.14 Mojave, or Later
Windows 10 or 8.1 |
| • Operating Temperature | • 32 to 104°F / 0 to 40°C |
| • Storage Temperature | • -4 to 113°F / -20 to 45°C |
| • Relative Humidity | • 0 to 90% Non-Condensing |

5.6. VIDEO CONFERENCING SYSTEM

(i) Video Conferencing Unit (Codec + Eagle Eye 4x camera + Microphone + Remote + Camera Mount)

This item shall be used in committee room to conduct video conferencing sessions with other parties in a different locations. It shall have the codec, eagle eye 4x camera, microphone and the camera mount.

Some common Features

- Simple to use, with one-touch dial from the integrated calendar and the Skype for Business
- Interface.
- Flexible, interactive content collaboration
- High-performance video and content quality
- Built-in interoperability unlocks access to the highest quality in-room collaboration experience for Video as a Service customers
- Content Sharing: People+Content and People+Content EagleEye IV camera and RealPresence Group Microphone Array
- Polycom® People+Content™ IP and Polycom Pano app support - VbSS content in Microsoft environments

Technical Specifications

- | | |
|---------------------------------|---|
| • Video Standards and Protocols | • H.261, H.263, H.264 AVC, H.264 High Profile, H.264 SVC, RTV |
| | • H.239/Polycom® People+Content™ |
| | • H.263 & H.264 video error concealment |
| • Video input | • 1 x HDCI |
| | • 1 x HDMI 1.3 |
| | • 1 x VGA |
| • Video out | • 2 x HDMI 1.3 |
| • People video resolution | • 1080p, 60 fps from 1740 Kbps |
| | • 1080p, 30 fps from 1024 Kbps |
| | • 720p, 60 fps from 832 Kbps |

- Etc.
- Input Content video resolution
 - HD (1920 x 1080i), HD (1920 x 1080p)
 - WSXGA+ (1680 x 1050)
 - UXGA (1600 x 1200), etc.
- Input Content video resolution
 - WUXGA (1920 x 1200)
 - HD (1920 x 1080)
 - WSXGA+ (1680 x 1050)
 - Etc.
- Content frame rate
 - 5–60 fps (up to 1080p resolution at 60 fps)
- Audio standards and protocols
 - 22 kHz bandwidth with Polycom®
 - Siren™ 22 technology, AAC-LD (TIP calls), G.719 (Live Music Mode)
 - 14 kHz bandwidth with Polycom®
 - Siren™ 14 technology, G.722.1 Annex C
 - 7 kHz bandwidth with G.722, G.722.1
 - 3.4 kHz bandwidth with G.711, G.728, G.729A
- Other Features
 - Skype for Business and Lync Integration (including Skype for Business Online / Office 365)
 - TIP interoperability
 - 1080p license, providing up to
 - 1080p60 for people and content
 - Multipoint license for up to 6 sites at 720p30, or 4 sites at 1080p30

(ii) Ceiling Microphone Array

This shall be a digital microphone array is the only audio pickup device that offers consistent, reliable, 360-degree voice pickup and StereoSurround™ audio. It shall be an easy-to-mount Ceiling Microphone Array that eliminates conference table clutter while providing the same clear, crisp audio delivery as our tabletop microphone arrays. It shall be mounted at a height of 7-8” above the floor. It shall be supplied with all the necessary

accessories and extension cables and installed to proper operation.

Features

- Supports stereo audio with Polycom Siren 22 audio technology
- Provides 360-degree coverage with three cardioid elements
- Full-duplex digital audio
- 12 foot pickup range (covering 450 square feet, 42 square meters)
- Group Series 500/ 700 support up to 4 ceiling microphones
- SoundStructure C12 and C16 support up to 4 ceiling microphones
- Instant Adaptation Echo Cancellation
- Automatic Noise Suppression (ANS)
- Automatic Gain Control (ACG)

Technical Specifications

- Extension kit includes
 - White Microphone array
 - Electronics enclosure with ceiling mounting hardware
- Digital microphone specifications
 - 360-degree directional pickup
 - Three cardioid elements per microphone
 - elements spaced 120 degrees apart
 - Total coverage area for a single Ceiling Microphone Array is 400 square feet
- Audio features
 - Dynamic microphone steering
 - Full-duplex digital audio
 - Instant adaptation echo cancellation
 - Automatic noise suppression (ANS)
 - Automatic gain control (ACG)

(iii) **Eagle Eye Camera Extender**

This shall be used to increase the flexibility of your video conference needs by mounting your EagleEye IV or EagleEye Acoustic cameras up to 330 feet away from the video conference system. The digital extender provides a separate power supply for the connection between the camera and video conferencing system, letting you extend the cable length between the two ends of the system. It shall be supplied with the power supply and adapters and connector cable - 3.28ft.

Technical Specifications

- Adaptor boosts signal:
 - Camera can be extended over CAT 6a to lengths up to 100m/330 ft (1080p), cat 5e for shorter runs to be accepted.
- Contents
 - transmitter unit, receiver unit, HDCI cable, power adapter, documentation
- General
 - Color: Black
 - Product Type: Extender
- Ports/Connectors

Transmitter Unit:

- (1) RJ-45 LAN
- (1) HDCI

Receiver Unit:

- (1) RJ-45 LAN
- (1) HDCI
- (1) Power in

(iv) Video Conferencing Control System (at least 500 users)

This shall be a system that connects people with HD voice, content, video and web collaboration, bridging locations across any distance, device or timeline. It shall provide access and licenses to atleast 500 users using different platforms including 3rd party applications on various devices like phones, tables, desktops, etc., to have secure conference calls with other parties.

It shall have the following **features**

- Superior video conferencing and collaboration experiences on any device
- Manage & monitor devices and conferences to minimize user support
- Broadest integration and interoperability: Seamless integration—Click-to-join simplicity for Skype for Business and leading UC vendors
- Unlimited copies of RealPresence® Desktop and Mobile deliver a high-quality,
- secure and reliable video experience beyond the office or conference room
- Powerful video collaboration software: Includes desktop, mobile and soft web clients for seamlessly connection to team environment solutions in huddle spaces, conference rooms, boardrooms and immersive telepresence.
- Virtual meeting rooms (VMRs): Allows people to collaborate with remote teams using any device from any location

- Comprehensive management
- Simplified user experience
- Flexible Deployment

Technical Specifications

- High quality video conferencing and collaboration services
 - Audio/video/content/web
- Full 1080pHD secure virtual meeting rooms: Personal rooms or shared
- Software for usage on personal BYOD devices
 - Automated device management to ease administration
- Scheduling
- Corporate directories and dial plans
- Secure communication with home workers, customers, partners for B2B and B2C applications
- Integration into 3rd-party applications and full developer's program
- Integration with leading UC solutions—Microsoft
- Virtual edition in HyperV or VMWare environment
- Software clients for BYOD devices such as tablets, smartphones, PCs and laptops
- Share multiple documents and content sources at once with other coworkers
- Seamless integration using existing workflows for Lync users and standard conference rooms participants
- Scheduling with everyday tools such as Outlook, using same workflows and applications
- Personal virtual meeting rooms to use anytime without worrying about booking/scheduling. Private numbers for use for audio dial-in, video, and content sharing.
- Open APIs provide business application and workflow integration capability
- Call Control: Multi-protocol call control with gateway: H.323, SIP, WebRTC, TIP with redundant/fault tolerant application with failover.
- Video Support—H.263 (H.263+), H.264 Baseline and High Profile, H.264 Annex G (SVC), WebRTC
- Audio support—G.711 μ , G.711A, G.722, G.722.1C, G.722.1, G.719, G.729A, and Siren™ 14, Siren 22, and Siren 22 LPR • Content Support—H.239/BFCP, H.263/H.264 at up to 720p/5 fps

(v) **Multipoint control unit Collaboration Server**

This shall be a multipoint control unit (MCU) that bridges the organization's multiparty video, voice, and content collaboration so everyone stays connected. It should provide for

the following features

- Universal bridging capabilities for seamless connectivity regardless of device, or protocol
- Call at any data rate or bandwidth with support for resolutions up to 1080p 60, fully transcoded
- Support for the latest technologies, including H.264 High Profile for optimal resource utilization
- Support for point-to-point calls with integrated dial-through gateway capabilities (ISDN, SIP, and H.323)
- Connect employees, partners and fragmented communication systems without expensive gateways
- Support future collaboration technology through the industry's broadest support for existing and emerging standards, protocols and natively integrated applications
- Reduce operating expenses and increase call capacity that use up to 50% less bandwidth
- Enhance your enterprise-grade collaboration through video conference control system (e.g. Polycom RealPresence Claririti) with 100% auto-failover, extreme scalability, security and interoperability
- **Management tools**
 - Web-based and application-based management & monitoring
 - View up to 10 Polycom RealPresence Collaboration Server platforms
- **Conferencing**
 - Over 30 different conference layouts
 - Conference profiles
 - Conference templates
- **Capacity (Virtual Edition)**

Dynamic Resource Allocation™ supports up to:

 - 18 HD 1080p60 Asymmetric
 - 27 HD 1080p30 transcoding resources
 - 275 HD 720p30 (Polycom) SVC endpoints
 - 55 HD 720p30 H.264 transcoding ports
 - 110 SD @ 30 fps H.264 transcoding ports
 - 110 CIF @ 30 fps H.264\H.263 transcoding ports
 - 600 VoIP endpoints

The RealPresence Collaboration Server solution provides the following specifications:

- **Capacity**
 - Dynamic Resource Allocation™ supports up to
 - 10 HD 1080p60 Asymmetric

- 21 HD 1080p30 transcoding resources
- 210 HD 720p30 (Polycom) SVC endpoints
- 42 HD 720p30 H.264 transcoding ports
- 84 SD @ 30 fps H.264 transcoding ports
- 84 CIF @ 30 fps H.264\H.263 transcoding ports
- 300 VoIP endpoints
- Integration with Polycom® RealPresence Clariti™, RealPresence® DMA® 7000 system for high-scale, redundant conferencing
- **Video support**
 - From QCIF to 720p including intermediate resolutions
 - H.263 (H.263++), H.264 Baseline and High Profile, H.264 Annex G (SVC)
 - 16:9 and 4:3 aspect ratio • WebRTC
 - Native Microsoft RTV support
 - H.239 content sharing resolution (H.263/H.264): VGA, SVGA, XGA and 720p
- **Audio support**
 - G.711a/u, G.722, G.722.1C, G.722.1, G.719 G.729A, and Polycom® Siren™ 14, Siren 22, and Siren 22 LPR
 - Siren 22 LPR SAC (Scalable Audio Coding) for SVC calls
 - IVR prompts for auto attendance
- **Network support**
 - Network Separation (multiple IPs)
 - ICE and SRTP Support–video and content
 - IP H.323 and SIP–video and content
 - VoIP voice
 - IPV4
 - 10/100/1000 Mb interface
 - 64 kbps to 2 Mbps conference data rates
 - Up to 768 kbps for content
 - Direct dial-in from any network
- **IP QOS**
 - Polycom® Lost Packet Recovery™ (LPR™) technology for AVC calls
 - Polycom error resiliency algorithms for SVC calls

(vi) **Rack Server + Softwares**

This server shall be used to control the video conferencing system. It shall run a number of application softwares for use in managing the realpresence video conferencing system. This item shall be supplied and installed to operation as the Rack server + softwares below and other necessary softwares.

Server

It shall have the following features/specifications

General

- Product Form Factor
- Hot-Swap Bays Qty.
- Rack-mountable - 1U
- 8

Processor and Chipset

- CPU
- Max Turbo Speed
- Number of Cores
- Features
- Intel Xeon E5-2690 / 2.9 GHz
- 3.8 GHz
- 8-core
- 64-bit Computing, Hyper-Threading Technology, Intel QuickPath Interconnect, Intel Turbo Boost Technology 2

Cache Memory

- Cache Per Processor
- Memory: Max Supported Size
- Form Factor
- 20 MB
- 384 GB
- DIMM 240-pin

RAM

- Technology
- Memory Speed
- 4x8 DDR3 SDRAM
- 1600 MHz

Environmental Parameters

- Humidity Range Operating
- 10 - 90% (non-condensing)

Networking

- Data Link Protocol
- Remote Management Protocol
- Form Factor
- 10 Gigabit Ethernet, Ethernet, Fast Ethernet, Gigabit Ethernet
- IPMI 2.0, SMASH CLP
- plug-in card

- Compliant Standards
- IEEE 802.1Q, IEEE 802.1p, IEEE 802.3, IEEE 802.3ab, IEEE 802.3ad (LACP), IEEE 802.3u
- Interface (Bus) Type
- PCI Express x4
- Ethernet Ports
- 2 x 10 Gigabit Ethernet
- Ethernet Controller(s)
- HP 530FLR
- Remote Management Controller
- Integrated Lights-Out 4
-
- Features
- Wake on LAN (WoL), PXE support

Softwares & Licenses

i. Distributed Media Application (DMA)

This shall be a network-based application that manages and distributes multipoint video calls within an organization and intelligently distributes multipoint calls across networked conference platforms. It shall provide call control for SIP and H.323 devices and serves as an H.323 Gatekeeper/SIP Registrar for up to 75,000 devices and 64 bridges based on license. It shall provide endpoint registration, call processing, and call admission control. Call control design considerations include the dial plan, endpoint addressing, call admission control, external connectivity, and general trunking requirements.

Key Features

Capacity

- Supports up to 64 Polycom RealPresence Collaboration Servers and Cisco Telepresence MCU
- Single cluster (node) supports:
 - Registrations: 15,000
 - Point to point concurrent calls: 5,000
 - VMR concurrent calls:
 - SIP: 2,400
 - H.323: 1,200
- Supercluster (up to 10 servers in a cluster) supports:
 - Registrations: 150,000
 - Point to point concurrent calls: 50,000
 - VMR concurrent calls:
 - SIP: 7,200
 - H.323: 3,600

Call Control features

SIP registrar

- SIP proxy
- H.323 gatekeeper
- 500 concurrent SIP/H.323 GW calls
- IPv4/IPv6 - H.323 and SIP
- Network bandwidth management
- Priority-based routing

Advanced dial plan management

ii. **Resource Manager Server (RPRM)**

This shall be an integrated scheduling and management platform for endpoints and video conferencing infrastructure management. In particular, it functions as the management and licensing platform for the video conferencing system (e.g. Polycom® RealPresence Clariti™). It also includes a rich suite of APIs for customized integration into the video network.

This system shall be used to manage voice, video and content devices with provisioning, managing and monitoring capabilities

Key Features

- Scalability to 50,000 devices helps you effectively manage your voice devices as well as mobile, desktop and group video systems
- RealPresence Web Suite Support – Key components of the RealPresence Platform and RealPresence Web Suite extend enterprise-grade visual collaboration to anyone, anywhere with just a browser and webcam
- Cloud / Service Provider Multi-tenant – Host numerous customers or departments on a single platform, for operational efficiency and lower TCO
- Simplified administration and provisioning – Dynamically provision mobile, personal, and group systems with feature sets, call quality, bandwidth rights and software updates – minimizing administration work and user setup
- Centralized device management – Single application to monitor and manage all voice and video devices in the network, immediate real time views of the status and health of the video network
- Conference scheduling and management application – Use either the web scheduler, Microsoft Outlook or API to schedule and launch video calls. Central application to manage ongoing conferences, point to point or multi-party
- API Suite – Combine with RealPresence DMA APIs for a complete video conferencing management API solution
- RealPresence Resource Manager is dependent on an external video call control

(gatekeeper/SIPRegistrar) for scale which is achieved via tight integration with Polycom RealPresence Distributed Media Application (DMA). This provides highly reliable scheduled conferences, a unified dial plan, and a variety of options for leading UC environments.

iii. Distributed Media Application Edge

This shall provide secure video collaboration from anywhere, supporting SIP and H.323 devices. Users can connect their devices and mobile clients simply and easily, reducing the cost to support the growing number of video-enabled workers in your organization without compromising network security.

Features:

- An application that combines remote and B2B calling scenarios with SIP, H.323, and HTTP tunneling capabilities, enabling a seamless video collaboration experience within and beyond the firewall
- Collaboration over video while on the go, in the office, or from home
- Support for up to 1000 simultaneous video calls securely without requiring additional client hardware or software
- Leverage of existing investments in UC products and IT infrastructure, which enable you to build towards a SIP-based future
- Easy, secure, and reliable extension of video collaboration to your mobile workforce

(vii) People + Content Multipoint License

This shall be used with the video conferencing system in item 5.6 (i) above.

This Software License shall allow for 6 way connection or 4 way if using high definition.

Features

Multipoint License

- Mixed protocol dialing, including IP, ISDN, and Serial
- Supports up to 6 participants
- Support for H.239 content sharing technology from any endpoint in the call

1080p License Key provides:

- Greater video resolution for both video and content
- Up to 1080p60

RTV / CCCP License

- Enables support for Microsoft RTV codec and direct calls to MS AV MCU

TIP License

- Enables support for Cisco TIP compatibility

SECTION G

GENERAL AND PARTICULAR SPECIFICATIONS FOR PUBLIC AREA DISPLAY SYSTEM (PADS) AND PUBLIC ADDRESS & EMERGENCY SOUND SYSTEM

I) GENERAL SPECIFICATIONS

1.0 General Requirements and Conditions

2.0 General Technical Requirements

II) PUBLIC AREA DISPLAY SYSTEM (PADS) PARTICULAR SPECIFICATIONS

1.0. Scope Of Work & Description Of The System

2.0. System Design Requirements

3.0. System Hardware Overview

4.0. System Software Overview

5.0. Equipment Particular Specifications

III) PUBLIC ADDRESS & EMERGENCY SOUND SYSTEM PARTICULAR SPECIFICATIONS

1.0 Scope Of Work & Description Of The System

2.0 System Design Requirements

3.0 System Hardware Overview

4.0 System Software Overview

5.0 Equipment Particular Specifications

I.

GENERAL SPECIFICATIONS

1. GENERAL REQUIREMENTS AND CONDITIONS

The scope of works under this sub-contract shall include; Supply, installation and commissioning of the all the Public Area Display System (PADS) and PA + Emergency Sound equipment to deliver a complete system. The contractor is however supposed to consider the following in coming up with the proposal for the system;

- Floor plan layout configuration shall be as per the Engineer's specifications
- The contractor must derive the appropriate distribution equipment and ensure that all signals are distributed at the correct levels to the points required.
- The contractor shall supply and install system equipment that meets Building Management System (BMS) standard and ensure that the system configures well to the BMS.
- A detailed technical proposal comprising detailed drawings and all layouts and schematic diagrams of the proposed system including wiring and interconnection diagrams must be submitted with the bid documents.
- All equipment must be provided with the necessary optional boards to achieve proper functionality.
- A list of all required spare parts must be provided separately.
- The contractor shall be required to provide experienced training personnel who must demonstrate their experience and manufacturer training and certification.
- The contractor shall ensure that all the works carried out on site conforms to the current relevant safety regulations.
- Equipment supplied must conform to PAL and DVB-T2 standards or the latest broadcast standards applicable in Kenya.
- All equipment **MUST** be tropicalised and those components prone to rust coated or treated with rust proof coatings.

2. GENERAL TECHNICAL REQUIREMENTS

2.1 Cable and Equipment Identification

- The contractor must supply all cables required and connectors.
- All cables except short mains shall be labelled at both ends.

2.10 Equipment Racks

- Rack mounted equipment shall be neatly wired and the following to be included with the equipment racks;
 - c) Power-coated cable tray on either sides
 - d) Suitable slotted trunking mounted on the cable tray to house all audio, video and data cabling.
 - e) Professional power distribution with suitably sized professional circuit breaker.
- The rack sizes shall be sufficient to provide floor or access spaces.
- All racks are to include removable front, rear or side doors.

2.11 Power amplifiers

- These shall be mounted within the rack in such a way that the power amplifiers do not overheat during normal operations.

2.12 Loudspeakers and display systems

- Brackets-steelwork and suspension systems. The Contactor shall ensure that these are properly designed and engineered.

2.13 Quality of workmanship

- The Engineer will closely monitor the quality of workmanship during execution and ensure that the specifications are adhered to.

2.14 System Setup and Alignment

- The contractor shall ensure that the systems installed are correctly programmed, tuned and setup to achieve a high level of audio-visual quality acceptable by the Engineer.

2.15 Schematic drawings

- The contactor shall be required to provide system schematic diagrams, rack layout drawings for the control room and scale drawings indicating the positions of all equipment and cable routing. The drawings and system literature shall be included.

2.16 Users Manuals and As Installed Drawings

- After system commissioning, the contractor shall provide all equipment Operation and Maintenance manuals, and the As Installed drawings for the system.
- In addition, the contractor shall also furnish all system designs, literature and applications software.

2.17 Electrical Power Requirements

- All the equipment to be Supplied equipment must conform to the Kenya standards of 240/415 V, three pin BNC, 50 Hz.

II.

PUBLIC AREA DISPLAY SYSTEM

(PADS)

1. SCOPE OF WORK & DESCRIPTION OF THE SYSTEM

This section contains details of the proposed Public Area Display System (PADS) to be used in the building complex to display real time audiovisual information and text to the public in lounges, receptions, lobbies and other public areas. The system shall also integrate with a SMATV for TV signal distribution to all Display units.

The PADS shall be provided as a complete package comprising of hardware and software systems designed for presenting and managing multimedia presentations on (large screen) monitors, LEDs or other display devices.

This will involve the use of Digital Signage technology that provides for streaming of audio-visual and text presentations in all LED TVs in real time. An external display LCD TV will also be provided at the building's frontal façade. In addition there should be feeds to some bill board displays mounted on specific areas within the building.

2. SYSTEM DESIGN REQUIREMENTS

This system shall be designed to allow one to create presentations with any type of content. These shall include but not limited to the ability to;

- Have video and sound (audio) presentations, TVs signals or include information from the Web or build complete multimedia presentations that use macromedia flash.
- Have simple text messages presentations scrolling on the screen.
- Use of an information kiosk operated on a touch screen display.

The other powerful aspect of PADS that shall be expected is the ability to include real-time data in the presentations from almost any possible data source and audiovisual presentations in this case coming from conference rooms or Auditorium rooms.

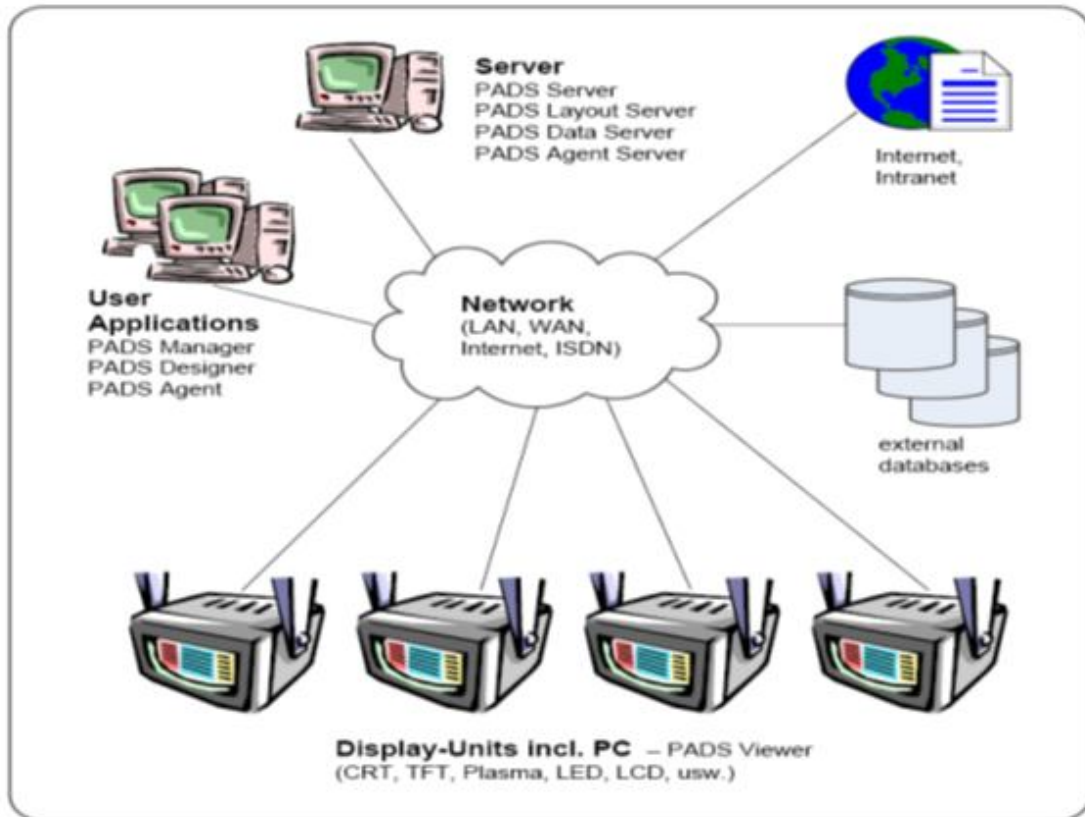
The system shall also incorporate external databases that will enable it to automatically display up-to-date information always.

1.1. System Administration

The system administration shall be capable to perform remote administration and several tasks like;

- Scheduling - This is a major component of the system setup capability that enables one to be completely free to decide where and when you want to display the presentations you have designed. Presentations can be scheduled once or with recurrence for individual displays, or at once for the entire group of displays. The scheduling as well as the displayed content can be adjusted at any time.
- Configuration of a PADS Viewer,
- Update of the PADS software,
- Screening the logfiles and
- Collection of the statistical data.

1.2. System design overview



3. SYSTEM HARDWARE OVERVIEW

3.1. PADS PC's suit

PADS PC's suit is a powerful suit installed with;

- Designer application software that shall allow designing PADS presentations
- Management applications software for scheduling the presentations designed
- The PADS server software that automatically handles the process of collecting and distributing the scheduled presentations as well as the delivery of real-time data to the PADS Viewers for displaying.

3.2. Distribution/Network

The PADS system shall automatically handles the distribution of the scheduled Presentations to the displays and there shall be no limitations to this.

The Presentations shall be distributed over the LAN (Local Area Network), WAN (Wide Area Network), Intranet or Internet or through any other wired or Wireless connections supported. This can include in the network but not limited to;

- CAT 6 Transmission System
- Fiber Optic Transmission System. Etc.

Besides the presentation itself, the system shall also automatically distribute the content files that are related to the presentation (like pictures, videos, etc.). When the presentation needs to display real-time information, the PADS system shall also take care of collecting the actual data from the specified data source and distribute it automatically to the displays.

3.3. Digital Signage Network Server

The system shall be a dedicated server used to manage content distribution within the network for PADS. It shall contain signage distribution softwares and shall be provide a flexible UI for managing several hundred hospitality displays remotely from one central location.

3.4. Outdoor LED Display Screen

This shall be an all-weather outdoor screen that will be able to be integrated with the indoor digital signage system.

3.5. LED Smart TV

This shall be an indoor smart TV with inbuilt digital signage media player that shall be used to display various content for digital signage.

4. PADS SYSTEM SOFTWARE OVERVIEW

The system software shall provide the following key functions;

- Creation of information pages
- Display management
- Content Management
- System management

For the system to perform the above key function the following feature must be provided for but not limited to;

a) PADS Designer application

PADS Designer is a powerful editor that allows one to design PADS presentations and can consist of one single page of a large number of alternating pages. It should be possible to use any combination of text, pictures, lines, shapes, videos, sound, scrolling text, web pages, Microsoft Powerpoint presentations, Macromedia Shockwave and Flash presentations, TV and even more in each page of your presentation. It should also be compatible with MS Outlook such that it can be intractable with the outlook Meeting Scheduler.

b) PADS Manager Application

PADS Manager Application is for scheduling the presentations that have been designed. You can schedule a presentation for an individual Viewer or at once for a group of Viewers. Presentations can be scheduled for one time only or to be repeated on a yearly, monthly, weekly or daily basis. Even recurrences within one day should be possible. This application also allows for several priority levels to distinguish between the importances of scheduled presentations.

c) PADS Server software

The PADS server software automatically handles the process of collecting and distributing the scheduled presentations as well as the delivery of real-time data to the PADS Viewers for displaying.

Besides the scheduled presentations and real-time data, the PADS Server software also controls the distribution of any content files like picture, videos etc. that are required for the presentations.

The system should use a 'Smart pulling technology. This means that the PADS Viewer application takes the initiative to contact the PADS Server. Once the connection has been established network, traffic will be minimized until the moment that there is a new presentation or new real-time data to be displayed.

This technology makes it possible that PADS can run with any type of TCP/IP connection between the PADS Server and PADS Viewer PCs.

d) PADS Viewer application

The PADS Viewer application is responsible for displaying the scheduled presentation on a display device. The PADS Viewer software communicates with the PADS Server software for the retrieval of presentations, related content files (like pictures and videos) and real-time data

The Viewer software automatically caches the schedule information, presentations and related content files that it receives from the PADS Server. This makes that whenever a network failure may occur in the communication with the PADS Server software, the Viewer will continue to operate as normal based on the cached information.

As a result network problems for a short or longer period of time will probably not even noticed by the public. The PADS Viewer application can also run interactive presentations. This allows it to be used as a kiosk solution where the user can browse through the displayed presentations or the displayed data, for instance in combination with a touch screen.

5. EQUIPMENT PARTICULAR SPECIFICATIONS

5.1. System setup Configurations

The requirements for the hardware that is needed to use the PADS Software depend strongly on the configuration that is used and the type of content that has to be displayed.

This project is required to give a configuration that builds a complete signage network that provide a *Solution for about fourth three (43) Public Displays connected, one user PC, and a separate Server PC*. And besides that, it should be possible to add an unlimited quantity of server PCs that run the PADS Layout Server or the PADS Data Server as well as display units. It shall also provide streaming of digital signage content on the outdoor screen.

The Server PC shall contain all the PADS Server components as well as the PADS Viewer software. PADS Designer and PADS Manager Applications shall be installed on the users PC.

1.3. System Equipment setup

a) Server PC

The Server PC is the pivot of the system. On this PC the PADS Server software runs. The requirements for this PC shall mainly depend on the size of the system and on how intensively the system is used. It shall comprise of a CPU, 19” LCD display, Keyboard, Mouse, latest operating system, and any other accessory for proper operations.

It shall have the following specifications

Processor: Intel® Core™ i7-6700

Operating System: Windows 10

Front I/O: 2 USB 3.0, 1 USB 2.0, 1 USB 2.0 Charging Data Port, 1 Headphone,

and 1 Microphone.

Internal I/O:	1 USB 3.0 and 3 USB 2.0 ports available as 2 separate 2x10 (3.0 x1, 2.0 x1) and 2x5 (2.0 x2) header:
Supports:	1 HP Internal USB 2.0 Port Kit and 1 USB 3.0 Media Card Reader.
Rear I/O:	1 DVI-I Single Link and 2 DisplayPort (DP 1.2) outputs from Intel® HD graphics (available on specific processors only); 4 USB 3.0 ports, 2 USB 2.0 ports, 1 serial port (optional), 1 parallel port (optional), 2 PS/2, RJ-45 (LoM), 1 Audio Line-in, and 1 Audio Line-out, Microphone; 2 IEEE 1394b ports (optio
Temperature Operating:	40° to 95°F (5° to 35°C)
Temperature Non-operating:	-40° to 140°F (-40° to 60°C)
Chipset:	Intel® C236 chipset
Memory:	4 DIMM slots, supporting up to 64GB ECC/non-ECC, DDR4 2133 MT/s
Monitors / Displays:	21.5-inch IPS LED Backlit Monitor
Hard Drives:	2.0TB SATA 7200 rpm 6Gb/s 3.5" HDD
PCIe SSDs:	HP Z Turbo Drive G2 512GB SSD
Memory:	HP 8GB DDR4-2133 ECC RAM
Integrated Graphics:	Intel® HD Graphics 530 (on Core i3/i5/i7-6xxx processors); Intel® Integrated Graphics for Xeon processors
Operating Voltage Range:	90-269 VAC
Rated Voltage Range:	100-240 VAC
Rated Line Frequency:	50-60 Hz
Operating Line FrequencyRange:	47-66 Hz
Rated Input Current:	6A @ 100-240V

b) Public displays (43"4K LED Smart TV

Public displays are used to display the PADS presentations. The recommended hardware specifications are as follows;

- Screen Size
- Technology:
- TV Style:
- Aspect Ratio:
- Resolution:
- Picture Engine
- DTV Capability:
- 43"
- LCD-LED 4K Smart TV
- Flat screen, Flat panel
- 16:9
- 3,840 x 2,160 Pixels or better
- UHD Mastering Engine
- DVB-T (terrestrial digital TV), DVB-C

- Video formats supported
- Audio format
- Speakers:
- Other features
- Inputs supported:
- Outputs Supported:
- Wall mountable
- Operating system
- Wireless network
- Ethernet Connection
- Energy efficiency class
- Operating Power consumption
- (digital cable tv), DVB-S (satellite TV), DVB-T2 (terrestrial digital TV, 2nd gen.), DVB-S2
- 2160p (4K Ultra HD)
- Dolby Digital Plus
- Two built-in stereo speakers
- Picture-in-Picture (PIP), Bluetooth, Support for HbbTV
- Component (1), Composite Video (1), HDMI (3), USB (2), Stereo Audio
- Digital optical output (S/PDIF), HDMI. Stereo Audio
- Yes
- Tizen OS
- Wi-Fi
- Enabled
- A+
- 215W max

c) Network infrastructure

The PADS system requires some type of network connection between the PADS Manager/Designer PC and the PADS Server PC on one side and between the PADS Server PC and the display screens. The most commonly used network infrastructure to be proposed and can include the LAN (Local Area Network), WAN (Wide Area Network), Intranet or Internet connection. Wired or Wireless connections. This shall be an existing network.

d) Rack Mount Server

This shall be a dedicated server for using the digital signage software solution, which provides a flexible UI. It shall provide a straightforward way to manage several hundred displays remotely from one central location.

The recommended hardware specifications are as follows;

- Product
- Type
- OS
- CPU
- North bridge
- South bridge
- GPU
- SSD
- REACH Server
- Rack-mounted server (1U)
- Windows® Embedded Standard 7
- AMD Ontario 1.6 GHz Dual
- AMD Radeon HD 6320 Graphics
- AMD Hudson M1
- AMD Radeon HD 6320 Graphics
- 128 GB

- Memory
- Ethernet
- USB
- RF Out
- Clock battery
- Number of fans
- RF out frequency
- RF output power
- RF matching impedance
- RF channel bandwidth
- 4 GB (1-channel)
- Gigabit LAN
- downstream 4
- DVB-C,
- 1
- 1
- 40 - 999 MHz
- 50 - 35 dBmV
- 75 ohm
- DVB-C (2.694 - 8.28 MHz), open cable (6 MHz)

e) All weather Outdoor LED display screen

The outdoor screen shall be of LED Technology and must be able to withstand any environmental condition (rain, heat, snow, wind, etc.) and must be bright enough to be seen perfectly, even in broad daylight.

It shall be supplied with all the necessary accessories.

The minimum recommended hardware specifications are as follows;

- Screen Size
- Type of LED
- Pixel (Pitch) mm
- Resolution
- Brightness
- Contrast Ratio
- Colour Processing
- Dimming Levels
- Colour Temperature
- Viewing Angle
- Power Requirement
- Operating Environment - Temperature
- 3 x 2 m
- 3-in-1 SMD Black Type
- At least 6.25mm
- 80 × 80 dots
- 3000 cd / m²
- 2000 : 1
- 14-bit
- 64 Levels
- 3200 - 9300 K
- (H) ±80°, (V) ±70°
- 240 V AC , 50 Hz
- -20 - 50 °C

III. PUBLIC ADDRESS & EMERGENCY SOUND SYSTEM

1. SCOPE OF WORK & DESCRIPTION OF THE SYSTEM

This section contains details of the proposed Digital Public Address Sound System within the building complex that shall be used by the authorised personnel in the building to make manual live announcements or pre-recorded announcements to any assigned zones, to selected zones or to execute predefined actions using a console (call station).

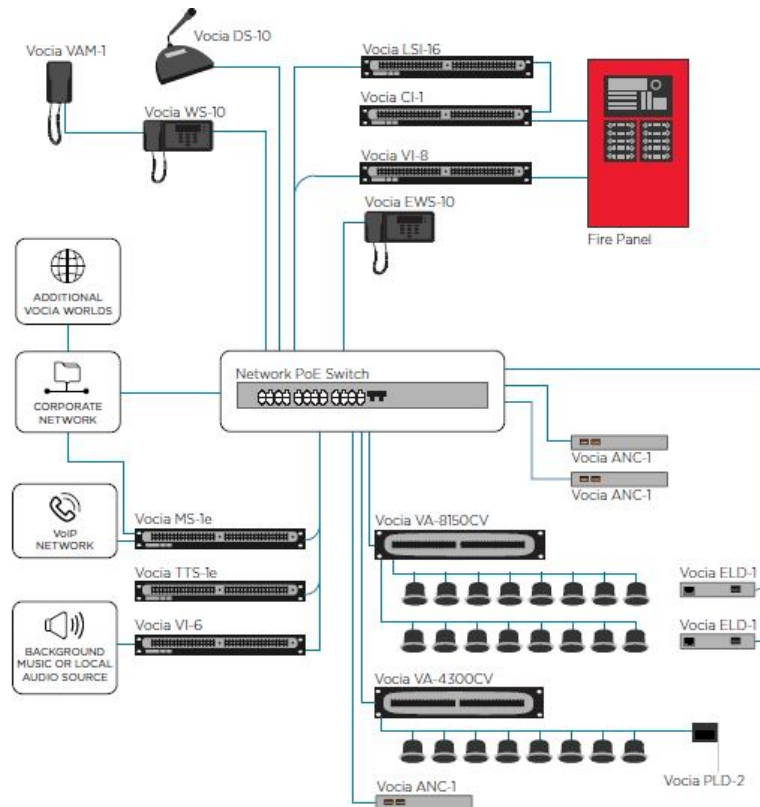
The system shall also be designed to provide the following functions:

- Provide for call station announcements.
- Provide background music in lounges, receptions, lobbies and any other public areas.(that may not be catered for by public area displays).
- Interfacing with Emergency Sound System to provide manual live announcements to all rooms within the complex in case of an emergency.
- Interfacing with fire alarm (and configuring to automatically broadcast voice alarms and evacuation on receiving input from the fire detection and alarm system)

The system is expected to bring out highly innovative and advanced digital technology in the public address market allowing all the processing and communication of both audio signals and control data to be entirely in the digital domain. It shall be designed for configuration and control from a PC and all the requirements placed by professional users on a public address/emergency system shall be met.

The system range of equipment shall have a multiple functions combined in a single unit to reduce the number of different types of equipment used in the system. The architecture of the system equipment shall be flexible to permit any type of equipment to be located and monitored anywhere in the building. Multiple systems shall be easily connected and controlled over TCP/IP using optical or standard copper cabling and the configuration software shall enable the user to configure all the functional parameters.

2. SYSTEM DESIGN REQUIREMENTS



A Sample PA System

1.1. Network Approach

The system network architecture shall be based on daisy-chaining of the units whereby it is possible to add or remove equipment anywhere in the network without affecting the performance of other units, provided that the network connection is available. This makes the system easily expandable, without adding any additional electronics.

It shall comprise a network controller that shall be capable of monitoring all the units in the system and with a built-in memory to stores messages. Any fault shall be reported back to the network controller. The system network shall also meet requirements for an emergency call stations by providing a large numbers of control inputs and outputs.

1.2. Distributed Control

The system shall be designed for distributed control of various system functions. This is whereby the external interfaces, which are control inputs and outputs, are located anywhere in the network. The processing of audio input and output signals shall be located in each unit. This distributed signal processing enables the central system unit – the Network Controller – to concentrate on functions such as

supervision, routing announcements, background music, pre-recorded messages, taking actions on control inputs, etc. As a result the response times are much shorter than for systems with centralized processing of all signals.

1.3. External Interfaces

The interfaces to the system shall be audio, control input or the Ethernet. The Ethernet open interface shall be provided at the network controller.

3. SYSTEM HARDWARE OVERVIEW

3.1. Controller Software

The network controlled software shall be the heart of the system where it stores all control information. It also provides for configuration as well as diagnostic and logging functions. The network controller also stores the digital audio messages for automatic announcements.

The controller monitors all the system components and reports any changes in status. The network controller stores the configuration details and the last 200 fault messages. The availability of the digital audio messages, the alarm tones and alarm tone generator and the control inputs are continuously monitored.

It shall be able to control up to 40 channels.

3.2. Power Amplifier

High-efficiency amplifiers that generate less heat, allow for closer stacking in a rack and which can be connected to the network line directly are to be provided. The power amplifiers are to be equipped with amplifier monitoring and change-over relays.

The amplifier shall also provide short-to-ground and short-circuit detection functions. If an end-of-line supervision card is plugged in, the loudspeaker lines are also monitored for open circuits.

The power amplifiers shall be equipped with audio processing facilities for each amplifier channel. The pilot tone for the monitoring shall be generated in the power amplifier itself.

3.3. Networked Audio Input expansion device

This shall be an expansion device for adding various audio sources to the system. It allows the user to add up to six channels of background music or user-defined audio to the system.

3.4. Networked Paging microphone

This shall be a desktop networked paging station featuring embedded DSP, on-board memory, and PoE supporting both standard and advanced public address functionality. All device-specific configuration information is stored locally, which means that it does not rely on a centralized controller for processing and page routing.

3.5. Emergency alarm interfacing device

This item shall serve as an enhanced emergency interface between the PA system and emergency/fire alarm systems.

3.6. Control line safety interface

This shall be used for connection of the PA system with the fire alarm/emergency system

3.7. Computer

This shall be used for configuring the PA system. It shall host the PA distribution software and shall run on the latest windows operating system.

3.8. Audio Player

This shall be a source of music to be played within the building.

3.9. End of line Monitoring unit

This shall be used for line monitoring of the PA to ensure proper operation of the PA system.

3.10. Zonal Volume controller

This shall be used to control the volume in areas where the common PA audio needs to be adjusted. This shall be used in restaurant areas.

3.11. Ceiling mount speakers

The ceiling mount speakers shall be 8" white speakers to be used for hearing the PA content.

3.12. Home Theatre System

This shall be used at the GYM and Aerobics center where different audio content and levels for the PA system are required.

3.13. Panaray Speakers & Sub-woofer

To be used with the item 3.12 above

3.14. Cabling

The cabling that ensures optimum signal integrity for longer cable interconnections shall be used.

4. SYSTEM SOFTWARE OVERVIEW

The system software configuration shall allow the user to configure the input to initiate the desired actions in the system, the flexibility to route any input from one system unit to another and Monitoring of all faults.

For instance, the system software shall allow configuration of:

- Routing of all zones and audio inputs
- Audio levels and functions (e.g. parametric equalization)
- Priority levels
- Descriptions/Naming of all devices
- Sequences and timing of messages & music
- Definitions and functions of call station keys and control input contacts
- Downloaded WAV-files for pre-recorded messages

5. EQUIPMENT PARTICULAR SPECIFICATIONS

5.1. System Equipment Setup and Configuration

This project is required to give a configuration that builds a complete system network that provide a *Solution for public address and emergency sound system in the building complex of about twenty eight (28) floors with various unique zones designed for configuration and control from a PC.* And besides that, it should be possible to add or remove equipment anywhere in the network without affecting the performance of other units.

The system configuration and setup will be as follows;

- i. A minimum of four (4) Zones distributed as follows;
 - a. **ZONE 1:** Corridor, washroom area, Parking area, Elevators and any other Public area.
 - b. **ZONE 2:** Committee rooms, control rooms, and offices
 - c. **ZONE 3:** Lounges, Receptions and Lobbies
 - d. **ZONE 4:** Restaurant, gym, e.t.c
- ii. Atleast 4 call stations (one for each zone and any others selections custom-made)
- iii. One(1) Network controller.
- iv. Four (4) call microphones
- v. Atleast three (2) music sources
- vi. Interface with fire alarm system - control inputs needed
- vii. Power amplifiers;
- viii. Loudspeaker line supervision
- ix. Several Loudspeakers in each zone (design specific)
- x. System Management PC.
- xi. System software for Management, Configuration, Diagnostic and Logging

5.2. Equipment Technical Specifications

(i) Controller Software

The main screen of the software shall provide an easy, at-a-glance overview of your universe, whether it contains a single world or several. This hierarchical view lists all devices included in the Universe by World, Device ID, online and configuration status, along with the loaded firmware version. The colors indicate the health of each device listed. An overall system alarm tab (“Acknowledge Alarms” in the upper right corner) flashes when an alarm or fault is detected

in the system.

Features of the software are designed to interface to any CobraNet audio system using explicit bundle numbers.

The scheduler feature (requires an MS-1e) is used to configure schedules for recorded announcements, background events (e.g. background music coordinated with the time of day), and user audio input events (e.g. an announcement that broadcasts for a certain period of time in a specified zone).

(ii) Audio Power Amplifiers

This shall be a digital networked eight-channel amplifier capable of delivering audio power at 150 Watts per channel. It shall be a CobraNet® enabled for audio and control with dynamic use of bundles. Two RJ-45 connectors on the rear panel provide redundant CobraNet connectivity to the audio network. The onboard DSP provides comprehensive fixed-chain, digital signal processing within the device. In addition, emergency messages are stored in local non-volatile memory.

Page active relay outputs provide a contact closure per channel when paging is active on the channel. The amplifier also has comprehensive failover capability with device-to-device and channel-to-channel failover.

Features

- Eight channels of 150W per channel
- Page active relay
- Comprehensive failover
- Extended audio delay
- CobraNet audio/control with dynamic use of available bundles
- Flexible line monitoring
- Dual Ethernet ports for redundancy
- Dual power inputs (100-240V AC and 48V DC)
- Rack mountable (2RU)
- DSP functionality includes: BGM, regular and emergency paging, emergency messages and ANC support

Technical Specifications

Channels: 8 – fixed

Technical Specifications

Network Connection: RJ-45 with shielded Ethernet (CAT5, CAT5e, CAT6 or CAT7)

Frequency Response:

Line Inputs (20Hz to 20kHz): ± 1 dB

Mic/Line Inputs (35Hz to 20kHz): ± 1 dB

THD + N (20Hz to 8kHz):

Line Inputs: $<0.02\%$

Mic/Line Inputs: $<0.05\%$

Line Inputs Signal-to-Noise Ratio: >84 dB

Mic Inputs Equivalent Input Noise: <-126 dBu

Dynamic Range: >100 dB

Crosstalk (10kHz): >75 dB

Input Impedance:

Line Inputs: >10 k Ω

Mic/Line Inputs: >1 k Ω

Mic Inputs Phantom Power: 18V behind 3.3k Ω /leg

Control Inputs:

Type: Digital, variable threshold

Max Input Threshold: 10V

Max Input Voltage: 12V

Min Input Threshold: 150mV

Input Impedance: 100k Ω

(iv) Networked Paging microphone

This shall be a desktop networked paging station for use in PA systems. It shall feature embedded DSP and on-board memory to support standard and advanced public address functionalities. It should be able to store 999 user-configurable page codes. The processing, routing and storage functionality in a PA system is decentralized, which eliminates any centralized point of failure.

Features

- Push-to-talk button with status indication
- Up to 999 user-configurable page codes
- Local digital signal processing, including gain, filters and compressor/limiter
- Local storage of configuration data

- Local storage of default and/or custom preambles
- Built-in store and forward functionality
- CobraNet® audio/control with dynamic use of available bundles, plus power over single Ethernet cable
- Backlit liquid crystal display (LCD) technology
- Optional PIN to restrict unauthorized use
- Auxiliary Port provides connection for power, line-level audio, and bi-directional RS232 for transmitting Text Protocol (VTP) commands
- High-quality gooseneck cardioid microphone
- Sturdy component housing
- Rotary ID switches for unit identification
- Monitored, high-quality, dynamic cardioid microphone capsule

Technical Specification

- Network Connection: RJ-45 with shielded Ethernet (CAT5, CAT5e, CAT6 or CAT7)
- Frequency Response (100Hz ~ 20kHz): +0, -1dB
- THD+N (100Hz ~ 8kHz): <0.05%
- Effective Input Headroom: 30dB
- System Headroom: 18dB
- Gain: Adjustable in 1dB steps over a 30dB range
- Input Impedance: 3k Ω
- Maximum Input: 125dB SPL
- Balanced Line In: -10dB Nominal
- Mic Type: Dynamic microphone with dual transducer (monitored)
- Mic Pattern: Cardioid
- Mic Frequency Response: 100Hz-10kHz
- Mic Gooseneck Length: 12.5 inches (317.5mm)
- PTT: Switch contact between pin and ground

(v) Emergency alarm interfacing

This shall be a networked device that serves as an interface between a PA system and emergency or fire alarm systems. It may accept up to three sources of power: main power is from an external, standards compliant, battery backed 24V DC source but can also utilize Power over Ethernet (PoE) delivered via either of its two network ports. The device shall be equipped with parallel I/O

ports for direct interface to fire and emergency control equipment.

Features

- Parallel I/O ports for direct interface with fire alarm and emergency equipment
- 8 monitored I/O and 8 control inputs
- Redundant network connection and power supply options
- Power and data over a single Ethernet cable
- Web interface for emergency device reporting
- Local storage of configuration data
- Rotary switches for unit identification
- Up to 4 discrete emergency inputs
- 16 additional general purpose inputs can be programmed to play an emergency message, enable zone reset or zone silence; maximum of 10 inputs can be assigned per emergency zone
- Each general purpose input can be programmed as TTL, high range or monitored high range
- General purpose inputs allow monitoring for short to ground and open circuit
- Up to 500 virtual inputs via RS232 or Ethernet

Technical Specifications

- Network Connection: RJ-45 with shielded Ethernet (CAT5, CAT5e, CAT6 or CAT7)

System Fault Relay:

- Type: Single Form C voltage-free SPST change-over contact
- Load: Resistive
- Max Operating Voltage: 125VAC, 60VDC
- Max Operating Current: 600mA AC, 1A DC
- Max switching capacity: 37.5VA, 30W
- Min permissible load: 10 μ A @ 10mVDC

Control Inputs:

- Number: Eight
- Type: Opto Isolator LED
- Cathode presented at input – pull low to enable Sink Current:
- Min: 1mA
- Max: 6mA
- Maximum Terminal Voltage: 24V

- Isolation: 3kV

(vi) Control line safety interface

This device that serves as a companion product to the fire alarm interfacing to provide the necessary life safety functionality.

Features

- High reliability switches for Local Sounder Silence, System Test and System Fault Reset
- High level sounder for Fault and Alarm warning
- Dual 24V DC power inputs with uninterrupted failover on power loss
- Provides terminating resistors for Alarm and Fault Inputs for LSI-16 and LSI-16e Life Safety interface devices
- Current limited reference voltage output

Technical Specification

Alarm Inputs:

- Assertion: Transition from 0V to 12-24V

Fault Inputs:

- Assertion: Transition from +V to 0V
- Maximum pull-up resistor: 2.2kΩ

Outputs:

- Assertion: Low
- Pull-up Load: max 2.2kΩ
- Maximum External Supply: 35V
- Maximum Continuous Current 350mA Current Limit: 800mA

Power: Dual 24V DC, 15W each

(vii) Desktop Computer

Processor:	Intel® Core™ i7-6700
Operating System:	Windows 10
Front I/O:	2 USB 3.0, 1 USB 2.0, 1 USB 2.0 Charging Data Port, 1 Headphone, and 1 Microphone.
Internal I/O:	1 USB 3.0 and 3 USB 2.0 ports available as 2 separate 2x10 (3.0 x1, 2.0 x1) and 2x5 (2.0 x2) header:
Supports:	1 HP Internal USB 2.0 Port Kit and 1 USB 3.0 Media Card Reader.
Rear I/O:	1 DVI-I Single Link and 2 DisplayPort (DP 1.2) outputs from Intel®

HD graphics (available on specific processors only); 4 USB 3.0 ports, 2 USB 2.0 ports, 1 serial port (optional), 1 parallel port (optional), 2 PS/2, RJ-45 (LoM), 1 Audio Line-in, and 1 Audio Line-out, Microphone; 2 IEEE 1394b ports (optio

Temperature Operating: 40° to 95°F (5° to 35°C)

Temperature Non-operating: -40° to 140°F (-40° to 60°C)

Chipset: Intel® C236 chipset

Memory: 4 DIMM slots, supporting up to 64GB ECC/non-ECC, DDR4 2133 MT/s

Monitors / Displays: 21.5-inch IPS LED Backlit Monitor

Hard Drives: 2.0TB SATA 7200 rpm 6Gb/s 3.5" HDD

PCIe SSDs: HP Z Turbo Drive G2 512GB SSD

Memory: HP 8GB DDR4-2133 ECC RAM

Integrated Graphics: Intel® HD Graphics 530 (on Core i3/i5/i7-6xxx processors); Intel® Integrated Graphics for Xeon processors

Operating Voltage Range: 90-269 VAC

Rated Voltage Range: 100-240 VAC

Rated Line Frequency: 50-60 Hz

Operating Line Frequency Range: 47-66 Hz

Rated Input Current: 6A @ 100-240V

(viii) Ceiling Mount Speakers

Features

- New speaker designs that harmonize with the venue's architecture and decor
- Quick and easy installation thanks to new SUS spring clamp installation method
- Wide frequency response
- Greater variety of ceiling speaker diameters (5", 6", 8" (12, 16, 20cm))
- Thin panel does not clash with interior design

Technical Specifications

- The speaker shall be a 8" (20cm) double cone-type speaker suitable for ceiling mounting. Ease of installation shall be insured by a SUS spring-based installation clamp mechanism. Cable connection shall be by means of a push-in connector (bridging terminal).
- The speaker shall include a transformer having multiple taps (0.8W, 1.5W, 3W, 6W at 100V and 0.4W, 0.8W, 1.5W, 3W at 70V) adjustable.

- The output sound pressure level at a distance of 1 m with a 1W input level applied shall be 94 dB SPL.
- The speaker shall have a frequency response of 40 – 20,000Hz (-20dB).
- The speaker baffle shall be constructed of steel plate.
- The grille shall be surface-treated steel plate.
- The speaker shall be available in off-white colour.
- The unit shall have dimensions of $\varnothing 280 \times 92$ (D)mm ($\varnothing 11.02'' \times 3.62''$), and a weight of 1.4 kg (3.09 lb).

(ix) Audio Player

This shall be used to provide audio input to the PA system.

It shall have the following;

- CD/DVD,
- USB,
- Tuner

(x) End of line Monitoring unit

This shall be a networked safety device for use with the amplifier and is an integral part of standard-compliant voice evacuation and mass notification systems. This equipment tests and reports speaker line integrity between itself and the amplifier. The device can be surface mounted and utilizes IEEE-compliant Power over Ethernet (PoE) technology.

Features

- Line monitoring
- Looks for inaudible signal from Vocia amplifier module
- Reports shorts or opens in the speaker line to the network
- Surface mountable
- Power and data over a single Ethernet cable
- Status LED
- One removable terminal block connector

Technical specification

- Network Connection: RJ45 with shielded Ethernet (CAT5, CAT5e, CAT6 or CAT7)
- Speaker Line Input Configuration: Balanced and Floating (transformer coupled)

Speaker Line Input Impedance:

- 70/100V Input: >100k Ω
- Low-Z Input: 10k Ω
- Max Input Level (AC): Adjustable in 1dB steps over a 30dB range

System Headroom:

- 70/100V Input: 200V
- Low-Z Input: 100V

(xi) Zonal Volume controller

This is a networked wall remote for use in a PA system. It shall be designed to control background audio, source selection, levels, and other functions within a zone. It shall utilize Power over Ethernet (PoE) technology. It shall allow the user to choose background music sources, inhibit pages and mute sources from an attractive wall-mounted panel. A backlit liquid crystal display (LCD) facilitates navigation through the system menu.

Features

- Wall mountable
- Power and data over a single Ethernet cable
- Backlit liquid crystal display (LCD)
- Rotary switches for unit identification
- Software-configurable settings, including volume, source selection, paging inhibit, and mute source control

Technical Specifications

- Network Connection: RJ-45 with shielded Ethernet (CAT5, CAT5e, CAT6 or CAT7)
- Power: 802.3af (PoE) Class 1

Environment:

- Ambient Operating Temperature Range: 23-104° F (-5 – 40° C)
- Humidity: 0 – 95% non-condensing
- Altitude: 0-10,000 Feet (0-3000 Meters) MSL

(xii) Home Theatre System

Key Features

- 5.1-channel system
- Stylish Quartz design
- Bluetooth® connectivity
- Karaoke feature

- S-Master Digital

specifications

- Speaker System: 2-way
- Band (FM / AM): FM
- Preset Station (FM / AM): 20 (FM)
- Power Output: 1000W
- Form Factor: 5.1
- Input And Output Terminals: Analog Audio Input: Pin Jack (1), Ethernet Connection (1), HDMI IN/OUT (0/1), Optical Audio Input (1), USB Input (1 Front), USB Keyboard
- Blu-Ray Disc™: Yes
- Blu-Ray 3D™: Yes
- DVD: Yes

(xiii) **Panaray Speakers**

Key Features

- Full-Range-Driver Array eliminates tweeters and crossovers for unsurpassed reliability in harsh environments and vocal clarity
- 4x Bose 4.5-inch full-range drivers for legendary reliability
- 120° x 60° articulated array design covers a very wide area, which can reduce the number of loudspeakers required
- 73 Hz - 15 kHz Frequency Range eliminates need for subwoofers for moderate full-range music levels
- 119 dB Peak SPL for sound-reinforcement and foreground music
- Rugged, lightweight enclosure with threaded inserts for easy installations
- Weather-rated design for indoor or outdoor installations

Technical Specifications

- | | |
|--------------------------|--------------------|
| • Speaker Type | • Passive |
| • Nominal Output Power | • 150 Watt |
| • Max (RMS) Output Power | • 600 Watt |
| • Frequency Response | • 73 - 15000 Hz |
| • Nominal Impedance | • 8 Ohm |
| • Output Level (SPL) | • 119 dB |
| • Sensitivity | • 91 dB |
| • Coverage | • 120° x 60° |
| • Recommended Placing | • Indoor / outdoor |

(xiv) Sub-woofer

Features

- Wide frequency range from 40 to 300 Hz, which can be easily matched to any Bose professional loudspeaker
- High-impact output for dominant bass material
- Rugged, portable enclosure with metal grille and carrying handles
- Distinctive styling
- Recessed back plate with 2 Speakon NL4 connectors
- Complies with ANSI/EIA 636 standard
- Recommended Loudspeaker Safety Practices and EMC Directive 89/336/EEC and Article 10 (1) of the Directive in compliance with EN50081-1, EN 50082-1, as signified by the CE mark
- Enclosure is constructed of high-density, multi-fiber, multi-layer wood particle panel with high-impact, foamed polypropylene end caps

- | | |
|------------------------|--------------------|
| • Configuration | • Passive |
| • Total Power Capacity | • 200 W RMS |
| • System Impedance | • 8 Ohms (Nominal) |

Technical Specifications

- | | |
|-----------------------|------------------------------|
| • Frequency Range | • 40 Hz to 300 Hz \pm 3 dB |
| • Maximum SPL | • 110 dB SPL |
| • Speaker Sensitivity | • 87 dB SPL |

SECTION H
SCOPE OF WORKS, GENERAL SPECIFICATIONS AND PARTICULAR
SPECIFICATIONS FOR SMATV SYSTEM

I) SCOPE OF WORKS

1.0. Introduction

II) GENERAL SPECIFICATIONS

2.0. General Requirements and Conditions

3.0. General Technical Requirements and Conditions

III) PARTICULAR SPECIFICATIONS

1.0. General Description of the System Equipment

1.1. Schematic Block Diagram

1.2. Schematic system Design

1.3. Equipment details

2.0. Technical Specification of the SMATV/MATV

3.0. Equipment Technical Specification

I. SCOPE OF WORKS

1. INTRODUCTION

This document contains details of a proposed project required for Satellite master antennae television system (SMATV) which will include both terrestrial and satellite signal reception for TV and FM Radio. The system involves a Centralized television reception system installation comprising of receivers connected to various broadcast receiving aerial systems and distribution to all the rooms within the building Complex. The system shall also integrate with Public area display system (PADS). Key Items to be supplied under this component of the project include the following:

- Head end station with amplifier and associated distribution equipment and accessories
- TV and FM Radio socket outlets in executive offices, lounges, receptions, lobbies and public areas
- LCD Television receivers in executive offices, lounges, receptions, lobbies and public areas

The system will enable reception of signals via satellite dish (es) as well as off- air, select the required programs and distribute them within the office block. This will incorporate both the local stations and some international feeds. The system will also interface to the existing Live Broadcast system and the Audio video conferencing system.

The proposed system shall comprise the following key components

- Reception antennae (SMATV/MATV antenna)
- Digital Head End (Electronics used to create the integrated cable TV and Radio feed)
- Fibre optic or Coax distribution network
- In office signal reception equipment

II. GENERAL SPECIFICATIONS

1. GENERAL REQUIREMENTS AND CONDITIONS

The scope of works under this sub-contract shall include; Supply, installation and commissioning of the all the SMATV equipment to deliver a complete system. The contractor is however supposed to consider the following in coming up with the proposal for the system;

- Floor plan layout configuration shall be as per the Engineer's specifications.
- The contractor must derive the appropriate distribution equipment and ensure that all signals are distributed at the correct levels to the points required.
- The contractor shall supply and install system equipment that meets Building Management System (BMS) standard and ensure that the system configures well to the BMS.
- A detailed technical proposal comprising detailed drawings and all layouts and schematic diagrams of the proposed system including wiring and interconnection diagrams must be submitted with the bid documents.
- All equipment must be provided with the necessary optional boards to achieve proper functionality.
- A list of all required spare parts must be provided separately.
- The contractor shall be required to provide experienced training personnel who must demonstrate their experience and manufacturer training and certification.
- The contractor shall ensure that all the works carried out on site conforms to the current relevant safety regulations.
- Equipment supplied must conform to PAL and DVB-T standards - the broadcast standards applicable in Kenya.
- All equipment **MUST** be tropicalised and those components prone to rust coated or treated with rust proof coatings.

III. GENERAL TECHNICAL REQUIREMENTS AND CONDITIONS

The general specifications for the proposed equipment are given below:

1.1. SYSTEM PARAMETERS

- a) Shall conform to Standard requirements and rules.
- b) Conform to an overall minimum total signal cross-modulation ratio of 57dB with the maximum output for all present and future programs set with an allowance of at least 3dB output under all known conditions.
- c) A pre-planning site survey will take into account the following factors, which must be satisfactory as agreed by the Engineer:
 - Adequate signal levels not less than 65 dB provided at the outlets for the specified signal/noise ratio or an agreed satisfactory subjective result.
 - Sockets with different attenuation levels shall be used to obtain the above mentioned signal level, if required.
 - Clean signals free from reflections and co-channel interference effects.
 - Regard to be paid to any very high level local field strengths leading to possible immunity and pre-image problems.
 - Possibility of interference from any source that may interfere with the system performance.
- d) **Quality Assurance** - Designing, Manufacturing and Installing of all the Equipment shall conform with the latest Standard Rules of the following:
 - CA of Kenya Standards and requirements
- e) Submittals
 - i) **Manufacturers Technical Data**

The contractor shall submit to the Engineer Copies of all the Descriptive Literature, Technical Data, Catalogues, Maintenance recommendation and Installation Instructions for all the Products used.
 - ii) **Drawings & Documentation:**

Before commencing the works, the Contractor shall provide detailed working/Shop Drawings for the review/approval by the Engineer which shall include but not limited to the following:

- Schematic Diagram of the TV/FM Distribution Network showing signal level at various levels with all supporting calculations and indicating all the System components including Splitters, Line Amplifiers, Sockets, Cables etc.
 - TV/FM Socket Outlets Layout Plan indicating the routing of cables from Headend Station to floor distribution boxes and then to final sockets.
 - Installation details of Mast/Satellite Dishes, LNB etc.
- f) **Codes & Standards** - All the equipment and components shall meet the following standards & markings:
- All parts of the system (Head-ends, Multiswitchers, Amplifiers, tap offs, distribution boxes, sockets) shall be CE certified and tested and CE Marking shall appear on the packaging and/or included in the operating instructions.
 - Standards for “Cable Networks for television signals, sound signals and interactive services” e.g IEC, ITU, ETS in compliance with CCK adopted standards.
 - For compliance with the legal EMC (Electromagnetic Compatibility) requirements and to prevent interference between TV cable networks and radio services, components with shielding rate shall be used for distribution items including connecting cables for terminal equipment.
 - Protection class 2 according to IEC 60417-5172 for components with power connection 230 / 240 V ~.

1.2. **OPERATIONS & MAINTENANCE**

- a) The Contractor shall provide Operations and maintenance manuals on commissioning of the project. The testing and commissioning shall be witnessed by the Engineer.
- b) The Contractor shall provide ‘As installed drawings’ on approval of the installation by the Engineer.
- c) **Maintenance** - The system shall be warranted for a period of 12 months after final approval. To maintain the system in a proper working condition a maintenance contract is strongly recommended.

IV. PARTICULAR SPECIFICATIONS

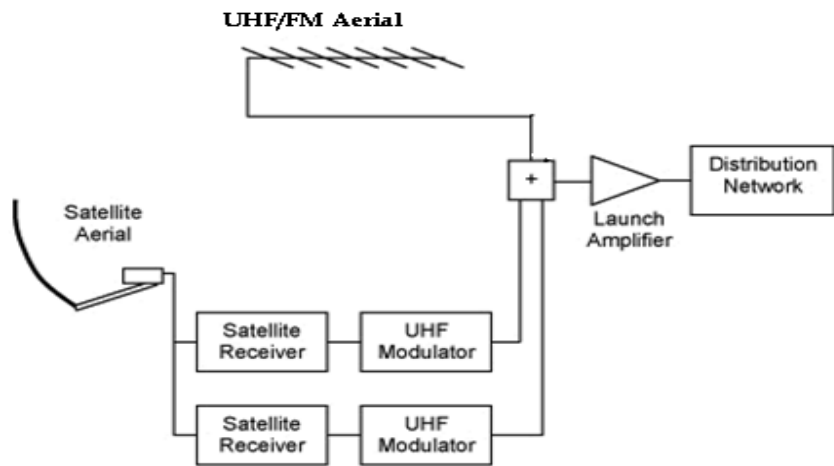
1. GENERAL DESCRIPTION OF THE SYSTEM EQUIPMENT

SMATV/MATV hardware configuration will consist of the following key items:

- Roof mounted antennae (Satellite, UHF and FM)
- Cable-run from satellite antenna to “head-end” rack and to distribution outlets in the offices
- “Headend” Equipment Rack;
 - Splitters & Filters
 - Multiswitches
 - Processors
 - Receivers (One per Channel)
 - Modulators (One per receiver/channel)
 - Demodulators
 - Combiner(s)
 - Diplexers
 - RF amplifiers
 - SMATV Headend Management system
 - UPS back up power, Monitor/Shelf, Fan(s)
- Distribution Network
 - Distribution amplifiers
 - Remote Controls
 - Combiners
 - Connectors, splitters, taps

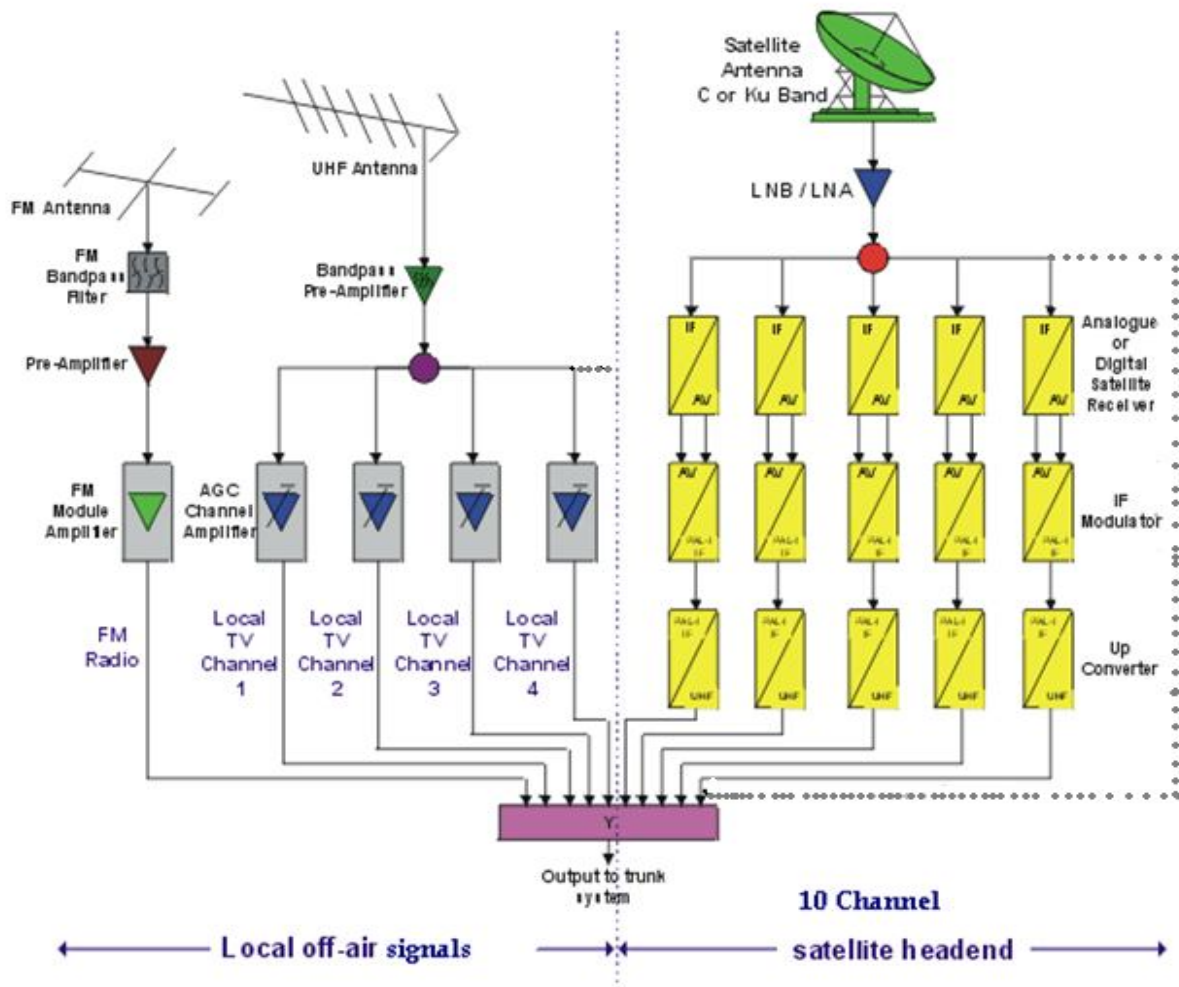
1.1. Schematic Block Diagram

The general arrangement of the equipment in the form of a block diagram is shown in the figure below;



1.2. Schematic system Design

Typical system configuration is as shown below:



1.3. Equipment Details

a) Reception Antennae

The antennae shall consist of the following:

Top-quality antennae to receive satellite and broadcast signals

- TVRO Satellite Receive antenna – Ku/C Band, 0.6 – 3.0 m to receive satellite signals from the selected satellite provider(s) – Refer to Particular Specifications Section.
- Terrestrial UHF TV aerial for off-air TV signals – Refer to Particular Specifications Section.

b) The Head End

The head end shall consist of the following equipment:

- **Satellite Receivers:** IRDs to tune in the satellite programming. A receiver for each pay-tv channel.
- **Demodulators:** RF demodulators for reception of broadcast signals. Each demodulator per broadcast channel.
- **Processors:** For special filtering of signals for conversion to the receiver system.
- **Modulators:** RF modulators that feed each channel's signal on to the required channel in the system. This will also determine the programming on each channel number.
- **Signal Combiners:** These will combine the individual channels into a single integrated cable feed. The resulting output will be the multi-channel cable TV/Radio signal ready for distribution.
- **SMATV/MATV Headend Management system:** Management of communication between modules, software updates, remote access
- **Amplifiers:** At the output of the system to trim the signal to the appropriate level for distribution to the building system.
- **Diplexers:** To combine the satellite and terrestrial signals
- **Filters and Splitters:** To filter and split the signals
- **Equipment Cabinet with racks:** To house all the above components

c) The Distribution Network

Distribution of the signal will be accomplished with an office-wide cabling infrastructure. Cabling shall be laid from the head end to all desired points in the office block. Typically there will be a main line running into the building where the building wiring is connected to the system in a single location. Two cables are necessary - one for the incoming TV signal and one

to carry internal programming back to the head end for integration into the system. Cabling shall be able to support both Coax and Fibre optic and incorporated to the general structured cabling of the building. The distribution system shall also include the following components;

- **Distribution amplifiers:** For amplifying and distributing the signal within the offices
- **Remote Controls:** For tuning the receivers
- **Combiners:** Combining of various outputs
- **Connectors, splitters, taps:** Splitting, connecting and screening the signals

d) In office signal reception equipment

This will include the following:

- TV/FM socket outlets in executive offices, lounges, receptions, lobbies and public areas - as shown in the Electrical drawings
- LCD Television and Radio receivers in executive offices, lounges, receptions, lobbies and public areas - as shown in the Electrical drawings

2. TECHNICAL SPECIFICATIONS FOR SMATV/MATV SYSTEM

a) GENERAL TECHNICAL SPECIFICATION OF THE PROPOSED SYSTEM

The Contractor shall supply, install, test, commission, guarantee and maintain a MATV that will include a modern Satellite Master Antenna Television (SMATV) system for the distribution of TV signals. The system shall be capable of receiving and distributing the present Satellite and television signals as listed herein with sufficient allowances made to include any future transmissions within the foreseeable future, without degrading of the system parameters.

The system shall have a central RF Headend for receiving & processing of the signals from the satellites and a centralised UHF receiving antenna and distribute through RF distribution network all the channels available to about 450 No. of executive offices and room.

The system equipment shall be from an approved manufacturer, supplied and installed by a specialist contractor who shall be the main agent of the equipment supplied. The contractor shall submit a complete proposal with schematic drawings with signal level calculations, list of materials and original detailed catalogues of the equipment for client approval before commencing the work.

b) **SELECTED CHANNELS FOR THE SYSTEM**

The following free to air satellite and UHF channels, pay to view channels and digital broadcasting channels reception shall be provided in the system through the central RF headend as follows;

- Satellite (pay to view) channels to be at least sixteen (16)
- Free to air Digital UHF channels to be at least ten (10)
- Free to air FM Radio channels to be at least ten (10)

The actual selection of channels will be done at the time of commissioning.

The system shall be of a modular construction, thus making it possible to add extra stations at a later date. A 13 AMP Fusible test socket shall be installed for the future connection of signal test equipment to aid the service requirement.

c) **SYSTEM TECHNICAL SPECIFICATIONS REQUIRMENTS**

- All radio frequency levels in this sub-division are to be construed and referred to microvolt across 75-Ohm (dB μ V).
- One standard radio frequency distribution impedance of 75-Ohm shall be used within the system.
- Return loss shall not be less than 14dB at any point of the system.
- Isolation between any two outlets shall be at least 22dB. Adjacent channels operation requires more than 50dB isolation.
- The system shall be such that the short or open circuit at any outlet socket will not significantly affect signals at other outlets (tap-off system).
- The system shall be capable of continuous operation in an ambient temperature up to + 50 C.
-

2.0. **EQUIPMENT TECHNICAL SPECIFICATIONS**

2.1. **General**

The system to be supplied shall include, but not be limited to the following key components:-

- 0.6 – 3.0 m solid aluminium dishes for preferably Eutelsat, Intelsat, Atlantic Bird, Hotbed e.t.c. either Ku or C-band including an 8 – way LNB. Contractor to give both and outline the better option
- UHF Master antenna Aerial with capacity for 10 channels and above

- Microprocessor based control unit having provision for 16No. Satellite signal processing modules, with integrated power supply unit and power-passive IF distribution panel.
- Digital satellite processing modules
- All necessary TV sockets, splitters, taps and filters suitable to handle frequencies up to 2400 MHz
- Cables
- Lockable Rack Cabinet

2.2. **Equipment Particular Specifications**

2.2.1. **SMATV ANTENNA**

a) **Dish Antenna**

Following shall be the minimum requirement for the Satellite dishes for signal reception from Eutelsat, Intelsat, Atlantic Bird and HotBird satellites.

i) **Satellite Dish Ku band**

- Frequency:	10.7 - 12.75 GHz
- Gain @ 10.95GHz:	41.5 dB
- Noise temp @ 30° elevation:	360 K
- Wind Load:	1270 N
- Diameter:	0.6 – 3.0 metres
- Reflector Material:	Aluminium
<u>Feed Horn & L.N.B</u>	
- Output Frequency:	950 MHz - 2150 MHz
- Polarization:	Linear, 4 outputs
- Noise Figure:	25 Deg. K

ii) **Satellite Dish C band**

- Band:	C – Band
- Diameter:	3 meter
- Material:	Mesh
<u>Feed Horn & L.N.B. Output</u>	
- Output Frequency:	950 MHz - 2150 MHz
- Polarization:	Linear or Circular

b) MATV UHF Antenna (Yagi 75 Ohm Receive Antenna, 15 Channel)

Key features

- Double-dipole design to deliver genuine broadband coverage.
- **15 consecutive UHF TV Channels** for a 105 MHz bandwidth within the range 520 to 820 MHz, Channels 27 to 69.
- Return loss optimised to better than -15 dB, < 1.5:1 VSWR across the chosen channel range.
- Constructed entirely from stainless steel for long term service, 15 element 14 dBd.
- Horizontal or Vertical mounted.
- Compression strut kit for support of the antenna boom weight.
- RG59 cable tail fitted with a 75 Ohm BNC Male connector rated for each Yagi - up to 50 watts input power.
- Mounting clamp, feeder cable, connectors and cable fittings.

Specifications

Specification	Description
• Construction:	• All stainless steel 25 mm square boom, double-dipoles and elements
• Frequency:	• Within the range 520 to 820 MHz
• Bandwidth:	• 105 MHz -Any 15 consecutive UHF TV channels in Band IV and Band V, Channels 27 to 69
• Return Loss, VSWR:	• Better than -15 dB, < 1.5:1 across the selected 15 consecutive channel range
• Number of Elements:	• 15
• Tuning:	• Factory
• Nominal Gain at Centre Frequency:	• 14 dBd
• Maximum Input Power:	• 50 Watts
• Impedance:	• 75 Ohms
• DC Grounding:	• Yes
• Polarisation:	• Mount either Horizontal or Vertical as required
• H Plane:	• 40 ⁰
• E Plane:	• 33 ⁰
• Front-to-Back Ratio:	• 20dB
• 75 Ohm Cable Tail:	• RG59
• 75 Ohm Connector:	• BNC Male fitted
• Boom Length:	• 1.85 metres
• Longest Element:	• 28 cm
• Wind Load at 160 kph:	• 8.4 kg, 0.83 kN
• Mounting Clamp:	• 1 x S48
• Strut kit:	• YS1-C48

2.2.2. HEAD-END STATION

- The head-end shall be capable of using adjacent channels without any restriction.
- Satellite processing head-end stations shall consist of basic unit with slots for plugging in the digital processing modules, vestigial/ double side band modulator modules, power supply unit and microprocessor-based control unit, output distribution panel (combiner), all housed in steel cabinet with a lockable door.
- The channel processing and modulator modules must be physically independent thereby the system will have built-in modularity enabling easy maintenance and support.
- Programming of the modules shall be done using remote control.
- It shall support VBI subtitling.

- It shall have the following technical specifications:
 - **Number of module slots:** 8 slots.
 - **Sat input distribution panel:** 4 RF inputs with 8 outputs
 - **Input/output impedance:** 75Ω
 - **Remote feed of LNBS:** 0/13/18 V Switchable
 - **Remote feed current:** 4 x 400 mA, 1 A max.
 - **Input Level:** 44...84 dBμV.
 - **Output Level:** 100 dBμV.
 - **Operating temperature:** -10 °C to + 45 °C
 - **Mains voltage:** 200V – 250 VAC/ 50/60Hz
 - **Gain at o/p collector panel:** 20 dB
 - **Power consumption:** Max. Approximately. 160W
 - **Material:** Galvanised Steel

a) Digital Satellite Processing Module

- Satellite Digital Processing Module shall be suitable for processing QPSK modulated Sat IF signals audio video output for feeding to the modulator modules in the same basic unit. Each digital module shall be suitable for processing single channel.

- It shall have the following technical specifications:
 - **Processing:** QPSK to AM TV or AV
 - **Input Frequency:** 920-2150 MHz.
 - **Input level range:** 44dBμV – 84 dBμV
 - **Input Impedance:** 75 Ohms

- **Output frequency range:** 110-862 MHz.
- **Operating temperature:** -10 °C to + 45 °C
- **Output Level:** 90 dB (Typical)

b) Modulator Modules

- Modulator modules shall be used to convert the Audio Video signal output from digital processors into standard TV channels.
- The RF output channels thus received shall be suitable for adjacent channel operation.
- Modulator modules shall have the following technical specifications:
 - **Video Input Level:** 1 Vpp
 - **Video band width:** 20 Hz – 5 MHz
 - **Video S/N ratio:** 56 dB
 - **Audio signal:** Stereo, dual, mono
 - **Audio band width:** 40 Hz – 15 KHz
 - **Audio S/N ratio:** 48 dB
 - **Audio freq. response:** -2...+2 dB
 - **Distortion factor (1 kHz):** 0.8%
 - **Output frequency range:** 110-862 MHz
 - **Output Level:** 90 dB μ V
 - **TV Standard:** PAL B/G
 - **Operating temperature:** -10 °C to + 45 °C
 - **Attenuator:** 0-10 dB

c) Steel Rack Cabinet

- Standard 19" Steel rack cabinets shall be provided for housing the basic units and decoders. Racks for the decoders shall have suitable number of horizontal shelves for placing them.
- The rack shall have enough ventilation to allow for dissipation of heat generated from the basic units and the decoders. Mechanical ventilation shall be provided by means of electric fans.
- The racks shall have required numbers of 230 / 240 V, 13A power sockets to power the basic units / decoders. Unused sockets shall be concealed.
- The racks shall have enough space to provide trunkings, splitters for cabling.

- Cables in the racks shall be wired through trunkings and shall be fastened by cable ties. No loose / unused cables shall be exposed.
- Metallic parts of the cabinets & racks shall be connected to earth rails for potential equalization.
- Construction: Finishes, mounting etc – As per Structured cabling specifications for cabinets

2.2.3. **DISTRIBUTION NETWORK**

The distribution elements shall be of die-cast aluminium housing protecting the electrical components against moisture and corrosion. All such units shall be located in dedicated weatherproof boxes protected from ingress of water and other external forces. The distribution components including amplifiers and splitters/tap-offs along the riser cable shall be of CATV grade.

a) **Cables:**

- Low loss coaxial cable shall be used in order to limit the number of cascaded amplifiers along the main line.
- Cables used within the system shall have air or polyethylene dielectric.
- Cables used for wiring dish antennas shall be ultra violet resistant.
- All the internal cables shall be double screened with the following minimum shielding rates:
 - i) 30 – 470 MHz > 75 dB
 - ii) 470 - 1000 MHz > 75 dB
 - iii) 1000 - 2050 MHz > 65 dB.
- Maximum loss of the coax-cables shall be as listed below:
 - i. For external feeders 6 dB/100m at 800 MHz.
 - ii. For internal sockets wiring 18 dB/100m at 800 MHz.
 - iii. For dish antennas wiring 29 dB/100m at 2150 MHz.
- Joints and cable termination shall be adequately sealed against ingress of moisture and migration along the cable.

b) **Splitters and tap-off boxes:**

- Splitters and tap-off boxes used within the system shall ensure approximately even signal levels at all the outlets in the building.

- Difference between the signal levels at the outlets shall not exceed 7 dB μ V under any circumstances.
- All splitters and tap-off boxes used within the system for distributing the signal to the outlet sockets shall have a minimum frequency range of 5 MHz - 2400 MHz.
- The minimum mutual attenuation between the branched outputs shall be 25dB or better.
- Main riser cable shall be securely clamped at each splitter and tap-off position.

c) **Wall sockets (TV/FM outlets):**

- Sockets shall be broadband type with operating frequency range from 5 MHz - 2400 MHz.
- Sockets shall have male/female double outlet in rigid metallic structure with cover similar to the adjacent wiring accessories.
- Sockets shall be wired radially from the concerned junction box. 75-Ohm end-of-line resistors shall be used for reflection free terminations.

d) **Line / Distribution amplifiers:**

Trunk/Distribution Amplifier shall be used as necessary with a virgin line fed from the main head end system; the specifications are as follows:

- Broad - band range: 47 – 862 MHz.
- Maximum gain: 29/36 dB
- Maximum noise factor: 7 dB
- Maximum output level: 122 dB μ V
- Ambient operating temp.: -20°C to + 50°C
- Built-in level attenuator: 0 – 18dB
- Integrated line equalizer: 0 – 18dB
- Possibilities of plug in return channel modules.
- Shielded metal housing (IP 65).

The number of line-amplifiers shall be made as required for the final wiring layout.

Proper arrangements shall be made to dissipate the heat generated during normal working of the amplifier.

e) **Amplifiers:**

Each office shall be provided with office connection amplifiers to boost the incoming signal to required level.

Specifications for office connection Amplifiers:

- Broad - band range: 47 – 862 MHz.
- Maximum gain: 29 dB
- Maximum noise factor: 6 dB
- Maximum output level: 102 dB μ V
- Ambient operating temp.: 20°C to + 50°C
- Level control: 20 dB
- Integrated line equalizer: 18 dB
- RF connections: F-connectors
- Plastic / metal housing (IP 20).

SECTION I

TECHNICAL SCHEDULE OF ITEMS TO BE SUPPLIED

CONTENTS

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1. GENERAL NOTES TO THE TENDERER.....	I/1
2. TECHNICAL SCHEDULE.....	I/2- I/5

TECHNICAL SCHEDULES

- a) The tender shall submit technical schedules for all materials and equipment upon which he has based his tender sum.
- b) The Tenderer shall also **submit separate comprehensive descriptive and performance details** for all plant apparatus and fittings, as described in the technical schedule.
- c) Completion of the technical schedules shall not relieve the contractor from complying with the requirements of the specification except as may be approved by the Engineer.

TECHNICAL SCHEDULES

ITEM	DESCRIPTION	TYPE/MAKE	COUNTRY OF ORIGIN
I	AUDIOVISUAL CONFERENCE SYSTEM		
1	PTZ Dome Cameras		
2	75" LED Monitors		
3	Delegate Conference System + Interpreter units		
4	Wireless Handheld Microphones		
5	Column Speakers		
6	Table Top units		
7	HDMI/CAT 5/6 Transmitters and Receivers		
8	Wireless Presentation System		
9	Audio Cable		
10	HDMI Cables		
11	Production Digital Video Switcher		
12	Character Generator		
13	32" LED Monitors		
14	Hard Drive Video Recorder		
15	Camera Control/Tracking Unit		
16	24 Port Network Switch		
17	Audio Mixer		
18	Audio Amplifier		
19	Powered Monitoring Speakers		
20	Audio De-embedder		
21	Audio Isolation Transformer		
22	Networking Cable		
23	Equipment Rack cabinet		
24	Multiviewer System		
25	Multiview Channel HD/SDI Router		
26	HD/SDI Network Video server		
27	40" LED Monitors		
28	A Processing Workstation		
29	48 Port Network Switch		
30	Smart Cards and ID card Encoder		

31	HD/SDI - Fiber Optic Transmitter and Receiver		
32	4-way HD/SDI Splitter		
33	Editing Room Recording Machine		
34	Final cut editing workstation and Software		
35	SSD dock		
36	Headphones		
37	Video Conferencing unit		
38	Ceiling Microphone Array		
39	video conferencing control system		
40	Multipoint control unit Collaboration Server		
41	Video Conferencing Rack Server		

ITEM	DESCRIPTION	TYPE/MAKE	COUNTRY OF ORIGIN
II	PUBLIC AREA DISPLAY SYSTEM		
1	43"4K LED Smart TV		
2	Rack mount Server		
3	Digital Management Content software		
4	TV Brackets		
5	Desktop Computer		
6	All weather Outdoor LED display screen		
III	PUBLIC ADDRESS AND EMERGENCY SOUND SYSTEM		
1	Public Address and Emergency sound systems controller software		
2	Digital Audio Power Amplifiers		
3	Audio Input expansion device		
4	Paging microphone		
5	Emergency alarm interfacing device		
6	Control line safety interface		
7	Desktop Computer		
8	8" White ceiling mount speakers		
9	Audio Player		
10	End of line Monitoring unit		
11	Zonal Volume controller		

12	Home Theatre System		
13	Panaray Speakers and Sub-woofer		

ITEM	DESCRIPTION	TYPE/MAKE	COUNTRY OF ORIGIN
IV	SMATV SYSTEM EQUIPMENT		
1	Satellite dishes		
2	UHF Receive Antennas		
3	SAT launch amplifier		
4	Digital Channel processing modules		
5	UHF multiband amplifier		
6	Cascadable Multiswitch		
7	Headend processor		
8	Taps with 'F' Connector		
9	Splitters		
10	Modulator modules		
11	Signal line amplifiers		
12	RG11 Coaxial Cable		
13	TV/FM outlet socket		
14	RG6 network RF Distribution cables		

SECTION J

STANDARD FORMS

NOTE:

ALL FORMS IN THIS SECTION MUST BE FILLED AS THEY SHALL BE PART OF THE EVALUATION CRITERIA

STANDARD FORMS

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PERFORMANCE BANK GUARANTEE

To:
The Director General,
The Parliamentary Service Commission
P. O. Box 41842,
Nairobi

Dear Sir,

WHEREAS(hereinafter called “the Contractor”) has undertaken, in pursuance of Contract No. dated to execute (hereinafter called “the Works”);

AND WHEREAS it has been stipulated by you in the said Contract that the Contractor shall furnish you with a Bank Guarantee by a recognized bank for the sum specified therein as security for compliance with his obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Bank Guarantee:

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of:

Kshs. (*amount of Guarantee in figures*)

Kenya Shillings (*amount of Guarantee in words*),

and we undertake to pay you, upon your first written demand and without cavil or argument, any sum or sums within the limits of Kenya Shillings

..... (*amount of Guarantee in words*) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

We hereby waive the necessity of your demanding the said debt from the Contractor before presenting us with the demand.

We further agree that no change, addition or other modification of the terms of the Contract or of the Works to be performed there under or of any of the Contract documents which may be made between you and the Contractor shall in any way release us from any liability under this Guarantee, and we hereby waive notice of any change, addition, or modification.

This guarantee shall be valid until the date of issue of the Certificate of Completion.

SIGNATURE AND SEAL OF THE GUARANTOR

Name of Bank

AddressDate

.....

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. Telex/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, telex):

.....

.....

Signature of Tenderer

CONFIDENTIAL BUSINESS QUESTIONNAIRE

You are requested to give the particulars indicated in Part 1 and either Part 2 (a), 2 (b) or 2(c) and (2d) whichever applies to your type of business.

You are advised that it is a serious offence to give false information on this Form.

Part 1 – General

Business Name

Location of business premises: Country/Town.....

Plot No..... Street/Road

Postal Address..... Tel No.....

Nature of Business.....

Current Trade Licence No..... Expiring date.....

Maximum value of business which you can handle at any time:

Kenya Shillings.....

Name of your bankers.....

Branch.....

Part 2 (a) – Sole Proprietor

Your name in full..... Age.....

Nationality..... Country of Origin.....

Citizenship details

Part 2 (b) – Partnership

Give details of partners as follows:

	<i>Name in full</i>	<i>Nationality</i>	<i>Citizenship Details</i>	<i>Shares</i>
1.
2.
3.
4.

Part 2(c) – Registered Company

Private or Public

State the nominal and issued capita of the company:

Nominal KShs.

Issued KShs.

Give details of all directors as follows:

	<i>Name in full</i>	<i>Nationality</i>	<i>Citizenship Details*</i>	<i>Shares</i>
1.
2.
3.
4.

Part 2(d) Interest in the Firm:

Is there any person/persons in the employment of the Government of Kenya WHO has interest in this firm? Yes/No (Delete as necessary)

I certify that the above information is correct.

.....
Title

.....
Signature

.....
Date

** Attach proof of citizenship*

KEY PERSONNEL

Qualifications and experience of key personnel proposed for administration and execution of the Contract.

POSITION	NAME	YEARS OF EXPERIENCE (GENERAL)	YEARS OF EXPERIENCE IN PROPOSED
-----------------	-------------	--------------------------------------	--

			POSITION
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			

I certify that the above information is correct.

.....

Title

.....

Signature

.....

Date

CONTRACTS COMPLETED IN THE LAST FIVE (5) YEARS

Work performed on works of a similar nature and volume over the last five years.

		TYPE OF WORK AND YEAR OF COMPLETION	VALUE OF CONTRACT (Kshs.)

I certify that the above works were successfully carried out and completed by ourselves.

.....
Title

.....
Signature

.....
Date

SCHEDULE OF ON-GOING PROJECTS

Details of on-going or committed projects, including expected completion date.

NAME		CONTRACT SUM	% COMPLETE	COMPLETION DATE

I certify that the above works are currently being carried out by ourselves.

.....
Title

.....
Signature

.....
Date

FINANCIAL REPORTS FOR THE LAST THREE YEARS

**(Balance sheets, Profits and Loss Statements, Auditor's reports, etc.
List below and attach copies)**

1. _____.

2. _____.
3. _____.
4. _____.
5. _____.
6. _____.
7. _____.
8. _____.
9. _____.
10. _____.

NAME, ADDRESS AND TELEPHONE, EMAIL OF BANKS

(This should be for banks that may provide reference if contacted by the employer)

NAME	ADDRESS	TELEPHONE	EMAIL

DETAILS OF LITIGATIONS OR ARBITRATION PROCEEDINGS IN WHICH THE TENDERER IS INVOLVED AS ONE OF THE PARTIES

1. . _____ .
2. . _____ .
3. . _____ .
4. . _____ .
5. . _____ .
6. . _____ .
7. . _____ .
8. . _____ .
9. . _____ .
- 10 . _____ .

STATEMENT OF COMPLIANCE

- a) I confirm compliance of all clauses of the General Conditions, General Specifications and Particular Specifications in this tender.
- b) I confirm I have not made and will not make any payment to any person, which can be perceived as an inducement to win this tender.

Signed:*for and on behalf of the Tenderer*

Date:

Official Rubber Stamp:

SELF-DECLARATION FORM ANTI-CORRUPTION DECLARATION

We (insert the name of the company/supplier)..... declare and guarantees that no offer, gift or payment consideration or benefit of any kind, which constitutes an illegal or corrupt practice, has been or will be made to anyone by our organization or agent, either directly or indirectly, as an inducement or reward for the award or execution of this procurement.

In the event the above is contravened we accept that the following to apply-

- a) The person shall be disqualified from entering into a contract for the procurement; or
- b) If a contract has already been entered into with the person, the contract shall be voidable at the option of Parliamentary Service Commission
- c) The voiding of a contract by the procuring entity under subsection (b) does not limit any other legal remedy that Parliamentary Service Commission may have

Name.....Signature.....Date.....
... Company Seal/Business Stamp

ANTI-FRAUDULENT PRACTICE DECLARATION

We (**insert the name of the company/supplier**)..... declares and guarantees that no person in our organization has or will be involved in a fraudulent practice in any procurement proceeding.

Name.....
Signature.....
Date.....
Company Seal/Business Stamp

NON-DEBARMENT DECLARATION

We (**insert the name of the company/ supplier**)..... declares and guarantees that no director or any person who has any controlling interest in our organization has been debarred from participating in a procurement proceeding.

Name.....Signature.....Date.....
.....Company Seal/Business Stamp

SECTION K
SCHEDULE OF CONTRACT DRAWINGS

SCHEDULE OF CONTRACT DRAWINGS

Tenderers may inspect the Electrical services drawings at the office of the Consulting Electrical & Mechanical Engineer - Mecoy Consultants Ltd., at PCEA Foundation flats block G, along Jabavu road in Hurlingham Nairobi, during normal working hours.

The drawings shall however be availed, on award of the tender, to the nominated Sub-contractor.



REPUBLIC OF KENYA
THE PARLIAMENTARY SERVICE COMMISSION
PROPOSED MULTI STOREY OFFICE BLOCK FOR THE KENYA
NATIONAL ASSEMBLY.
W.P. ITEM NO. D29 NB/NB 901 –JOB NO. 7753C
TENDER NO. PJS/013/2019-2020

2. FINANCIAL TENDER DOCUMENT

**SPECIFICATIONS
FOR
SUPPLY, DELIVERY, INSTALLATION, TESTING AND COMMISSIONING
OF
AUDIO VISUAL/MULTIMEDIA AND CONFERENCE
MANAGEMENT SYSTEMS**

ARCHITECT

Chief Architect
Ministry of Transport, Infrastructure, Housing, Urban
Development and Public Works
P.O. Box 30743-00100
NAIROBI

QUANTITY SURVEYOR

Chief Quantity Surveyor
Ministry of Transport, Infrastructure, Housing, Urban
Development and Public Works
P.O. Box 30743-00100
NAIROBI

ENGINEER (STRUCTURAL)

Chief Engineer (Structural)
Ministry of Transport, Infrastructure, Housing, Urban
Development and Public Works
P.O. Box 30743-00100
NAIROBI

MECHANICAL ENGINEER

Chief Engineer (Mechanical)
Ministry of Transport, Infrastructure, Housing, Urban
Development and Public Works
P.O. Box 41191-00100
NAIROBI

ELECTRICAL ENGINEER

Chief Engineer (Electrical)
Ministry of Transport, Infrastructure, Housing, Urban
Development and Public Works
P.O. Box 41191-00100
NAIROBI

PROJECT CONSULTANTS

CONSULTING ARCHITECT

Mutiso Menezes International
P.O. Box 44934 - 00100
NAIROBI.

CONSULTING QUANTITY SURVEYOR

Quantech Consultancy
P.O. Box 44660 – 00100
NAIROBI

CONSULTING ELECT. AND MECH. ENGINEER

Mecoy Consultants Ltd
P.O. Box 20198-00200
NAIROBI

CONSULTING STRUCTURAL & CIVIL ENGINEER.

Wanjohi Mutonyi Consult
P.O. Box 21714 - 00505
NAIROBI

CLIENT

The Parliamentary Service Commission
P.O. BOX 41842,
Nairobi

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2. SECTION K: BILLS OF QUANTITIES	K/1 – K/22
3. SECTION L: SCHEDULE OF UNIT RATES	L/1 - L/2

FORM OF TENDER

To: Director General,
Parliamentary Service Commission
P. O. Box 41842,
NAIROBI

Dear Sir,

THE SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF AUDIO VISUAL/MULTIMEDIA AND CONFERENCE MANAGEMENT SYSTEMS FOR THE PROPOSED MULTI-STORIED OFFICE BLOCK FOR THE KENYA NATIONAL ASSEMBLY.

1. In accordance with the Instructions to Tenderers, Conditions of Contract, Specifications and Bills of Quantities for the execution of the above named Works, we, the undersigned offer to construct, install and complete such Works and remedy any defects therein for the sum of:

Kshs..... *[Amount in figures]*

Kenya Shillings.....
.....
..... *[Amount in words]*

2. We undertake, if our tender is accepted, to commence the Works as soon as is reasonably possible after the receipt of the Employer's Representative's notice to commence, and to complete the whole of the Works comprised in the Contract within the time stated in the Appendix to Conditions of Contract.
3. We agree to abide by this tender for **a period of 120 days from the date of tender opening** and shall remain binding upon us and may be accepted at any time before that date.
4. Unless and until a formal Agreement is prepared and executed this tender together with your written acceptance thereof, shall constitute a binding Contract between us.
5. Understand that you are not bound to accept the lowest or any tender you may receive.

Dated this day of20.....

Signaturein the capacity of

duly authorized to sign tenders for and on behalf of:

.....*[Name of Tenderer]*

of.....*[Address of Tenderer]*

PIN No.

VAT CERTIFICATE No.

Witness: Name

Address

Signature

SECTION K

**BILLS OF QUANTITIES FOR THE AUDIO
VISUAL/MULTIMEDIA AND CONFERENCE MANAGEMENT
SYSTEMS**

SECTION K – BILLS OF QUANTITIES

A)

PRICING OF PRELIMINARIES ITEMS

Prices will be inserted against item of preliminaries in the Contractor's Bills of Quantities and specification. These Bills are designated as Bill No.1 in this Section. Where the Contractor fails to insert his price in any item he shall be deemed to have made adequate provision for this on various items in the Bills of Quantities. The preliminaries form part of this contract and together with other Bills of Quantities covers for the costs involved in complying with all the requirements for the proper execution of the whole of the works in the contract.

The Bills of Quantities are divided generally into three sections:

(a) **Preliminaries – Bill No.1**

Contractor's preliminaries are as per those described in Section D – Contract Preliminaries and General Conditions of Contract. The Contractor shall study the conditions and make provision to cover their cost in this Bill. The number of preliminary items to be priced by the Tenderer has been limited to tangible items such as site office, temporary works and others. However the Tenderer is free to include and price any other items he deems necessary taking into consideration conditions he is likely to encounter on site.

(b) **Installation Items – Other Bills**

- (i) The brief description of the items in these Bills of Quantities should in no way modify or supersede the detailed descriptions in the contract Drawings, conditions of contract and specifications.
- (ii) The unit of measurements and observations are as per those described in clause 1.0 5 of the section D.

(c) **Summary**

The summary contains tabulation of the separate parts of the Bills of Quantities carried forward with provisional sum, contingencies and any prime cost sums included. The Contractor shall insert his totals and enter his grand total tender sum in the space provided below the summary.

This grand total tender sum shall be entered in the Form of Tender provided elsewhere in this document.

A. PREAMBLE

1. The Bills of Quantities shall be read in conjunction with the Notes to Tenderers, Preliminaries, General Conditions of Contract, Technical Specifications and Drawings.
2. The rates and prices tendered in the priced Bills of Quantities shall, except in so far as it is otherwise provided under the Contract, include all Plant, equipment, labour, supervision, materials, erection, maintenance, insurance, profit together with all general risks, liabilities and obligations set out or implied in the Contract, including taxes and duties **(including 16% V.A.T where applicable)**. The quantities given are provisional and are for guidance only. The whole works shall be re-measured upon practical completion.

In accordance with Government policy, 3% Withholding Tax **shall be deducted** from all payments made to the Tenderer, and the same shall be forwarded to the **Kenya Revenue Authority (KRA)**.

3. A rate of price shall be entered against each item in the priced Bills of Quantities, whether quantities are stated or not. The cost of items against which the Contractor has failed to enter a rate or price shall be deemed to be covered by other rates and prices entered in the Bills of quantities.
4. The whole cost complying with the provision of the contract shall be included in the Items provided in the Bills of Quantities, and where no items are provided the cost shall be deemed to be distributed among the rates and prices entered for the related Items of Work.
5. General directions and descriptions of work and materials are into necessarily repeated nor summarized in the Bills of Quantities. Reference to the relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bills of Quantities.
6. Provisional Sums and contingencies included and so designated in the Bills of Quantities shall be expanded in whole or in part at the direction and discretion of the Engineer.
7. Errors in pricing will be corrected by the Client for any arithmetic errors in computation or summation as follows:-
 - a) Where there is a discrepancy between amount in figures and in words, the amount in words will govern and
 - b) Where there is a discrepancy, between the unit rate and the total amount derived from the multiplication of the unit price and the quantity, the unit rate as quoted will govern, unless in the opinion of the Client, there is obviously gross misplacement of the decimal point in the unit prices, in which event total amount as quoted will govern and the unit rate will be corrected.
8. Should the Contractor install any material not specified here in before receiving **written approval** from the Project Manager, the Contractor shall remove the material in question and, **at his own cost**, install the proper material.
9. The grand total of prices in the price summary page must be carried forward to the **Form of Tender for the tender to be deemed valid**.

10. Tenderers must fill all rates and prices in the bills / schedule of unit rates. Failure to do so may lead to disqualification.

SCHEDULE 1.0 - CONTRACT PRELIMINARIES (Refer to Section C of this Tender Document)

ITEM	DESCRIPTION	QTY	UNIT	RATE	KSHS
1	Discrepancies clause 1.02				
2	Conditions of contract Agreement clause 1.03				
3	Payments clause 1.04				
4	Site location clause 1.06				
5	Scope of Contract Works clause 1.08				
6	Extent of the Contractor's Duties clause 1.09				
7	Firm price contract clause 1.12				
8	Variation clause 1.13				
9	Prime cost and provisional sum clause 3.14 (insert profit and attendance which is a percentage of expended PC or provisional sum.)				
10	Bond clause 1.15				
11	Government Legislation and Regulations clause 1.16				
12	Import Duty and Value Added Tax clause 1.17 (Note this clause applies for materials supplied only)				
13	Insurance company Fees clause 1.18				
14	Provision of services by the Main contractor clause 1.19				
15	Samples and Materials Generally clause 1.21				
16	Supplies clause 1.20				
17	Bills of Quantities clause 1.23				
SUB-TOTAL CARRIED TO PAGE K/6					

ITEM	DESCRIPTION	QTY	UNIT	RATE	KSHS
18	Contractor's Office in Kenya clause 1.24				
19	Builder's Work clause 1.25				
20	Setting to work and Regulating system clause 1.29				
21	Identification of plant components clause 1.30				
22	Working Drawings clause 1.32				
23	Record Drawings(As Installed) and Instructions clause 1.33				
24	Maintenance Manual clause 1.34				
25	Hand over clause 1.35				
26	Painting clause 1.36				
27	Testing and Inspection – manufactured plant clause 1.38				
28	Testing and Inspection – Installation clause 3.39				
29	Storage of Materials clause 1.41				
30	Initial Maintenance clause 1.42				
SUB-TOTAL CARRIED TO PAGE K/6					

ITEM	DESCRIPTION	QTY	UNIT	RATE	KSHS
31	Local and other Authorities notices and fees clause 1.60				
32	Temporary Works clause 1.63				
33	Patent Rights clause 1.64				
34	Mobilization and Demobilization Clause 1.65				
35	Supervision by engineer and site meetings clause 1.67				
36	Allow for profit and Attendance for the above (item 35)				
37	Amendment to Scope of Contract Works Clause 1.68				
38	Contractor Obligation and Employers Obligation clause 1.69				
Sub-total from above					
Sub-total B/F from Page K/4					
Sub-total B/F from Page K/5					
TOTAL FOR PRELIMINARIES CARRIED FORWARD TO PRICE SUMMARY PAGE					

Bidders MUST either insert percentage or indicate as NIL for the following clauses:

- (1). Attendance Upon Tradesmen, etc. **(Insert percentage only)** clause 1.58 of section C

.....%

- (2). Extended Preliminaries **(Insert percentage only)** Clause 1.66 of section C

.....% per month

SECTION L

SCHEDULE OF UNIT RATES

SCHEDULE OF UNIT RATES

1. The Tenderer shall insert unit rates against the items in the following schedules and may add such other items as he considers appropriate.
2. The unit rates shall include for supply, transport, insurance, delivery to site, storage as necessary, assembling, cleaning, installing, connecting, profit and maintenance in defects liability and any other obligation under this contract.
3. The unit rates will be used to assess the value of additions or omissions arising from authorised variations to the contract works.
4. Where trade names or manufacturer's catalogue numbers are mentioned in the specification, the reference is intended as a guide to the type of article or quality of material required. Alternative brands of **equal** and **approved** quality will be accepted.

SCHEDULE OF UNIT RATES
(To be completed by the Tenderer)

ITEM	DESCRIPTION	QTY	UNIT	RATE (KES)	AMOUNT (KES)
	AUDIO / VIDEO CONFERENCE EQUIPMENT				
(i)	Video Cameras (other alternatives available)				
	1				
	2				
(ii)	Display Screens (other alternatives available)				
	1				
	2				
(iii)	Conference microphone systems (other alternatives available)				
	1				
	2				
(iv)	Handheld Microphones (other alternatives available)				
	1				
	2				
(v)	Column speakers (other alternatives available)				
	1				
	2				
(vi)	Table Top (other alternatives available)				
	1				
	2				
(vi)	Wireless presenter system (other alternatives available)				
	1				
	2				
(vii)	Production digital video switcher (other alternatives available)				
	1				
	2				
(viii)	Character Generator (other alternatives available)				
(ix)	Hard Drive Video Recorder (other alternatives available)				
	1				

	2					
(x)	HD Camera control/Tracking (other alternatives available)					
	1					
	2					
(xi)	Audio mixer (other alternatives available)					
	1					
	2					
(xii)	Audio Amplifier (other alternatives available)					
	1					
	2					
(xiii)	Multiview HD/SDI Router (other alternatives available)					
	1					
	2					
(xiv)	HD/SDI network video server (other alternatives available)					
	PUBLIC AREA DISPLAY SYSTEMS (other alternatives available)					
(a)	Touch screens (other alternatives available)					
	1					
	2					
	3					
(b)	Digital Display screen (other alternatives, e.g. 50", 60")					
	1					
	2					
	3					

(A) - CONFERENCE SYSTEM

Bill No.1 – Committee Room (27 Pax) (2 No.)

Item	Description	Qty	Unit	Rate (Ksh)	Amount (Ksh)
	SUPPLY, DELIVER TO SITE, INSTALL, TEST AND COMMISSION THE FOLLOWING:				
	A Video Equipment				
1.01	HD PTZ Dome Camera complete with lense and mounting as Bosch VCD-811-IWT or equal and approved equivalent.	2	No.		
1.02	85" 4K LED Smart TV as Samsung 75HJ690U or equal and approved equivalent.	1	No.		
1.03	LED/LCD Wall Mount Bracket for item No. 1.02	1	No.		
	B Audio Equipment				
1.04	Chairperson Unit Conference microphone complete with chairman buttons, headphone, 480 mm Long Microphone, LCD display, and with voting, channel selection, and card reader as Bosch DCN-CONCM Concentus Chairman or equal and approved equivalent.	1	No.		
1.05	Delegate Unit Conference microphone complete with headphones, 480 mm Long Microphone, LCD display, and with voting, channel selection, and card reader as Bosch DCN-CONFF Concentus Full Function or equal and approved equivalent.	26	No.		
1.06	Dual Channel Wireless Handheld Microphone with table stand as shure PG58 or equal and approved equivalent.	2	No.		
1.07	High quality 20W column speakers with 10W and 5W tapping and white in colour as Toa TZ series or equal and approved equivalent.	6	No.		
	C Presentation Equipment				
1.08	Table Top as Kramer TBUS 10XL (enclosure) + TS-2U (Dual Power) + W-H(B) (HDMI Ports) + W4545 (RJ45) + T10F-22M (Inner frame) or equal and approved equivalent.	2	No.		
1.09	HDMI - CAT6 Transmitter as Kramer TP-580Txr or equal and approved equivalent.	2	No.		
1.10	CAT6 – HDMI Receiver as Kramer TP-580Rrx or equal and approved equivalent.	1	No.		
1.11	Wireless presentation system for connecting Laptop, PC, tablet, etc. to screen for video presentation as Barco ClickShare CSE-200 or equal and approved equivalent.	1	No.		
	D Cables				
1.12	High quality Oxygen-free Audio Cables	25	LM		
1.13	0.9m HDMI Cable as Kramer C-HM/HM-3 or equal and approved equivalent.	3	No.		
1.14	1.8m HDMI Cable 1.8M as Kramer C-HM/HM/6 or equal and approved equivalent.	2	No.		
E	Total Cost for 1No. Room (Subtotal for video + Audio + Presentation Equipment + Cables)				
	TOTAL FOR 2 ROOMS (5th Flr - Room 22 and 25) (E x 2) (CARRIED FORWARD TO COMMITTEE ROOMS EQUIPMENT COLLECTION PAGE K/16)				

Bill No.2 – Committee Room (30 Pax) (10 No.)					
Item	Description	Qty	Unit	Rate (Ksh)	Amount (Ksh)
	SUPPLY, DELIVER TO SITE, INSTALL, TEST AND COMMISSION THE FOLLOWING:				
	A Video Equipment				
2.01	HD PTZ Dome Camera complete with lense and mounting as Bosch VCD-811-IWT or equal and approved equivalent.	2	No.		
2.02	85" 4K LED Smart TV as Samsung or equal and approved equivalent.	1	No.		
2.03	LED/LCD Wall Mount Bracket for item 2.03	1	No.		
	B Audio Equipment				
2.04	Chairperson Unit Conference microphone complete with chairman buttons, headphone, 480 mm Long Microphone, LCD display, and with voting, channel selection, and card reader as Bosch DCN-CONCM Concentus Chairman or equal and approved equivalent.	1	No.		
2.05	Delegate Unit Conference microphone complete with headphones, 480 mm Long Microphone, LCD display, and with voting, channel selection, and card reader as Bosch DCN-CONFF Concentus Full Function or equal and approved equivalent.	29	No.		
2.06	Dual Channel Wireless Handheld Microphone with table stand as shure PG58 or equal and approved equivalent.	2	No.		
2.07	High quality 20W column speakers with 10W and 5W tapping and white in colour as Toa TZ series or equal and approved equivalent.	6	No.		
	C Presentation Equipment				
2.08	Table Top as Kramer TBUS 10XL (enclosure) + TS-2U (Dual Power) + W-H(B) (HDMI Ports) + W4545 (RJ45) + T10F-22M (Inner frame) or equal and approved equivalent.	2	No.		
2.09	HDMI - CAT6 Transmitter as Kramer TP-580Txr or equal and approved equivalent.	2	No.		
2.10	CAT6 – HDMI Receiver as Kramer TP-580Rrx or equal and approved equivalent.	1	No.		
2.11	Wireless presentation system for connecting Laptop, PC, tablet, etc. to screen for video presentation as Barco ClickShare CSE-200 or equal and approved equivalent.	1	No.		
	D Cables				
2.12	High quality Oxygen free Audio Cables	25	LM		
2.13	0.9m HDMI Cable as Kramer C-HM/HM-3 or equal and approved equivalent.	3	No.		
2.14	1.8m HDMI Cable 1.8M as Kramer C-HM/HM/6 or equal and approved equivalent.	2	No.		
E	Total Cost for 1No. Room (Subtotal for video + Audio + Presentation Equipment + Cables)				
	TOTAL FOR 10 ROOMS (1st Flr - Room 3,5,6,7,8 and 2nd Flr - Room 11,12,13,14,15) (E x 10) (CARRIED FORWARD TO COMMITTEE ROOMS EQUIPMENT COLLECTION PAGE K/16)				

Bill No.3 – Committee Room (31 Pax) (1 No.)					
Item	Description	Qty	Unit	Rate (Ksh)	Amount (Ksh)
	SUPPLY, DELIVER TO SITE, INSTALL, TEST AND COMMISSION THE FOLLOWING:				
	A Video Equipment				
3.01	HD PTZ Dome Camera complete with lense and mounting as Bosch VCD-811-IWT or equal and approved equivalent.	2	No.		
3.02	85" 4K LED Smart TV as Samsung or equal and approved equivalent.	1	No.		
3.03	LED/LCD Wall Mount Bracket for item 3.02	1	No.		
	B Audio Equipment				
3.04	Chairperson Unit Conference microphone complete with chairman buttons, headphone, 480 mm Long Microphone, LCD display, and with voting, channel selection, and card reader as Bosch DCN-CONCM Concentus Chairman or equal and approved equivalent.	1	No.		
3.05	Delegate Unit Conference microphone complete with headphones, 480 mm Long Microphone, LCD display, and with voting, channel selection, and card reader as Bosch DCN-CONFF Concentus Full Function or equal and approved equivalent.	30	No.		
3.06	Dual Channel Wireless Handheld Microphone with table stand as shure PG58 or equal and approved equivalent.	2	No.		
3.07	High quality 20W column speakers with 10W and 5W tapping and white in colour as Toa TZ series or equal and approved equivalent.	6	No.		
	C Presentation Equipment				
3.08	Table Top as Kramer TBUS 10XL (enclosure) + TS-2U (Dual Power) + W-H(B) (HDMI Ports) + W4545 (RJ45) + T10F-22M (Inner frame) or equal and approved equivalent.	2	No.		
3.09	HDMI - CAT6 Transmitter as Kramer TP-580Txr or equal and approved equivalent.	2	No.		
3.10	CAT6 – HDMI Receiver as Kramer TP-580Rxr or equal and approved equivalent.	1	No.		
3.11	Wireless presentation system for connecting Laptop, PC, tablet, etc. to screen for video presentation as Barco ClickShare CSE-200 or equal and approved equivalent.	1	No.		
	D Cables				
3.12	High quality Oxygen free Audio Cables	25	LM		
3.13	0.9m HDMI Cable as Kramer C-HM/HM-3 or equal and approved equivalent.	3	No.		
3.14	1.8m HDMI Cable 1.8M as Kramer C-HM/HM/6 or equal and approved equivalent.	2	No.		
E	Total Cost for 1No. Room (Subtotal for video + Audio + Presentation Equipment + Cables)				
	TOTAL FOR 1 ROOM (1st Fir - Room 2) (E x 1) (CARRIED FORWARD TO COMMITTEE ROOMS EQUIPMENT COLLECTION PAGE K/16)				

Bill No.4 – Committee Room (33 Pax) (1 No.)					
Item	Description	Qty	Unit	Rate (Ksh)	Amount (Ksh)
	SUPPLY, DELIVER TO SITE, INSTALL, TEST AND COMMISSION THE FOLLOWING:				
	A Video Equipment				
4.01	HD PTZ Dome Camera complete with lense and mounting as Bosch VCD-811-IWT or equal and approved equivalent.	2	No.		
4.02	85" 4K LED Smart TV as Samsung or equal and approved equivalent.	1	No.		
4.03	LED/LCD Wall Mount Bracket for item 4.02	1	No.		
	B Audio Equipment				
4.04	Chairperson Unit Conference microphone complete with chairman buttons, headphone, 480 mm Long Microphone, LCD display, and with voting, channel selection, and card reader as Bosch DCN-CONCM Concentus Chairman or equal and approved equivalent.	1	No.		
4.05	Delegate Unit Conference microphone complete with headphones, 480 mm Long Microphone, LCD display, and with voting, channel selection, and card reader as Bosch DCN-CONFF Concentus Full Function or equal and approved equivalent.	32	No.		
4.06	Dual Channel Wireless Handheld Microphone with table stand as shure PG58 or equal and approved equivalent.	2	No.		
4.07	High quality 20W column speakers with 10W and 5W tapping and white in colour as Toa TZ series or equal and approved equivalent.	6	No.		
	C Presentation Equipment				
4.08	Table Top as Kramer TBUS 10XL (enclosure) + TS-2U (Dual Power) + W-H(B) (HDMI Ports) + W4545 (RJ45) + T10F-22M (Inner frame) or equal and approved equivalent.	2	No.		
4.09	HDMI - CAT6 Transmitter as Kramer TP-580Txr or equal and approved equivalent.	2	No.		
4.10	CAT6 – HDMI Receiver as Kramer TP-580Rxr or equal and approved equivalent.	1	No.		
4.11	Wireless presentation system for connecting Laptop, PC, tablet, etc. to screen for video presentation as Barco ClickShare CSE-200 or equal and approved equivalent.	1	No.		
	D Cables				
4.12	High quality Oxygen free Audio Cables	25	LM		
4.13	0.9m HDMI Cable as Kramer C-HM/HM-3 or equal and approved equivalent.	3	No.		
4.14	1.8m HDMI Cable 1.8M as Kramer C-HM/HM/6 or equal and approved equivalent.	2	No.		
E	Total Cost for 1No. Room (Subtotal for video + Audio + Presentation Equipment + Cables)				
	TOTAL FOR 1 ROOM (3rd Flr - Room 18) (E x 1) (CARRIED FORWARD TO COMMITTEE ROOMS EQUIPMENT COLLECTION PAGE K/16)				

Bill No.5 – Committee Room (34 Pax) (6 No.)					
Item	Description	Qty	Unit	Rate (Ksh)	Amount (Ksh)
	SUPPLY, DELIVER TO SITE, INSTALL, TEST AND COMMISSION THE FOLLOWING:				
	A Video Equipment				
5.01	HD PTZ Dome Camera complete with lense and mounting as Bosch VCD-811-IWT or equal and approved equivalent.	2	No.		
5.02	85" 4K LED Smart TV as Samsung or equal and approved equivalent.	1	No.		
5.03	LED/LCD Wall Mount Bracket for item 5.02	1	No.		
	B Audio Equipment				
5.04	Chairperson Unit Conference microphone complete with chairman buttons, headphone, 480 mm Long Microphone, LCD display, and with voting, channel selection, and card reader as Bosch DCN-CONCM Concentus Chairman or equal and approved equivalent.	1	No.		
5.05	Delegate Unit Conference microphone complete with headphones, 480 mm Long Microphone, LCD display, and with voting, channel selection, and card reader as Bosch DCN-CONFF Concentus Full Function or equal and approved equivalent.	33	No.		
5.06	Dual Channel Wireless Handheld Microphone with table stand as shure PG58 or equal and approved equivalent.	2	No.		
5.07	High quality 20W column speakers with 10W and 5W tapping and white in colour as Toa TZ series or equal and approved equivalent.	6	No.		
	C Presentation Equipment				
5.08	Table Top as Kramer TBUS 10XL (enclosure) + TS-2U (Dual Power) + W-H(B) (HDMI Ports) + W4545 (RJ45) + T10F-22M (Inner frame) or equal and approved equivalent.	2	No.		
5.09	HDMI - CAT6 Transmitter as Kramer TP-580Txr or equal and approved equivalent.	2	No.		
5.10	CAT6 – HDMI Receiver as Kramer TP-580Rxr or equal and approved equivalent.	1	No.		
5.11	Wireless presentation system for connecting Laptop, PC, tablet, etc. to screen for video presentation as Barco ClickShare CSE-200 or equal and approved equivalent.	1	No.		
	D Cables				
5.12	High quality Oxygen free Audio Cables	25	LM		
5.13	0.9m HDMI Cable as Kramer C-HM/HM-3 or equal and approved equivalent.	3	No.		
5.14	1.8m HDMI Cable 1.8M as Kramer C-HM/HM/6 or equal and approved equivalent.	2	No.		
E	Total Cost for 1No. Room (Subtotal for video + Audio + Presentation Equipment + Cables)				
	TOTAL FOR 6 ROOMS (1st Flr - Room 1 and 4, 2nd Flr - 9 and 10, 3rd Flr - Room 16 and 17) (E x 6) (CARRIED FORWARD TO COMMITTEE ROOMS EQUIPMENT COLLECTION PAGE K/16)				

Bill No.6 – Committee Room (40 Pax) (4 No.)					
Item	Description	Qty	Unit	Rate (Ksh)	Amount (Ksh)
	SUPPLY, DELIVER TO SITE, INSTALL, TEST AND COMMISSION THE FOLLOWING:				
	A Video Equipment				
6.01	HD PTZ Dome Camera complete with lense and mounting as Bosch VCD-811-IWT or equal and approved equivalent.	2	No.		
6.02	85" 4K LED Smart TV as Samsung or equal and approved equivalent.	1	No.		
6.03	LED/LCD Wall Mount Bracket for item No. 6.02	1	No.		
	B Audio Equipment				
6.04	Chairperson Unit Conference microphone complete with chairman buttons, headphone, 480 mm Long Microphone, LCD display, and with voting, channel selection, and card reader as Bosch DCN-CONCM Concentus Chairman or equal and approved equivalent.	1	No.		
6.05	Delegate Unit Conference microphone complete with headphones, 480 mm Long Microphone, LCD display, and with voting, channel selection, and card reader as Bosch DCN-CONFF Concentus Full Function or equal and approved equivalent.	39	No.		
6.06	Dual Channel Wireless Handheld Microphone with table stand as shure PG58 or equal and approved equivalent.	2	No.		
6.07	High quality 20W column speakers with 10W and 5W tapping and white in colour as Toa TZ series or equal and approved equivalent.	6	No.		
	C Presentation Equipment				
6.08	Table Top as Kramer TBUS 10XL (enclosure) + TS-2U (Dual Power) + W-H(B) (HDMI Ports) + W4545 (RJ45) + T10F-22M (Inner frame) or equal and approved equivalent.	2	No.		
6.09	HDMI - CAT6 Transmitter as Kramer TP-580Txr or equal and approved equivalent.	2	No.		
6.10	CAT6 – HDMI Receiver as Kramer TP-580Rxr or equal and approved equivalent.	1	No.		
6.11	Wireless presentation system for connecting Laptop, PC, tablet, etc. to screen for video presentation as Barco ClickShare CSE-200 or equal and approved equivalent.	1	No.		
	D Cables				
6.12	High quality Oxygen free Audio Cables	25	LM		
6.13	0.9m HDMI Cable as Kramer C-HM/HM-3 or equal and approved equivalent.	3	No.		
6.14	1.8m HDMI Cable 1.8M as Kramer C-HM/HM/6 or equal and approved equivalent.	2	No.		
E	Total Cost for 1No. Room (Subtotal for video + Audio + Presentation Equipment + Cables)				
	TOTAL FOR 4 ROOMS (3rd Flr - Room 21, 22, 23, 24, and 26) (E x 4) (CARRIED FORWARD TO COMMITTEE ROOMS EQUIPMENT COLLECTION PAGE K/16)				

Bill No.7 – Control Room for 1 No. Committee Room (24 No.)					
Item	Description	Qty	Unit	Rate (Ksh)	Amount (Ksh)
	SUPPLY, DELIVER TO SITE, INSTALL, TEST AND COMMISSION THE FOLLOWING:				
	A Video Equipment				
7.01	Production digital video switcher and Streaming Studio With Built-In 17.3" Lcd Monitor as DataVideo HS-3200 or equal and approved equivalent.	1	No.		
7.02	Character Generator with the necessary software as DataVideo CG-350 or equal and approved equivalent.	1	No.		
7.03	16GB RAM, 2TB HDD, NTI Pro i7 with 21" LCD monitor, Keyboard, mouse, and connectors as HP Z240 or equal and approved equivalent.	1	No.		
7.04	32" LED Smart TV as Samsung 32HE690 or equal and approved equivalent	1	No.		
7.05	LED/LCD Wall Mount Bracket for item No. 7.04	1	No.		
7.06	Hard Drive Video Recorder as DataVideo HDR-70 plus 2TB HDD as DataVideo SATA-50025 or equal and approved equivalent.	1	No.		
7.07	HD Camera control/Tracking as Kramer MV-6 or equal and approved equivalent.	1	No.		
7.08	24 port floor edge POE switch as Cisco SG350 series or equal and approved equivalent.	1	No.		
	B Audio Equipment				
7.09	High Quality 8 Channel Audio mixer with necessary plugins and connectors as Toa M-900MK2 or equal and approved equivalent	1	No.		
7.10	120 W Digital Audio Amplifier as Toa P-900 series or equal and approved equivalent.	1	No.		
7.11	Powered Speakers/Audio monitors (stereo speakers) (1 pair) as PreSonus Eris E3.5 3.5" 2-Way 25W or equal and approved equivalent.	1	No.		
7.12	Central Control Unit for controlling delegate and chairman units complete with all the necessary installation kits and cables, softwares, and licences that allow multi-voting and database management, seat identification, and Camera control software for proper operation as Bosch DCN-CCU2 plus other necessary modules or equal and approved equivalent.	1	No.		
7.13	HDMI Audio De-embedder as Kramer FC-46XL or equal and approved equivalent.	1	No.		
7.14	Audio Isolation Transformer as Datavideo DAC-80 or equal and approved equivalent.	1	No.		
7.15	Rack mount 6 Channel Audio Delay/Mixer with Level Adjustment as Datavideo AD-200 or equal and approved equivalent.	1	No.		
	C Presentation Equipment				
7.16	HDMI - CAT6 Transmitter as Kramer TP-580Txr or equal and approved equivalent.	1	No.		
7.17	CAT6 – HDMI Receiver as Kramer TP-580Rrx or equal and approved equivalent.	2	No.		
	D Cables and Other Accessories				
7.18	1.8m HDMI Cable 1.8M as Kramer C-HM/HM/6 or equal and approved equivalent.	2	No.		
7.19	High quality RG6 Cable as Kramer or Belden or equal and approved equivalent.	50	LM		
7.20	High quality CAT6 Cable as Siemons or equal and approved equivalent.	60	LM		
7.21	42U Equipment rack cabinet with shelves, casings, and mountings Giganet GN-002-8842 or equal and approved equivalent.	1	No.		
7.22	3m CAT 6 factory terminated cable as siemon or equal and approved equivalent.	4	No.		
7.23	Connectors, Splitters, Terminals, and other Accessories	1	Lot		
7.24	List any other required Item for proper operation of Conference System 1) 2)				
E	Total Cost 1No. Room (Subtotal for video + Audio + Presentation Equipment + Cables)				
	TOTAL FOR 24 ROOMS (for Bill No. 1-6) (E x 24) (CARRIED FORWARD TO COMMITTEE ROOMS EQUIPMENT COLLECTION PAGE K/16)				

Bill No.8 – Committee Room (53 Pax) (1 No. with Foldable Partition)					
Item	Description	Qty	Unit	Rate (Ksh)	Amount (Ksh)
	SUPPLY, DELIVER TO SITE, INSTALL, TEST AND COMMISSION THE FOLLOWING:				
	A Video Equipment				
8.01	HD PTZ Dome Camera complete with lense and mounting as Bosch VCD-811-IWT or equal and approved equivalent.	4	No.		
8.02	85" 4K LED Smart TV as Samsung or equal and approved equivalent	2	No.		
8.03	LED/LCD Wall Mount Bracket for item No. 8.02	2	No.		
	B Audio Equipment				
8.04	Chairperson Unit Conference microphone complete with chairman buttons, headphone, 480mm Long Microphone, LCD display, and with voting, channel selection, and card reader as Bosch DCN-CONCM Concentus Chairman or equal and approved equivalent.	2	No.		
8.05	Delegate Unit Conference microphone complete with headphones, 480mm Long Microphone, LCD display, and with voting, channel selection, and card reader as Bosch DCN-CONFF Concentus Full Function or equal and approved equivalent.	51	No.		
8.06	Dual Channel Wireless Handheld Microphone with table stand as shure PG58 or equal and approved equivalent.	4	No.		
8.07	High quality 20W column speakers with 10W and 5W tapping and white in colour as Toa TZ series or equal and approved equivalent.	12	No.		
	C Presentation Equipment				
8.08	Table Top as Kramer TBUS 10XL (enclosure) + TS-2U (Dual Power) + W-H(B) (HDMI Ports) + W4545 (RJ45) + T10F-22M (Inner frame) or equal and approved equivalent.	4	No.		
8.09	HDMI - CAT6 Transmitter as Kramer TP-580Txr or equal and approved equivalent.	4	No.		
8.10	CAT6 – HDMI Receiver as Kramer TP-580Rxr or equal and approved equivalent.	2	No.		
8.11	Wireless presentation system for connecting Laptop, PC, tablet, etc. to screen for video presentation as Barco ClickShare CSE-200 or equal and approved equivalent.	2	No.		
	D Cables				
8.12	High quality Oxygen free Audio Cables	50	LM		
8.13	0.9m HDMI Cable as Kramer C-HM/HM-3 or equal and approved equivalent.	6	No.		
8.14	1.8m HDMI Cable 1.8M as Kramer C-HM/HM/6 or equal and approved equivalent.	3	No.		
E	Total Cost for 1No. Room (Subtotal for video + Audio + Presentation Equipment + Cables)				
	TOTAL FOR 1 ROOM (3rd Fir - Room 19/20) (E x 1) (CARRIED FORWARD TO COMMITTEE ROOMS EQUIPMENT COLLECTION PAGE K/16)				

Bill No.9 – Control Room for 1 No. Committee Room (1 No. with Foldable Partition)					
Item	Description	Qty	Unit	Rate (Ksh)	Amount (Ksh)
	SUPPLY, DELIVER TO SITE, INSTALL, TEST AND COMMISSION THE FOLLOWING:				
	A Video Equipment				
9.01	Production digital video switcher and Streaming Studio With Built-In 17.3" Lcd Monitor as DataVideo HS-3200 or equal and approved equivalent.	2	No.		
9.02	Character Generator with the necessary software as DataVideo CG-350 or equal and approved equivalent.	2	No.		
9.03	16GB RAM, 2TB HDD, NTI Pro i7 with 21" LCD monitor, Keyboard, mouse, and connectors as HP Z240 or equal and approved equivalent.	2	No.		
9.04	32" LED Smart TV as Samsung 32HE690 or equal and approved equivalent	2	No.		
9.05	LED/LCD Wall Mount Bracket for item No. 9.04	2	No.		
9.06	Hard Drive Video Recorder as DataVideo HDR-70 plus 2TB HDD as DataVideo SATA-50025 or equal and approved equivalent.	2	No.		
9.07	HD Camera control/Tracking as Kramer MV-6 or equal and approved equivalent.	2	No.		
9.08	24 port floor edge POE switch as Cisco SG350 series or equal and approved equivalent.	2	No.		
	B Audio Equipment				
9.09	High Quality 8 Channel Audio mixer with necessary plugins and connectors as Toa M-900MK2 or equal and approved equivalent	2	No.		
9.10	120 W Digital Audio Amplifier as Toa P-900 series or equal and approved equivalent.	2	No.		
9.11	Powered Speakers/Audio monitors (stereo speakers) (1 pair) as PreSonus Eris E3.5 3.5" 2-Way 25W or equal and approved equivalent.	2	No.		
9.12	Central Control Unit for controlling delegate and chairman units complete with all the necessary installation kits and cables, softwares, and licences that allow multi-voting and database management, seat identification, and Camera control software for proper operation as Bosch DCN-CCU2 plus other necessary modules or equal and approved equivalent.	2	No.		
9.13	HDMI Audio De-embedder as Kramer FC-46XL or equal and approved equivalent.	2	No.		
9.14	Audio Isolation Transformer as Datavideo DAC-80 or equal and approved equivalent.	2	No.		
9.15	Rack mount 6 Channel Audio Delay/Mixer with Level Adjustment as Datavideo AD-200 or equal and approved equivalent.	2	No.		
	C Presentation Equipment				
9.16	HDMI - CAT5/6 Transmitter as Kramer TP-580Txr or equal and approved equivalent.	2	No.		
9.17	CAT5/6 – HDMI Receiver as Kramer TP-580Rxr or equal and approved equivalent.	4	No.		
	D Cables and Other Accessories				
9.18	1.8m HDMI Cable 1.8M as Kramer C-HM/HM/6 or equal and approved equivalent.	4	No.		
9.19	High quality RG6 Cable as Kramer or Belden or equal and approved equivalent.	100	LM		
9.20	High quality CAT6 Cable as Siemons or equal and approved equivalent.	120	LM		
9.21	42U Equipment rack cabinet with shelves, casings, and mountings Giganet GN-002-8842 or equal and approved equivalent.	2	No.		
9.22	3m CAT 6 factory terminated cable as siemon or equal and approved equivalent.	6	No.		
9.20	Connectors, Splitters, Terminals, and other Accessories	1	Lot		
9.21	List any other required Item for proper operation of Conference System				
9.22	1)				
9.23	2)				
E	Total Cost 1No. Room (Subtotal for video + Audio + Presentation Equipment + Cables)				
	TOTAL FOR 1 ROOM (for Bill No. 8) (E x 1) (CARRIED FORWARD TO COMMITTEE ROOMS EQUIPMENT COLLECTION PAGE K/16)				

COMMITTEE ROOMS EQUIPMENT – COLLECTION PAGE

Item	Description	Amount (Ksh)
1.00	TOTAL FOR 2 NO. COMMITTEE ROOMS (BILL NO. 1) - BROUGHT FORWARD FROM PAGE K/7	
2.00	TOTAL FOR 10 NO. COMMITTEE ROOMS (BILL NO. 2) - BROUGHT FORWARD FROM PAGE K/8	
3.00	TOTAL FOR 1 NO. COMMITTEE ROOM (BILL NO. 3) - BROUGHT FORWARD FROM PAGE K/9	
4.00	TOTAL FOR 1 NO. COMMITTEE ROOM (BILL NO. 4) - BROUGHT FORWARD FROM PAGE K/10	
5.00	TOTAL FOR 6 NO. COMMITTEE ROOMS (BILL NO. 5) - BROUGHT FORWARD FROM PAGE K/11	
6.00	TOTAL FOR 4 NO. COMMITTEE ROOMS (BILL NO. 6) - BROUGHT FORWARD FROM PAGE K/12	
7.00	TOTAL FOR 24 NO. CONTROL ROOMS (BILL NO. 7) - BROUGHT FORWARD FROM PAGE K/13	
8.00	TOTAL FOR 1 NO. COMMITTEE ROOM (BILL NO. 8) - BROUGHT FORWARD FROM PAGE K/14	
9.00	TOTAL FOR 1 NO. CONTROL ROOM (BILL NO. 9) - BROUGHT FORWARD FROM PAGE K/15	
TOTAL FOR 2 No. COMMITTEE ROOMS EQUIPMENT (CARRIED FORWARD TO AUDIOVISUAL CONFERENCE SYSTEM COLLECTION PAGE ON PAGE K/21)		

Bill No.10 – Main Control Room Equipment					
Item	Description	Qty	Unit	Rate (Ksh)	Amount (Ksh)
	SUPPLY, DELIVER TO SITE, INSTALL, TEST AND COMMISSION THE FOLLOWING:				
	A Video Equipment				
10.01	16HD/SDI Channel Multiviewer system as Blackmagic Design MULTIP6G/16 or equal and approved equivalent.	2	No.		
10.02	Multiview 40 Channel HD/SDI Router to allow for rerouting the signals from all the committee rooms to external feed as Blackmagic Smart Videohub 40 x 40 12G-SDI or equal and approved equivalent.	1	No.		
10.03	30 Channel HD/SDI network video server for streaming the captured content from committee rooms as Dell Precision 7920 with Blackmagic DeckLink Quad2 interface cards and EMS Multichannel Ingest Software with 30 licenses and streaming software/licenses and any other item/modules/software/licenses necessary for streaming of Video on the network or equal and approved equivalent.	1	No.		
10.04	40" Full HD LED Smart TV for both on and off-air monitoring as samsung HG40NE690BF or equal and approved equivalent.	2	No.		
10.05	LED/LCD Wall Mount Bracket	2	No.		
10.05	A processing work station with 32GB RAM, 1TB SATA HDD, 4k Video Interface Cards and 21" LCD Display as Dell Precision 7920 Tower with Blackmagic Decklink Studio 4k Video Interface Cards and 21" LCD Display or equal and approved equivalent.	1	No.		
10.06	48 port floor edge POE switch as Cisco SG350 series or equal and approved equivalent.	1	No.		
10.07	Powered Speakers/Audio monitors (stereo speakers) as Bosch or equal and approved equivalent.	2	No.		
10.07	Smart cards for use with the delegate system as MIFARE Classic ISO 1K Card or equal and approved equivalent.	500	No.		
10.08	ID Card Encoder with its software for encoding the cards in item 10.07 as Bosch DCN encoder or equal and approved equivalent.	2	No.		
10.08	HD/SDI to Fiber Optic Converter Transmitter/Receiver Complete with power supply as Blackmagic Design Mini Converter Optical Fiber 12G-SDI or equal and approved equivalent.	48	No.		
10.09	4-way HD/SDI Splitter Complete with power supply as Extron DA4 12G HD-SDI or equal and approved equivalent.	24	No.		
10.10	RG6 Low Loss Serial Digital Coaxial Cable as Belden 1694A or equal and approved equivalent.	2	Roll		
10.11	1000 Foot Indoor Fiber Optic Cable, Multimode, 62.5/125 for connecting committee control rooms to the main control rooms	2	Roll		
10.11	1.8m HDMI Cable 1.8M as Kramer C-HM/HM/6 or equal and approved equivalent.	4	No.		
10.12	CAT6 Cable as Siemon or equal and approved equivalent.	1	Roll		
10.13	42U Equipment rack cabinet with shelves, casings, and mountings as Giganet GN-002-8842 or equal and approved equivalent.	2	No.		
10.14	Connectors, Splitters, Terminals, and other Accessories	1	Lot		
10.15	List any other required Item for proper operation of complete Conference systems and for proper signal distribution.				
	1)				
	2)				
	3)				
TOTAL FOR MAIN CONTROL ROOM CARRIED FORWARD TO CONFERENCE ROOMS EQUIPMENT COLLECTION					
PAGE K/21					

Bill No.11 – Interpreters' Room Equipment (3 No.)					
Item	Description	Qty	Unit	Rate (Ksh)	Amount (Ksh)
	SUPPLY, DELIVER TO SITE, INSTALL, TEST AND COMMISSION THE FOLLOWING:				
11.01	Interpreters Console Unit + 2 Headsets (Mics + Earpiece) with necessary softwares and licenses fro proper operation as Bosch DCNM-IDESK (Interpreter Module), DCN-MICL (Microphone Long Stem), HDP-HQ (Headphones) or equal and approved equivalent.	1	No.		
11.02	2 Pax Fully-encapsulated soundproof Interpreters Booth with ventilation and all the necessay kits for installation as Bosch or approved equivalent.	1	No.		
11.03	List any other required Item for proper operation of Interpreter System 1) 2) 3)				
	Total Cost 1 No. Room				
	TOTAL FOR 3 INTERPRETER ROOMS CARRIED FORWARD TO CONFERENCE ROOMS EQUIPMENT COLLECTION PAGE K/21				

Bill No.12 – Editing/Recording Room Equipment and Softwares - (1No.)					
Item	Description	Qty	Unit	Rate (Ksh)	Amount (Ksh)
	SUPPLY, DELIVER TO SITE, INSTALL, TEST AND COMMISSION THE FOLLOWING:				
12.01	Recording Machine as BlackMagic Design HYPERD/ST/PRO2 or equal and approved equivalent.	2	No.		
12.02	Final cut editing workstations with latest operating system and all necessary accessories as Apple MMQA2LL/A with 21.5" diagonal backlight display or approved equivalent.	2	No.		
12.03	32" LED FHD Smart TV as Samsung 32HE690 or equal and approved equivalent.	2	No.		
12.04	LED/LCD Wall Mount Bracket	2	No.		
12.05	Speakers/Audio Monitors + Subwoofer as PreSonus/Eris E3.5/USA or equal and approved equivalent.	2	No.		
12.06	High Quality Headphones as Sony MDR-7506 or equal and approved equivalent.	2	No.		
12.07	Editing Software's as Apple Final Cut Pro X or latest with the necessary licences or equal and approved equivalent.	2	No.		
12.08	SSD dock with built in AC power supply as BlackMagic Design MultiDock 10G DISKMDOCK4/U10G or equal and approved equivalent.	2	No.		
12.09	1.8m HDMI Cable 1.8M as Kramer C-HM/HM/6 or equal and approved equivalent.	4	No.		
12.10	Connectors, Splitters, any required cabling, and other Accessories	1	Lot		
12.11	List any other required Item for proper operation in Editing/Recording				
	1)				
	2)				
	3)				
	..				
TOTAL FOR EDITING EQUIPMENT BILL NO.12 CARRIED FORWARD TO CONFERENCE ROOMS EQUIPMENT					
COLLECTION PAGE K/21					

Bill No. 13 – Video Conferencing System

Item	Description	Qty	Unit	Rate (Ksh)	Amount (Ksh)
	SUPPLY, DELIVER TO SITE, INSTALL, TEST AND COMMISSION THE FOLLOWING:				
13.01	Video Conferencing unit complete with the Codec, Eagle Eye 4x camera, Microphone, Remote, Camera Mount, and Assorted cabling and assessories for proper operation based on the room location (for 3 conference rooms) as Polycom RealPresence Group 500HD or equal and approved equivalent.	3	No.		
13.02	Ceiling Microphone Array (White in colour) with 360 degree voice pickup complete with its extension kit, mounting assessories, extension cable, and any other required assessorry for complete integration and operation with item no. 13.01 above as Polycom 2200-23809-002 or equal and approved equivalent.	6	No.		
13.03	Eagle eye camera extender (a pair) with its power adapter and necessary cables for connection between the decoder and extender, and between extender and the camera for extending the distance between the decoder and the camera upto 10m as Poycom 2215-64200-001 or equal and approved equivalent.	3	No.		
13.04	10m CAT6 cable (factory terminated) for conntecting the camera extenders as siemon or equal and approved equivalent.	3	No.		
13.05	A high capacity video conferencing control system that can integrate into multiple platforms. It should allows sessions between various parties using item 13.01 above, Skype for business, Teams, or any other desktop/laptop or mobile application and with the necessary licenses that can support users upto 500 within or outside the network plus support as Real Presence Clariti 5230-51031-000 or equal and approved equivalent.	1	No.		
13.06	Multipoint control unit Collaboration Server for provision of audio and video conferencing resources as Polycom Real Presence collaboration server or equal and approved equivalent.	1	No.		
13.07	1U Rack Server with a minimum of 2x Intel Xeon E5-2690 2.9G with the resource manager server, distributed media application server, and access directory server and any other necessary accessory for proper operation as HP ProLiant DL360p G8 + Polycom RPRM + Polycom DMA + Polycom RPAD or equal and approved equivalent.	1	No.		
13.08	1 year People + content multipoint license 6-way for item no. 13.01 and any other associated required license for proper operation as Polycom multipoint licence 5150-65081-001 and Polycom Premier license 4870-64510-002 or equal and approved equivalent.	1	No.		
13.09	Allow for interconnection of Delegate Microphone system to Video Conferencing in designated committee rooms	1	No.		
13.09	List any other required Item for proper operation of Video Conferencing System. 1) 2) 3)				
TOTAL FOR VIDEO CONFERENCING SYSTEM CARRIED FORWARD TO CONFERENCE ROOMS EQUIPMENT					
COLLECTION PAGE K/21					

AUDIOVISUAL CONFERENCE SYSTEM – COLLECTION PAGE

Item	Description	Amount (Ksh)
1.00	TOTAL FOR COMMITTEE ROOMS EQUIPMENT BROUGHT FORWARD FROM COLLECTION PAGE - PAGE K/16	
2.00	TOTAL FOR MAIN CONTROL ROOM BILL NO. 10 BROUGHT FORWARD FROM PAGE K/17	
3.00	TOTAL FOR 3 No. INTEPRETER ROOMS BILL NO. 11 BROUGHT FORWARD FROM PAGE K/18	
4.00	TOTAL FOR EDITING EQUIPMENT BILL NO.12 BROUGHT FORWARD FROM PAGE K/19	
5.00	TOTAL FOR VIDEO CONFERENCING SYSTEM BILL NO.13 BROUGHT FORWARD FROM PAGE K/20	
TOTAL FOR AUDIOVISUAL CONFERENCE SYSTEM (CARRIED FORWARD TO PRICE SUMMARY K/29)		

(B) - PUBLIC AREA DISPLAY SYSTEM (PADS) AND PUBLIC ADDRESS & EMERGENCY SOUND SYSTEM**Bill No.14 – Public Area Display System**

Item	Description	Qty	Unit	Rate (Ksh)	Amount (Ksh)
	SUPPLY, DELIVER TO SITE, INSTALL, TEST AND COMMISSION THE FOLLOWING:				
14.01	43"4K LED Smart TV as Samsung 690 series or equal and approved equivalent.	43	No.		
14.02	Rack mount Server with at least 2.4 GHz Dual processor, 128 GB SSD, and 8 GB memory for managing content distribution to different display screens as Samsung REACH 4.0 Server or equal and approved equivalent.	1	No.		
14.03	Digital Management Content software for desinging and managing displayed content complete with the necessary licenses for proper operation as Samsung REACH 4.0 or equal and approved equivalent.	1	No.		
14.04	16GB RAM, 2TB HDD, Pro NTI Core i7 Computer with 19" LCD monitor, Keyboard, mouse, and connectors as HP Z240 or equal and approved equivalent.	2	No.		
14.05	A 3 x 2m All weather Outdoor LED display screen for displaying content from Digital Management Content software complete with installation and mounting kits, necessary cabling, weather protection, software, light sensor and any other accessory necessary for proper operation as NEC or equal and approved equivalent.	1	No.		
14.06	LED/LCD Wall Mount Bracket	43	No.		
14.07	1m CAT 6 factory terminated cable as siemon or equal and approved equivalent.	43	No.		
14.08	3m CAT 6 factory terminated cable as siemon or equal and approved equivalent.	4	No.		
14.09	List any other required Item for proper operation of Public Area Display System. 1) 2) 3)				
TOTAL FOR PUBLIC AREA DISPLAY SYSTEMS CARRIED FORWARD TO COLLECTION PAGE K/24					

Bill No.15 – Integrated Public Address and Emergency Sound System					
Item	Description	Qty	Unit	Rate (Ksh)	Amount (Ksh)
	SUPPLY, DELIVER TO SITE, INSTALL, TEST AND COMMISSION THE FOLLOWING:				
15.01	Public Address and Emergency sound systems controller software for designing and controlling upto 40 audio channels as BiAmp Vocia or equal and approved equivalent	1	No.		
15.02	8-Channel 150W Digital Audio Power Amplifiers with all the necessary modules for proper channel audio amplification as BiAmp Vocia VA-8150CV or equal and approved equivalent.	4	No.		
15.03	Networked Audio Input expansion device for adding up to six channels of background music as BiAmp Vocia VI-6 or equal and approved equivalent.	1	No.		
15.04	Networked Paging microphone with Push-to-Talk button with status indication as BiAmp Vocia DS-10 or equal and approved equivalent.	10	No.		
15.05	Emergency alarm interfacing device to connect the audio system with the fire alarm system as BiAmp Vocia LSI-16e or equal and approved equivalent.	1	No.		
15.06	Control line safety interface for item 15.05 as BiAmp Vocia CI-1 or equal and approved equivalent.	1	No.		
15.07	16GB RAM, 2TB HDD, Pro NTI Core i7 Computer with 19" LCD monitor, Keyboard, mouse, and connectors as HP Z240 or equal and approved equivalent.	1	No.		
15.08	High quality 8" White ceiling mount speakers as Toa PC 2869 or equal and approved equivalent.	1100	No.		
15.09	Audio Player complete with CD/DVD, USB, and Tuner as Samsung or equal and approved equivalent.	2	No.		
15.10	High quality Oxygen free Audio Cables (305m per roll)	10	No.		
15.11	End of line Monitoring unit as BiAmp Vocia ELD-1 or equal and approved equivalent.	25	No.		
15.12	Zonal Volume controller for adjusting the volume of music at the restaurant area - 24th Floor as BiAmp Vocia WR-1 or equal and approved equivalent.	2	No.		
15.13	1m CAT 6 factory terminated cable as siemon or equal and approved equivalent.	45	No.		
15.14	42U Equipment rack cabinet with shelves, casings, and mountings Giganet GN-002-8842 or equal and approved equivalent.	1	No.		
	C Aerobics Area - 25th Floor				
15.15	Home Theatre System with Bluetooth and USB for use in for the Strength, Cardio and Aerobics Gym as Sony BDV 6100 or equal and approved equivalent .	1	No.		
15.16	Panaray Speakers as Bose 402 or equal and approved equivalent.	4	No.		
15.17	High quality Sub woofer as Bose MB4 or equal and approved equivalent.	1	No.		
15.18	Allow for interlinking PA system with Fire Alarm system for emergency evacuation	1	No.		
15.19	Connectors, Splitters, other Accessories for Public Address and Emergency Sound System	1	Lot		
15.20	List any other required Item for proper operation of Public Address and Emergency Sound System. 1) 2) 3)				
TOTAL FOR PUBLIC ADDRESS AND EMERGENCY SOUND SYSTEM CARRIED FORWARD TO COLLECTION PAGE					
K/24					

**PUBLIC AREA DISPLAY SYSTEM (PADS) AND PUBLIC ADDRESS & EMERGENCY SOUND SYSTEM –
COLLECTION PAGE**

Item	Description	Amount (Ksh)
1.00	TOTAL FOR PUBLIC AREA DISPLAY SYSTEMS BILL No. 14 BROUGHT FORWARD FROM PAGE K/22	
2.00	TOTAL FOR PUBLIC ADRESS AND EMERGENCY SOUND SYSTEM BILL No. 15 BROUGHT FORWARD FROM PAGE K/23	
TOTAL FOR PUBLIC AREA DISPLAY SYSTEM (PADS) AND PUBLIC ADDRESS & EMERGENCY SOUND SYSTEM CARRIED FORWARD TO PRICE SUMMARY ON PAGE K/29		

(C) -SMATV SYSTEM**Bill No.16 – SMATV System Equipment**

Item	Description	Qty	Unit	Rate (Ksh)	Amount (Ksh)
	SUPPLY, DELIVER TO SITE, INSTALL, TEST AND COMMISSION THE FOLLOWING:				
16.01	0.6 – 3.0 m solid aluminium dish antenna as specified, C/Ku-band LNB with 8-way LNB (for Eutelsat, Intelsat, Atlantic Bird, HotBird) as Televes 7575,747701 or equal and approved equivalent.	2	No.		
16.02	UHF Receive Antenna as Televes 149942 or equal and approved equivalent.	1	No.		
16.02	Digital Channel processing modules as specified to receive and process 16 number digital programs from Eutelsat, Intelsat, Atlantic Bird and HotBird as DSTV Explorer or equal and approved equivalent.	16	No.		
16.03	SAT launch amplifier for the Dish as Televes 5363 or equal and approved equivalent.	2	No.		
16.04	UHF multiband amplifier for MATV systems as Televes 539201 or equal and approved equivalent.	1	No.		
16.05	Cascadable Multiswitch with 5 inputs and 16 outputs complete with the necessary accessories/modules and power supply as Televes 715505 or equal and approved equivalent.	1	No.		
16.06	Headend processor complete comprising of A/D Channel Processor, Broadband Amplifier, Power Supply, In/Out amplifier panels, etc as Televes 564901, 5629, 5575, etc or equal and approved equivalent.	1	No.		
16.07	Taps with 'F' Connector as Televes 5141 or equal and approved equivalent.	5	No.		
16.08	2 Way splitters as Televes 5150 or equal and approved equivalent.	10	No.		
16.09	4 way splitters as Televes 5152 or equal and approved equivalent.	2	No.		
16.09	8 way splitters as Televes 5159 or equal and approved equivalent.	26	No.		
16.10	Modulator modules as Televes 563822 or equal and approved equivalent.	16	No.		
16.11	Signal line amplifiers as Televes 5338 or equal and approved equivalent.	15	No.		
16.12	RG11 Coaxial Cable for connecting the Satellite dish to equipment in the main control room as Televes or equal and approved equivalent.	1500	LM		
16.13	TV/FM outlet socket with plastic cover plate as Televes 5440, 5232 or equal and approved equivalent.	460	No.		
16.14	RG6 network RF Distribution cables (100M/roll) as Televes or equal and approved equivalent.	41	No.		
16.15	42U Equipment rack cabinet with shelves, casings, and mountings Giganet GN-002-8842 or equal and approved equivalent.	1	No.		
16.16	Connectors, Splitters, other Accessories for Public Address and Emergency Sound System	1	Lot		
16.17	List any other required Item for proper operation of SMATV System. 1) 2) 3)				
TOTAL FOR SMATV BILL No 16 CARRIED FORWARD TO COLLECTION PAGE K/29					

PROVISIONAL SUMS

Item	Description	AMOUNT (Ksh.)
A	CONTINGENCY Allow a Provisional sum of Kenya Shillings Fourteen Million only (14,000,000.00) only for contingency	14,000,000.00
B	FLUCTUATIONS Allow a Provisional sum of Kenya Shillings Seven Million (7,000,000.00) only for fluctuations.	7,000,000.00
C	SERVICE PROVIDERS SERVICE CHARGE Allow a Provisional sum of Kenya Shillings Two million (2,000,000.00) only for service providers, e.g. CAK, Telkom Kenya etc	2,000,000.00
D	EQUIPMENT FAMILIARIZATION & FACTORY INSPECTION Allow a Provisional sum of Kenya Five Million (5,000,000.00) only for equipment familiarization & overseas factory inspection	5,000,000.00
	Sub-total for PROVISIONAL Sums C/F to price Summary page K/29	28,000,000.00

ELECTRICAL ENGINEER'S STATIONERY

Item	Description	Qty	Unit	Rate (Ksh.)	Amount (Ksh.)
	<u>STATIONERY</u>				
	<u>Tenderers shall price for the following stationery requirements. These shall then be delivered, upon their first demand to the Chief Engineer (Electrical) (BS) immediately after the award to the successful Tenderer.</u>				
1	High back Office chair with heavy duty plastic armrests and heavy duty leather, swivel base, gas lift and castors as Supreme Furnitures or approved equivalent.	1	No.		
2	Low back visitor chair with heavy duty plastic armrests and heavy duty fabric as Supreme Furnitures or approved equivalent.	1	No.		
3	HP Laser jet 05A CE505A toner cartridge	2	No.		
4	HP Laser jet Q5949A toner cartridge	2	No.		
5	HP Laser jet 05A Q53A toner cartridge	2	No.		
6	Sharp photocopier AR-M531N/M351N toner cartridge	2	No.		
7	Ricoh/Nashuatec 9002 toner cartridge	2	No.		
8	2 Terabytes external drives with USB 3.0 interface, impact and shock protection cover and compatible software. To be as Transcend or approved equivalent.	2	No.		
9	16GB flash disks with USB 2.5 interface and to be as Transcend or approved equivalent.	4	No.		
10	Size A4 white paper with 80g/cm ² packed in 500 sheets ream.	4	No.		
11	Size A4 green letter head paper with 80g/cm ² packed in 500 sheets ream as Classic or approved equivalent	4	No.		
12	Size A4 blue letter head paper with 100g/cm ² packed in 500 sheets ream as Conqueror or approved equivalent	4	No.		
	Sub total for Electrical Engineer's Stationery C/F to price Summary page 29				

PRICE SUMMARY

Item	Description	AMOUNT (Ksh.)
A.	PRELIMINARIES AND GENERAL CONDITIONS B/F FROM K6.....	
B	TOTAL FOR AUDIOVISUAL CONFERENCE SYSTEM - BROUGHT FORWARD FROM COLLECTION PAGE K/21.....	
C	TOTAL PUBLIC AREA DISPLAY SYSTEM (PADS) AND PUBLIC ADDRESS & EMERGENCY SOUND SYSTEM - BROUGHT FORWARD FROM COLLECTION PAGE K/24	
D	TOTAL FOR SMATV SYSTEM - BROUGHT FORWARD FROM COLLECTION PAGE K/25	
E	TOTAL FOR ANY OTHER NECESSARY EQUIPMENT - BROUGHT FORWARD FROM COLLECTION PAGE K/26	
F	SUB TOTAL FOR PROVISIONAL SUMS B/F FROM PAGE K/27.....	28,000,000.00
G	SUB TOTAL FOR ELECTRICAL ENGINEER'S STATIONARY B/F FROM PAGE K/28.....	
H	ALLOW FOR TRAINING OF TECHNICAL & OPERATIONAL STAFF.....	
	TOTAL AMOUNT FOR AUDIO VISUAL / MULTIMEDIA AND CONFERENCE MANAGEMENT SYSTEMS INSTALLATIONS	

TOTAL AMOUNT IN WORDS.....

TENDERER'S NAME & STAMP.....

SIGNATURE..... DATE.....

P.I.N No. V.A.T. CERTIFICATE No.....

WITNESS..... ADDRESS.....

SIGNATURE OF WITNESS..... DATE.....