



**PROPOSED CONSTRUCTION OF ROADS FOR  
NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT  
NO.2782/4 AT SNOWVIEW ESTATE-  
NANYUKI, LAIKIPIA COUNTY.**

**TENDER DOCUMENTS**

**Prepared By**

AMAZON CONSULTANTS LIMITED  
Quantity Surveyors & Project Managers  
P.o. Box 1756-00100  
Nairobi.

**FEBRUARY 2024**



ACL/P150/7402A/24

20<sup>th</sup> February 2024

TO ALL TENDERERS

Dear Sir/Madam,

**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY**

**INVITATION TO TENDER**

On behalf of our client, **Nanyuki Snowview Heights Ltd**, we are pleased to invite you to submit a competitive tender for the above works.

The tender documents may be downloaded from <https://amazon.co.ke/>

The tenderer shall download the tender documents, duly fill and return in **HARDCOPY** to **ATTICSPACE Architects Ltd, Office No. B13 (0758197996-Zipporah Wangui)** on **1<sup>st</sup> Floor, Nanthill Court (RRHF + MCV)** located in **Kiambu Town**, not later than **10:00 AM** on **Monday 4<sup>th</sup> March 2024**, where they shall be opened immediately thereafter.

Bidders are welcome to witness the opening of the Tenders.

All queries and/or clarifications shall be forwarded to [info@amazon.co.ke](mailto:info@amazon.co.ke) and copied to [rukwaro@amazon.co.ke](mailto:rukwaro@amazon.co.ke)

Yours faithfully,

A handwritten signature in blue ink, appearing to read 'Steve Rukwaro', is written over a light blue rectangular background.

**Steve Rukwaro**  
**For: Amazon Consultants Ltd**

Cc: Directors; Nanyuki Snowview Heights Ltd

**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

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SIGNATURE PAGE

PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.

Supplied as part of the contract for the above works

Issued by:

Amazon Consultants Ltd  
Quantity Surveyors  
P.O. Box 1756-00100,  
Nairobi

February 2024

The Contract for the above-mentioned Works, entered into on the

\_\_\_\_\_ day of \_\_\_\_\_ 2024

by the undersigned parties refers to these Bills of Quantities which shall be read and Construed as part of the said Contract.

\_\_\_\_\_  
(EMPLOYER)

\_\_\_\_\_  
(CONTRACTOR)

DATE \_\_\_\_\_ 2024

DATE \_\_\_\_\_ 2024

FORM OF TENDER

TO: NANYUKI SNOWVIEW HEIGHTS LTD  
P.O. BOX 1756-00100  
NAIROBI.

Messrs,

PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY

- a) We \_\_\_\_\_ subject to the conditions of tendering general conditions of contract, drawings and specifications, offer to execute the works at a lump sum of \_\_\_\_\_ (Kshs \_\_\_\_\_)
- b) We agree to complete the works within \_\_\_\_\_ weeks from the date of possession of the site or within such extended time as provided in the contract conditions.
- c) Further we agree that this tender shall remain valid for One Hundred and Eighty (180) days from the date of submission.
- d) We further understand that the lowest or any tender may neither be necessarily accepted nor will expenses incurred in the preparation of this tender be allowed.

Signature of Tenderer \_\_\_\_\_

Name and Stamp \_\_\_\_\_

Date \_\_\_\_\_

Witnessed by: \_\_\_\_\_

Date \_\_\_\_\_

**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY**

**SPECIAL NOTES AND CONDITIONS OF TENDERING**

1. The Contractor is required to check the numbers of the pages and should any be found to be missing or in duplicate or the figures or writing indistinct, he must inform Qs. Rukwaro through [info@amazon.co.ke](mailto:info@amazon.co.ke) and copy [rukwaro@amazon.co.ke](mailto:rukwaro@amazon.co.ke) at once and have the same rectified. Should the Contractor be in doubt about the precise meaning of any item, word or figure, for any reason whatsoever, or observe any apparent omission of words or figures he must inform the Quantity Surveyor in order that the correct meaning may be decided upon before the date for the submission of the tender.
2. No liability whatsoever will be admitted nor claim allowed in respect of errors in the Contractor's tender due to mistakes in the Bills of Quantities which should have been rectified in the manner described above.
3. The Contractor shall not alter or otherwise qualify the text of these Bills of Quantities. Any alteration or qualification made without authority will be ignored and the text of the Bills of Quantities as printed will be adhered to.
4. The Contractor shall be deemed to have made allowance in his prices generally to cover items of Preliminaries or additions to Prime Cost Sums or other items, if these have not been priced against the respective items.
5. All items of measured work shall be priced in detail and tenders containing lump sums to cover trades or groups of work must be broken down to show prices for each item before they will be accepted. Lump sums to cover items of Preliminaries shall likewise be broken down if so required.
6. In no case will any expenses incurred by Contractors in preparation of this Tender be reimbursed.

7. The copyright of these Bills of Quantities is vested in the Quantity Surveyor and no part thereof may be reproduced without their express permission given in writing.
8. The Contractor is solely responsible for the accurate ordering of materials in accordance with the Drawings and Engineer's Instructions and no claims for any loss or expense will be entertained for orders for materials based upon the Bills of Quantities.
9. The Bills of Quantities must be priced and in Kenya currency, i.e. Shillings and cents
10. The bidders are encouraged to visit the site before submission of the bids. No claims will be allowed for travelling or other expenses which may be incurred by the contractor in visiting the site or preparing the tender for the works. The site is located off road C76 (Nanyuki-Ramuruti Road) at the junction of the road to Mukima Shopping Centre.
11. Rates inserted in the bills of quantities shall be deemed to be INCLUSIVE of all taxes including VAT.

**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

**INVITATION TO TENDER FOR CIVIL WORKS CONTRACTORS**

**The Client**

The client is Nanyuki Snowview Heights Ltd.

**Description of the project**

Nanyuki Snowview Heights Ltd is looking for Civil Works Contractors interested in construction of roadworks for an upcoming commercial and residential development. The total length of roads is 6.5km comprising of 2No. 2.5km main access of 15m width and a 3.99km minor access of 12m width. The works include earthworks, approved filling materials, compaction and construction of culverts. The site of the proposed works is located off road C76 (Nanyuki-Ramuruti road) at the junction of the road to Mukima shopping centre.

**Notes to Bidders**

1. The purpose of this document is to assist the client, Nanyuki Snowview Heights Ltd in the evaluation of Contractors who will carry out the works.
2. Bidders will be selected in accordance with the procedures set out by the Client.
3. The client reserves the right to verify the accuracy of the information provided in the bidding documents. Bidders may be asked to clarify the information provided after close of the submission deadline.
4. This tender does not amount to any contractual obligation on the part of the client and neither does it oblige them to award any bidder(s) nor give reasons for their decision(s).
5. Bidders will meet all cost associated with preparation and submission of their tender.



6. Bidders are advised to regularly check the website <https://amazon.co.ke/> for any updates, amendments or clarifications.
7. All documents must be submitted in English language.
8. Bidders may request for additional information or clarifications from the client through [info@amazon.co.ke](mailto:info@amazon.co.ke) and copied to [rukwaro@amazon.co.ke](mailto:rukwaro@amazon.co.ke) not later than four [4] days before the submission deadline. Any such response or clarification shall be uploaded on the portal for access by all bidders.
9. The completed tender document shall be submitted following the outlined sequence on or before **1000Hrs on 4<sup>th</sup> March 2024** and delivered to the **ATTICSPACE Architects Ltd, Office No. B13 on 1<sup>st</sup> Floor, Nanthill Court (RRHF + MCV)** located in **Kiambu Town**. The tender documents shall thereafter be opened on **4<sup>th</sup> March** in the presence of the bidders' designated representatives who choose to attend.
10. Any tender documents received by the client after the deadline shall be declared late and rejected, and promptly returned unopened.
11. Sealing and marking of the tender.
  - a. The tender document shall be delivered in a single sealed envelope or package, or in a single sealed container bearing the following details:
    - i. The name of the assignment.
    - ii. The name and address of the client.
    - iii. A warning: **'DO NOT OPEN BEFORE 1000Hrs on Monday 4<sup>th</sup> March 2024.**
  - b. Within the single sealed envelope, package or container referred to above, the bidder shall place the following in separately sealed envelopes:
    - i. An envelope marked 'TECHNICAL PROPOSAL', containing ONE (1) original and ONE (1) copy of the Technical Proposal.
    - ii. An envelope marked 'FINANCIAL PROPOSAL', containing ONE (1) original and ONE (1) copy of the Financial Proposal.
  - c. Each envelope in item (b) above shall bear the following details:
    - i. The name of the assignment.
    - ii. The name and address of the client.
    - iii. The name and address of the bidder.

- iv. A warning on the Financial Proposal envelope: 'DO NOT OPEN WITH THE TECHNICAL PROPOSAL'

### **Tender Evaluation Criteria**

The tenders shall be evaluated in the following four (4) stages:

- Stage A. Preliminary Evaluation;**  
Evaluation of Mandatory requirements  
All requirements MUST be met to proceed to Technical Evaluation.
- Stage B. Technical Evaluation**  
Bidders who score 70 and above shall qualify for financial evaluation.
- Stage C. Financial Evaluation**  
A detailed financial analysis of the bids shall be done at this stage and the lowest 3No. Responsive bidders will proceed to due diligence stage.
- Stage D. Due Diligence**  
Due diligence may be done to seek further clarification/confirmation if necessary

The lowest most responsive bidders shall be awarded.

### **Stage A: Preliminary Evaluation**

#### **Mandatory Requirements for Civil Works Contractors**

Bidders are required to submit the following mandatory documents/information:

1. Valid copy of Certificate of Incorporation.
2. Valid Tax Compliance Certificate.
3. Valid copy of National Construction Authority (NCA) Registration Certificate for Building and Civil Works and associated services.
4. Valid Annual Contractors Practicing License from NCA.

5. Valid copy of the current Single Business Permit.
6. Valid CR12 form showing the list directors /shareholding (issued within the last 6 Months) or National Identity Card for Sole Proprietorship.
7. Certified audited accounts for the last two [2] years (2021&2022).
8. Letter of authority to seek reference from the bidder's bank (include bank details such as the bank name, branch name and account number(s) and contact(s)).
9. Dully filled, signed and stamped form of tender shall form part of the technical proposal.
10. Interested bidders/applicants shall submit a paginated document which shall be intact, sequentially serialized and securely bound.

**NB:** Bidders who do not meet any of the above requirements will be disqualified and shall **not** be evaluated further.

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

## Stage B: Technical Evaluation

Bidders will be required to provide documents/information based on the following technical and general requirements in response to this tender. The award of points for the Technical Evaluation will be as follows: -

### Technical and General Requirements for Civil Works Contractors

Parameter	Maximum Points
1) Key personnel_____	20
2) Completed Projects_____	20
3) Schedules of appropriate equipment_____	20
4) Evidence of having a registered office/ physical address_____	10
5) Evidence of financial resources_____	10
6) Evidence of financial strength_____	10
<b>Total</b>	<b>90</b>

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

**Table 1: Scores for the Technical Evaluation - Civil Works Contractors**

Item	Description	Points Scored	Max Points
1	<p><b>Key Personnel (Attach evidence)</b></p> <p><b>Project Engineer</b> with a degree/diploma or higher qualification in building/construction related field. Attach;</p> <ul style="list-style-type: none"> <li>▪ Curriculum Vitae..... (1Mark )</li> <li>▪ CERTIFIED qualification certificate.....(1Mark )</li> </ul> <p>a) With at least 7 years relevant experience ----- ----- (8 marks)</p> <p>b) With at least 5 years relevant experience ----- ----- (3 marks)</p> <p>c) With at least 3 years relevant experience ----- ----- (1 mark)</p>		10
	<p><b>Site Agent / Foreman</b> with a diploma/trade certificate or higher qualification in building/construction related field. Attach;</p> <ul style="list-style-type: none"> <li>▪ Curriculum Vitae..... (1Mark )</li> <li>▪ CERTIFIED qualification certificate.....(1Mark )</li> </ul> <p>a) With at least 7 years relevant experience ----- ----- (8 marks)</p> <p>b) With at least 6 years relevant experience ----- ----- (4 marks)</p> <p>c) With at least 3years relevant experience ----- ----- (1 mark)</p>		10
			<b>20</b>

2	<p><b>Completed or ongoing projects;</b> a max of 2 No. projects (Attach evidence in letters of award or completion certificates, photographs, recommendation letter(s) from client or consultants). At least 1No. Project must be complete. Ongoing projects to be over 50% complete.</p> <ul style="list-style-type: none"> <li>• Letter of award or completion certificate----- ------(4 marks each)</li> <li>• Recommendation letters; 1 No. from Client and 1 No. from any Consultant for each project----- ----- (4 marks each)</li> <li>• Photographs------(2 marks each)</li> </ul>		20
			20
3	<p><b>Schedules of contractor's equipment. (ATTACH EVIDENCE OF PROOF OF OWNERSHIP OR LEASE AGREEMENT)</b></p> <p>For each specific equipment required in the construction work being tendered for;</p> <ul style="list-style-type: none"> <li>a) At least 2No. Trucks ----- (2.5 Marks each)</li> <li>b) At least 1No. pickup ----- (2.5 Marks)</li> <li>c) At least 1No. grader ----- (2.5 Marks)</li> <li>d) At least 1No. 5 tonne Roller ----- (5 Marks)</li> <li>e) At least 1No. Excavator------(5Marks)</li> </ul>		20
			20
4	<p><b>Evidence of having a registered office/ physical address Locally.</b></p> <p>Provide evidence as follows:</p> <ul style="list-style-type: none"> <li>a) Location- Co-ordinates or street name and address--- ------(2.5 marks)</li> <li>b) Tenancy or Lease Agreement or Title Deed(for owner occupied) ------(2.5 marks)</li> <li>c) Business Permit------(2.5 marks)</li> <li>d) Photographic evidence of the office------(2.5 marks)</li> </ul>		10
			10

5	<b>Financial report</b>  <b>Audited financial report (last two [2] years) - (2021-2022)</b> a) Turn over greater or equal to 1.5 times the cost of the project ----- (10 Marks) b) Turn over greater or equal to the cost of the project -- ----- (5 Marks) c) Turn over below the cost of the project ----- ----- (3 Marks)		10
			10
6	<b>Evidence of financial strength (cash in hand, lines of credit, over draft facility etc.)</b> a) Has financial strength above 20% of the cost of the project ----- (10marks) b) Has financial strength between 10-20% of the cost of the project----- (6marks) c) Has financial strength below 10% of the cost of the project ----- (3marks)		10
			10
	<b>TOTAL</b>		90

**NB:** Any bidder who scores 70 % and above in this Technical Evaluation shall be considered for further evaluation.

### **Stage C: Financial Evaluation**

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

The financial evaluation shall be evaluated on the following criteria:

- a) Determination of Arithmetic errors
- b) Comparison of Rates;
- c) Consistency of the Rates.
- d) Front loading.

### **Stage D: Due Diligence**

The Client may inspect the premises and undertake due diligence to seek further clarification/confirmation if necessary, to confirm authenticity /compliance of any condition of the tender /qualifications of the tenderer.

### **Award Criteria:**

The lowest most responsive tender shall be awarded



# **BIDDING DOCUMENTS**

# **SPECIFICATIONS**

## SECTION No. I

### SPECIFICATIONS

{These specifications shall be read in conjunction with Ministry of Works General Specifications 1976 edition together with any amendments issued thereto

If there is any discrepancy between the Specifications and these Bills of Quantities and the General Specifications, the Project manager shall give direction}

## SPECIFICATIONS

- |    |                          |                |
|----|--------------------------|----------------|
| A. | General Items            | spec / 64-65   |
| B. | Excavation and Earthwork | spec / 66-69   |
| C. | Drainage                 | spec / 157-161 |
| D. | Roadworks                | spec / 162-175 |

## GENERAL ITEMS

### **Materials Generally**

A.1 All materials used on the works shall be new and of the qualities and kinds specified herein and equal to approved samples. Deliveries shall be made sufficiently in advance to enable samples to be taken and tested if required. No materials shall be used until approved and all materials which are not approved or which are damaged, contaminated or have deteriorated in any way or do not comply in any way with the requirements of this specification shall be rejected and shall be immediately removed from the site at the Contractor's expense.

#### **A.2 Material for which there is a Kenya Bureau of Standard specification**

All materials used in the works for which a Kenya Bureau of Standards Specification has been published shall conform with the latest edition thereof in every way. The Architect reserves the right to demand that the Contractor shall obtain at his own expense a certificate in respect of any materials to state that is in accordance with the Kenya Bureau of Standard specification.

#### **A.3 Materials for which there is no Kenya Bureau of Standards specification**

All materials used in the works for which no Kenya Bureau of Standards specification has been published shall conform with the British Standards Specification for such materials. If there are no published standards as specified for any materials, the quality of such materials shall be generally of a standard equal to those for which there is a Kenya Bureau of Standards or British Standard specification.

#### **A.4 Alternatives to proprietary brands**

Where materials are specified by their proprietary names or where fittings are specified by catalogue numbers or descriptions, the contractor may offer materials or fittings of alternative manufacture which are of equal or superior quality. Such alternative must be approved before being used in the works and the Contractor shall allow for this, but prior to tendering he may submit to the Architect for approval the names of any suppliers or manufacturers whose

products he intends to use, together with catalogue numbers and descriptions and/or samples but the decision of the Architect shall be final.

#### **A.5 Samples**

The Contractor shall furnish for approval with reasonable promptness all samples of materials and workmanship required by the Architect. The Architect shall check and approve such samples for conformance with the design concept of the works and for compliance with the information given in the Contract Documents. The work shall be in accordance with approved samples.

- a) All material samples shall be delivered to the Architect's office with all charges in connection therewith paid by the Contractor.
- b) Duplicate final approved samples, in addition to any required for the Contractor's use shall be furnished to the Architect, one for office use and one for the site.
- c) Samples shall be furnished so as not to delay fabrication, allowing the Architect reasonable time for consideration of the sample submitted.
- d) Each sample shall be properly labelled with the name and quality of the material, manufacturers name, name of the project, the Contractor's name and the date of submission and the specification number to which the sample refers.

#### **A.5 Measuring and Testing Equipment**

The Contractor shall provide the following equipment for carrying out measuring and control tests on the site and maintain in full working order:

- a) Straight edges 2 metres and 4 metres long for testing the accuracy of the finished concrete.
- b) A glass graduated cylinder for use in the silt test or organic impurities in the sand.

- c) Slumb test apparatus
- d) 150mm steel tube moulds with base plates and tamping rod to B.S. 1881.
- e) Two 30 metre steel tapes
- f) One dumpy or quickest level and staff
- g) Micrometer

## EXCAVATION AND EARTHWORK

### D.1 Site Clearance

Site Clearance shall include the cutting down of all trees, stumps, bushes, vegetation and rubbish, burning the debris arising in approved locations and carting remaining material to a tip provided by the Contractor.

### D.2 Grubbing

Grubbing up roots etc. shall include the following and disposal shall be as described under the foregoing clause:

- 1) Stumps and roots of large trees shall be completely removed
- 2) Stumps and roots of small trees, bushes or other vegetation shall be completely removed to a depth of at least 600mm below formation.
- 3) Smaller stumps and roots of vegetation up to 25mm thick shall be completely removed to a depth of 230mm below formation.
- 4) Fine roots shall be removed to as great depth as is practicable by hand.

Except where the area of grubbing is to be excavated, all resulting holes shall be filled up solid with approved material compacted to the same relative density as the surrounding.

### D.3 Nature of the Soil

The Contractor is advised to visit the site and ascertain the nature of the ground to be excavated and he shall price accordingly and no claim will be allowed for want of knowledge in this respect.

Rates for excavation shall include for excavation in soil, earth, black cotton, sandy soil, Murram, tuff, soft rock, boulders or whatever other subsoil is encountered except hard rock as defined below.



#### D.4 **Hard Rock.**

Any rock or other hard materials encountered in excavating to the required depths which in the opinion of the Architect or Engineer can only be removed by wedges, compressed air or other special plant or explosives shall be paid for as an extra and the price shall include for trimming and leveling. No plastering will be allowed without prior written permission from the Engineer and relevant Government Authority. Material which can be removed by a pick or traxcavator, ripper or similar mechanical plant will not be classed as rock.

#### D.5 **Foundation Excavations**

- a) The foundation trenches and column bases shall be excavated to the widths and depths of the concrete foundations shown on the drawings or to such widths and depths as the Engineer may instruct after examination of the excavations. Quantities of all excavations shall be measured and valued by the Quantity Surveyor and any difference between such measurements and the measurements herein given shall be dealt with as a variation to the Contract.

If however, the Contractor excavates to any greater depths than shown in the drawings or as instructed by the Engineer, then he shall at his own expense fill in such extra depth of excavation with concrete as specified for the foundations to the satisfaction of the Engineer. The Contractor shall not be paid for the cost of any excavation executed deeper or wider than shown on the drawings or instructed by the Engineer nor the cost of back filling such excavation or disposing of surplus.

- b) The Contractor shall report to the Engineer when secure bottoms have been obtained to the excavations and are ready to receive the foundation concrete. Any concrete or other work put in before the excavations have been inspected and approved by the Engineer shall, if so directed be removed and new work substituted in accordance with the specification after excavations have been approve, all at the Contractor's expense.
- c) The bottom of all foundation trenches and column bases shall be trimmed square and level. The Contractor shall form such steps on bottoms of

foundation trenches as the Engineer may consider necessary in such positions and to such depths as he may direct.

#### **D.6 Unauthorised Excavations**

The Contractor is prohibited from making excavations other than those approved by the Architect as necessary for the works.

#### **D.7 Borrow Pits**

No borrow pits will be allowed to be opened on the site.

#### **D.8 Surplus Soil Disposal**

Excavated material not required for subsequent refilling shall be removed to areas off site which shall be approved by the Architect.

#### **D.9 Top Soil for Spreading**

Where required in the Bills of Quantities, top soil required for subsequent spreading over finished work shall be especially selected and shall be dumped in special heaps as indicated by the Architect. Such top soil shall be reasonably free from vegetation to the satisfaction of the Architect and shall be compacted as little as possible in the heaps.

#### **D.10 Filling under Surface Beds in Buildings**

##### **i) Murram filling**

Murram for filling as base course shall be from an approved source and of the highest quality. It shall be laid in layers not less than 150mm thick and not greater than 230mm thick prior to compaction. Water will be applied to O.M.O. and each layer will be thoroughly compacted by at least 8 passes of a 10 tonne smooth wheeled roller or a 2 tonne vibrating roller until all movement ceases and 100% C.B.R. is obtained.

##### **ii) Hardcore filling**

Hardcore filling shall be crushed rock, broken brick, broken concrete or other approved hard granular materials broken to pass not greater than a 150mm ring or to be 75% of the finished thickness of the layers being compacted whichever is the less and graded so that it can be easily and thoroughly compacted by rolling. The filling is to be laid in layers each of a consolidated thickness not exceeding 230mm.

Where rolling by 10 tonne smooth wheeled roller or 2 tonne vibrating roller is impossible, compaction shall be by hand or mechanical tampers. Each layer shall be compacted by at least 8 passes of the roller.

The top surface of the hardcore shall be leveled or graded to falls as required and blinding with similar material broken to 25mm gauge and surfaced with stone dust and well wetted before consolidation by the roller. The surface so obtained shall be to the Engineer's approval.

#### **D.11 Filling obtained from the Excavations**

Filling obtained from surplus excavated materials is to be free from all weeds, roots, vegetable soil or other unstable materials and is to be filled in layers each of not more than 230mm finished thickness. Each layer to be well wetted and consolidated as described herein.

#### **D.12 Anti-termite treatment**

Where described the top surface of filling shall be treated with Gladiator T C Pesticides to be supplied by Rentokil Ltd. P.O. Box 44360, Nairobi or other equal and approved firm strictly in accordance with the satisfaction of the Architect. The Contractor must destroy any termite nests found within the perimeter of the building and within 20 metres from the building externally and take out and destroy queens, impregnate holes and tunnels with approved insecticide and backfill with hard material, well rammed and consolidated.

#### **D.13 Polythene Sheeting**

Polythene sheeting shall be produced by an approved manufacturer. Joints in sheeting shall be treble folded with a 150mm fold and taped at 300mm intervals with 50mm wide back plastic adhesive tapes. The sheeting shall not stretched but shall be laid with sufficient wrinkles to permit shrinkage up to 15%.

The Contractor shall ensure that the membrane is not pierced buying laying and concreting.

#### **D.14 Cutting Down Trees**

The Contractor must consult the Architect before cutting down or pruning any trees or shrubs encountered on the site. The Contractor shall be held responsible for any damage caused by the building operations to those shrubs or trees not so directed.

#### **D.15 Existing Services**

Before commencing works, the Contractor shall at his own expense ascertain in writing from the relevant Local Authorities and all other Public bodies, companies and persons who may be affected, the position and depths of their respective ducts, cables, mains or pipes and appurtenance. He shall thereupon search for and locate such services.

Active existing services shall be adequately protected from damage or relocated as directed by the Architect. Inactive services shall be removed or sealed off in accordance with the direction of the Architect.

#### **D.16 Protection**

The Contractor shall protect all graded and filled areas from the actions of the elements. Any settlement or washing away that occur prior to acceptance of the works shall be repaired and grades re-established to the required elevations and slopes.

#### **D.17 Removal of Obstruction**

In the event of any derelict foundations, walls, slabs, cabs etc, being discovered upon the site of the works, they shall, if below new foundations be completely removed to a level of 150mm below the level of the new foundations as instructed by the Architect. For graded or planted areas, any such obstructions shall be removed to a depth of 600mm below the finished grade.

# DRAINAGE

## LIST OF CLAUSES

### GENERALLY

- V.1 Specification to other sections
- V.2 Notices
- V.3 Drainage Bye-laws
- V.4 Inspections
- V.5 Levels of existing drains

### MATERIALS

- V.6 Salt-glazed ware spigot and socket pipes and specials
- V.7 Concrete pipes and specials
- V.8 Concrete porous pipes
- V.9 Concrete Drain invert Blocks
- V.10 Concrete Slabs for open drains
- V.11 Agricultural Tiles and pipes
- V.12 Cast Iron Pipes and Specials
- V.13 Manhole covers and frames
- V.14 Gulley Grafting and Frames
- V.15 Precast Concrete manholes and Inspection Chambers
- V.16 Precast Concrete Gullies
- V.17 Manhole Step Irons
- V.18 PVC Pipes
- V.19 Pitch Fibre Pipes
- V.20 Mesh reinforcement

### WORKMANSHIP

- V.21 Setting out
- V.22 Excavation
- V.23 Planking and strutting
- V.24 Backfilling
- V.25 Laying drains
- V.26 Pitch impregnated fibre drains

- V.27 P.V.C. drains
- V.28 Cast iron drains
- V.29 Concrete beds, haunches and coverings
- V.30 Sleeves
- V.31 Benching
- V.32 Bedding and sealing covers and frames
- V.33 Testing
- V.34 Clean and flush all drains

## **DRAINAGE**

### **V.6 Salt-glazed ware spigot and socket pipes and specials**

Salt-glazed ware spigot and socket pipes and specials shall comply with the requirements of British Standard 65: salt-glazed ware pipes. Unless otherwise stated in the Bills of Quantities, they shall be of British Standard quality as defined therein.

### **V.7 Concrete pipes and specials**

Concrete pipes and specials shall comply with the requirements of British Standards 556 or 4101 as appropriate. They shall carry the British Standard Institution registration certification trade mark, or test certificates shall be furnished by the manufacturer.

### **V.8 Concrete porous pipes**

Concrete porous pipes shall comply with the requirements of British Standard 1194: Concrete Porous Pipes for under-drainage.

### **V.9 Concrete drain invert blocks**

Precast concrete invert blocks shall be manufactured to the detailed drawings supplied from concrete as specified using maximum 12mm aggregate. If required, cube test certificates shall be supplied by the manufacturers.

### **V.10 Concrete slabs for open drains**

Precast concrete slabs for lining open drains shall be manufactured to the detailed drawings supplied from concrete as specified using maximum 12mm aggregate. If required, cube test certificates shall be supplied by the manufacturer.

#### **V.11 Agricultural tiles and pipes**

Agricultural tiles and pipes shall be best well burnt earthenware true and circular in bore and with an extremely flat bottom and plain ends suitable for laying with open or butt joints.

#### **V.12 Cast iron pipes and specials**

Cast iron pipes, bends, junctions and fittings shall be provided with spigot and socket joints and shall comply with the requirements of British Standard 78: Cast iron pipes (vertically cast) for water, gas and sewage. Class B pipes shall be used, and they shall carry the British Standard Institution registered certification trade mark, or test certificates shall be furnished by the manufacturers.

#### **V.13 Manhole covers and frames**

Manhole covers and frames shall be basically in accordance with the requirements of B.S. 497: Cast Manholes Covers, Road Gully Gratings and Frames for drainage purposes except that the manhole covers shall be constructed of mild steel. Concrete filled in accordance with the Council's standard detailed drawings.

Foul water sewer manholes shall have triangular Grade A heavy duty covers and frames. Circular manhole covers and frames shall be used on surface water sewer manholes.

#### **V.14 Gully gratings and frames**

Gully gratings and frames shall be basically in accordance with the requirements of B.S. 497, nominal size 500mm x 250 mm except that the gully



gratings shall be constructed of mild steel. Concrete filled in accordance with the Council's standard detailed drawings.

Where indicated as being kero inlet type, the gullies shall conform to the shape and dimensions given on the detail drawings supplied but in respect of materials and workmanship conform to B.S.497.

#### **V.15 Precast concrete manholes and inspection chambers**

Precast concrete manholes and inspection chambers shall comply with the requirements of British Standard 556: Concrete Cylindrical Pipes and Fittings including Manholes, Inspection Chambers and Street Gullies and they shall carry the British Standard Institution registered certification trade mark, or test certificates shall be furnished by the manufacturers.

#### **V.16 Precast concrete gullies**

Precast concrete gullies shall be unreinforced and shall comply with the requirements of British Standard 556: Concrete Cyndrical Pipes and Fittings including Manholes....., Inspections Chamber and Street Gullies.

#### **V.17 Manhole step irons**

Step irons of general purpose type shall comply in all respects with B.S. 1247: Maileable irons.

#### **V.18 PVC Pipes**

PVC pipes and fittings shall be Key Terrain 1800 PVC underground system of other equal and approved manufacturing source.

#### **V.19 Pitch fibre pipes**

Pitch fibre pipes, pends, junctions and taper joints shall comply with the requirements of British Standard 2760: Pitch-impregnated Fibre Drain and Sewer Pipes except that they shall be perforated if so shown on the drawings or required by the Bills of Quantities. They shall carry the British Standards

Institution registered certification trade mark or test certificates shall be furnished by the manufacturers.

#### V.20 **Mesh reinforcement**

Mesh reinforcement shall be steel fabric complying with BS 4483.

### **WORKMANSHIP**

#### V.21 **Setting out**

The Contractor shall set out all drains in accordance with the drawings and provide all profiles, etc., necessary for the execution of the work.

#### V.22 **Excavation**

The bottoms of all excavations shall be trimmed and consolidated to the correct levels. Unauthorised excavations below the required level shall be filled with concrete of the same composition as for drain beds at the contractor's expense.

Where the bottom is insufficiently firm, the Contractor shall excavate until, in the Architect's opinion, a firm bottom is obtained and the level shall be made up with concrete of the same composition as for drain beds. Particulars of such additional work shall be agreed with the Architect's representative before the work is covered up, otherwise no claim in this respect will be entertained.

#### V.23 **Planking and strutting**

Care shall be taken not to undermine the foundations of the buildings and, if so directed by the Architect, planking and strutting shall be left in, or other means adopted to protect the foundations. Details of such additional items shall be agreed with the Architect's representative before the work is covered up otherwise no claim in this respect will be entertained.

#### V.24 **Backfilling**

Trenches for pitch impregnated fibre or PVC pipes shall first be filled with selected screened material carefully hand-tamped between the pipe and sides of the trench, followed by 150mm - 200mm of similar material before the general filling is carried out.

Trenches for concrete or cast iron drains shall be filled to a depth of 300mm with selected fine material carefully hand-packed around the pipe. On no account shall materials be tipped into the trench until the first 300mm has been completed.

Filling shall be continued in layers not exceeding 300mm thick well rammed and, if necessary watered.

#### **U.25 Laying drains**

Drains shall be laid truly straight on line and gradient with sockets upstream and the full bore shall be unobstructed.

#### **U.26 Pitch impregnated fibre drains**

All hard obstructions shall be removed from trench bottoms before laying pitch impregnated fibre pipes. The pipes shall be bedded in sand and laid and jointed in accordance with Appendix 'C' to B.S. 2760.

#### **U.27 P.V.C. drains**

P.V.C. drain pipes shall be laid and jointed with elastomeric or solvent welded joints entirely in accordance with the manufacturers instructions. Pipes shall be bedded in sand after all hard obstructions have been removed from trench bottoms.

#### **U.28 Cast iron drains**

Cast iron drains shall be laid on concrete beds where specified or shown on the drawings and shall be jointed with a gasket of hemp, well caulked, to a depth of 30mm for 100mm pipes and 40mm for larger pipes, and remainder of the socket shall be filled with molten lead or lead fibre solidly caulked.

Connections of iron to concrete drains shall be jointed as described for concrete drains.

Cast iron drains fixed to walls or beams shall be supported on brackets at 1,350mm centres.

Gullies, outlets, etc., on drains under concrete floors shall be set in position at correct levels before the floors are laid.

#### **U.29 Concrete drains**

Concrete drains shall be jointed with one turn of tarred gaskin, well caulked and the remainder of the socket filled with cement and sand (1:3), finished with an angle fillet around the pipe. All surplus mortar shall be removed from the inside of the pipe with a badger. Where pipes are sulphate resisting, the jointings mortar shall contain sulphate resisting cement.

#### **U.30 Concrete beds, haunches and coverings**

Where specified or shown on drawings drains shall be laid on concrete (14N/sq mm - 40 mm aggregate) beds 100 mm thick, 400 mm wide for 100 mm diameter drains and 450 mm wide for 150 mm diameter drains. The concrete shall be haunched up on both sides of the barrel to give lateral support.

Where drains, other than cast drains, are laid under buildings or pavings carrying vehicular traffic, they shall be completely surrounded in concrete (14N/sq mm - 40mm aggregate) 150 mm thick, (i.e. 400 x 400 mm overall for 100 mm pipes and 450 mm x 450 mm overall for 150 mm pipes).

Gullies shall be bedded and surrounded in concrete 14N/sq - 40 mm aggregate) minimum 150 mm thick all round.

#### **U.31 Sleeves**

All drains passing through walls or foundations shall have sleeves of cast iron pipe of sufficient size to allow a clearance round the drain.

### **U.32 Benching**

Benching in bottoms of manholes shall be concrete (14N/sq mm - 40 mm aggregate) with falls of not less than 10qor to channels finished with cement and sand (1:2) 25mm thick, trowelled hard and smooth with all angles rounded.

### **U.33 Bedding and sealing covers and frames**

Frames to manholes shall be tested for water-tightness and straightness to satisfaction, and in the presence, of the Architect and the Local Authority, Drains shall be filled with water to a head of 1.50 metres and are to be tested in sections agreed with the Architect:

- (i) after joining
- (ii) after haunching and backfilling
- (iii) after completion of the works

The contractor shall provide all necessary testing apparatus and shall carry out such other tests as are required by the Architect and the Local Authority.

### **U.25 Clean and flush all drains**

All drains, gullies, manholes, etc., shall be cored, cleaned and flushed on completion.

## ROADWORKS

### LIST OF CLAUSES

- X.1 Materials and Testing of Materials
- X.2 Portland Cement
- X.3 Hydrated Lime
- X.4 Aggregate
- X.5 Crusher Run Material
- X.6 Hard Packed Stone Base Course and Sub-Base Material
- X.7 Surface Dressing
- X.8 Waterbound Stone Base Material
- X.9 Premix Weaving Course and Base Course Aggregate
- X.10 Bitumen Grouted Stone Base Course Aggregate
- X.11 Bitumen and Bitumen Emulsion
- X.12 Sampling of Bitumen and Bitumen Emulsion
- X.13 Tests for “ “ “
- X.14 Testing of concrete
- X.15 Tolerances
- X.16 Materials Tolerances
- X.17 Slope Tolerances
- X.18 Widths of Cuttings and Embankments Tolerances
- X.19 Compaction Tolerances
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- X.21 Precast concrete Kerbs, Channels and Quadrants
- X.22 “ “ Edgings
- X.23 Concrete Beddings and Haunching for kerbs and Quadrants
- X.24 Cut-off walls
- X.25 Precast Concrete Flag Paving
- X.26 Murrum Footways
- X.27 Permanent Traffic Signs
- X.28 Murrum
- X.29 Water for Cement Treated Materials

## ROADWORKS

### MATERIALS AND TESTING OF MATERIALS

#### a) **Acceptable Standards of Materials**

All materials used in or upon the works shall be to the satisfaction of the Engineer and, where specified shall comply with the appropriate Specification named, e.g. British Standards Institution (hereinafter referred to as the 'B.S.'): American Society for Testing and Materials (ASTM) or American Association of State Highway Officials (AASHO) including any subsequent revisions of such Specifications. Materials complying with Specifications other than those quoted will be accepted in lieu provided the quality is comparable with the Specification named but tenderers should ascertain before tendering whether or not any such other specification is acceptable.

Similarly, where a material has been specified by manufacturer's Trade name, the product of another manufacturer will be accepted provided it is in all respects of equivalent or higher quality.

Samples of all materials proposed to be used shall be submitted to the Engineer, and shall be tested where required and receive his approval prior to being delivered in bulk upon the works. The Contractor shall provide all samples free of charge.

#### c) **Range of Testing**

As provided in Clause 36 of the Conditions of Contract and in accordance with the Specification quoted for any material used on the works of this Contract, tests may be called for by the Engineer to be carried out at the place of manufacture or on the site. The Contractor may assume that tests will be required on all materials including sand, stone, road stone, concrete pipes, proprietary concrete products, reinforcement, welding, bitumen and bitumen products.

Where a sample complies with the Specification, the cost of testing ordered by the Engineer will be borne by the Client, but where a sample fails to comply with the Specification, the cost of testing will be borne by the Contractor who shall make due allowance in his prices for this and rendering any assistance required in carrying out tests.

Loading tests on structure will not generally be called for unless specifically mentioned elsewhere.

All samples shall be obtained, and tests are to be carried out in accordance with Specifications quoted. Techniques or tests adopted within the Ministry of Transport and Communications but which are not explicitly in these standards are as detailed in (c) below.

(c) Sample preparation and test procedures peculiar to Ministry of Transport and Communications

i) Preparation of gravel Samples:

Materials such as murram or soft rock which are agglomerations of materials and not discrete particles (such as quartz gravel) are first broken (usually by hand hammers) to pass a 20mm slays. The materials shall not be broken more than necessary to achieve this state.

ii) Moisture Content:

Wherever possible, moisture contents determined by the oven method shall be used. Where for field control purposes, it is necessary to use other methods the various methods shall not be mixed.

iii) Bitumen Affinity of Stone

Stone between 20 mm and 13 mm in size and 3.5% bitumen at standard working temperatures are mixed, allowed to stand for 24



hours, then immersed in distilled water and inspected 24 hours later for signs of stripping.

iv) A L D (Average least Dimensions) of Aggregate:

The average least dimension of a sample of aggregate shall be determined by obtaining and averaging the thickness (least dimension between two parallel planes) of all the pieces in the sample. The sample shall contain at least 100 pieces.

d) Abbreviations

The following abbreviations are used in this Specification:

Aggregate Crushing Value           A C V

Los Angeles Abrasion               L A A

British Standard Compaction Test  
5.5 1b. Rammer Method           B S Compaction test

California Bearing Ration           C B R

Maximum Dry Density               M D D

Optimum Moisture Content           O M C

Plasticity Index                   P 1

Liquid Limit                       L L

Sodium Sulphate Soundness           S S S

Unconfined Compressive Strength    U C S

Linear Shrinkage                   L S

## X.2 Portland Cement

### Ordinary

All cement used upon the works shall be Ordinary Portland cement unless otherwise specified or permitted by the Engineer, complying with B.S. 12 in all respects.

The Contractor shall supply with each consignment of cement a copy of the invoice stating the quantity delivered, the maker's name and also the maker's certificate showing that each consignment has been tested and analysed and conforms with the B.S. 12. The cement will be subject to such test in accordance with B.S. 12 as the Engineer may deem necessary and he may reject any cement which proves unsatisfactory notwithstanding the maker's certificates.

All cement shall be stored in a waterproof shed on a wooden floor raised at least 0.15m above the surrounding ground and any cement injuriously affected by damp or other cause shall be open to inspection by the Engineer at all reasonable times. Each consignment shall be stored separately and used in order of delivery.

### Rapid Hardening

Where the Engineer orders or permits rapid hardening cement to be used in lieu of ordinary Portland cement, it shall comply in all respects with B.S. 12 and all special conditions applicable to its use stipulated by the manufacturers shall be observed.

The conditions specified in Clause 202 for ordinary Portland cement shall apply.

## X.3 Hydrated Lime

Lime for stabilization shall be Hydrated Calcium Lime (not of Lime to B.S. 890 and Contractors are advised, prior to tendering to ascertain from the Chief Materials Engineer, Ministry of Transport and Communications, What local

times may be suitable . All percentages of lime specified are based upon Hydrated Calcium Limes complying with B.S. 890 and an adjustment of these percentages May be required for some locally made limes.

The Contractor shall submit with all consignments the manufacturer's certificate that it complies with B.S. 890 or his chemical analysis.

#### X.4 **Aggregate**

Aggregate shall consist of sharp sand or crusher dust, or a mixture of these, and hard durable crushed or knapped locally occurring stone to the approval of the Engineer. All aggregate shall be free from clay, shale, pyrites and all other impurities. The coarse part of the aggregate shall be roughly cubicle in shape and free from excess of flat and/or elongated particles. The grading of the aggregate shall be according to fable 1 Section 17. Concrete Works (excluding Pre-stressed).

In respect of purity and soundness, the aggregate shall in all respects, comply with B.S. 882.

#### X.5 **Crusher run material**

The aggregate shall consist of crushed stone which is tough and durable, roughly cubicle in shape and free from excess of flat and/or elongated particles, clay, top soil or other cleterious matter and shall be to the approval of the Engineer

The rock from which the stone is to be produced shall comply with the following:

Aggregate Crushing Value : Not greater than 35%

Los Angeles Abrasion value : Not greater than 50%

Sodium Sulphate Soundness Test : Loss on 5 cycles to be not less  
Than 12%

The grading shall conform to the grading requirements given in the table:

B S Sieve Size	Percentage Passing by Weight
50 mm	100
25 mm	75 - 95
10 mm	40 - 70
5 mm	30 - 60
No. 7	20 - 45
No. 36	15 - 30
No. 200	5 - 15*

The percentage passing No.200 sieve shall not be more than one-half

Added fines: a) Up to 15% may be added

b) P 1 of fines shall not be greater than 6.  
and LL not greater than 20.

Sampling of rock and crusher run material shall be in accordance with B.S.  
812.

of that passing No.36 sieve.

#### X.6 Hand packed stone base course and sub-base material

a) **General Requirements:**

The rock from which the stones and screenings are to be produced shall comply with the following:

A C V : Not greater than 40%

L A A : Not greater than 60%

S S S : Loss on 5 cycles to be not more than 12%

b) **Stones:**

The stones shall be free from an excess of flat or a slongated particles soft and less durable rock, clay, loam, top soil and other deleterious matter and shall be to the approval of the Engineer.

The grading for coarse aggregate shall be as follows:

B S Sieve Size	Percentage Passing by Weight
75 mm (3")	100
63 mm (2.5")	90 -100
50 mm (2")	35 -70
25 mm (1")	0 -15
20 mm (3/4")	0 - 5

c) **Binder Materials**

Soil binder material, which may, with the Engineer's approval be added to the screenings or used in lieu of the screenings or used in lieu of the screenings, shall comply to either of the following requirements.

- i) The fraction passing B S Sieve No.200 shall be less than half that passing No.36 sieve
- ii) P 1 not greater than 8, and preferably not greater than 5.

X.7 **Surface Dressing Chippings**

**a) Generally**

All chippings shall consist of tough durable crushed stone preferably cubicle in shape and absolutely free from visible stone dust and harmful material such as clay, lime, organic matter or other deleterious substances.

The rock from which the chippings are to be produced, shall comply with the following:

A C V : Not greater than 22%

L A A : Not greater than 28%

S S S : Loss on 5 cycle to be not more than 12%

The larger stones shall have a maximum dimension slightly greater than the thickness of the required compacted layer and be of a shape acceptable to the Engineer.

The smaller stones shall have a reasonable uniform grading and be of a nominal size suitable. In the opinion of the Engineer, for filling the surface voids of the as placed large stones. The nominal size will be of the order of 50 mm (2").

**b) Screenings**

The screenings shall consist of tough durable crushed rock, free from an excess of flat elongated soft or disintegrated pieces and harmful material such as loam, clay, organic matter, or other deleterious substances and shall be to the Engineer's approval.

The grading of the screenings shall form a smooth curve and shall be within and approximately parallel to the following grading limits:

B S Sieve Size	Percentage by weight Passing B.S. Sieves
3/8"	100
3/16"	85 - 100
No.36	30 - 50
No.100	10 - 30
No. 200	0 - 20

Sandy soil which may, with the approval of the Engineer, be added to the screenings or used in lieu of the screenings, shall comply with the following requirements:

- i) It shall consist mainly of sand sizes and have a reasonable smooth grading.
- ii) The fraction passing No.200 sieve shall be less than the weight passing No.36 sieve.
- iii) P 1 shall not be greater than 3.

#### X.8 Waterbound stone base material

##### a) General Requirements

The rock from which the aggregate is to be produced is to be produced shall comply with the following:

A C V of stone: Not greater than 35%

L A A of stone: Not greater than 50%

S S S of stone : Loss of 5 cycles to be not more than 12%

**b) Course Aggregate**

The coarse aggregate and screenings shall consist of tough, durable crushed stone, free from excess of flat, elongated, soft or disintegrated pieces and harmful material such as loam, clay, organic matter or other deleterious substances and shall be to the Engineer's approval.

**c) Grading**

Chippings for surface treatment work shall comply with B.S. 63 single sized Roadstone and chippings except that the maximum permissible flakiness index shall not exceed 20%. The following table is appended for information:

	Percentage by Weight Passing				
	B.S. Nominal Sizes				
B S Sieve	20 mm (3/4")	13 mm (1/2")	10 mm (3/8")	6.3 mm (1/4")	3 mm (1/8")
(3/4") 20 mm	85 - 100	100			
(1/2") 13 mm	0 - 35	85 - 100			
(3/8") 10 mm	0 - 7	0 - 45	100		
(1/4") 6.3mm		0 - 7	85 - 45	100	100
(3/16") 5 mm		0 - 2	0 - 10	85 - 100	85 - 100
(1/8") 3 mm	0 - 2		0 - 2		
No.7					0 - 35
No.10				0 - 10	0 - 10
No.14				0 - 2	0 - 2
No.25					



Despite the provisions of this B.S.. the Engineer may accept chippings which do not comply with the requirements in respect of flakiness index, specified size and oversize fraction of the aggregate. Contractors are advised to submit samples of chippings for test and approval.

**d) Deleterious Substances**

The percentage by weight of deleterious substances in the chippings shall not exceed the following:

Soft Fragments	2.0%
Clay Lumps	0.25%
Humus	0.25%
Removal of decantation	1.0%

**e) Other Properties**

In the event of suitable tests and service records of the chippings, satisfactory to the Engineer, not being available, the chippings shall be subjected to such other tests as are necessary to determine its acceptability for surface necessary to determine its acceptability for surface treatment such as specific gravity absorption detrographic analysis, alkali aggregate recations, bitumen affinity etc.

**X.9 Premix wearing course and base course aggregate**

**a) General Requirements**

The aggregate for premix wearing course and base course shall consist of tough, durable, crushed stone, and shall be clean, free from visible dust and harmful material. Such as loam, salt, lime, organic matter or other deleterious substances and shall be to the approval of the Engineer.

The rock from which the aggregate is to be produced shall comply with the following:

A C V : Not greater than 26% wearing course 30% base course

L A A :Not greater than 30% wearing course 42% base course

S S S : Loss on 5 cycles to be not more than 12%

Bitumen Affinity: To be good

The Flakiness Index on the aggregate shall not be greater than 20%.

b) The grading of the aggregate shall be as follows:

	Nominal Maximum Size of Aggregate mm.					
B S Sieve Size	40	25	20	13	10	5
50.8(2") 38.1(1 1/2")	100 85 - 100	100				
25.4(1")	75 - 90 65 - 82	85 - 100 75 - 95	100 85 - 100	100		
12.7(1/2") 19.1(3/4")	55 - 70 45 - 65	60 - 80 52 - 72	75 - 90 65 - 80	85 - 100 75 - 95	100 85 - 100	100
4.8(3/16") No.7	30 - 50 20 - 40	35 - 55 20 - 40	45 - 65 30 - 50	50 - 70 35 - 55	65 - 80 45 - 60	70 - 95 50 - 70
No.36 No.200	7 - 20 2 - 6	8 - 20 4 - 8	10 - 22 12 - 23	12 - 23 4 - 8	18 - 35 5 - 9	20 - 35 5 - 9

## X.10 Bitumen Grouted stone base course aggregate

### a) General Requirements:

The rock from which the stone, choke and chippings are to be produced shall comply with the following:

A C V : Not greater than 26%

L A A : Not greater than 36.5%

S S S : Loss on 5 cycles to be not more than 12%

Bitumen Affinity : to be good

The aggregate shall consist of tough, durable crushed stone, preferably cubicle in shape and shall be clean free from visible dust and harmful material such as loam, clay salt, lime, organic matter or other deleterious substances, and shall be to the approval of the Engineer.

The aggregates shall have a flakiness index not greater than 20%.

### b) Penetration course stone:

The grading of stone for a penetration course shall be within the limits given in Table 1 in this clause for material for a course of thickness between 60 - 100 mm or of 40 - 60 mm respectively.

**TABLE 1**

B S Sieve	Percentage by Weight Passing by sieves	Course Thickness
	Course Thickness	40 - 60 mm

	60 - 100mm	
76.2 mm (3")	100	
63.2 mm (2.5")	90 - 100	100
50.8 mm (2")	35 - 70	90 - 100
38.1 mm (1.5")	0 - 15	20 - 55
25.4 mm (1")	-	0 - 15
19 mm (3/4")	-	-
12.7 mm (1/2")	0 - 5	0 - 5
9.5 mm (3/8")	-	-

**TABLE 2**

	Percentage by weight passing by Sieves	
B.S. Sieve Size	Course Thickness 60 - 200mm	Course Thickness 40 - 60 mm
25.4 mm (1")	100	100
19 mm (3/4")	90 - 100	-
12.7 mm (0.5")	-	40 - 70
9.5 mm (3/8")	20 - 55	0 - 15
4.8 mm (3/16")	0 - 10	0 - 5
2.4 mm No.7	0 - 5	

c) **Sealing Chippings:**

The grading of sealing chippings shall be within the limits given in Clause 208 of the specification for surface dressing chippings.

**X.11 Bitumen and bitumen emulsion**

**a) General Requirements**

Before any bitumen emulsion is delivered upon the site, the Contractor shall provide the Engineer with a certificate from the manufacturer that the material to be supplied complies in all respects to the relevant specification given or referred to hereinafter.

Any bitumen or bitumen emulsion delivered in leaking containers or deteriorated in the containers may be rejected.

The types of bitumen binders required will normally be as follows:

i) Prime Coat:

On stone base course ) R C 70 or M C 70

On stabilized base course) alternatively R C I or M C I

ii) Premix and surface dressing:

Above 2.000m 180x200 Penetration

Below 2.000m 80 x 100 Penetration

iii) Grouted stone:

80/100 Penetration

Penetration Grade Bitumen - shall comply with the requirements given in Table 1 in this clause.

Cutback Grades of Penetration Bitumen - shall comply with the requirements given in Table 2 or 3 in this clause for rapid curing (RC) and Table 4 or 5 in this clause for medium curing (MC).

Bitumen Emulsion Additive - shall comply with a B.S. 434

Bitumen Road Emulsion, section  
3 clause 10 - 13 and 15.

Bitumen Additive - shall be Erol Asco 6671 as supplied  
by:

Joseph Well & Son Limited  
Friars House  
39 - 41 New Broad Street  
London E C 2  
ENGLAND

Or other similar approved materials.

## X.12 Sampling of Bitumen and Bitumen Emulsion

### a) General

Every precaution shall be taken to obtain samples that will show the true nature and condition of the material. A sample should not include material other than that to be sampled, and should not be altered, e.g. by evaporation of volatile constituents or by oxidation in the process of sampling.

### b) Penetration Grade Bitumen and Cutback Penetration Grade Bitumen:

Sampling is to be carried out in accordance with standard methods of sampling bituminous materials given under AASHD Designation T.40. It is required, however, that the load sinker shown in fig.1 - Bottle sampler for Tank Bars be fixed externally since irregularities in the metal may retain material which will contaminate the sample if the weight is fitted in the interior, alternative designs are given in B.S. 3195 and also in duplication of Institute of Petroleum standard for Testing Petroleum and its products under 1P 51 Section 35.

It is possible that suitable sampling equipment will be available at the Material Branch Ministry of Transport and Communications and application for use of such equipment should be made to the Chief

Material Engineer. Suitable friction top tin plated cans are manufactured in Kenya and are referred to as having cushion ring and cap they should have seams soldered only on the outside.

- c) Sampling is to be carried out in accordance with Section 2 of B.S. 434 except that where a delivery is made in drums or barrels, the number of samples obtained shall depend upon the number of drums or barrels constituting the deliver concerned and be in accordance with the Table given below:

<u>Packages in shipment</u>	<u>Packages selected</u>
2 to 8	2
9 to 27	3
28 to 64	4
65 to 125	5
126 to 216	6
217 to 343	7
344 to 512	8
513 to 729	9
730 to 1000	10

Samples taken shall be placed in wide-mouth glass jars.

**d) Sample sizes (with S1 equivalents)**

a. Liquid material and materials made liquid by heating

- i) For routine laboratory examination - Penetration grades and cutback grades, 1 quart or litre Emulsion, 1 gallon or 5 litres.
- ii) From bulk storage, during loading or filling distributors, tank cars or trucks - gallons or 5 litres.

**b. Semi-solid or solid materials**

- i) From barrels, drums or cakes -2 -3 pounds or 1 to 1.5 kilogrammes.
- ii) From crushed or powdered material in bulk or page 2 to 3 pounds or 1 to 1.5 kilogrammes.

**c. Cleaning of sample containers**

Cans:

Particular care is necessary to ensure that cans are properly cleaned even when new, as this cannot be checked by visual examination. Cans shall be washed with solvent and dried with a clean dry cloth before being dried in an oven at 105 degrees centigrades. It is essential that all traces for soldering fluid, rust etc be removed.

Gas Jars

It is essential that jars should always be scrupulously clean. For samples for reference tests, jars shall be cleaned by treatment with chromic acid and shall then be well washed with water, followed by rinsing with distilled water and drying in an oven at 105 degrees centigrade. Used jars shall first be cleaned with a suitable hydrocarbon solvent, dried and then treated as above.

Cleaning of glassware with chromic acid should be undertaken only in a laboratory or by persons fully conversant with the hazards entailed.

**X.13 Tests for Bitumen and Bitumen Emulsions**

**a) Test for Penetration Grade Bitumen**

Routine:



- i) Penetration of Bituminous Materials ASTM D.5.
- ii) Softening Point of Asphalts and Tap Pitches (Ring-and-ball Apparatus) (Tentative) ASTM D.36.
- iii) Solubility of Bitumens materials in organic Solvents ASTM d.14 Procedure No.1 except that of carbon tetrachloride shall be used in place of carbon disulphide.
- iv) Water in Petroleum and other Bituminous Materials ASTM d.95.
- v) Specific Gravity of Road Oils, Road Tars, Asphalt Cements, and Soft Tar Pitches ASTM d.70.

As required:

- i) Ductility of Bituminous materials ASTM D.113
- ii) Flash and Fire Points by Cleveland Open Cup ASTM D.92
- iii) Loss on Heating of oil and Asphalt Compounds ASTM D.6
- iv) On residue from loss on Heating Test, Penetration of Bituminous Materials ASTM D.

**b) Tests for Cutback Grades of Penetration Bitumen**

Routine:

- i) Distillation of Cutback Asphalt Products ASTM d.402
- ii) Penetration of Bituminous Materials ASTM D.5
- iii) Softening Point of Asphalts and Tap Pitches (Ring- and - apparatus) (Tentative) ASTM D.36.

- iv) Solubility of Bituminous Materials in Organic Solvents ASTM D.4 procedure No.1, except that of carbon tetrachloride shall be used in place of carbon disulphide.
- v) Ductility of Bituminous Materials ASTM D.++

**c) Tests for Bitumen Road Emulsion**

Routine:

- i) Residue on No. B.S. Sieve Test A.B.S. 434
- ii) Stability to mixing with Coarse Graded Aggregate Test C, B.S. 434
- iii) Water Content, Test E. B.S. 434

As required:

- i) Residue on a No.100 B.S. Sieve Test B.S. 434
- ii) Stability of Bitumen Emulsion to mixing with Cement Test
- iii) Sedimentation Test H. B.S. 434

**X.14 Testing of Concrete**

**Method of Making Test Cubes**

- i) Test cubes shall be made by or under the supervision of the Engineer or his representative from concrete placed in or about to be placed in the works.
- ii) Test cubes shall be made, stored and cured and tested in accordance with B.S. 1881 Methods of Testing Concrete except that no 4" cubes will be permitted. The method of compaction by hand or vibrator will be at the Engineer's discretion.

## X.15 Tolerances

This section deals with the range of tolerances that shall apply for different stages in construction. The relevant tolerances are also given in each section for ease of reference.

The Engineer shall have the right to reject any work which fails to comply with these tolerances and the Contractor shall at his own expense make good any defects as directed by and to the satisfaction of the Engineer.

## X.16 Materials Tolerances

For materials where B.S. shall apply unless otherwise specifically mentioned.

	VARIATIONS PERMITTED				
NAME	mm Thickness	mm Level	Mm 3mm Straight Edge	Mm Grade in 30mm	mm
PREMI X WEARI NG COURS E	+ 6 mm - 0 mm	+ 40 mm - 70 mm	+ - 6 mm	+ 15 mm -	0.1
BASE COURS E	+ 10 mm - 0 mm	+ 35 mm - 70 mm	+ - 6mm	+ 15mm -	0.1
SUB- BASE	+ 25 mm - 10 mm	+ 25 mm - 30 mm	+ - 20 mm	+ 15mm -	0.1
SUBGR ADE	N/A	+ 0 mm - 60 mm	+ 25 mm -	+ 0 mm - 30 mm	0.1

LAYER S					
GRAVE L WEARI NG	- 25 mm	+ 0 mm - 60 mm	+ 25 mm -	+ 25 mm	0.1

# PRELIMINARIES

**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

ITEM	DESCRIPTION	AMOUNT
A	<u><b>BILL 1</b></u>	
	<u><b>PARTICULAR PRELIMINARIES</b></u>	
	<u><b>PARTIES</b></u>	
	(a) The " The Employer" is	
	<b>Nanyuki Snowview Heights Ltd</b>	
	(c) The " Quantity Surveyor" is	
	<b>Amazon Consultants Ltd</b>	
	<b>P.O. Box 1756- 00100</b>	
	<b>Nairobi</b>	
B	<u><b>LOCATION OF SITE</b></u>	
	The site for the proposed works is in Nanyuki , Laikipia County	
	The Contractor shall be deemed to have visited the site and satisfied himself as to:-	
	<b>a)</b> The nature, position, topography and access of the site.	
	<b>b)</b> The amount of the rubbish or debris to be cleared away before commencement.	
	<b>c)</b> The nature, current usage, proximity and size of adjoining property and buildings.	
	<b>d)</b> The availability of land for the erection and positioning of all temporary structures, plant and materials necessary for the execution of the works.	
	The Contractor shall obtain approval from the relevant Local Authority in adherence to site access and erection of temporary structures and must ensure all matters relating to the requirements of these authorities.	
	No claim will be allowed for travelling or other expenses which may be incurred by the Contractor in visiting the site or preparing the tender for the works.	

PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.

<p><b>A</b></p>	<p><b><u>EXISTING SITE CONDITIONS</u></b></p> <p>The Contractor is advised to take all measure to protect the existing site and its environs against pollution and distractions.</p> <p><b>B</b></p> <p><b><u>SCOPE OF CONTRACT AND DESCRIPTION OF THE WORKS</u></b></p> <p>The scope of work involves excavation, compaction and fillings to internal roads.</p> <p>The works under this contract generally comprises of the following:-</p> <ul style="list-style-type: none"><li>a) Excavations</li><li>b) Compaction</li><li>c) Fillings</li><li>d) Culverts</li></ul>	
	<p><b>Carried to Collection</b></p>	

**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

<b>A</b>	<p><b><u>CONTRACT PARTICULARS</u></b></p> <p><b><u>FORM OF CONTRACT</u></b></p> <p>The Form of Contract shall be the Agreement and Conditions of Contract for Small Construction Works, 2nd Edition 2022 (IQSK) herein referred to as the Agreement. Form of Bond and the Drawings may be viewed with arrangement of the Architect on any working day until the time appointed for the submission of tenders.</p> <p>If the contractor considers that compliance with any of the conditions of contract of which headings are set out hereunder involves expense to him which is not included elsewhere in his prices, he shall set down opposite any such condition the value he attaches there to.</p> <p><b><u>Clause</u></b></p> <ol style="list-style-type: none"> <li>1 Agreement</li> <li>2 Contract Documents</li> <li>3 Language, Applicable Law And Currency</li> <li>4 Project Consultants</li> <li>5 Obligations of the Parties</li> <li>6 Duties of the Project Consultants</li> <li>7 Statutory Obligations and Compliance</li> <li>8 Insurance</li> <li>9 Temporary Works, Safety and Discoveries</li> <li>10 Performance Security</li> <li>11 Nominated Subcontractors and Suppliers</li> <li>12 Works by Specialists Engaged Directly by Employer</li> <li>13 Assignment and Subletting</li> <li>14 Possession of Site and Commencement of Works</li> <li>15 Programme of Works and Progress Reports</li> <li>16 Electricity, Water and Other Services</li> <li>17 Labour</li> <li>18 Plant, Tools and Equipment</li> <li>19 Setting Out</li> <li>20 Tests and Samples</li> <li>21 Site Instructions</li> <li>22 Request For Information (RFI)</li> <li>23 Site Meetings and inspectoins</li> <li>24 Variations</li> <li>25 Dayworks</li> <li>26 Payments, Valuations and Certificates</li> <li>27 Final Account</li> </ol>	
	<p><b>Carried to Collection</b></p>	



**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

	<p>28 Suspension of Works                  29 Extension of Time                  30 Claims for Loss and Expense                  31 Termination                  32 Termination Process                  33 Force Majeure                  34 Sectional Completion and Taking Over                  35 Completion and Taking Over                  36 Liquidated Damages                  37 Warranties for Materials and Workmanship                  38 Defects, Defects Liability Period and Latent Defects                  39 Disputes Settlement                  40 Appendix</p> <p><b>A</b>    <b><u>EMPLOYER'S BOND</u></b></p> <p>The Employer shall not be required to provide a surety or bond.</p> <p><b>B</b>    <b><u>CONTRACTOR'S BOND</u></b></p> <p>The Contractor shall find and submit on the Form of Tender the name of one Surety who shall be an established Bank, who will be willing to be bound to the Employer in an amount equal to ten (10%) percent of the Contract amount specified herein for the due performance of the Contract up to the date of practical completion as certified by the Architect and who will, when and if called upon, sign a bond to that effect on the Contract Agreement (without the addition of any limitations) on the same day as the Contract Agreement is signed.</p> <p>No additional costs shall be entertained for a performance bond that deviates from the FORM OF PERFORMANCE BOND BY THE CONTRACTOR as spelt out in the Agreement and Conditions of Contract for Small Construction Works, .</p> <p>In the event of the Surety named in the Form of Tender not being approved by the Employer, the Contractor shall furnish within seven days another Surety to the approval of the Employer.</p> <p><b>C</b>    <b><u>INSURANCE AGAINST INJURY TO PERSONS AND PROPERTY</u></b></p> <p>The Contractor shall take out insurance in accordance with Condition 8 of the Agreement and to the Employer's approval and shall provide the Employer with a copy of such insurances for their approval and record.</p> <p align="center"><b>Carried to Collection</b></p>	
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**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

<p><b>A</b></p>	<p><b><u>INSURANCE OF THE WORKS</u></b></p> <p>The Contractor shall insure the works in accordance with Condition 8 of the Agreement.</p> <p>No payment on account of the work executed will be made to the contractor until he has satisfied the Architect and Employer either by production of an Insurance Policy or an Insurance Certificate that the provisions of the foregoing Insurance Clauses have been complied with in all respects and to their satisfaction.</p> <p>Thereafter the Architect shall from time to time ascertain that premiums are duly paid up by the Contractor who shall, if called upon to do so produce receipted premium renewals for the Architect's inspections.</p>	
<p><b>B</b></p>	<p><b><u>FIXED PRICE CONTRACT</u></b></p> <p>This is a fixed price contract. The contract price shall be deemed to have been calculated to include all duties on materials and goods to be incorporated into the finished Works unless otherwise stated in the contract. If at any time during the period of the contract the duties shall be varied and this shall affect the cost to the Contractor of such materials, then the Quantity Surveyor shall assess the net difference in 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. For purposes of this clause, „duties“ shall include all customs and excise charges, tariffs, V.A.T. and other taxes and duties imposed by statutory or other authority in the country where the Works are being carried out.</p>	
<p><b>C</b></p>	<p><b><u>POSSESSION AND COMMENCEMENT</u></b></p> <p>The Contractor shall take possession of the site on the date indicated in the acceptance letter. The date of commencement of the works shall also be communicated to the Contractor and the contract period shall run from the commencement date.</p> <p>The Contractor is expected to utilise the period between possession and commencement to mobilise his resources to ensure smooth running of the works from the commencement date.</p>	
<p><b>D</b></p>	<p><b><u>DAYWORKS</u></b></p> <p>Any dayworks ordered under Clause 25 shall be executed at the following rates:-</p> <p>LABOUR: The prime cost to which _____ per centum shall be added</p> <p align="center"><b>Carried to Collection</b></p>	



**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT  
SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

ITEM	DESCRIPTION	AMOUNT
	<p><b><u>GENERAL PRELIMINARIES</u></b></p> <p><b>A <u>PRICING OF ITEMS OF PRELIMINARIES AND PREAMBLES</u></b></p> <p>Whenever in the Contractor's priced Bills of Quantities no price appears against an item of Preliminaries or Preambles, the value of such item shall be deemed to be included in his prices for other items in the Bills of Quantities.</p> <p><b>B <u>ABBREVIATIONS</u></b></p> <p>Throughout these Bills, units of measurements and terms are abbreviated and shall be interpreted as follows:</p> <p>mm shall mean millimeter</p> <p>lm shall mean linear meter</p> <p>sm shall mean square meter</p> <p>m<sup>2</sup> shall mean square meter</p> <p>cm shall mean cubic meter</p> <p>kg shall mean kilogramme</p> <p>N shall mean Newton</p> <p>KN shall mean KiloNewton</p> <p>in/" shall mean inches</p> <p>L f shall mean linear foot</p> <p>s f shall mean square foot</p> <p>c f shall mean cubic foot</p> <p>L b shall mean pound avoirdupois</p> <p>No. shall mean number</p> <p>B.S. shall mean the current British Standard Specification published by the British Standard Institution, 2 Park Street, LONDON W.1, England.</p> <p align="center"><b>Carried to collection</b></p>	

**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

	<p>B.S.M shall mean both sides measured</p> <p>K.S. shall mean current Kenya Standard specification published by the Kenya Bureau of Standard, P.O. Box 54974. NAIROBI, Kenya.</p> <p>As described' shall mean as described in these Bills of Quantities.</p> <p>As before described' shall mean the whole of the previous description except as qualified in the current one.</p> <p><b>A <u>VISIT SITE AND EXAMINE DRAWINGS</u></b></p> <p>The Contractor is recommended to examine the drawings and visit the site, the location of which is herein described. He shall be deemed to have acquainted himself therewith as to its nature, position, means of access or any other matter which may affect his tender. No claim arising from his failure to comply with this recommendation will be considered.</p> <p><b>B <u>METHOD OF MEASUREMENT</u></b></p> <p>The works are measured in accordance with the Standard Method of Measurement of Building Works 2008 Edition, published by the Architectural Association of Kenya.</p> <p><b>C <u>PRICING RATES</u></b></p> <p>The tenderer shall include for all costs in executing the whole of the works, including transport, replacing damaged items, fixing, all to comply with the said Conditions of Contract.</p> <p><b>D <u>TRADE PREAMBLES</u></b></p> <p>For the full description of material and workmanship method of execution of the work and notes for pricing the Contractor is referred to the specification and preambles which follow in this document, and which shall be followed in all respects unless they conflict with the Preliminaries, or other items in these Bills of Quantities shall apply.</p>	
	<p><b>Carried to collection</b></p>	

**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

<p><b>A</b></p>	<p><b><u>PROGRESS CHART</u></b></p> <p>The Contractor shall allow for providing, within two weeks of the date for possession of the site, and in agreement with the Architect and Employer, a Progress Chart for the whole of the Works including the Works of Nominated Sub-Contractors. One copy shall be forwarded to the Architect and another to the Employer and a further copy shall be retained on the site on which the progress shall be recorded by the Contractor. Should any circumstances arise affecting the programme or progress, the chart shall be modified as necessary within 2 weeks and the Architect and Employer informed.</p>	
<p><b>B</b></p>	<p><b><u>PLANT, TOOLS AND VEHICLES</u></b></p> <p>Allow for providing all scaffolding, plant, tools and vehicles required for the works unless stated otherwise herein and except for such items specifically and only required for the use of the nominated Sub-Contractor as described herein. No timber used for scaffolding, formwork or temporary works of any kind shall be used afterwards in the permanent work.</p> <p>All such plant, tools and scaffolding shall comply with all regulations whether general or local in force throughout the period of the contract and shall be required as may be necessary to comply with any amendments in or additions to such regulations.</p>	
<p><b>C</b></p>	<p><b><u>MATERIALS AND WORKMANSHIP</u></b></p> <p>All work is to be carried out in accordance with the Ministry of Works General Specifications for Building Works, 1976 Edition together with any amendments thereto. All materials and workmanship used in the execution of the works shall be of the best quality and description unless otherwise described. The Contractor shall order all materials to be obtained from overseas immediately after the Contract is signed and shall also order materials to be obtained from local sources as early as necessary to ensure that they are on site when required for use in the works. The Bills of Quantities shall not be used for the purposes of ordering materials.</p>	
<p><b>Carried to collection</b></p>		



**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

<p><b>A</b></p>	<p><b><u>GOVERNMENT ACTS REGARDING WORK PEOPLE, ETC</u></b></p> <p>Allow for complying with all Government Acts, Orders and Regulations in connection with the employment of labour and other matters related to the execution of the works. In particular the Contractor's attention is drawn to the provisions of the Factory Act of 1950, and his tender must include for all costs arising or resulting from compliance with any Act, Order or Regulations relating to Insurance, Pensions and Holidays for workpeople or the safety, health or welfare of workpeople.</p> <p>The Contractor must make himself fully acquainted with current Acts and Regulations, including Police Regulations regarding the movement, housing, security and control of labour, labour camps, passes for transport, etc. It is important that the Contractor before tendering, shall obtain from the relevant Authority the fullest information regarding all such regulations and/ or restrictions which may affect the organisation of the works, supply and control of labour etc., and allow accordingly in his tender. No claim in respect of want of knowledge in this connection will be entertained.</p>	
<p><b>B</b></p>	<p><b><u>LABOUR CAMPS</u></b></p> <p>The contractor will not be allowed to erect labour camps on site and shall take full responsibility for transporting labour daily to and from the site as required, and the cost of this shall be deemed to be included in his tender.</p>	
<p><b>C</b></p>	<p><b><u>SIGN BOARD</u></b></p> <p>The Contractor shall provide and erect where directed; and maintain during the whole period of the building operation and remove at completion, one approved temporary sign board to the Architect's standard design giving a brief description of the works, an illustration of the design and showing the names of the employer and the consultants, with sufficient space to append the names of the Sub-Contractors and suppliers when known. The lettering concerning the consultants is not to be more than 50mm high.</p>	
<p><b>Carried to collection</b></p>		



**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

<b>A</b>	<b><u>OFFICE FOR THE CONSULTANTS</u></b>	<p>The contractor shall , if so instructed, supply, maintain, service, clean and light a fully furnished, suitable office, having an approximate floor area of not less than 100 sqm for exclusive use of the project. The office shall have a sample room, a toilet and bathroom, kitchen of suitable dimensions with clean running water and electricity connected to the approval of the Project Manager.</p> <p>On completion of the contract the contents of the office specified above shall revert to the Client. The contractor shall be responsible throughout the contract period for provision of insurance cover, maintenance of the office equipment and furniture, providing all necessary staff and providing security and garbage disposal facilities.</p>	
<b>B</b>	<b><u>POSSESSION AND COMMENCEMENT</u></b>	<p>The Contractor shall take possession of the site on the date indicated in the acceptance letter. The date of commencement of the works shall also be communicated to the Contractor and the contract period shall run from the commencement date. The Contractor is expected to utilize the period between possession and commencement to mobilize his resources to ensure smooth running of the works from the commencement date.</p>	
<b>C</b>	<b><u>TELEPHONE</u></b>	<p>The Contractor shall provide telephone facilities during the contract period and pay all charges.</p>	
<b>D</b>	<b><u>DOMESTIC SUB-CONTRACTORS</u></b>	<p>Any domestic Sub-Contractor shall be approved by the Engineer in writing before the Contractor sublets any portion of the works. The Contractor should especially note this for Civil Works and Services.</p>	
<b>E</b>	<b><u>RECORDS</u></b>	<p>The Contractor shall ensure proper records are kept and maintained for: Daily Reports on Personnel and Machinery; tracked programme; site photographs in digital camera; weather charts/reports; site instruction book and query book. A digital camera shall be provided for taking good quality progress photos and videos and sharing with the project team bi-weekly.</p>	
<b>Carried to collection</b>			

<b>A</b>	<p><b><u>SECURITY OF WORKS AND FENCING</u></b></p> <p>The Contractor shall be entirely responsible for the security of the works and shall provide all necessary watching, lighting, cctv and other precautions necessary to ensure security against theft, loss or damage; and the safety and protection of the public.</p> <p>The Contractor shall also be entirely responsible for the security of the stores, materials, plant, personnel, etc., both his own and the Sub-Contractors' and shall take all measures and precautions as necessary.</p> <p>The Contractor shall leave works secure at completion with all accesses locked, account for all keys and hand over to the Architect with an itemised schedule, retaining a duplicate schedule signed by the Architect as receipt.</p>	
<b>B</b>	<p><b><u>PUBLIC AND PRIVATE ROADS</u></b></p> <p>The Contractor shall maintain as required throughout the execution of the works and make good any damage to public or private roads arising from or consequent upon the execution of the works to the approval of the local or other competent authority and the Architect.</p>	
<b>C</b>	<p><b><u>EXISTING PROPERTY</u></b></p> <p>The Contractor shall take every precaution to avoid damage to all existing property including roads, cables, drains and other services, and he will be held responsible for and shall make good all such damage arising from the execution of this Contract at his own expense to the satisfaction of the Architect.</p>	
<b>D</b>	<p><b><u>ACCESS TO SITE AND TEMPORARY ROADS</u></b></p> <p>Means of access to the site shall be agreed with the Employer prior to commencement of the work and the Contractor must allow for building any necessary temporary access roads for the transport of the materials, plant and workmen as may be required for the complete execution of the works including the provision of temporary culverts, crossing, bridges, or any other means of gaining access to the site.</p> <p>Upon completion of the works, the Contractor shall remove such temporary access roads, temporary culverts, bridges, etc., and make good reinstate all works and surfaces disturbed to the satisfaction of the Architect.</p> <p align="center"><b>Carried to collection</b></p>	

**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT  
SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

<p><b>A</b></p>	<p><b><u>AREA TO BE OCCUPIED BY THE CONTRACTOR</u></b></p> <p>The area of the site which may be occupied by the Contractor for use of storage and for the purpose of erecting workshops, etc., shall be defined on the site by the Architect or client.</p>	
<p><b>B</b></p>	<p><b><u>WATER FOR THE WORKS</u></b></p> <p>The Contractor shall provide at his own risk and cost all necessary water required for use in all the works, including Sub-Contract works. No guarantee is given or implied that sufficient water will be available from the mains and the Contractor must make his own arrangements for augmenting this supply at his own cost if necessary. He must also provide temporary storage tanks and meters as required at his own cost and clear when no longer required and make good on completion to the entire satisfaction of the Architect. The Contractor shall pay all charges in connection therewith.</p>	
<p><b>C</b></p>	<p><b><u>ELECTRICITY FOR THE WORKS</u></b></p> <p>The Contractor shall provide at his own risk and cost all necessary electricity light and power required for use in all the works, including Sub-Contract works. No guarantee is given or implied that sufficient electricity supply will be available from the mains and the Contractor must make his own arrangements for augmenting this supply at his own cost if necessary. He must also provide temporary meters as required at his own cost and clear when no longer required and make good on completion to the entire satisfaction of the Architect. The Contractor shall pay all charges in connection therewith.</p>	
<p><b>D</b></p>	<p><b><u>SANITATION OF THE WORKS</u></b></p> <p>The sanitation of the works shall be arranged and maintained by the Contractor to the satisfaction of the Government and/ Local Authorities, Labour Department, and the Architect.</p>	
<p><b>Carried to collection</b></p>		

<b>A</b>	<p><b><u>SUPERVISION AND WORKING HOURS</u></b></p> <p>The works shall be executed under the direction and to the entire satisfaction in all respects of the Architect who shall at all times during normal working hours have access to the works and to the yards and workshops of the Contractor and Sub-Contractor or other places where work is being prepared for the Contract.</p> <p>The working hours shall be those generally worked by good employers in the Building and Civil Engineering Trades in Kenya. No work shall be carried out at night or on gazetted holidays unless the Architect shall so direct. No work shall be covered up nor shall any concreting be carried out in the absence of the Clerk of Works without the prior approval of the Architect in writing.</p> <p>The Contractor may be required to execute some of the work outside the normal working hours with prior arrangements. These will be communicated to the architect for planning and approval purposes. No extensions to the approved hours will be allowed without notification in advance.</p>	
<b>B</b>	<p><b><u>PROVISIONAL SUMS</u></b></p> <p>The term "Provisional Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A, Item A6 (I) of the Standard Method of Measurement. Such sums are net and no addition shall be made to them for profit.</p>	
<b>C</b>	<p><b><u>PRIME COST (OR P.C.) SUMS</u></b></p> <p>The term "Prime Cost Sum" or "P.C. Sum" wherever used in these Bills of Quantities shall have the meaning stated in Section A Item A6 (II) of the Standard Method of Measurement.</p> <p>Persons or firms nominated by the Architect to execute work or to provide and fix materials or goods as stated in condition No. 19 of the conditions of contract are described herein as Nominated Sub-Contractors. Persons or firms so nominated to supply goods or materials are described herein as Nominated Suppliers.</p>	
	<p><b>Carried to collection</b></p>	

<b>A</b>	<p><b><u>ADJUSTMENT OF P.C. SUMS</u></b></p> <p>In the final account all P.C. Sums shall be deducted and the amount properly expended upon the Architect's order in respect of each of them added to the Contract Sum. The Contractor shall produce to the Architect such quotations, invoices or bills properly receipted as may be necessary to show the actual details of the sums paid by the Contractor.</p> <p>Items of profit upon P.C. Sums shall be adjusted in the final account pro-rata to the amount paid. Items of "attendance" and "special attendance" following P.C. Sums shall be adjusted pro-rata to the Physical extent of the work executed (not pro-rata to the amount paid) and this shall apply even though the Contractor's priced Bill shows a percentage in the rate column in respect of them.</p> <p>Should the Contractor be permitted to tender and his tender be accepted for any work for which a P.C. Sum is included in these Bills of Quantities profit an attendance will be allowed at the same rate as it would be if the work were executed by a nominated Sub-Contractor.</p>	
<b>B</b>	<p><b><u>ADJUSTMENT OF PROVISIONAL SUMS</u></b></p> <p>In the final account all Provisional Sums shall be deducted and value of the work properly executed in respect of them upon the Architect's order added to the Contract Sum. Such work shall be valued as described for variations in Condition No. 24 of the Conditions of Contract, but should any part of the work be executed by a Nominated Sub-Contractor or any articles for the work to be supplied by a Nominated Supplier, the value of such work or articles shall be treated as a P.C. Sum and profit and attendance comparable to that contained in the priced Bills of Quantities for similar items added.</p>	
<b>C</b>	<p><b><u>NOMINATED SUB-CONTRACTORS</u></b></p> <p>When any work is ordered by the Architect to be executed by nominated sub-contractors, the contractor shall enter into sub-contracts as described in Condition No. 19 of the conditions and shall thereafter be responsible for such sub-contractors in every respect. Unless otherwise described the Contractor is to provide for such sub-contractors any or all of the facilities described in these Preliminaries.</p>	
	<p><b>Carried to collection</b></p>	

**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

	<p>The Contractor should price for these with the nominated sub-contractor's work concerned in the P.C. Sums under the description "Add for Attendance".</p> <p><b>A <u>ATTENDANCE UPON NOMINATED SUB-CONTRACTORS</u></b></p> <p>The term "attendance" following P.C. Sums for Nominated Sub-Contractors' work in these Bills of Quantities shall be deemed to include both attendance and items of special attendance.</p> <p><b>B <u>DIRECT CONTRACTS</u></b></p> <p>Notwithstanding the foregoing conditions, the Employere reserves the right to place a "Direct Contract" for any goods or services required in the works which are measured or covered by a P.C. or Provisional Sum in the Bills of Quantities and to pay for the same direct. In any such instance, profit relative to the P.C. Sums in the priced Bills of Quantities will be adjusted as described for P.C. Sums.</p> <p><b>C <u>ATTENDANCE UPON OTHER TRADESMEN, etc.</u></b></p> <p>The Contractor shall allow for the attendance of trade upon trade and shall afford any tradesmen or other person employed for the execution of any work not included inthis contract every facility for carrying out their work and also for the use of his ordinary scaffolding. The contractor, howevr, shall not be required to erect any special scaffolding for them.</p> <p>The Contractor shall perform such cutting away for and making good after the work of such tradesmen or persons as may be ordered by the Architect and the work will be measured and paid for the extent executed at rates provided in these Bills.</p> <p><b>D <u>PROVISIONAL WORK</u></b></p> <p>All work described as " Provisional" in these Bills of Quantities is subject to re-measurement in order to ascertain the actual Quantity executed for which payment will be made.</p> <p align="center"><b>Carried to collection</b></p>	

**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

	<p>All "Provisional" and other work liable to adjustment under this contract shall be left uncovered for a reasonable time to allow all measurements needed for such adjustment to be taken by the Quantity Surveyor. Immediately the work is ready for measuring, the Contractor shall give notice to the Quantity Surveyor.</p> <p>If the Contractor makes default in these respects he shall if the Architect so directs uncover at his expense the work to enable all measurements to be taken and afterwards reinstate at his own expense.</p> <p><b>A <u>MATERIALS ARISING FROM EXCAVATIONS</u></b></p> <p>Materials of any kind obtained from the excavations shall be property of the Employer. Unless the Architect directs otherwise, such materials shall be dealt with as provided in the contract. Such materials shall only be used in the works, in substitution of materials which the Contractor would otherwise have had to supply with the written permission of the Architect. Should such permission be given the Contractor shall make due allowance for the Value of the materials so used at a price to be agreed.</p> <p><b>B <u>SAFETY MEASURES</u></b></p> <p>The contractor is to adhere to strict safety measures. In this regard the contractor should ensure that all his workers, the consultants and his sub-contractors workmen are wearing Personal Protective Equipment (PPE) before commencement of any work where applicable including overalls with the company name clearly printed on the back each with clearly marked Identification Numbers stitched or imprinted on. The Contractor shall allow for providing all watching, lighting, barriers, signs, covering open trenches and protection of the works, including Sub-Contract works, as may be necessary for the safety of the works and for the protection of the public and his own and Sub-Contractors' employees. The Contractor is to allow for all temporary protection required during the works including ordinary and special dust screens, hoardings, barriers, warning signs etc. as directed by the Architect and as necessary for the adequate protection of adjacent property and finishes, workmen employed upon the site and the public. Any damage or loss incurred due to the insufficiency of such protection must be made good by the Contractor. All protective devices are to be removed on completion of the work and any necessary making good consequent upon this is to be executed to the satisfaction of the Architect The Architect expects full compliance to this regulation and no excuses will be entertained for non-compliance.</p> <p align="center"><b>Carried to collection</b></p>	

**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

	<p>The Contractor shall allow for providing sanitizers and the contractor shall observe all the guidelines provided by the MOH and NCA on complying with revised Health Act due to COVID-19. These include but are not limited to providing sanitizers, hand washing points, thermo guns and exercising social distancing.</p> <p><b>A <u>HOARDING</u></b></p> <p>The contractor, if so instructed, should erect hoarding comprising timber framework and 30 gauge GCI sheets to Architect's approval .The Contractor is to obtain any necessary permits, maintain in position, pay all necessary fees and finally clear away all hoarding on completion.</p> <p><b>B <u>REMOVAL OF RUBBISH, etc.</u></b></p> <p>Remove all rubbish and debris from the buildings and site as it accumulates and at completion of the works and remove all plant, scaffolding and unused materials at completion.</p> <p><b>C <u>WORKS TO BE DELIVERED UP CLEAN</u></b></p> <p>Clean and flush all gutters, rainwater and waste pipes manhole and drains, wash (except where such treatment might cause damage) and clean all floors, sanitary fittings, glass inside and outside and any other parts of the works which may require it; remove all marks, blemishes, stains and defects from joinery fittings and decorated surfaces generally, polish door furniture and bright parts of metalwork and leave the whole of the buildings watertight, clean, perfect and fit for occupation to the approval of the Architect.</p> <p><b>D <u>ALTERATIONS TO BILLS, PRICING, etc.</u></b></p> <p>Any unauthorised alteration or qualification made to the text of the Bills of Quantities may cause the Tender to be disqualified and will in any case be ignored. The Contractor shall be deemed to have made allowance in his prices generally to cover any items against which no price has been inserted in the priced Bills of Quantities.</p> <p>All items of measured work shall be priced in detail and Tenders containing Lump sums to cover trades or groups of work must be broken down to show the price of each item before they will be accepted. Lump sums to cover items of Preliminaries shall be likewise broken down if so required.</p>	
	<p><b>Carried to collection</b></p>	



PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.

<b>A</b>	<b><u>TRAINING LEVY</u></b>  The Contractor's attention is drawn to the current Legal Notice of 2007 (and subsequent amendments) which requires payment of Training Levy on all contracts of more than Kenya Shillings Fifty Thousand (KShs.50,000/=) in value and his tender must include for all costs arising or resulting therefrom.	
<b>B</b>	<b><u>VALUE ADDED TAX</u></b>  The Contractor's attention is drawn to V.A.T PUBLIC NOTICE NO. 6 of 5th August, 1993 regarding the Finance Bill 1993 which expanded the V.A.T base to cover construction services amongst other items and sum. The Contractor shall familiarize himself with the said notice and allow in all his Bills of Quantities rates (Excluding P.C and Provisional Sums) for the net tax. (i.e. less input tax where applicable) as required by law. Please note that allowing a lump sum tax either in preliminaries or in summary page shall not be acceptable. Any additional information and assistance concerning the application of the said notice should be directed to the office of the Commissioner of Value Added Tax.  The Contractor is required to note that all Prime Cost and Provisional Sum given in the Bills of Quantities are inclusive of VAT.	
<b>Carried to collection</b>		

<p><b><u>GENERAL PRELIMINARIES</u></b></p> <p><b><u>COLLECTION</u></b></p> <p>Carried from page 1/7</p> <p>Carried from page 1/8</p> <p>Carried from page 1/9</p> <p>Carried from page 1/10</p> <p>Carried from page 1/11</p> <p>Carried from page 1/12</p> <p>Carried from page 1/13</p> <p>Carried from page 1/14</p> <p>Carried from page 1/15</p> <p>Carried from page 1/16</p> <p>Carried from page 1/17</p> <p>Carried from page 1/18</p> <p>Carried from page 1/19</p> <p>Carried from page 1/20</p> <p>Carried from page 1/21</p> <p><b>General Preliminaries Carried to Main Summary</b></p>	

# **BILLS OF QUANTITIES**

**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT  
SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<b><u>BILL NO. 2</u></b>				
	<b><u>INTERNAL ROADS</u></b>				
	<b><u>Excavations and Compaction</u></b>				
	<i><u>Roads Excavation</u></i>				
A	Excavate to reduce levels from stripped level & Load and cart away.	CM	25,064		
B	Allow a provision for cut and fill in soft and hard material as directed by the Engineer.	CM	3,760		
C	Grade and compact bottoms of excavations : to receive fillings	SM	35,805		
	<i><u>Earth Drain Excavation</u></i>				
D	Excavate trench for 450x300mm external dimension Pcc IBD not exceeding 1.5m deep including trimming sides to slope and disposal of surplus material to engineer's detail.	CM	3,125		
	<i><u>Culvert Excavation</u></i>				
E	Excavate for pipe culverts, piped drains, cut-off drains, inlet and outlet drains, invert block drains and catchwater drains in soft material including support of trench sides, dewatering and carting away surplus material to spoil. Rate to include backfilling with existing suitable material.	CM	188		
	<i><u>Disposal</u></i>				
F	Remove surplus excavated material in soil heaps and cart away from site to the designated and approved dumping site	CM	28,377		
	<i><u>Scour Checks</u></i>				
G	Provide and install scourchecks in accacia sticks and grouted rock.	No.	205		
	Excavations and Compaction Summary Carried to Collection				

PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<b><u>Earthworks</u></b>				
	<i><u>Stabilized Rock</u></i>				
A	300mm thick stabilized rock filling, graded, compacted to falls and cross-falls, appropriately blinded.	SM	35,805		
	<i><u>Murram Filling</u></i>				
B	400mm thick Murram filling (high CBR>20 and low plasticity), laid to falls and cross-falls, graded and compacted in (Two) 200 mm thick layers to Engineer's satisfaction.	SM	35,805		
	Earthworks Summary Carried to Collection				

PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
A	<p><b><u>Culverts</u></b></p> <p><i><u>Precast Concrete Culvert Pipes</u></i></p> <p>600mm diameter precast concrete DIA culvert pipe on mass concrete bed (class 15) and surround; laid in trench and including jointing in cement and sand (1:3)</p>	LM	196		
B	<p><i><u>Headwall</u></i></p> <p>Culvert headwall 1500mm long, 900mm high overall consisting of 225mm medium chisel dressed stone bedded, jointed and pointed in cement and sand (1:4) mortar on and including 150mm thick concrete (1:3:6) to 40mm gauge) foundation average 900mm below ground level including forming opening for 300mm diameter pipe and all necessary excavation, disposal of surplus excavated material and formwork.</p>	No.	46		
	Culverts Summary Carried to collection				

PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT  
SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.

ITEM	DESCRIPTION	UNIT	QTY	RATE	AMOUNT
	<u>BILL NO. 2</u>				
	<u>INTERNAL ROADS</u>				
	<u>COLLECTION</u>				
		Page No			
1	Excavations and Compaction	1			
2	Earthworks	2			
3	Culverts	3			
	Total Carried Forward to Final Summary				

**PROPOSED CONSTRUCTION OF ROADS FOR NANYUKI SNOWVIEW HEIGHTS LTD ON PLOT NO. 2782/4 AT SNOWVIEW ESTATE- NANYUKI, LAIKIPIA COUNTY.**

**GRAND SUMMARY**

Section	Description		Amount
1	PARTICULAR AND GENERAL PRELIMINARIES		
2	ROADWORKS		
<i>SUBTOTAL</i>			
3	CONTINGENCY SUM		1,900,000.00
<b>Total Project Cost</b>		<b>Kshs</b>	

**Amount in Words:**

.....  
 .....  
 .....

Date .....

Signature .....



# **DRAWINGS & SITE REPORT**

Station	Y (Northings)	X (Eastings)	Heights	Class of Beacon
m	8547.03	4382.90		LP C.U.N.W.
ms279a	8206.90	4627.15		
ms282a	8288.40	4891.70		
ms283a	8385.30	4921.41		
ms285a	8214.85	4938.34		
ms287a	8226.82	4807.11		
ms289a	8197.86	4978.88		
ms291a	8202.52	4989.96		
ms292a	8284.54	4811.47		
ms297a	8211.53	4938.22		
ms299a	8289.47	4924.89		
ms300a	8223.52	4888.05		
ms304a	8220.04	4862.51		
ms307a	8284.97	4823.77		
ms309a	8221.58	4934.68		
ms312a	8263.35	4931.31		
ms314a	8266.61	4931.19		
ms316a	8408.89	4849.68		
ms317a	8281.49	4995.70		
ms318a	8221.53	4982.32		
ms319a	8322.89	4879.93		
ms320a	8308.84	4986.76		
ms321a	8317.28	4943.36		
ms322a	8330.73	4976.55		
ms323a	8261.56	4911.68		
ms324a	8361.81	4963.95		
ms325a	8347.32	4931.19		
ms326a	8312.28	4932.04		
ms327a	8299.99	4900.67		
ms328a	8308.25	4906.12		
ms329a	8342.52	4908.16		
ms330a	8336.56	4884.47		
ms331a	8365.50	4921.67		
ms332a	8388.21	4954.91		
ms333a	8500.89	4916.80		
ms334a	8342.59	4930.18		
ms335a	8291.75	4904.32		
ms336a	8355.97	4937.81		
ms337a	8370.17	4960.57		
ms338a	8399.51	4948.68		
ms339a	8385.00	4925.92		
ms340a	8393.41	4912.81		
ms341a	8407.94	4945.26		

F.R. No. 702/97

2782/B  
F.R. No. 513/B

2782/3  
F.R. No. 473/17

2783/18  
F.R. No. 12/68

2783/18  
F.R. No. 12/68

Line	Bearing	Distance
Na-4b	32° 52' 46"	8.49
Na-4c	112° 50' 00"	8.48
Na-4d		8.48
Na-4e		8.49

is 14.73 m from the centreline of the river  
ms37 is 16.76 m  
ms38 is 26.16 m  
ms39 is 16.12 m  
ms40 is 28.5 m  
ms41 is 15.00 m  
ms42 is 15.15 m  
ms43 is 21.22 m  
ms44 is 37.44 m  
ms45 is 16.11 m  
ms46 is 15.12 m  
ms47 is 15.25 m  
ms48 is 15.02 m  
ms49 is 16.89 m  
ms50 is 27.77 m  
ms51 is 21.09 m

INSET FOR  
C.O. USER  
SCALE 1:7500

I hereby certify that I, in person made, and on the Dec 2023 completed the survey represented by this plan, on which are written the bearings and lengths of the lines surveyed by me, and that the survey has been executed in accordance with the existing regulations and with the approved scheme

P.W. Mwangi  
Surveyor

I certify that all the work performed in the field and in the office by my assistance P.W. Mwangi has been carried out under my personal direction and I take full responsibility for all work performed

ONEYO ORARO  
Land Surveyor  
No. 177

F.R. No. 513/18, 662/1 SCALE 1:2,500

Registration	Transactions	Authentication	Date	Records	Date
Date Received: 20/12/23	Provisional Approval: 2	Examined by: P.W. Mwangi	15/12/23	Traced by:	
File Reference: CT 66/18/166	Final Approval: Jua Compl	Approved by:	31/01/24	Compared by:	
Computations No: 244-2	Charted by:	Authenticated by: P.W. Mwangi		Cadastral Sheet	
Field Book No: 110-6		(No Lines, C.P.S.) for Director of Surveys		R.I.M.	

Folio No. 571  
Register No. 6

Plot / Parcel No. Parcel No. 7480-7587  
(Part of 7480)

Ref. Map / R.I.M. N.A. 37/1 v. d. 9

Registration Block: KENYA/10/19/12

Registration District: LAKE VICTORIA

Locality: N. of G. Mwangi's Farm

## INTRODUCTION

A field inspection visit to the site was carried out on Friday 11<sup>th</sup> August 2022. The site is located off Road C76 (Nanyuki – Nyahururu road), at the Junction of the road to Mukima shopping centre. The land is already subdivided into various plots for commercial and residential development.

### Topography

The site slopes gently from the river Uu to Likii river, in the general profile of the 2 main roads with 15m road reserves. Transverse slopes are gentle.

There appears to have been previous exploitation (excavation) of material adjacent to the river.

### Soils

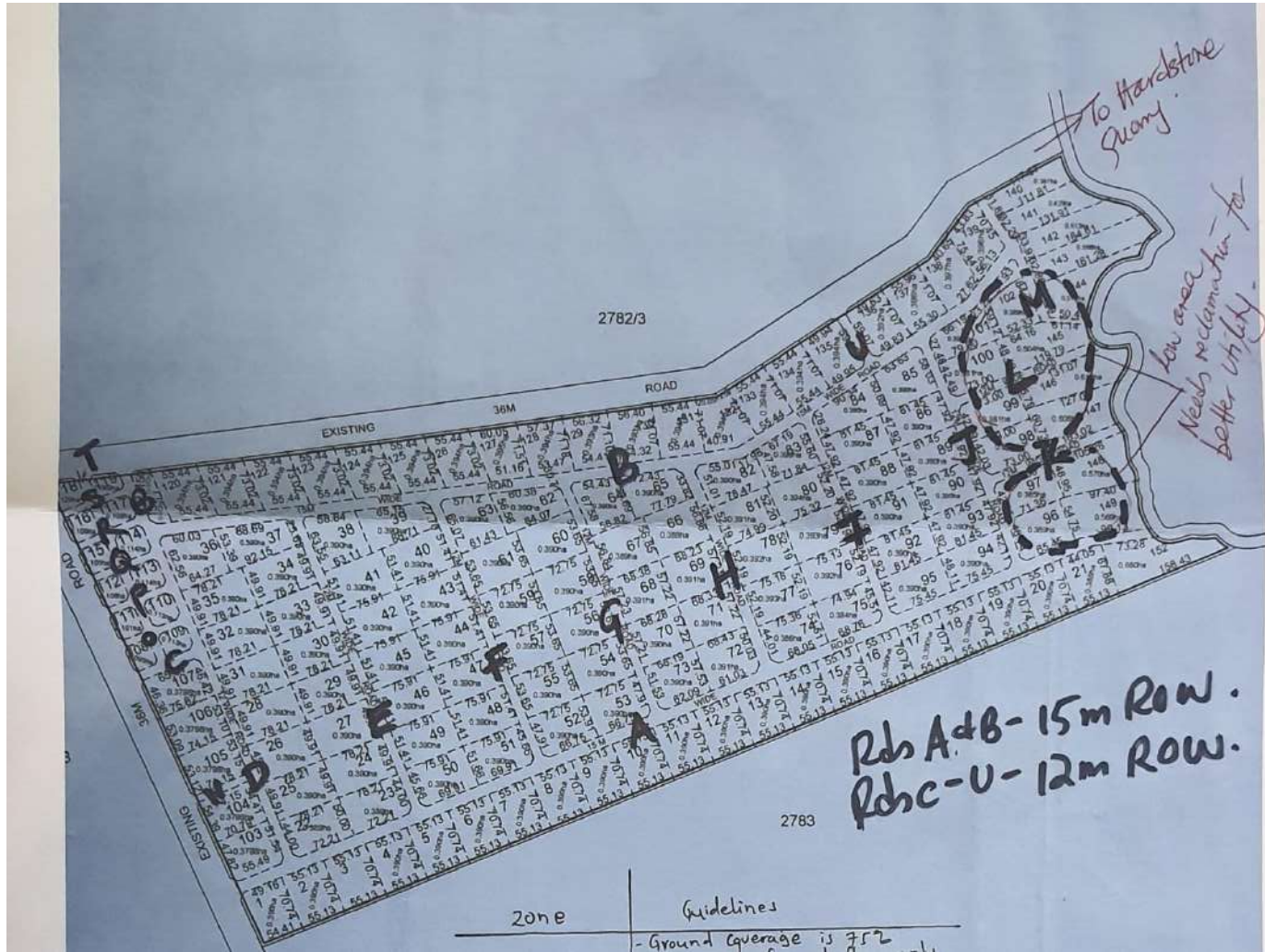
Predominant in-situ soils are expansive black cotton soils. Trial pits showed a depth exceeding 1m. Some coarse loam soils were exposed at a depth of 0.6m along road B. Such would be suitable for general fill below 0.7m.

## PROPOSED PROJECT.

The Client intends to upgrade the road network to paved standard with installation of drainage, footpaths and other associated infrastructure in a staged development.

The total length of roads was 6.51km comprising 2.5km of two main accesses (15m ROW) and remaining minor accesses (12m ROW) at 3.99km. Road layout is presented overleaf.

ROAD DATA			
No	Road	Length - m	ROW -m
1	A	1249	15
2	B	1271	
		<b>2520</b>	
3	C	95	12
4	D	427	
5	E	390	
6	F	350	
7	G	316	
8	H	279	
9	I	279	
10	J	313	
11	K	184	
12	L	206	
13	M	173	
14	N	95	
15	O	100	
16	P	100	
17	Q	106	
18	R	106	
19	S	106	
20	T	265	
21	U	100	
		<b>3990</b>	
<b>Total Length -km</b>		<b>6.51</b>	



A three stage approach is proposed as follows:-

**Stage I - Basic Accessibility.**

Top soil and black cotton soil to a total depth of 700mm will be removed. 300mm of stabilizing rock will be placed and compacted to refusal and appropriately blinded. Murrum of good quality (high CBR >20 and low plasticity ) will be laid and compacted in two 200mm thick layers.

Earth drain will be built and ascour check built to prevent scouring from flood water.

Where the tranverse slope allows for minor interior road with 12m Road reserve, drains will be provided on the higher sides to double up as cut-off drains and road drains for road crossection in cross fall. Culverts will be introduced at road crossings.

There appears to have been previous excavation of the property next to the river, leaving the area low and subject to flooding if the river overflows. This can be reclaimed by spiling the black cotton soil on the area and cmpacting with a sheepfoot roller.

**Stage II – Permamanet Surfacing Works.**

The top gravel layer will be processed, hand packed stone laid and Block paving laid. Asphalt can also be laid. Channel block and kerbs will be installed as required.

**Stage III – Lining of Drains and Footpath, etc**

Drains will be lined with precast concrete Invert block drains and side slabs. Footpaths will be built together with road furniture items and any other support infrastructure.

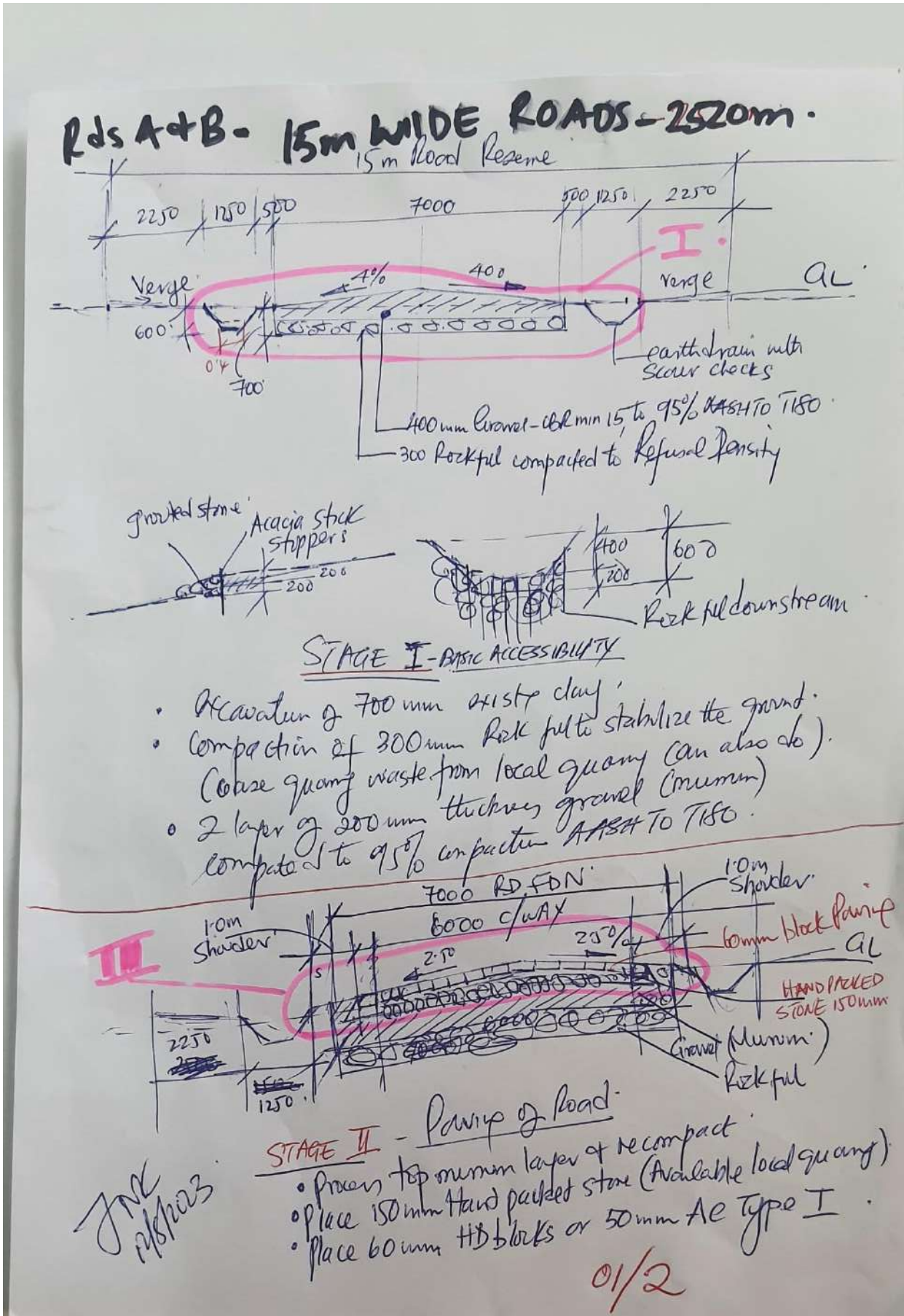
These proposals are presented below.

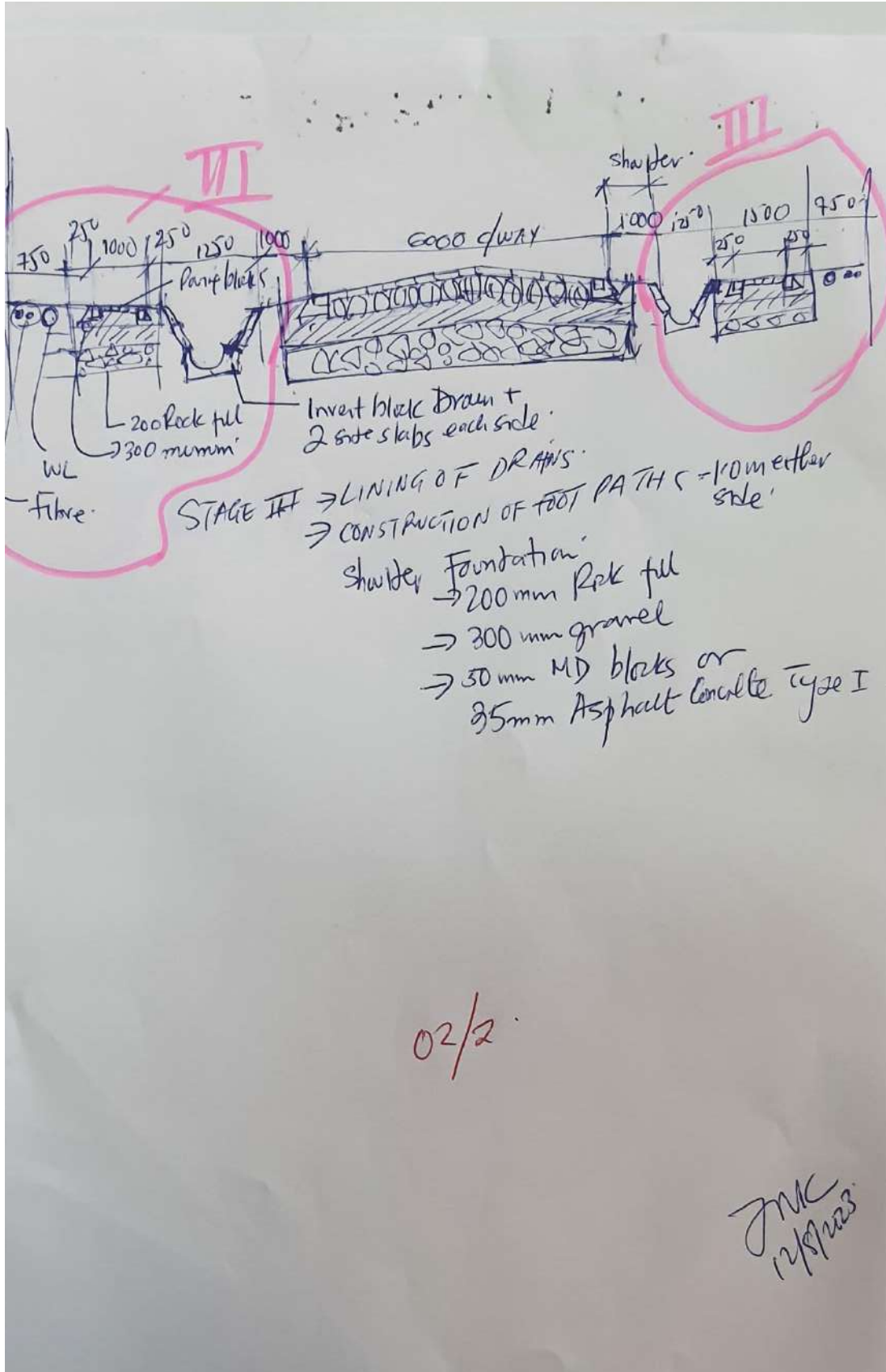
The success of the project is predicated on getting suitable material for backfilling. Rock is available in large quantities at Mukima Quarry. Murrum could pose a challenge and will require proper investigations to get the closest source with suitable material.



Mukima Quarry

15m road Reserve Staged Construction





12m road Reserve Staged Construction

