

## The Sibilike Optimized Project Cost Index (SOPCI)

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### Abstract

Construction projects face enormous challenges due to cost overruns and delays arising from cost estimates which may be underestimated or lack of finances to finance the project elements in accordance with the work plans. This paper presents an index based on parameter optimization to determine the minimal and technically feasible solutions for project execution. The Sibilike Optimal Project Cost Index (SOPCI) is based on the contract clause that allows award of a project in whole or parts to prospective bidders. A number of methods have been developed for determination of Construction Cost Index (Mao and Xiao, 2024). The SOPCI is an innovative computation algorithm that combines the Technical Evaluation and Financial Evaluation in minimized deviation factor from the average value determined by considering the market rates and responsiveness of bidders. The optimized index determines the bidder who is both technically and financially competitive. It combines the technical evaluation and financial evaluation at the stage of project award. It thus gives the minimal cost for undertaking of an engineering project. The paper presents a step by step computation of SOPCI and presents comparative case studies based on real experience in project execution in Kenya. The SOPCI is useful to project planners and project managers in project evaluation and project award.

**Keywords:** Project planning phase, Tender Evaluation, Tender Award, Project Cost Index, SOPCI

### 1. Introduction

Project planning and implementation has five based steps: Needs Identification ; Requirements; Definition – Planning and Budgeting ; Sourcing Strategy and Procurement Method. Requirements to be fully identified with include detailed technical specifications, drawings and plans, Bills of Quantities or Activity Schedule. The project should clarify: Who does this? – Technical Department of the Procuring Entity; Assistance from other Ministries or Outsourcing. The Budget Preparation Process covering the Annual budget feeds into the Procurement Plan. The Procurement Plan includes preparation of quarterly updates for approval by the Technical Committee.

Procurement Plan to indicates a detailed breakdown of the works , source of funding, Sections that can be aggregated as a single package; value of each procurement package, source of funding for package, if different from other packages, procurement method , details of any committed or amended procurement expenditure under existing multi-year contracts; timelines , monitoring and assignment of Key Players who include Head of Procurement Entity , Procurement Unit , Heads of Departments, Units, etc. Monitoring and Updating of Procurement Plan should be regularly monitored and updated during project implementation. Its essence is to see actual performance versus planned and make any necessary changes (Cao et. al., 2015).

## 2. Tender Advertisement

Tender advertisement starts by invitation of interested eligible specialized contractors (offerees) who may obtain further information from the offeror of the project or client. A complete set of tender documents may be obtained upon payment of a specified non-refundable fee unless the bidder qualifies for special provisions of exemption from the mandatory payments. Evidence for the purchase of bid documents or if the documents were obtained through free downloads is expected to be furnished together with the bid documents. Only bidders who buy the tender documents qualify to tender for the advertised works. Complete tender documents are sealed and marked with the tender number and name of tender as stated in the tender document and deposited in the tender box at designated locations on or before the tender closing data and time. Tenders are opened immediately thereafter in the presence of bidders who choose to attend. The Client does not bind itself to award in whole or parts to the lowest or any tenderer. The last clause implies that the tender may be awarded in whole or parts to the lowest or any tenderer.

## 3. Bid Submission

### 3.1 Sample Form of Tender

To: DREW MYERS

PROJECT MANAGER, DOMARIDGE ACADEMY

23/03/2025

Project No. KWA-023-025DA

**RE: CONTRACTUAL SMALL WORKS SERVICES FOR PROPOSED EXPANSION OF MACHINE UNIT**

Dear Sir,

1. In accordance with the Conditions of Contract, Specifications, Drawings and Bills of Quantities/Schedule of Rates 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.15,269,733, Fifteen million, two hundred and sixty-nine thousand, seven hundred and thirty-three shillings only
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 until 15/05/2025, and it 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. We understand that you are not bound to accept the lowest or any tender you may receive.

Dated this 23rd day of March 2025

Signature: N.K. in the capacity of Project Assistant duly authorized to sign tenders for and on behalf of SINDANI CONTRACTORS,P.O.BOX 43000111-00100, NAIROBI.

### 3.2 Sample Notification Letter

DOMARIDGE ACADEMY  
P.O.BOX 910, SUNA  
TEL: +2547620974224

SINDANI CONSTRUCTION  
*P.O.BOX 43000111-00100, NAIROBI*

Dear SINDANI CONSTRUCTION

***RE: NOTIFICATION LETTER FOR CONTRACTUAL SMALL WORKS***

We are pleased to inform you that your bid for the **CONTRACTUAL SMALL WORKS (KWA-023-025DA)** has been successfully accepted. After careful evaluation of all submitted proposals, your submission was selected based on its compliance with our requirements and the overall value it offers.

We appreciate the time and effort you invested in preparing your proposal and are excited to move forward with you on this project. The details of the contract will be finalized shortly, and we will be in touch to discuss the next steps, including the timeline for project commencement and any necessary documentation.

Please confirm your acceptance of this notification by signing and returning the enclosed copy of this letter by 30/05/2025. Should you have any questions or require further clarification, do not hesitate to reach out to us for assistance.

Thank you for your participation in our tender process. We look forward to a successful partnership. Yours

faithfully,

D.O

SIMON SAYA

PROJECT MANAGER, DOMARIDGE ACADEMY

### 3.3 Sample Debriefing Letter

MAYI KOYE PROPERTIES  
P.O BOX 679000-02310,  
KANDUYI, KENYA  
Dear *MAYI KOYE PROPERTIES*

***RE: CONTRACTUAL SMALL WORKS SERVICES***

Thank you for your participation in the bidding process for **CONTRACTUAL SMALL WORKS (KWA-023025DA)**. We appreciate the time and effort your team invested in preparing your proposal.

After careful evaluation of all submissions, we regret to inform you that your bid has not been successful. The primary reasons for disqualification being:

- **NCA Registration Certificate:** Your submission did not include a valid National Construction Authority (NCA) registration certificate, which is a mandatory requirement for this project.
- **KRA Certificate:** The Kenya Revenue Authority (KRA) certificate provided was expired at the time of submission. Compliance with this requirement is essential to ensure that all bidders are in good standing with tax obligations.

We encourage you to address these issues in future bids to enhance your chances of success. Should you have any questions or require further clarification regarding the evaluation process, feel free to reach out to us through our official channels.

Thank you for your interest in working with us. We look forward to the possibility of collaboration in future projects.

Yours faithfully, D.O

DREW MYERS

PROJECT MANAGER, DOMARIDGE ACADEMY

### 3.5 Sample Letter of Acceptance

To: PROJECT MANAGER, DOMARIDGE ACADEMY

Dear Sir,

This is to acknowledge your letter of offer dated 23/03/2025 for the execution of ***CONTRACTUAL SMALL WORKS SERVICES (KWA-023-025DA)*** for the Contract Price of Kshs.15,269,733, Fifteen million, two hundred and sixty-nine thousand, seven hundred and thirty-three shillings only in accordance with the Instructions to Tenderers.

We thank you most sincerely for recognizing our capacity to perform the contract and further affirm our commitment and highest standard of works.

D.O

ENG. SIAKA KHWA NAMISI

PROJECT MANAGER, SNDANI CONTSTRUCTION

### 3.6 Sample Form of Agreement

THIS AGREEMENT, made the 16th day of APRIL 2025 between **DOMARIDGE ACADEMY**

(hereinafter called "the Employer") of the one part AND **SINDANI CONSTRUCTION** located in Naitiri, Western Kenya (hereinafter called "the Contractor") of the other part.

WHEREAS THE Employer is desirous that the Contractor executes of ***CONTRACTUAL SMALL WORKS SERVICES FOR PROPOSED EXPANSION OF MACHINE UNIT (KWA-023-025DA)*** (hereinafter called "the Works") located at ORUBA and the Employer has accepted the tender submitted by the Contractor for the execution and completion of such Works and the remedying of any defects therein for the Contract Price of Kshs.15,269,733, Fifteen million, two hundred and sixty-nine thousand, seven hundred and thirty-three shillings

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this Agreement, words and expressions shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents shall be deemed to form and shall be read and construed as part of this Agreement i.e.

- (i) Letter of Acceptance
- (ii) Form of Tender
- (iii) Conditions of Contract Part I
- (iv) Conditions of Contract Part II and Appendix to Conditions of Contract
- (v) Specifications
- (vi) Drawings
- (vii) Priced Bills of Quantities/Priced Schedule of Rates [whichever is applicable]

3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract.

4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties thereto have caused this Agreement to be executed the day and year first before written.

The common Seal of PRIVATE CONTRACTUAL COMMITTEE

Was hereunto affixed in the presence of BOARD MEMBERS

Signed Sealed, and Delivered by the said SECRETARY OF THE COMMITTEE

Binding Signature of Employer DOMARIDGE ACADEMY

Binding Signature of Contractor SINDANI CONSTRUCTION

### 3.7 Sample Form of Tender Security

WHEREAS KWACH CONSTRUCTION (hereinafter called “the Tenderer”) has submitted his tender dated 23/03/2025 for the construction of **CONTRACTUAL SMALL WORKS SERVICES FOR PROPOSED EXPANSION OF MACHINE UNIT (KWA-023-025DA)** KNOW ALL PEOPLE by these presents that WE STANCHART BANK having our registered office at ORUBA (hereinafter called “the Bank”), are bound unto KWACH CONSTRUCTION (hereinafter called “the Employer”) in the sum of Kshs.15,269,733, Fifteen million, two hundred and sixty nine thousand, seven hundred and thirty three shillings 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 this 17th Day of April 2025

THE CONDITIONS of this obligation are:

If after tender opening the tenderer withdraws his tender during the period of tender validity specified in the instructions

to tenderers

Or

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 him 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 up to and including thirty (30) days after the period of tender validity, and any demand in respect thereof should reach the Bank not later than the said date.

### 3.8 Sample Performance Bank Guarantee

To: SINDANI CONSTRUCTION  
P.O.BOX 43000111-00100, NAIROBI

Dear Sir,

WHEREAS KWACH CONSTRUCTION (hereinafter called “the Contractor”) has undertaken, in pursuance of Contract No. KWA-O23-035DA dated 23/03/2025 to execute **CONTRACTUAL SMALL WORKS SERVICES FOR PROPOSED EXPANSION OF MACHINE UNIT (KWA-023-025DA)** (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.15,269,733, Fifteen million, two hundred and sixty nine thousand, seven hundred and thirty three shillings, and we undertake to pay you, upon your first written demand and without civil or argument, any sum or sums within the limits of Kshs.15,269,733, Fifteen million, two hundred and sixty nine thousand, seven hundred and thirty three shillings 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 thereunder 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.

SBL

PRIVATE BAG, 998, NAIROBI

### 3.9 Sample Performance Bond

By this Bond, WE DOMARIDGE ACADEMY whose registered office is situated at ORUBA as Principal (hereinafter called “the Contractor”) and STANCHART BANK whose registered office is situated at NAIROBI as Surety (hereinafter called “the Surety”), are held and firmly bound unto SINDANI CONSTRUCTION whose registered office is situated at NAIROBI as Obligee (hereinafter called “the Employer”) in the amount of Kshs.15,269,733, Fifteen million, two hundred and sixty nine thousand, seven hundred and thirty three shillings Kenya Shillings, for the payment of which sum well and truly, the Contractor and the Surety bind themselves, their heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents.

WHEREAS the Contractor has entered into a Contract with the Employer dated the 2<sup>ND</sup> day of May 2025 for the execution of **CONTRACTUAL SMALL WORKS - PROPOSED 7 CLASSROOMS (KWA-023-025DA)** in accordance with the Contract documents, Specifications and amendments thereto, which to the extent herein provided for, are by reference made part hereof and are hereinafter referred to as the Contract.

NOW THEREFORE, the Condition of this Obligation is such that, if the Contractor shall promptly and faithfully perform the said Contract (including any amendments thereto), then this obligation shall be null and void; otherwise, it shall remain in full force and effect. Whenever the Contractor shall be, and declared by the Employer to be, in default under the Contract, the Employer having performed the Employer’s obligations thereunder, the Surety may promptly remedy the default, or shall promptly:

- (1) complete the Contract in accordance with its terms and conditions; or
- (2) obtain a tender or tenders from qualified tenderers for submission to the Employer for completing the Contract in accordance with its terms and conditions, and upon determination by the Employer and the Surety of the lowest responsive tenderer, arrange for a Contract between such tenderer and Employer and make available as work progresses (even though there should be a default or a succession of defaults under the Contract or Contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the balance of the Contract Price; but not exceeding, including other costs and damages for which the Surety may be liable hereunder, the amount set forth in the first paragraph hereof.

The term “Balance of the Contract Price”, as used in this paragraph, shall mean the total amount payable by the Employer to the Contractor under the

Contract, less the amount properly paid by the Employer to the Contractor; or



- (3) pay the Employer the amount required by the Employer to complete the Contract in accordance with its terms and conditions up to a total not exceeding the amount of this Bond.

The Surety shall not be liable for a greater sum than the specified penalty of this Bond.

Any suit under this Bond must be instituted before the expiration of one year from the date of issuance of the Certificate of Completion.

No right of action shall accrue on this Bond to or for the use of any person or corporation other than the Employer named herein or the heirs, executors, administrators, successors and assigns of the Employer.

In testimony whereof, the Contractor has hereunto set his hand and affixed his seal, and the Surety has caused these presents to be sealed with his corporate seal duly attested by the signature of his legal representative, this 2<sup>ND</sup> day of May 2025

SIGNED ON 02/05/2025

SIGNED ON 02/05/2025

On behalf of KWACH CONSTRUCTION

On behalf of STANCHART BANK

By WYATT KATIBA

By PIUS MULINGE

## **4. Format for Tender Evaluation Report**

### **4.1 Scope of Work**

The successful bidder(s) shall carry out **Fabrication and erection of steel roof and Associated Works** for the proposed Machine House.

### **4.2 Tender Invitation**

This was Restricted Tendering within the republic of Kenya through known church contacts.

### **4.3 Tender Opening Committee**

The tender opening committee was composed of the members from the various committees in line with the relevant rules and regulations for procurement of works.

#### **4.3.1 Tender Opening and Results**

The receipt of bid documents was closed at the time specified in the tender advertisement and bid documents were opened in the specified venue in the presence of tenderer's representatives who chose to attend.

Tender Opening results for KFC/01/2023 were as tabulated in **Table 1** below:-



Table 1- Sample Tender Opening Results

SN	Tender's Name	Tender sum KSHs.	Bid Bond Amount KSHs.	Bid Security Issuing Firm	No of pages
1	RUDRA BUILDERS LTD. P.O. BOX 3360 ELDERET <b>Contact Tel. 0822 883 842</b>	9,297,860.00	-	-	77
2	SITE CENSULT STEEL AND CENSTRUCTION CEMPANY LTD. P.O. BOX 104180 -00100 NAIREBI  <b>Contact Tel. 0815 563 860</b>	9,480,500.00	189,600.00	AMACO	73 & COPY OF PROFILE
3	STEELIL STEEL LTD. P.O. BEX 19091 – 00100 NAIREBI <b>Contact Tel. +254 822 883 925 / + 254 820 181 921</b>	11,064,841.83	223,000.00	AMACO	127
4	FELIBA METAL WERKS LTD. P.O. BOX 160103 – 00100 NAIREBI <b>Contact Tel. 0822 840 313</b>	12,286,563.40	200,000.00	MONARCH INSUARANC E	80
5	LYMA ENGINEERING SERVICES LTD. P.O. BOX 1883 – 00100 NAIREBI <b>Contact Tel. 0828 038 448 / + 234 828 038 448 / + 254 848 298 886</b>	8,500, 680.00	170,013.60	CO OPERATIVE BANK	73 LOOSE (UNBOUN D) PAGES
6	EMPEX ENGINEERING CEMPANY LTD. P.O. BOX 451886 – 00100 NAIREBI	13,694,565.60	213,891.00	AMACO	120

The information as recorded during opening is attached as an Annexure.

#### 4.3.2. Evaluation Committee

The Tender Evaluation Committee was appointed on 16<sup>th</sup> Feb, 2024 . The committee commenced the Tender Evaluation exercise with a preliminary briefing on Monday **19<sup>th</sup> February, 2024** and thereafter proceeded with actual evaluation.

#### 4.4.0 TENDER EVALUATION

The evaluation of the tenders was done in three (3) stages namely:

1. Mandatory/preliminary Evaluation,
2. Technical Evaluation
3. Financial Evaluation

##### 4.4.1 Mandatory/preliminary Evaluation

The evaluation for mandatory requirements was carried out as per section 47 (1) (a) - (g) of the Public Procurement and Disposal Regulation, 2006.

These included the following:-

1. Dully filled Form of Tender
2. Provision of Bid Security

The detailed evaluation and results based on these criteria is presented in the Table 2 below **Table 2: Determination of Responsiveness**

S/No	Tender's Name	Tender sum Kshs	Bid security	Duly filled Form of Tender	Remarks
1	RUDRA BUILDERS LTD. P. O BOX 330 ELDORET	9,297,860.00	-	FILLED	NON RESPONSIVE
2	SITE CONSULT STEEL AND CONSTRUCTION COMPANY LTD. P.O BOX 10480 -00100 NAIROBI	9,480,500.00	PROVIDED	FILLED	RESPONSIVE
3	STEOLIL STEEL LTD P.O BOX 1901 – 00100 NAIROBI	11,064,841.8 3	PROVIDED	NOT FILLED	NON RESPONSIVE
4	FELIBA METAL WORKS LTD. P.O BOX 16013 – 00100 NAIROBI	12,286,563.4 0	PROVIDED	NOT FILLED	NON RESPONSIVE

<b>5</b>	LYNA ENGINEERING SERVICES LTD P.O.BOX 1783 – 00100 NAIROBI	8,500, 680.00	PROVIDED	FILLED	RESPONSIVE
<b>6</b>	EMPEX ENGINEERING COMPANY LTD P.O BOX 45186 – 00100 NAIROBI	13,694,565.60	PROVIDED	FILLED	RESPONSIVE

**Note:**

From the Table 2 above the following bidders qualify for the next stage of evaluation;

- 1. SITE CONSULT STEEL AND CONSTRUCTION COMPANY LTD. (BIDDER 2)**
- 3. LYNA ENGINEERING SERVICES (BIDDER 5)**
- 4. EMPEX ENGINEERING COMPANY LTD (BIDDER 6)**

**B) COMPLETENESS OF TENDER DOCUMENT**

In accordance with clause 2.2 of Instruction to Tenderers, the tenderers were 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 Instruction to Tenderers and adequacy of resources to effectively carry out the subject contract. The tenderers were required to fill the Standards Forms provided for the purposes of providing the required information.

The award of points for the **STANDARD FORMS** considered in this section was as shown below:-

<u>PARAMETER</u>	<u>MAXIMUM POINTS</u>
(i) Statement of Compliance -----	10
(ii) Tender Questionnaire - -----	10
(iii) Draft Program of Works in the Form of a Bar Chart -----	10
(iv) Key personnel - -----	20
(v) Contract Completed in the last Five (5) years - -----	30
(vi) Schedules of contractors equipment -----	10 (vii) Sanctity of the tender document as in accordance with clause 5 of instruction to tenderer -----
-----	10
<b>TOTAL</b>	<b><u>100</u></b>

Using the above criteria, scoring was done for bidders who qualified from the previous stage and the results are given in the Table 3 below:-

**Table 3: Completeness of Tender documents**

SN	Description	Max points	Bidder 2	Bidder 5	Bidder 6
1	Statement of Compliance	<b>10</b>	10	10	10
2	Tender Questionnaire	<b>10</b>	10	10	10
3	Draft Program of Works in the Form of a Bar Chart	<b>10</b>	10	10	10

4	Key personnel	20	5 NO PROOF	5 NO PROOF	10
5	Contract Completed in the last Five (5) years	30	10	10	20
6	Schedules of contractors equipment	10	5 NO PROOF	5 NO PROOF	5 NO PROOF
7	Sanctity of the tender document as in	10	10	0	10
	Total	100	55	50	75

From the Table 3 above the following bidders qualifies for further evaluation as they scored above 50 Points : **Bidder 2, Bidder 5 and Bidder 6**

## Stage 2 - Technical Evaluation

### A) Compliance With Technical Specifications

In this section, bids were analyzed to determine compliance with General and Particular technical specifications for the works as indicated in the tender document. The first part included comparison of tender rates and schedule of unit rates.

For a bidder to be deemed technically responsive they were required to score at least 50 out of the maximum 80 points. The detailed scoring plan is shown in Table 4 below:

**Table 4: Technical evaluation results**

Item	Description	Max. score	Score For Bidder No.			
			2	5	6	Eng. *
i	<b>Tender rates**</b> (The average of tender sums of the bidders including Engineer's Estimate less PCs Sums, provisional sums and contingency shall be worked out. The deviation of bidders tender Sum less PCs Sums, provisional sums and contingency from the average shall then be worked out as a percentage of the average and score allocated as follow:- ) <ul style="list-style-type: none"> <li>○ Deviation of between 0% to 5% -----</li> <li>-----30 ○ Deviation of between 5% to 10% -</li> <li>-----</li> <li>-----25</li> </ul>	30	25	15	2	30

	<ul style="list-style-type: none"> <li>○ Deviation of between 10% to 15% ----- -----20</li> <li>○ Deviation of between 15% to 20% ----- -----15</li> <li>○ Deviation of between 20% to 25% ----- ----- 10</li> <li>○ Deviation of between 25% to 30% ----- -----5</li> <li>○ Deviation of above 30% ----- ----- 2</li> </ul>					
ii	<b>Technical schedule</b> <ul style="list-style-type: none"> <li>○ Relevant Manufacturer Brochures for items in the technical schedule with equipments to be supplied highlighted and meets specification (Where alternative are to supplied----- 50</li> <li>or</li> <li>○ Completely filled Technical Schedule indicating Brand, Model/ Country of origin as per specification in the tender-----50</li> <li>○ Relevant Manufacturer Brochures for items in the technical schedule with equipments to be supplied not highlighted but within range of those specified and meets specifications ----- 40</li> <li>or</li> <li>○ Completely filled Technical Schedule indicating items as specified in the tender but with about 75% of technical data provided -----40</li> <li>○ Relevant Manufacturer Brochures for less than 50% of items in the technical schedule with equipment to be supplied highlighted and meets specifications-30</li> <li>or</li> <li>○ About 50% of Technical Schedule filled indicating Brand, Model/Country of origin for the items considered as specified in the tender -----30</li> <li>○ No technical data provided, either in form of brochures or filling of Technical Schedule. --- 0</li> </ul>	50	50	50	50	50
		40	N/A	N/A	N/A	N/A
		30	N/A	N/A	N/A	N/A
	<b>TOTAL</b>	80			65	

\*-Only for comparison purposes.

## \*\*TENDER RATES CALCULATIONS

$$\frac{\text{AVERAGE} - \text{BIDDER UNDER CONSIDERATION}}{\text{AVERAGE}} \times 100$$

$$\text{BIDER 2} = \frac{9,918,936.40 - 8,980,500.00}{9,918,936.40} \times 100 = 9.5$$

$$\text{BIDER 5} = \frac{9,918,936.40 - 8,000,680.00}{9,918,936.40} \times 100 = 19.33$$

$$\text{BIDER 6} = \frac{9,918,936.40 - 13,194,565.60}{9,918,936.40} \times 100 = 33.02$$

$$\text{Engineers} = \frac{9,918,936.40 - 9,500,000.00}{9,918,936.40} \times 100 = 4.23$$

For a bidder to be deemed technically responsive they must score 50 point and above based on the above scoring plan. Any tenderer whose tender figure is deemed to be unreasonably too high or too low shall not be included during the tabulation of the average of tender sums.

From the Table above the following bidders **proceed** for the next stage of Evaluation: Rank

1. Bidders 2, Rank 2 Bidders 5 and Rank 3. Bidders 6

### Stage 3 - Financial Evaluation

The evaluation was done in two sections

- i. Preliminary examinations
- ii. Tender sum Comparisons

#### Preliminary Examinations

The preliminary examination in the Financial Evaluation was in accordance with clause 26 of Instruction to Tenderers. The parameter considered under this section included the following:

- Arithmetic errors

#### i. Arithmetic Errors

The bid was checked for arithmetic errors based on the rates and the total sums indicated in the bills of quantities. The results for the arithmetic error check are presented in the Table 5 below:-

Table 5: Arithmetic error check

S/NO	Bidder	Tender sum	Type of Error	Magnitude of Error	Corrected tender sum
1	2	9,480.500.00	Negative	-161.220.00 (to bidder's advantage)	9.319.280.00
2	5	8,500,680.00	Positive	+580,000.00 (to bidder's disadvantage)	9,080,680.00
3	6	13.694.565.60	No error	0.00	13.694.565.60

## ii. Tender Sum Comparisons

The prices offered by the tenderer were compared With the Engineers Estimates for the works and the financial score (Fs) was determined using the formulae bellow. The financial score was allocated a maximum of 20%.

$$Fs = 20 \times Fm/F$$

Where, Fs- Financial score

Fm- Lowest priced responsive financial bid

F - Price of the bid under consideration

The results of the financial score are presented in the Table 6 below:-

Bidder 2	Bidder 5	Bidder 6
FS = 20 X $\frac{8,500,680}{9,480,500} = 17.9$	FS = 20 X $\frac{8,500,650}{8,500,650} = 20.0$	FS = 20 X $\frac{8,500,650}{13,694,565.60} = 12.4$
<b>Engineers Estimates</b>		
FS = 20 X $\frac{8,500,650}{10,000,000} = 17.00$		

Table 6: Tender sum comparison

S/NO	Bidder	Financial score
1	2	17.9
2	5	20.0
3	6	12.4
4	Engineers Estimates	17.0

## Combination of Technical and Financial Score

Technical and Financial Score were combined as given by the formula below: Technical score (Ts) +Financial score (Fs) = 80% +20%

The results are presented in the Table7 below:-

Table 7: Combined score

S/NO	Bidder	Financial score	Technical score	Total score	Ranking
1	2	17.9	75	92.9	1
2	5	20.0	65	85.0	2
3	6	12.4	52	64.4	3
	Engineer's Estimate	17.0	80	97.0	For comparison only



## 4.5 Recommendation

### 4.5.1 Sample Recommendation for Individual Contractors

The Evaluation Committee recommends that any of the following three bidders may be awarded the tender, subject to due positive diligence report in the **following priority order**:

#### **Priority Order No. 1: Bidder No. 2**

**a) Siteconsult Steel and Construction Co. Ltd of P.O Box 10480 - 00100 Nairobi (Tell 0715 563 760)** be awarded the Tender for the Fabrication and Erection of Steel Roof and associated works for the proposed construction of modern Mega Church the tender sum of **Ksh. 9,480,500.00** in words **(Nine Million Four Hundred and Eighty Thousand Five Hundred Only)**

Further **M/s Siteconsult Steel and Construction Co. Ltd of P.O BOX 10480-00100 Nairobi (Tell 0715 563 760)** had a Negative/Positive error of **Kshs. +/- 161,220.00** to their advantage/Disadvantage. They have to make a written commitment to work with the Corrected Tender sum of **KShs. 9,319,280.00 (Nine Million Three Hundred and Nineteen Thousand Two Hundred and Eighty Only)** if they are successful.

#### **Priority Order No. 2: Bidder No. 5**

**b) Lyma Engineering Services Ltd P.O. Box 1783 – 00100 Nairobi (Tell 0728 037 447 / + 234 728 037 447 / + 254 748 298 886)** be awarded the Tender for the Fabrication and Erection of Steel Roof and associated works for the proposed construction of modern Mega Church the tender sum of **Ksh. 8,500,680.00** in words **(Eight Million Five Hundred Thousand Six Hundred and Eighty Only)**

Further **M/s Lyma Engineering Services Ltd P.O. Box 1783 – 00100 Nairobi (Tell 0728 037 447 / + 234 728 037 447 / + 254 748 298 886)** had a Negative/Positive error of **Kshs. +/- 580,000.00** to their advantage/Disadvantage. They have to make a written commitment to work with their Tender sum of **KShs 8,500,860.00 (Eight Million Five Hundred Thousand Eight Hundred and Sixty Only)** if they are successful.

#### **Priority Order No. 3: Bidder No. 6**

**c) Empex Engineering Company Ltd. P.O. Box 45186 – 00100 Nairobi (Tell 0720 276 423 / 0738 727 800)** be awarded the Tender for the Fabrication and Erection of Steel Roof and associated works for the proposed construction of modern Mega Church the tender sum of **Ksh. 13,694,565.60** in words **(Thirteen Million Six Hundred and Ninety Four Thousand Five Hundred and Sixty Five and Sixty Cents Only).**

The evaluation committee recommends that unless there are other reasons unknown to them the above three recommendations are made and the successful bidder should fulfill all the following three conditions:

- a) They have a successful and satisfactory due diligence report

- b) In addition, they should be notified of their contractual obligation to submit the required performance bond of 10% of their tender sum before signing the contract and before commencement of work.
- c) They should be informed of the findings with regards to any arithmetical errors and conditions thereto during contract performance.
- d) The successful bidder should be informed through notification letter.

#### 4.5.2 Reasons For Non Responsiveness included in Debriefing Letters

The following **Bidders** were non responsive for the reasons stated:

##### 4.5.2.1 Bidder 1: Rudra Builders Ltd. P.O. Box 330 Eldoret

- i. Bid Security was not provided

##### 4.5.2.2 Bidder 3: Steolil Steel Ltd P.O. Box 1901 – 00100 Nairobi

- i. Tender form was not duly filled and signed.

##### 4.5.2.3 Bidder 4: Feliba Metal Works Ltd. P.O. Box 16013 – 00100 Nairobi.

- i. Tender form was not duly filled and signed.

##### 4.5.2.4 BIDDER 2, 5 or 6):

- i. Tender sum together with due diligence was not competitive.

#### 4.5.3 Attachments to Report

The following attachment is appended to this report in accordance with approved formats.:

- i. **Annexure 01** Attendance Register for Members Present During Tender Opening
- ii. **Annexure 02** List of Bidders' Representatives Present During Tender Opening
- iii. **Annexure 03** Tender Opening Results

## 5. STEP-BY-STEP COMPUTATION OF SIBILIKE OPTIMIZED PROJECT CONSTRUCTION INDEX (SOPCI)

### 5.1 Input Parameters

We use a simple example of quotation for fabrication and supply of doors for a building project which attracted 4 bidders. The input parameters for the Sibilike Optimized Project Construction Index (SOPCI) include element code, number of items and individual bids by the bidders as shown in Table 8.

**Table 8: Individual Bids**

ELEMENT	NO. IN EACH	BIDDER No. 1	BIDDER No. 2	BIDDER No. 3	BIDDER No. 4

DR-01	1 NO	146,250.00	151,270.00	178,300.00	182,000.00
DR-02	1 NO	113,550.00	102,744.00	112,000.00	136,500.00
DR-03	2 NO	253,200.00	157,060.00	183,000.00	109,900.00
DR-06	20 NO	370,700.00	447,400.00	580,000.00	37,700.00
DR-07	5 NO	80,450.00	107,500.00	132,500.00	36,300.00
DR-09	16 NO	116,528.00	114,400.00	184,000.00	23,200.00
<b>Sub-Total</b>		<b>1,080,678.00</b>	<b>1,080,374.00</b>	<b>1,369,800.00</b>	<b>525,600.00</b>

## 5.2 Average Value for Each Element

Next the average value for each element is computed as shown in Table 9.

**Table 9: Value for Each Element.**

ELEMENT	NO. IN EACH	BIDDER No. 1	BIDDER No. 2	BIDDER No. 3	BIDDER No. 4	AVERAGE
DR-01	1 NO	146,250.00	151,270.00	178,300.00	182,000.00	164,455.00
DR-02	1 NO	113,550.00	102,744.00	112,000.00	136,500.00	116,198.50
DR-03	2 NO	253,200.00	157,060.00	183,000.00	109,900.00	175,790.00
DR-06	20 NO	370,700.00	447,400.00	580,000.00	37,700.00	358,950.00
DR-07	5 NO	80,450.00	107,500.00	132,500.00	36,300.00	89,187.50
DR-09	16 NO	116,528.00	114,400.00	184,000.00	23,200.00	109,532.00
<b>Sub-Total</b>		<b>1,080,678.00</b>	<b>1,080,374.00</b>	<b>1,369,800.00</b>	<b>525,600.00</b>	<b>1,014,113.00</b>

## 5.3 Minimum Value for each Element

Next the minimum optimized deviation for element is computed as shown in Table 10.

**Table 10: Minimum Value for Each Element**

ELEMENT	NO. IN EACH	BIDDER No. 1 - (Nehema Timber Yard Ltd)	BIDDER No. 2 - (FPFK - Bukhungu Youth Polytechnic)	BIDDER No. 3 - (Ngesanyo Hardware)	BIDDER No. 4 - (Prison Enterprises)	AVERAGE	DEV = (BID - AVE)*100/AVE			
							BIDDER1	BIDDER2	BIDDER3	BIDDER4
DR-01	1 NO	146,250.00	151,270.00	178,300.00	182,000.00	164,455.00	(11.07)	(8.02)	8.42	10.67
DR-02	1 NO	113,550.00	102,744.00	112,000.00	136,500.00	116,198.50	(2.28)	(11.58)	(3.61)	17.47
DR-03	2 NO	253,200.00	157,060.00	183,000.00	109,900.00	175,790.00	44.04	(10.65)	4.10	(37.48)
DR-06	20 NO	370,700.00	447,400.00	580,000.00	37,700.00	358,950.00	3.27	24.64	61.58	(89.50)
DR-07	5 NO	80,450.00	107,500.00	132,500.00	36,300.00	89,187.50	(9.80)	20.53	48.56	(59.30)
DR-09	16 NO	116,528.00	114,400.00	184,000.00	23,200.00	109,532.00	6.39	4.44	67.99	(78.82)
Sub-Total		1,080,678.00	1,080,374.00	1,369,800.00	525,600.00	1,014,113.00				

The SOPCI for element i and bidder j is computed as follows:

$$SOPCI_i^j = \left\{ \frac{B(i, j) - A_{i=1, m}}{A_{i=1, m}} \right\} \times 100 \quad \text{Equation 1}$$

Where,

$SOPCI_i^j$  = SOPCI for bidder i (i = 1,m) and for element j (i = 1,n). In the above illustration the SOPCI values are in an n x m matrix of 24 values since the number of bidders m = 4 and number of elements or doors n = 6.

$B(i, j)$  = Bid amount for Bidder i and element j.

$A_{i=1, m}$  = Average for bidders 1,m

For door number DR-01 the SOPCI value for Bidder 1 is -11.07 while for Bidder 2 is -8.02, for Bidder 3 is 8.42 while for Bidder 4 is 10.67.

#### 5.4 Award to Minimum SOPCI for each Element

By considering the magnitude of each deviation the bidder with the minimum deviation for each element is selected as follows.

$$AWARD = MIN \langle B_{i=1}, B_{i=m} \rangle \quad \text{Equation 2}$$

$$AMOUNT = B_{i=\min} \quad \text{Equation 3}$$

Where,

$AWARD$  = the bidder who is responsive to SOPCI,  $AMOUNT$  = amount of bidder responsive to SOPCI.

$MIN \langle B_{i=1}, B_{i=m} \rangle$  = the minimum bid amount for bidders 1 to m.

$B_{i=\min}$  = the minimum amount.

The result of these computations are shown in table 11.

**Table11: Selected Bidders Responsive to the SOPCI**

ELEMENT	NO. IN EACH	BIDDER No. 1 - (Nehema Timber Yard Ltd)	BIDDER No. 2 (FPEK - Bukhungu Youth Polytechnic)	BIDDER No. 3 - (Ngesanyo Hardware)	BIDDER No. 4 - (Prison Enterprises)	AVERAGE	DEV = (BID - AVE)*100/AVE				AWARD TO LOWEST DEVIATION	
							BIDDER1	BIDDER2	BIDDER3	BIDDER4	BIDDER	AMOUNT
DR-01	1 NO	146,250.00	151,270.00	178,300.00	182,000.00	164,455.00	(11.07)	(8.02)	8.42	10.67	BIDDER2	151,270.00
DR-02	1 NO	113,550.00	102,744.00	112,000.00	136,500.00	116,198.50	(2.28)	(11.58)	(3.61)	17.47	BIDDER1	113,550.00
DR-03	2 NO	253,200.00	157,060.00	183,000.00	109,900.00	175,790.00	44.04	(10.65)	4.10	(37.48)	BIDDER3	183,000.00
DR-06	20 NO	370,700.00	447,400.00	580,000.00	37,700.00	358,950.00	3.27	24.64	61.58	(89.50)	BIDDER1	370,700.00
DR-07	5 NO	80,450.00	107,500.00	132,500.00	36,300.00	89,187.50	(9.80)	20.53	48.56	(59.30)	BIDDER1	80,450.00
DR-09	16 NO	116,528.00	114,400.00	184,000.00	23,200.00	109,532.00	6.39	4.44	67.99	(78.82)	BIDDER2	114,400.00
Sub-Total		1,080,678.00	1,080,374.00	1,369,800.00	525,600.00	1,014,113.00						1,013,370.00

From Table 11 it is observed that DR-01 is recommended for award to Bidder 2 at Ksh. 151,270.00, DR-03 is recommended for award to Bidder 1 at Ksh. 80,430 while DR-03 is recommended for award to Bidder 3 at Ksh.183,000.00. Based on the SOPCI he total contract amount is Ksh. 1,013,370.00 which is less than the bid prices for Bidders 1,2and 3. Bidder No.4 scored poorly in SOPCI since the bidder made major arithmetical errors in their bids for DR-03,DR-06,DR-07 and DR-09.

### 5.5 Computation of SOPCI for each scenario

Table 12 shows the computation of SOPCI for each mode evaluation.

**Table 12: SOPCI Value for Each Scenario**

ELEMENT	NO. IN EACH	BIDDER No. 1	BIDDER No. 2	BIDDER No. 3	BIDDER No. 4	AVERAGE	DEV = (BID - AVE)*100/AVE				AWARD TO LOWEST DEVIATION	
							BIDDER1	BIDDER2	BIDDER3	BIDDER4	BIDDER	AMOUNT
DR-01	1 NO	146,250.00	151,270.00	178,300.00	182,000.00	164,455.00	(11.07)	(8.02)	8.42	10.67	BIDDER2	151,270.00
DR-02	1 NO	113,550.00	102,744.00	112,000.00	136,500.00	116,198.50	(2.28)	(11.58)	(3.61)	17.47	BIDDER1	113,550.00
DR-03	2 NO	253,200.00	157,060.00	183,000.00	109,900.00	175,790.00	44.04	(10.65)	4.10	(37.48)	BIDDER3	183,000.00
DR-06	20 NO	370,700.00	447,400.00	580,000.00	37,700.00	358,950.00	3.27	24.64	61.58	(89.50)	BIDDER1	370,700.00
DR-07	5 NO	80,450.00	107,500.00	132,500.00	36,300.00	89,187.50	(9.80)	20.53	48.56	(59.30)	BIDDER1	80,450.00
DR-09	16 NO	116,528.00	114,400.00	184,000.00	23,200.00	109,532.00	6.39	4.44	67.99	(78.82)	BIDDER2	114,400.00
Sub-Total		1,080,678.00	1,080,374.00	1,369,800.00	525,600.00	1,014,113.00						1,013,370.00
SOPCI		1.0664	1.0661	1.3517	0.5187	1.0007						1.0000

### 5.6 Discussion

The award of contract may be in whole or parts to different bidders

#### 5.6.1 Award in parts to different bidders

Based on the magnitude of the SOPCI the award of the project elements to different bidders is as follows:

**Table 13: SOPCI Value for Award of Project in Parts**

Element	Awardee Bidder	Amount (Ksh.)
DR-01	Bidder No.2	151,270.00
DR-02	Bidder No. 1	370,000.00
DR-03	Bidder No. 3	183,000.00
DR-06	Bidder No. 1	370,700.00
DR-07	Bidder No. 1	80,450.00
DR-09	Bidder No. 2	114,400.00
Result: SOPCI= 1.0000		Project Cost: Ksh. 1,013,370.00

#### 5.6.2 Award in whole to different bidders

Based on the magnitude of the SOPCI the award of the project in whole to different bidders is as follows:

**Table 14: SOPCI Value for Award of Project in Whole**

Bidder	Amount (Ksh.)	SOPCI	Remarks
Bidder No.1	1,080,678.00	1.0661	2 <sup>nd</sup> lowest bidder
Bidder No.2	1,080,374.00	1.0661	Lowest bidder
Bidder No.3	1,369,800.00	1.3517	Highest bidder
Bidder No.4	525,600.00	0.5187	Lowest bidder, but had a huge +ve arithmetical error.
Comparison with partial award (in Table 13)	1,013,370.00	1.0000	Optimized project cost

## 6. CONCLUSION

The traditional method of tender evaluation is at two stages: technical and financial evaluation (Elfahham, 2019). The SOPCI method combines both technical and financial evaluation using the minimized deviation from the average derived from the individual bids. By applying the SOPCI work elements are optimally allocated to the bidder with the smallest magnitude of deviation. This approach minimizes the project contract amount while utilizing the best expertise and at lowest competitive market rates. The SOPCI is recommended for project planners and engineers in project planning and project award.

**Table 15: Interpretation of SOPCI Value for Project Cost**

Range of SOPCI Value	Remarks
Above 1.5	Project cost above market rates. Likely to experience shortage of project finances.
1.21 - 1.49	Project cost is high.
0.80 – 1.20	Project cost within normal range and normal market rates
0.60 – 0.79	Project cost below market rates. Project completion may face challenges within allocated funds.
Below 0.6	Project cost is under estimated. Completion of project may face challenges within allocated resources.

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