Democratic Socialist Republic of Sri Lanka

Ministry of Defence

National Building Research Organization (NBRO)

Reduction of Landslide Vulnerability by Mitigation Measures Project (RLVMMP)

funded by

Asian Infrastructure Investment Bank (AIIB)

(Loan No: L0124A)

Request for Tender (RFT)

For

Design and Construction of Rock Fall Protection Works at 03 Locations in Kandy District (Site No. 153, 154, 155) under Package 10A of Reduction of Landslide Vulnerability by Mitigation Measures Project (RLVMMP)

Contract No: RLVMMP/WORKS/10A

Tenderers Name: .....

August 2025

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REQUEST FOR TENDERS
Ministry of Defence,
National Building Research Organization (NBRO)
Reduction of Landslide Vulnerability by Mitigation Measures Project (RLVMMP)

Funded by Asian Infrastructure Investment Bank (AIIB)
Loan No.: L0124A
RFT Reference No.: RLVMMP/WORKS/10A
Country: Sri Lanka

DESIGN AND CONSTRUCTION OF ROCK FALL PROTECTION WORKS ON LANDSLIDE MITIGATION MEASURES AT 03 LOCATIONS IN KANDY DISTRICT (SITE NO. 153, 154, 155) UNDER PACKAGE 10A OF REDUCTION OF LANDSLIDE VULNERABILITY BY MITIGATION MEASURES PROJECT (RLVMMP)

1. The Government of Sri Lanka has already obtained financing from the Asian Infrastructure Investment Bank (AIIB) towards the cost of the Reduction of Landslide Vulnerability by Mitigation Measures Project (RLVMMP), and intends to apply part of the proceeds towards payments under the Design and Construction of Rock Fall Protection Works at 03 Locations in Kandy District (Site no. 153, 154, 155). and estimated to cost **LKR 582 Million (USD 1.35 Million)** excluding contingencies and VAT.

2. The Chairman, Project Procurement Committee on behalf of the Ministry of Defence now invites sealed Tenders from eligible Tenderers for the above work located in **Kandy District.** The Works (including design) period of this contract shall be **270 calendar days** and the defects liability period shall be **365 calendar days** after completion of all construction works.

To be eligible for contract award, the successful Tenderer shall not have been blacklisted/debarred and shall meet the following requirements.

(a). Domestic Tenderers should have been registered and hold a valid registration in the Construction Industry Development Authority (CIDA/ICTAD) (previously known as ICTAD) - Grade C2 or above in Building & Civil Engineering or SP1 in Soil nailing & Stabilization (SN). Any foreign Contractor who wishes to carry out any "Construction Contract" as the main/lead party shall obtain a Temporary Registration Certificate for the Foreign Contractor upon being successfully awarded the Contract. Please refer to Gazette no.2085/19 dated 23.08.2018 “Registration of foreign contractors”- *this can be downloaded from* www.documents.gov.lk & visit www.cida.gov.lk for more details.

(b) Only eligible Tenderers with the following key qualifications need to participate in this Tendering:

A. Financial

i. The Tenderer shall demonstrate that it has access to, or has available, liquid assets, unencumbered real assets, lines of credit, and other financial means (independent of any contractual advance payment) sufficient to meet the construction cash flow requirements estimated as **LKR 220 million** for the subject contract(s) net of the Tenderer’s other commitments;

ii. The Tenderers shall also demonstrate, to the satisfaction of the Employer, that it has adequate sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments;

iii. The audited balance sheets or, if not required by the laws of the Tenderer's country, other financial statements acceptable to the Employer, for the last 05 years (2019 - 2020 to 2023 - 2024) shall be submitted and must demonstrate the current soundness of the Tenderer's financial position and indicate its prospective long-term profitability. (As the minimum requirement, a tenderer's net worth calculated as the difference between total assets and total liabilities should be positive. A negative trend in area of profitability may also be caused by the rejection of tender).

iv. Minimum Average annual construction turnover, calculated as total certified payments received for the volume of construction work in progress and/or completed performed within the last five years (up to tender submission deadline) divided by 5 shall be at least **LKR. 1280 Million;**

B. Experience

General Experience

i. Experience under construction contracts in the role of prime contractor, JV member, subcontractor, or management contractor for at least the last 05 years, Since **1st June 2020;**

Specific Experience

ii. One Contract with similar construction techniques (including Designing and Construction of rock fall mitigation systems, netting/fencing/bolting etc.) minimum value of **LKR 530 Million** that has been satisfactorily and substantially completed as a prime contractor, joint venture member, management contractor, or sub-contractor between **1st June 2015** and the Tender submission deadline.
or

Maximum of 03 contracts of similar construction techniques (Designing and Construction of rock fall mitigation systems, netting/fencing/bolting etc.) completed simultaneously, total value equal to or more than **LKR 530 Million** that have been satisfactorily and substantially completed as a prime contractor, joint venture member, management contractor, or sub-contractor between **1st June 2015** and Tender submission deadline shall also be considered;

iii. For the above and any other contracts [substantially completed and under implementation] as prime contractor, joint venture member, or sub-contractor between **1st June 2015** and the Application submission deadline, a minimum construction experience in the following key activities successfully completed, within any one-year period:

a) Design and Construction of rockfall mitigation systems, stabilizing of unstable hanging rock slabs/ boulders with suitable techniques (rock bolts/ rock netting/ and Rock fencing work etc.) – 24000m^2 (rock netting area/ rock bolting area (stabilized rock area parallel to the bolting surface) or fencing area)

iv. If a bidder forms a joint venture with a consulting firm, who has required design experience, for doing this design, the designing firm should have following experience;

a) Over the period of the last ten (10) calendar years prior to bid submission, the consulting firm should have implemented design of three (03) similar projects of rock fall mitigation systems, netting/fencing/bolting etc.
b) The aggregated value of the contracts should be at least LKR 26.20 million (USD 87,000) or an equivalent amount (consultancy fee) similar to this proposed contract. Similarity shall be as described under Section VII- Employer's Requirements.

C. Key Equipment & Personals

The Bidder must demonstrate the availability of key equipment for the proposed work in accordance to their technical proposal and timely acquisition of essential staff listed in Section VI -Employer's Requirement of the tender document.

3. Tender will be conducted through National Competitive Tendering (NCT) using a Request for Tender (RFT) as specified in the AIIB's Interim Operational Directive on Procurement Instructions for Recipient June 2, 2016.

4. Interested eligible International and local Tenderers may obtain further information from the Project Director - RLVMMP. (Tele: 011 2559869) and inspect the Tender document during office hours of 09.00 to 15.30 hours at National Building Research Organisation, No. 99/1, Jawatta Road, Colombo 05 on working days. The tender documents can also be inspected through www.nbro.gov.lk and https://rlvmmp.lk/ commencing from ***27.08.2025*** *to* ***09.10.2025*** The tender document downloaded through the web shall not be accepted for submission.

5. For the submission of tender, the Tender document in English language can be purchased from ***26.08.2025 to 09.10.2025.*** by interested eligible Tenderers upon the production of a letter requesting tender documents, on a business letterhead, addressed to the Director General, National Building Research Organization, 99/1, Jawatta Road, Colombo 05 and upon payment of a non-refundable fee of **LKR 75,000.00.** The method of payment will be, by cash to NBRO cashier.

Further, it is also necessary to register online www.drc.gov.lk of Registrar of Companies for getting PCA 3 form which is required to submit with the tender. Registration process has been converted into online system, through web:eroc.drc.gov.lk

6. A pre-tender meeting will be held at the Auditorium of National Building Research Organisation, No. 99/1, Jawatta Road, Colombo 05 commencing at 10.00 hrs **on 12.09.2025** A Site visits will be held on **09.09.2025** commencing as scheduled in ITT 7.4.

7. Tenders must be delivered to the address below on or before **14.00 hrs.** on **10.10.2025** Electronic Tender will not be permitted. Late Tenders will be rejected. Tenders will be publicly opened in the presence of the Tenderers' designated representatives and anyone who chooses to attend at the address below soon after the tender closing.

8. All Tenders must be accompanied by a Tender Security of **LKR 9.6 million or 32000 USD.**

Tender securities shall only be unconditional guarantees issued by a commercial bank recognized by the Central Bank of Sri Lanka accepted by the Employer in accordance with the format given in the Section IV – Tender Forms.

If the Tender security is obtained from a bank based in another country, it shall be confirmed by a corresponding bank in Sri Lanka, recognized by the Central Bank of Sri Lanka, in accordance with the format given in Section IV – Tender Forms.

9. The address(es) referred to above is: Project Director, Project Management Unit, Reduction of Landslide Vulnerability by Mitigation Measures Project, National Building Research Organisation, No 99 / 1, Jawatta Road, Colombo 05.

Chairman,
Project Procurement Committee,
Reduction of Landslide Vulnerability by Mitigation Measures Project (RLVMMP)
Ministry of Defence, Disaster Management Division
Vidya Mawatha, Colombo 7,
Sri Lanka.

Note : *Terminology Clarification:*

For the purpose of this Tender Document, it is hereby clarified that the terms "Bid" and "Bidder", as used in the Standard Bidding Document (SBD 04) – Conditions of Contract issued by the Construction Industry Development Authority (CIDA), shall be interpreted to have the same meaning as "Tender" and "Tenderer", respectively, as used in the Asian Infrastructure Investment Bank (AIIB) Procurement Guidelines.

Accordingly, any reference to "Bid" or "Bidder" in this document or its annexes, schedules, or related correspondence shall be deemed interchangeable and has the same meaning with "Tender" or "Tenderer", to ensure consistency with the terminology of the AIIB procurement framework.

Section - I

INSTRUCTIONS TO BIDDERS

Note 02: ***Bidders are advised to refer Section 1 – Instructions to Bidders of Standard Bidding Document CIDA Publication No. – CIDA/SBD/04 – First Edition (reprinted) - May 2003***

Note:

Instruction to Bidders shall be read in conjunction with Bidding Data under Section 2 (Volume 1B). Matters governing the performance of the Contractor, payments under the Contract, or matters affecting the risks, rights, and obligations of the parties under the Contract are included under Section 3 – Conditions of Contract (Volume 1A) and Contract Data under Section IV (Volume1B). However, some information is reproduced in this section to facilitate the bidders to price their bids.

Instructions to Bidders will not be a part of the Contract and will cease to have effect once the Contract is signed.

Note:

Bidders may consider the information printed in blue colour in the document as a checklist, when preparing their bids. However, it is the responsibility of the bidders to comply with all the requirements given in the bidding document.

Note: ***Bidding Data***

This section shall be read in conjunction with Section 1 – Instructions to Bidders of ICTAD/SBD/04- First Edition (reprinted) - May 2003, and is intended to provide specific information in relation to corresponding clauses in Section 1. Whenever there is a discrepancy, provided in the Section II – Bidding Data shall supersede these provided in the Section I – Instructions to Bidders.

Bidders are advised to ignore the information printed in blue colour in the document, when preparing their bids. Such information is provided for the guidance of the Employer.

Section - II

BIDDING DATA

ITB 1.1 & 9.1	The Employer is: Secretary, Ministry of Defence, Disaster Management Division, Vidya Mawatha, Colombo 07. Employer's Representative is Project Director, Project Management Unit, Reduction of Landslide Vulnerability Mitigation Measures Project (RLVMMP), National Building Research Organization, 99/1, Jawatta Road, Colombo 05
ITB 1.2	The Time for Completion for the whole of Works (including design) shall be **270 calendar days** from the Start Date.
ITB 1.2	The delay damages for the whole of the Works shall be 0.05 % of the Initial Contract Price per Day. The maximum amount of delay damages for the whole of the Works shall be 5% percent of the Initial Contract Price.
ITB 1.2	Defects Notification Period is: **365 calendar days** from Employer's Taking over
ITB 2.1	The source of funds is **Asian Infrastructure Investment Bank (AIIB) & Government of Sri Lanka (GOSL)**
ITB 3.1	The registration required. Shall be currently registered with the Construction Industry Development Authority (CIDA/ICTAD) (previously known as ICTAD) **- Grade C2 in Building & Civil Engineering** or **SP1 in Soil nailing & Stabilization (SN)**. Foreign bidders are allowed to participate in the Bidding process. In the event they are not registered in CIDA, they shall obtain the registration within a reasonable time.
ITB 3.4	Foreign bidders may submit a bid with or without a local agent(s). If the foreign bidder uses a local agent(s), and if the bid price exceed Rupees 250 million the bidder shall provide the following information with the bid. Failing to furnish such information may result in rejection of the bid by the Employer. (i) the name and address of the local agent(s) (ii) the year of registration of the business of the local agent(s); (iii) a certified copy of the audited accounts of the local agent(s) for any one of the two financial years immediately preceding the date of submission of Bids audited by an independent external auditor in accordance with Sri Lanka auditing standards together with the auditor's report confirming that the accounts were prepared in accordance with the Sri Lanka accounting standard; and (iv) all details of commissions or gratuities, if any, paid or to be paid to the local agent(s) connected with or relating to the Bid up to contract

	execution if the bidder is awarded the contract, including any success fees payable.
ITB 3.5	Following new Clause added after the ITB 3.4; Following options are allowed for submission of Bids; 1. Option 1: As a single firm, which means the contractor firm has the design capability 2. Option 2: As a JV between a contractor and design consultant(s), in which case all firms are jointly and severally liable for the entire contract Under the Option 01; Bidders shall be contractors legally authorized to carry out both construction and design works. Alternatively, under Option 02 a contractor may submit a bid in Joint Venture with a design engineering firm, provided that the designer shall be an established and legally registered firm but not as an individual Designer.
ITB 3.1,3.2.4.1	The following information shall be provided in Section VIII: • CIDA /(ICTAD) registration Registration number: Grade: Specialty: Expiry date: • VAT registration number • Attach construction program • Attach legal status (Sole proprietor, Partnership, Company etc.) • Attach authentication for signatory • Total monetary value of construction work* performed for each of the last five years; • Experience in works of a similar nature and size for each of the last five years; • Construction equipment; • Staffing; • Attach Work plan and methods; • Construction equipment; • Staffing; • Attach Work plan and methods;
ITB 4.3(a)	Average annual volume of construction work performed in last five years shall be at least **LKR 1280 million**.
ITB 4.3(b)	ITB 4.3(b) shall be amended as follows; I. Experience as prime contractor, joint venture member, management contractor, or sub-contractor in the construction of; a. One Contract with similar construction techniques (including rock fall mitigation systems, netting/fencing/bolting etc.) minimum value of **LKR 530 million** that has been satisfactorily and substantially completed as a prime contractor, joint

	venture member, management contractor, or sub-contractor between **1st June 2015** and the Tender submission deadline**.** or b. Maximum of 03 contracts of similar construction techniques (including rock fall mitigation systems, netting/fencing/bolting etc.) completed simultaneously, total value equal to or more than **LKR 530 million** that have been satisfactorily and substantially completed as a prime contractor, joint venture member, management contractor, or sub-contractor between **1st June 2015** and Tender submission deadline shall also be considered; II. For the above and any other contracts [substantially completed and under implementation] as prime contractor, joint venture member, or sub-contractor between **1st June 2015** and the tender submission deadline, a minimum construction experience in the following key activities successfully completed, within any one-year period: a) Design and Construction of rock fall mitigation systems, stabilizing of unstable hanging rock slabs/ boulders with rock bolts/ rock netting/ and Rock fencing work– **24000m^2** (rock netting/bolting or fencing area) (to comply with this requirement, work cited should at least 70% completed)
ITB 4.3 (c)	The Bidder must demonstrate the availability of key equipment for the proposed work in accordance to their technical proposal.
ITB 4.3 (d)	ITB 4.3(d) shall be amended as follows; The Bidder must demonstrate availability of the essential staff listed in Section VI -Employer's Requirement of the tender document.
ITB 4.3 (f)	ITB 4.3(f) shall be amended as follows; Each of the proposed design team member should have carried out at least 03 rockfall mitigation systems within last 10 years.
ITB 4.3(g)	ITB 4.3(g) shall be amended as follows; i. The minimum amount of financial resources/ liquid assets and/or credit facilities net of other contractual commitments and exclusive of any advance payments which may be made under the contract shall be not less than **LKR 220 million**. ii. The Tenderers shall also demonstrate, to the satisfaction of the Employer, that it has adequate sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments; iii. The audited balance sheets or, if not required by the laws of the Tenderer's country, other financial statements acceptable to the Employer, for the last 05 years (2019 - 2020 to 2023 - 2024) shall be submitted and must demonstrate the current soundness of the Tenderer's financial position and indicate its prospective long-term profitability. (As the minimum requirement, a tenderer's net worth calculated as the difference between total assets and total liabilities should be positive. A negative trend in area of profitability may also be caused by the rejection of tender).

ITB 4.3 (i)	Add this new clause after Sub Clause ITB 4.3 (h); If a bidder forms a joint venture with a consulting firm, who has required design experience, for doing this design, the designing firm should have following experience; Over the period of the last ten (10) calendar years prior to bid submission, the consulting firm should have implemented design of three (03) similar projects of rock fall mitigation systems, netting/fencing/bolting etc. The aggregated value of the consultancy contracts should be at least LKR 26.20 million (USD 87,000) or an equivalent amount (consultancy fee) similar to this proposed contract. Similarity shall be as described under Section VII- Employer's Requirements. Schedule A 5 -Consultant's Experience Including a letter from the Employer/ Client certifying the execution and completion of projects shall be submitted. The consulting firm shall demonstrate that the personnel proposed for the design in Schedule B3 and Schedule B4 in Section VIII-Schedules meet the requirements specified in the Section VI- Employer Requirement.
ITB 4.4	Clause 4.4 shall be revised as follows; The construction volume for each of the partners of a joint venture shall be added together to determine the bidder's compliance with the minimum qualifying criteria for sub clause 4.3(a) & 4.3(g) however for a joint venture to qualify, each of its partners must meet at least 25% of minimum criteria 4.3(a) & 4.3(g) and the partner in charge must meet at least 40% of those minimum criteria. Failure to comply with this requirement will result in rejection of the joint venture's bid. Sub contractor's experience and resources will to be taken in to account in determining the bidder's compliance with the qualification criteria. **Multiple Contracts-** In the event that a Tenderer has submitted tenders for more than one package (for different Design & Build Civil Works Contracts under RLVMMP) and the tender is assessed evaluated substantially responsive tenderer in more than one tender, the Employer shall assess its capacity to meet the aggregated qualifying requirements (cumulative) for the following in case more than one package is considered for award: a. financial capabilities (Construction cash flow requirement, adequate sources of finance to meet the cash flow requirements on works currently in progress and for future contract commitments, Average Annual Construction Turnover); b. Key Personal to be provided; c. Equipment

ITB 12	The bidder shall submit the following additional documents with it's bid: a) **AIIB's covenant of integrity** The bidder shall sign and submit the attached AIIB's covenant of integrity under Section 7 (Annex X) In case of joint venture, the name of the joint venture shall be inserted here, and the Covenant shall be signed by the person duly authorized to sign the application, bid or proposal on behalf of the applicant, proposer, bidder or consultant. b) **Code of Conduct (ESHS)** The bidder shall submit its Code of Conduct that will apply to its employees and subcontractors, to ensure compliance with its Environmental, Social, Health and Safety (ESHS) obligations under the contract. *[Note: Complete and include the risks to be addressed by the Code in accordance with Section VII-Works' Requirements, e.g. risks associated with: labor influx, spread of communicable diseases, sexual harassment, gender-based violence, sexual exploitation and abuse, illicit behavior and crime, and maintaining a safe environment etc.]* In addition, the Bidder shall detail how this Code of Conduct will be implemented. This will include: how it will be introduced into conditions of employment/engagement, what training will be provided, how it will be monitored and how the Contractor proposes to deal with any breaches. The Contractor shall be required to implement the agreed Code of Conduct. The Code of Conduct should be displayed in clear view at workers' camps, offices and etc. Individual Codes of Conduct to be translated into the appropriate language of use in the work site. Staff lists and signed copies of Individual Code of Conduct should be provided to the ESHS officer. c) **Management Strategies and Implementation Plans (MSIP) to manage the (ESHS) risks** The Bidder shall submit Management Strategies and Implementation Plans (MSIP) to manage the following key Environmental, Social, Health and Safety (ESHS) risks. • *Traffic Management Plan to ensure safety of local communities from construction traffic.* • *Water Resource Protection Plan to prevent contamination of drinking water.* • *Boundary Marking and Protection Strategy for mobilization and construction to prevent offsite adverse impacts.* • *Strategy for obtaining Consents/Permits prior to the start of relevant works such as opening a quarry or borrow pit.* • *Gender based violence and sexual exploitation and abuse (GBV/SEA) prevention and response action plan.* The Contractor shall be required to submit for approval, and subsequently implement, the Contractor's Environment and Social Management Action Plan (C-ESMAP), in accordance with the Particular Conditions of Contract Sub-Clause 16.2, that includes the agreed Management Strategies and Implementation Plans

described here.

[Note: The extent and scope of these requirements should reflect the significant ESHS risks or requirements set out as advised by Environmental/Social specialist/s. The key risks to be addressed by the Bidder should be identified by Environmental/Social specialist/s from the Environmental and Social Impact Assessment (ESIA), Environmental and Social Management Plan (ESMP), and, where appropriate, from the Resettlement Action Plan (RAP), and/or Consent Conditions (regulatory authority conditions attached to any permits or approvals for the project). The risks may arise during mobilization or construction phases, and may include construction traffic impacts on the community, pollution of drinking water, depositing on private land and impacts on rare species etc. The management strategies and/or implementation plans to address these could include, as appropriate: mobilization strategy, strategy for obtaining consents/permits, traffic management plan, water resource protection plan, bio-diversity protection plan and a strategy for marking and respecting work site boundaries etc.]

c) Proposal for sub-contracting elements of the works if the total of such subcontracting is more than 10 percent of the Tender price;

d) VAT Registration certificate. Bidders already registered for VAT should submit this with their Tender while successful foreign Bidders are allowed to complete the requirement before award of the contract;

e) If Bidder is a joint venture, a copy of JV agreement or letter of intent to execute a JV agreement in the event of a successful Tender shall be signed by all partners together with the proposed JV agreement or the Memorandum of Understanding clearly indicating the JV composition.

If the Bidder is limited liability Company, a copy of certificate of Incorporation and if the Bidder is partnership, partnership agreement and business registration, if the Bidder is proprietorship, a certificate of business registration.

f) Authority to seek references from the bidder's bankers;

g) Any person who acts as Local Agent in Sri Lanka, representative or nominee for or on behalf of any Bidder shall register himself with the Registrar of Companies if the bid price exceeds LKR 5 Million in accordance with the Public Contracts Act No. 3 of 1987 and subsequent gazette notification. Such certificate issued to the local agent/ representative by the registrar of companies, essential to be submitted.

The Letter of Acceptance shall not be issued to any bidder unless that bidder has submitted the Certificate of Registration issued in terms of the Public Contract Act No. 3 of 1987 to the Procurement Committee and shall get the Contract registered, after the Letter of Acceptance is issued.

<table>
<tr><td>ITB 13.3</td><td>VAT component shall not be included in the rates. The amount written in the Form of Bid shall be without VAT. However, VAT component shall be shown separately at the end of the price schedule summary. All other taxes such as SSCL, custom duties and other import taxes levied on the imported Good, sales and other similar taxes, which will be payable on the Goods shall be included in the Contract BOQ rates.</td></tr>
<tr><td>ITB 13.4</td><td>The Contract is not subject to price adjustment in accordance with Clause 13.7 of the Conditions of Contract.</td></tr>
<tr><td>ITB 14.1</td><td>The Bidders are not allowed to bid in foreign currency(ies)</td></tr>
<tr><td>ITB 15.1</td><td>The bid validity period shall be up to 03.04.2026 from the date of bid closing</td></tr>
<tr><td>ITB 16.1</td><td>The amount of Bid security shall be Sri Lanka Rupees Nine Million Six Hundred Thousand (LKR 9,600,000.00)</td></tr>
<tr><td>ITB 16.2</td><td>The Bid security shall be valid up to 01.05.2026 from the date of bid closing

The bid security shall be an on demand bank guarantee in the form of an unconditional and irrevocable bank guarantee issued by a commercial bank recognized by the Central Bank of Sri Lanka accepted to the Employer in accordance with the format given in Section V (Standard Forms)

Insurance Guarantees are not accepted.

If the bid security furnished by the Bidder is issued by a bank located outside Sri Lanka, it shall have a correspondent Bank located in Sri Lanka, which is approved by the Central Bank of Sri Lanka, to make it enforceable.</td></tr>
<tr><td>ITB 17.1</td><td>Pre-Bid meeting will be held at

Venue : Auditorium of NBRO Project Management Unit, No.99/1 Jawatta Rd, Colombo 05, Sri Lanka

Date: 12.09.2025

Time : 10.00 a.m.

A pre-bid site visit will be conducted by the Employer before the Pre-Bid meeting.

Date: 09.09.2025
<table>
<tr><th>Sites</th><th>Time</th></tr>
<tr><td>Between Culvert No:61km to 61/3 RHS</td><td>8.30 a.m</td></tr>
<tr><td>Between Culvert No: 60km –10 Bend RHS</td><td>9.00 a.m</td></tr>
<tr><td>Between Culvert No: 59/6 – 08 Bend RHS</td><td>9.30 a.m</td></tr>
<tr><td>Between Culvert No: 58/4 to 58/5 LHS</td><td>10.00 a.m</td></tr>
<tr><td>Between Culvert No: 56/2 to 56/3 LHS</td><td>10.30 a.m</td></tr>
<tr><td>Between No: 56km</td><td>11.00 a.m</td></tr>
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</table>

	<table><tr><td>Between Culvert No: 54/5 to 54/6 RHS</td><td>11.30 a.m</td></tr><tr><td>Between Culvert No: 46km to 47/1 RHS</td><td>12.00 noon</td></tr><tr><td>Between Culvert No: 43/8 to 44/1 RHS</td><td>12.30 p.m</td></tr><tr><td>Between Culvert No: 38/8 to 38/9</td><td>01.00 p.m</td></tr><tr><td>Between Culvert No: 38/4 to 38/5 RHS</td><td>1.30 p.m</td></tr><tr><td>Between Culvert No: 35/7 to 35/9 RHS</td><td>2.00 p.m</td></tr><tr><td>Between Culvert No: 31/7 to 31/9 LHS</td><td>2.30 p.m</td></tr><tr><td>Between Culvert No: 31/1 to 31/2 LHS</td><td>3.00 p.m</td></tr><tr><td>Between Culvert No: 29/3 to 29/9 LHS</td><td>3.30 p.m</td></tr><tr><td>Between Culvert No: 27 KMP to 28/1 LHS</td><td>4.00 p.m</td></tr><tr><td>Between Culvert No: 17/3 to 17/4 RHS</td><td>4.30 p.m</td></tr></table> All costs associated with the attendance of the pre-bid meetings and site visit shall be borne by the Bidder.
ITB 19.2 **ITB 19.3**	The following information also shall be included in the inner covers of envelope marked as “Envelope 1- Preliminary Information”: (i) Schedule A 1, “Preliminary Information”; (ii) Schedule A 2, “Annual turn-over Information”; (iii) Schedule A 3 “Adequacy of Working capital”; (iv) Schedule A 4, “Construction experience in last five Years; (v) Schedule A 5, “Design experience in last five Years”; (v) Schedule A 6, “Major items of construction equipment proposed”; The following information also shall be included in the inner covers of envelope marked as “Envelope 2- Design/Technical Proposal”: (i) Schedule B 1, “Comments and Suggestions on Employer’s Requirements”; (ii) Schedule B 2, “Contractor’s Proposal”; (iii) Schedule B 3, “Team composition and Task Assignment”; (iv) Schedule B 4, “Curriculum vitae of key staff”; (v) Schedule B 5, “Time Schedule for key staff”; (vi) Schedule B 6, “Work program (Design Related Activities)”; (vii) Schedule B 7, “Work program (Construction Related Activities)”;
ITB 19.4	The following information also shall be included in the inner covers of envelope marked as “Envelope 3- Financial Proposal”: (i) Schedule C1, “Price Schedule”; (ii) Schedule C2, “Day work rates schedule”; (iii) Schedule C3, “Overhead and profit percentage for Provisional Sum activities”; (iv) Schedule C4, “Price Schedule- Summary”;

ITB 19.5 (a)	For **bid submission purposes** only, the Employer's address is: **Project Director,** **Project Management Unit,** **Reduction of Landslide Vulnerability by Mitigation Measures Project,** **National Building Research Organisation,** **No. 99/1, Jawatta Road,** **Colombo 05.** Attention: Procurement Specialist, Project Management Unit, Street Address: Project Management Unit, 99 / 1, Jawatta Road, Colombo 05. Floor/ Room number: Auditorium of NBRO City: Colombo ZIP/Postal Code: 00500 Country: Sri Lanka
ITB 19.5 (b)	**Contract name:** *Design and Construction of Rock Fall Protection Works on Landslide Mitigation Measures at 03 Locations in Kandy District (Site No. 153, 154, 155) Under Package 10A of Reduction of Landslide Vulnerability by Mitigation Measures Project (RLVMMP)* **Contract No:** RLVMMP/WORKS/10A
ITB 20.1	The deadline for submission of Bids shall be Date: **10.10.2025** Time: **2.00 p.m.** (Sri Lanka Standard Time) For **bid submission purposes** only, the Employer's address is: **Project Director,** Project Management Unit, Reduction of Landslide Vulnerability by Mitigation Measures Project, National Building Research Organisation, No. 99/1, Jawatta Road, Colombo 05. Attention: Procurement Specialist, Project Management Unit, Street Address: Project Management Unit, 99 / 1, Jawatta Road, Colombo 05. Floor/ Room number: Auditorium of NBRO City: Colombo ZIP/Postal Code: 00500 Country: Sri Lanka

<table>
<tr><td>ITB 23.1</td><td>The bid opening shall take place at:
Street Address: 99 / 1, Jawatta Road, Colombo 05.
Floor/ Room number: Auditorium of NBRO
City: Colombo
Country: Sri Lanka

Date: 10.10.2025
Time: immediately after Bid closing</td></tr>
<tr><td>ITB 27</td><td>For evaluation and comparison of Bids Option A is selected.</td></tr>
<tr><td>ITB 27.4</td><td>The table shall be amended as follows;

<table>
<tr><th colspan="2">Criteria</th><th>Maximum Points</th><th>Minimum Required</th></tr>
<tr><td>(i)</td><td>Specific experience of the Bidder or the composition of the design team related to the design of proposed work</td><td>15</td><td>05</td></tr>
<tr><td>(ii)</td><td>Overall compliance with the requirements of the Bidding Document</td><td>10</td><td>05</td></tr>
<tr><td>(iii)</td><td>Experience of the key members of the Design Team</td><td>35</td><td>20</td></tr>
<tr><td>(iv)</td><td>Work Plan and Time Schedule</td><td>10</td><td>08</td></tr>
<tr><td>(V)</td><td>Preliminary Design Approach</td><td>30</td><td>13</td></tr>
<tr><td colspan="2">Total</td><td>100</td><td>65</td></tr>
</table>
Under item (iii) of above table, allocating maximum points for each design team member shall be as follows;

Design Team Leader 20 points

Senior Geologist 15 points</td></tr>
<tr><td>ITB 28.1 (c)</td><td>Clause 28.1(c) modified as follows:

The amount stated in the Bid will be adjusted by the Employer in accordance with the above procedure for the correction of errors and, with the concurrence of the bidder, shall be considered as binding upon the bidder. If the bidder does not accept the corrected amount of Bid, his Bid will be rejected, and the Bid Security may be forfeited in accordance with Sub-Clause 16.6(b)</td></tr>
</table>

<table>
<tr><td>ITB 28.1 (d)</td><td>Sub-Clause 28.1(d) is deleted.</td></tr>
<tr><td>ITB 32.1</td><td>Performance Security shall be an on demand bank guarantee in the form of an unconditional and irrevocable bank guarantee issued by a bank recognized by the Central Bank of Sri Lanka accepted by the Employer in accordance with the format given in Section V (Standard Forms).

Insurance Guarantee not accepted.

The amount of Performance Security is 10% of the Initial Contract Price.

The Performance Security shall be valid until 28 days beyond the defects liability period.

If the Performance Security furnished by the Bidder is issued by a bank located outside Sri Lanka, it shall have a correspondent Bank located in Sri Lanka, which is approved by the Central Bank of Sri Lanka, to make it enforceable.</td></tr>
<tr><td>ITB 34.1</td><td>The retention from each payment shall be 10 percent (10%) of certified work done excluding Schedule C1- Activity 1, Preliminaries.
The limit of retention shall be five percent (5%) of the Initial Contract Price.</td></tr>
<tr><td>ITB 34.2</td><td>five percent (5%) of Initial Contract Price.</td></tr>
<tr><td>ITB 34.3</td><td>Add this new Sub Clause after Sub Clause 34.2:

Maximum payment for the design works will be 10% of the Design and Construction/Installation cost, quoted by the Bidder as shown below;

<table>
<tr><th>Output Category</th><th>Item in Table (C1) of the Financial Bid</th><th>Percentages of the Lump Sum Bid Price to be Apportioned to Contract Payments*</th></tr>
<tr><td>Design Works</td><td>(C-1, activity 2)/(C-1, activity 2) +(C-1, activity 3)</td><td>10%</td></tr>
<tr><td colspan="3">* The percentages are of the contract price excluding the provisional sums.</td></tr>
</table>

If the Contractor’s Price proposal exceeded the given design threshold limit. Balance amount due to the Contractor will be released after the taking over of the works.</td></tr>
<tr><td>ITB 35.1</td><td>The Adjudicator proposed by the Employer is:

The Adjudicator shall be appointed by the Construction Industry Development Authority (CIDA) at the request of either the Employer or the Contractor.
Fees and types of reimbursable expenses to be paid to the Adjudicator shall be on a case-to-case basis and shall be shared equally by the Bidder and the Employer.
If the Bidder disagrees with the proposal of the Employer or the Adjudicator was not proposed, then the Adjudicator shall be appointed by the Appointing Authority who shall be the Institute for Construction Training and Development (ICTAD)</td></tr>
</table>

Note : *Terminology Clarification:*

For the purpose of this Tender Document, it is hereby clarified that the terms "Bid" and "Bidder", as used in the Standard Bidding Document (SBD 04) – Conditions of Contract issued by the Construction Industry Development Authority (CIDA), shall be interpreted to have the same meaning as "Tender" and "Tenderer", respectively, as used in the Asian Infrastructure Investment Bank (AIIB) Procurement Guidelines.

Accordingly, any reference to "Bid" or "Bidder" in this document or its annexes, schedules, or related correspondence shall be deemed interchangeable and has the same meaning with "Tender" or "Tenderer", to ensure consistency with the terminology of the AIIB procurement framework.

Section - III

CONDITIONS OF CONTRACT

Note :

Bidders are advised to refer Section III – Condition of Contract of Standard Bidding Document CIDA Publication No. – CIDA/SBD/04 –first edition (reprinted) - May 2003

Note:

Conditions of Contract shall be Read in Conjunction with Section IV-Contract Data in Volume 1B, which shall take precedence over the Condition of Contract

Note :

This section shall be read in conjunction with Section III- Conditions of Contract, and is intended to provide specific information in relation to corresponding Clauses in Section III. Whenever there is ambiguity, the provisions in Section IV- Contract Data shall supersede these provided in the Section III-Conditions of Contract.

Section - IV

CONTRACT DATA

Sub Clause 1.1.2.2	**The Employer is:** Secretary, Ministry of Defence, Disaster Management Division, Vidya Mawatha, Colombo 07. **Employer's Representative is:** Project Director, Project Management Unit, Reduction of Landslide Vulnerability Mitigation Measures Project (RLVMMP), National Building Research Organization, 99/1, Jawatta Road, Colombo 05
Sub Clause 1.1.2.4	**The Engineer is** : Director General- National Building Research Organization, No 99/1, Jawatta Road, Colombo 05 Engineer's representative: [*to be nominated]*
Sub Clause 1.1.5.6	**Sections of Works:** **Location 01(site no. 153)** 1. Between Culvert No: 17/3 to 17/4 RHS on Kandy Mahiyangana Road (A026) 2. Between Culvert No: 27 KMP to 28/1 LHS on Kandy Mahiyangana Road (A026) 3. Between Culvert No: 29/3 to 29/9 LHS on Kandy Mahiyangana Road (A026) 4. Between Culvert No: 31/1 to 31/2 LHS on Kandy Mahiyangana Road (A026) 5. Between Culvert No: 31/7 to 31/9 LHS on Kandy Mahiyangana Road (A026) **Location 02(site no. 154)** 1. Between Culvert No: 35/7 to 35/9 RHS on Kandy Mahiyangana Road (A026) 2. Between Culvert No: 38/4 to 38/5 RHS on Kandy Mahiyangana Road (A026) 3. Between Culvert No: 38/8 to 38/9 on Kandy Mahiyangana Road (A026) 4. Between Culvert No: 43/8 to 44/1 RHS on Kandy Mahiyangana Road (A026) 5. Between Culvert No: 46Km to 47/1 RHS on Kandy Mahiyangana Road (A026) 6. Between Culvert No: 54/5 to 54/6 RHS on Kandy Mahiyangana Road (A026) 7. Between Culvert No: 56Km on Kandy Mahiyangana Road (A026) 8. Between Culvert No: 56/2 to 56/3 LHS on Kandy Mahiyangana Road (A026) **Location 03(site no. 155)** 1. Between Culvert No: 58/4 to 58/5 LHS on Kandy Mahiyangana Road (A026) 2. Between Culvert No: 59/6 – 08 Bend RHS on Kandy Mahiyangana Road (A026) 3. Between Culvert No: 60Km – 10 Bend RHS on Kandy Mahiyangana Road (A026) 4. Between Culvert No: 61Km to 61/3 RHS on Kandy Mahiyangana Road (A026)
Sub Clause 3.1	**Engineer's Duties and Authority** The Engineer shall obtain the specific approval of the Employer before taking action under the following Sub-Clauses of these Conditions:

(a) consenting for the subletting of any part of the Works under Sub-Clause 4.4 ;

(b) approving an extension of the Time for Completion, and/or any additional payment under Sub-Clause 19.1 *(Contractor's Claim)* issuing variation under Sub-Clause 13.1 *(Right to vary Employer's Requirement)*, except in an emergency situation, as reasonably determined by the Engineer.

(c) approving additional payment under Sub-Clause 13.3

Notwithstanding the obligation, as set out above, to obtain approval, if, in the opinion of the Engineer, an emergency occurs affecting the safety of life or of the Works or of adjoining property, he may, without relieving the Contractor of any of his duties and responsibilities under the Contract, instruct the Contractor to execute all such work or to do all such things as may, in the opinion of the Engineer, be necessary to abate or reduce the risk. The Contractor shall forthwith comply, despite the absence of approval of the Employer, with any such instruction of the Engineer. The Engineer shall determine an addition to the Contract Price, in respect of such instruction, in accordance with Clause 13.3 and shall notify the Contractor accordingly, with a copy to the Employer.

Sub Clause 4.1

Schedule of Key Personnel:

Position/specialization	No. of persons	Engagement
(A) Design		
Design Team Leader	1	*Part time as required
Senior Geologist	1	*Part time as required
(B) Contract Administration		
Project Manager / Contractor's representative	1	Fulltime/Physically at site
Geotechnical Engineer	1	Fulltime/Physically at site
Site Engineers	1	Fulltime/Physically at site
Technical Officer	6	Fulltime/Physically at site
Surveyor	1	Fulltime/Physically at site
QA/QC Engineer	1	Fulltime/Physically at site
Quantity Surveyor	1	Fulltime/Physically at site
Environmental & Social Officer	1	Fulltime/Physically at site
Health & Safety Officer	1	Fulltime/Physically at site

**Design Team shall be available on full-time basis until the approval is granted for the detailed design by the Engineer. During construction period, the Design Team shall be available as necessary.*

The Qualification and the experience of each of the officer is given in the Section VI-Employer's Requirement.

The Employer may deduct up to 10% as penalties from interim/final payments due for Contractors Employees as per Contract, if the Contractor failed to Employ and deploy, any single or many designated Key Staff of Contractor as per Contract. In addition, the Employer shall be entitled to withhold 5% of the remaining value of the respective Interim/Final Payment for such noncompliance, and release the said amount once the Contractor rectify/comply with such nonconformities which is accepted by the Engineer.

Sub Clause 4.2	Performance security shall be an unconditional bank guarantee issued by a bank recognized by the Central Bank of Sri Lanka accepted by the Employer in accordance with the format given in Section V (Standard Forms). **Insurance Guarantee is not accepted.** The amount of Performance Security is 10% of the Initial Contract Price. The Performance Security shall be valid until 28 days beyond the defects liability period.
Sub Clause 7.2	Add this new paragraph after Sub Clause 7.2; The Contractor shall permit the Bank and/or persons appointed by the Bank to inspect the Site and/or the accounts and records of the Contractor and its sub-contractors relating to the performance of the Contract, and to have such accounts and records audited by auditors appointed by the Bank if required by the Bank. The Contractor's attention is drawn to Sub-Clause 21.1 which provides, inter alia, that acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under Sub-Clause 7.2 constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility under the Procurement Guidelines).
Sub Clause 8.2	The Time for Completion for the whole of Works (including Design) shall be **270 calendar days**
Sub Clause 8.7	The Delay Damages for the whole of the Works shall be 0.05 percent (0.05%) of Initial Contract sum per Day. The maximum amount of Delay Damages for the whole of the Works shall be **Five** percent (5%) of the Initial Contract Price.
Sub Clause 11.1	Defects Notification Period is: **365 calendar days** from Taking-over Certificate.
Sub Clause 12.1	Sub paragraphs (a), and (b) are amended, and Employer's obligations are limited as follows: Not Applicable
Sub Clause 13.7	Contract is not subjected to price adjustment for fluctuation of prices
Sub Clause 14.1	The Works described below is to be paid according to quantity supplied or work done: Preliminary works of BOQ (Price Schedule C1- Activity 1 " Preliminaries" includes provisional sum items. Each provisional sum shall only be used, in whole or in part, in accordance with the Engineer's instructions, and the contract price shall be adjusted accordingly. The Contractor shall, when required by the Engineer, produce quotations, invoices, vouchers and accounts or receipts in substantiation for these

	items. Attending fee for PS items shall be Contractor as specified in Schedule C3, Section VIII-Schedules BOQ items under Schedule C2- Price Schedule for Day works will be for the quantity of the work accomplished at the rate in the Bill of Quantities for each item instructed to carry out as per the Engineer's instructions.
Sub Clause14.2	The Sub Clause 14.2 will be replaced as follows; The Advance Payments shall be: 20 % of the initial Contract Price excluding Provisional Sums, Contingencies and Day works and shall be paid to the Contractor in the following two installments; **Installment I:** 10 % of the Initial Contract Price (Excluding Provisional Sums, Contingencies and Day Works) within 14 days after signing of Contract Agreement and submission of Advance Payment Guarantee. **Installment II:** 10% of the Initial Contract Price (Excluding Provisional Sums, Contingencies and Day Works) Submission of detailed design report to the Engineer, Submission of acceptable Work program, methodology, cash flow estimate and resource analysis. Advance payment Guarantee shall be an unconditional bank guarantee issued by a commercial bank recognized by the Central Bank of Sri Lanka accepted by the Employer in accordance with the format given in Section V (Standard Forms). Insurance Guarantee not accepted. The advanced payment shall be repaid by deducting proportionate amounts from payments otherwise due to contractor, following the schedule of completed percentage of the Works on a payment basis. The advance payment shall be repaid in full when the total certified value of work reaches 90% of the initial contract price. No account shall be taken of the advance payment or its repayment in assessing valuation of work done, Variations, price adjustment, Compensation Events, Bonuses, or Liquidated Damages.

<table>
<tr>
<td>Sub Clause 14.3 (c)</td>
<td>
The retention from each payment shall be 10 percent (10%) of the Initial Contract Price excluding Activity 1: Preliminaries, Schedule C1-Price Schedule in Section VIII- Schedules.

The limit of retention shall be 5 percent (5%) of the Initial Contract Price.

At end of sub-clause 14.3 insert;

The Contract Price shall be paid as specified in Annex A- Schedule of payments.

Threshold limit for Design Work is as follows:

<table>
<tr><th>Output Category</th><th>Item in Table (C1) of the Financial Bid</th><th>Percentages of the Lump Sum Bid Price to be Apportioned to Contract Payments*</th></tr>
<tr><td>Design Works</td><td>(C-1, activity 2)/(C-1, activity 2) +(C-1, activity 3)</td><td>10%</td></tr>
<tr><td colspan="3">* The percentages are of the contract price excluding the provisional sums.</td></tr>
</table>

If the Contractor’s Price proposal exceeded the given design threshold limit. Balance amount due to the Contractor will be released after the taking over of the works.
</td>
</tr>
<tr>
<td>Sub Clause 14.4</td>
<td>Minimum amount of Interim Payment Certificates shall be: six percent (6%) of the Initial Contract sum</td>
</tr>
<tr>
<td>Sub Clause 14.7</td>
<td>On reaching the limit of retention stated in Contract Data the Contractor may substitute full retention money with an unconditional guarantee acceptable to the Employer to a value equal to the full retention money, and valid up to 28 days beyond the end of Defect Notification Period. On receipt of such bank guarantee the Employer shall repay the full retention money. The guarantee will be released to the Contractor upon the certification of the Engineer that all Defects notified by the Engineer to the Contractor before the end of this period have been corrected.</td>
</tr>
<tr>
<td>Sub Clause 15.2</td>
<td>Add this new Sub Clause 15.2 (g) after Sub Clause 15.2 (f);
(g) If the Contractor, in the judgment of the Employer, has engaged in corrupt or fraudulent practices in competing for or in executing the Contract, pursuant to GCC Clause 21.1.</td>
</tr>
</table>

Sub Clause 18.2	This Amount of insurance per occurrence is amended as: **Not amended**
Sub Clause 18.4	Professional Indemnity insurance shall be not less than 10% of the Contract value
Sub Clause 19.2 & 19.2	The appointing entity for appointing the Adjudicator is the Institution of Engineers, Sri Lanka (IESL)

Annex A - SCHEDULE OF PAYMENTS

The Contract Price shall be paid according to the following Schedule of Payments with appropriate deduction for repayment of the Advance Payment as per clause 14.2 [Advance Payment]

(a) Price Schedule C 1, Activity 1 – Preliminaries"

i. The payment will be made based on presentation, acceptance and certification of Interim Payment Applications by the Engineer:

ii. the Contractor's Invoice (in accordance to Clause 14.3 [Application for Interim Payments])

(b) Price Schedule C1, Activity 2 – "Design"

(1) Amount in the Price schedule item for " Delivery of Survey and Investigation report" against presentation of:

i. the Contractor's Invoice (in accordance to Clause 14.3 [Application for Interim Payments])

ii. Copy of the Engineer's certificate, stating that the Survey and Investigation report has been approved.

(2) 95% of the amount in the Price schedule item for "Design" against presentation of:

iii. the Contractor's Invoice (in accordance to Clause 14.3 [Application for Interim Payments])

iv. Copy of the Engineer's certificate, stating that the Design Drawings has been approved.

(3) 05 % of the amount in the BOQ item for " Delivery of Design reports and Detailed drawings" against presentation of:

i. the Contractor's Invoice (in accordance to Clause 14.3 [Application for Interim Payments])

ii. Copy of the Engineer's certificate, stating that the As Built Drawings has been approved.

(c) Price Schedule C1, Activity 3 – "Construction of Rockfall Mitigation Measures"

Amount in the Price schedule item for " Construction of Rockfall Mitigation Measures" in monthly installments corresponding to the progress of Construction/Installation milestones submitted and agreed as stated in Section -VI – Employer's Requirement, against presentation of:

i. the Contractor's Invoice (in accordance to Clause 14.3 [Application for Interim Payments]) in accordance to Sub-Clause 14.4.

ii. monthly interim payment certificate, issued by the Engineer.

(d) Price Schedule C2,– " Dayworks"

i. The payment will be made based on completion of relevant work, presentation, acceptance and certification of Interim Payment Applications by the Engineer:

ii. the Contractor's Invoice (in accordance to Clause 14.3 [Application for Interim Payments])

(e) Price Schedule C3,– " Overheads and profits for P. Sum"

iii. The payment will be made based on, presentation, acceptance and certification of Interim Payment Applications by the Engineer:

iv. the Contractor's Invoice (in accordance to Clause 14.3 [Application for Interim Payments])

Section - V

STANDARD FORMS (CONTRACT)

- ***Bid Security***
- ***Letter of Acceptance***
- ***Agreement***
- ***Performance Guarantee***
- ***Advance Payment Guarantee***
- ***Retention Money Guarantee***

Notes:

The Bidders are advised to use the information printed in blue in this volume as a check list when submitting the bid. However, it is the responsibility of the bidders to comply with all the requirements given in the bidding document. Failure to non compliance with any of them may be a reason for rejection of the bid.

Notes on Standard Forms

- *Bidders shall submit the completed form of Bid Security as appropriate in compliance with the requirements of the bidding documents.*
- *Bidders should not complete the Form of Agreement at the time of preparation of bids.*
- *The successful bidder will be required to sign the Form of Agreement, after the award of contract.*
- *Any corrections or modifications to the accepted bid resulting from arithmetic corrections, acceptable deviations, or quantity variations in accordance with the requirements of the bidding documents should be incorporated into the Agreement.*
- *The form of Performance Security, Form of Advance Payment Security and Form of Retention Money guarantee should not be completed by the bidders at the time of submission of bids.*
- *The successful bidder will be required to provide these securities in compliance with the requirements herein or as acceptable to the Employer.*

FORM OF BID SECURITY

[this Guarantee form shall be filled in accordance with the instructions indicated in brackets]
……*[insert issuing agency's name, and address of issuing branch or office]*

Beneficiary: Secretary, Ministry of Defence, Disaster Management Division, Vidya Mawatha, Colombo 07.

Date: ……*[insert (by issuing agency) date]*

BID GUARANTEE No.: ……*[insert (by issuing agency) number]*

We have been informed that ……. *insert (by issuing agency) name of the Bidder]* (hereinafter called "the Bidder") has submitted to you its bid dated ……. *[insert (by issuing agency) date]* (hereinafter called "the Bid") for the execution of **"Design and Construction of Rock Fall Protection Works on Landslide Mitigation Measures at 03 LOCATIONS in Kandy District (Site No. 153, 154, 155) Under Package 10A of Reduction of Landslide Vulnerability By Mitigation Measures Project (RLVMMP)** under CONTRACT NO: **RLVMMP/WORKS /10A**

Furthermore, we understand that, according to your conditions, Bids must be supported by a Bid Guarantee.

At the request of the Bidder, we …….*[insert name of issuing agency]* hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of ……*[insert amount in figures]* ……..*[insert amount in words]* upon receipt by us of your first demand in writing accompanied by a written statement stating that Bidder is in breach of its obligation(s) under the bid conditions, because the Bidder:

i. has withdrawn its Bid during the period of bid validity specified; or
ii. does not accept the correction of errors in accordance with the Instruction to Bidders (hereinafter "the ITB") of the IFB or
iii. having been notified of the acceptance of its Bid by the Employer during the period of bid validity,
   (i) fails or refuses to execute the Contract Form, if required, or
   (ii) fails or refuses to furnish the Performance Security, in accordance with the ITB.

This Guarantee shall expire:
(a) if the Bidder is the successful bidder, upon our receipt of copies of the Contract signed by the Bidder and of the Performance Security issued to you by the Bidder; or
(b) if the Bidder is not successful bidder, upon the earlier of the successful bidder furnishing the performance security, otherwise it will remain in force up to ……..*(insert date*)

Consequently, any demand for payment under this Guarantee must be received by us at the office on or before that date.....

Signature and the Seal of the Guarantor:
Name of the Organization ……...
Date: …….
Witness: ……...

FORM OF LETTER OF ACCEPTANCE

[letter head paper of the Employer]

_____ *[date]*

To: _____

[name of the Contractor]

_____

[address of the Contractor]

This is to notify you that your Bid dated _____for design, construction and remedying defects of the _____ *[name of the Contract and identification number, as given in the Contract Data]* for the Contract price of Rupees

_____ *[amount in numbers and words]* as corrected in accordance with Instructions to Bidders and/ or modified by a Memorandum of Understanding (if any), is hereby accepted.

You are hereby instructed to proceed with the execution of the said Works in accordance with the Contract documents.

The Start Date shall be: _____ *(fill as per Clause 8.1 of Conditions of Contract).*

The amount of Performance Security is *:* _____ *(fill as per Clause 4.2 of Conditions of Contract).*

The deadline for submission of Performance Security is _____ *(fill as per Clause 4.2 of Conditions of Contract).*

Authorized Signature : _____

Name and title of Signatory : _____

_____

Name of Agency : _____

FORM OF CONTRACT AGRREMENT

This Agreement made the ---------- *[day*] of ---------- *[month*] 20 ----- [*year],* between ---------- *[name and address of Employer]* (hereinafter called and referred to as "the Employer"), of the one part, and ---------- ---------- *[name and address of Contractor*] (hereinafter called and referred to as "the Contractor"), of the other part:

Whereas the Employer desires that the Contractor design and execute ---------- ---------- *[name and identification no of Contract](hereinafter called and referred to as "the Works")* and the Employer has accepted the Bid by the Contractor for the design, execution and completion of such Works and remedying of any defects therein.

The Employer and the Contractor agree as follows:

1. In this Agreement words and expressions shall have the same meanings as are respectively assigned to them in the Contract hereinafter referred to.

2. In consideration of the payments to be made by the Employer to the Contractor as indicated in this Agreement, the Contractor hereby covenants with the Employer to design, execute and complete the Works and remedy any defects therein in conformity in all respects with the provisions of the Contract.

3. The Employer hereby covenants to pay the Contractor in consideration of the design, execute and complete the Works and remedy any defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

In Witness whereof the parties hereto have caused this Agreement to be executed the day and year first before written in accordance with their respective laws.

---------- ----------

Authorised signature of Contractor **Authorised signature of Employer**

SEAL SEAL

In the presence of:

Witnesses :

1. Name and NIC No. ----------
   Signature ----------

   Address ----------

2. Name and NIC No. ----------
   Signature ----------

   Address ----------

FORM OF PERFORMANCE GUARANTEE
(Unconditional)

NUMBER : ..... DATE : .....

SUM GUARANTEED : .....

To: **Secretary, Ministry of Defence, Disaster Management Division, Vidya Mawatha, Colombo 07.** (hereinafter called and referred to as "the Employer")

Whereas ..... *[name and address of Contractor*] (hereinafter called and referred to as "the Contractor) has undertaken, in pursuance of contract No. ..... dated ..... to execute .....… *[name of Contract*] (hereinafter called and referred to as "the Contract");

AND WHEREAS it has been stipulated by the Employer in the said Contract that the Contractor shall furnish the Employer with a Guarantee issued by a recognized organization for the sum specified therein as security for compliance with its obligations in accordance with the Contract;

AND WHEREAS we have agreed to give the Contractor such a Guarantee;

NOW THEREFORE we hereby affirm that we are the Guarantor and responsible to you, on behalf of the Contractor, up to a total of Rupees.....……..... *[amount of guarantee]* .....……. *[amount in words],* such sum being payable in the type and proportions of currencies in which the Contract Price is payable, and we undertake to pay the Employer, upon the Employer's first written demand and without cavil or objection, any sum or sums within the said amount as aforesaid without the Employer's needing to prove or to show grounds or reasons for the Employer's demand for the sum specified therein.

We hereby waive the necessity of the Employer's demanding the said debt from the contractor before presenting us with the demand.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed thereunder or of any of the Contract documents which may be made between the Employer and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice or any such change, addition or modification.

This guarantee shall be valid until the date of issue of the Performance Certificate.

Signature and the Seal of the Guarantor : .....

Name of the Bank : .....

Address : .....

Date: .....

Witness : .....

FORM OF GUARANTEE FOR MOBILISATION ADVANCE PAYMENT

NUMBER : .....…….. DATE : .....

SUM GUARANTEED : .....

To : **Secretary, Ministry of Defence, Disaster Management Division, Vidya Mawatha, Colombo 07.**
(hereinafter called and referred to as "the Employer")

Name of the Contract .....

In accordance with the provisions of the Conditions of Contract, of the above mentioned contract ……. *[name and address of Contractor]* (hereinafter called and referred to as "the Contractor") shall deposit with the Employer a bank guarantee to guarantee his proper and faithful performance under the said Contract in and amount of ..... *[amount of guarantee*] ..... *[amount in words]*

We, the ..... *[name and address of the organization*], as instructed by the contractor, agree unconditionally and irrevocably to guarantee as primary obligator and not as surety merely, the payment to the Employer on his first demand without whatsoever right of cavil and objection on our part and without the Employer's needing to prove or to show grounds or reason for the Employer's demand for the sums specified therein and without his first claim to the Contractor, in the amount not exceeding Rupees ..... *[amount of guarantee*]……*[amount in words]* such amount to be reduced periodically by the amounts recovered by the Employer from the proceeds of the contract.

We further agree that no change or addition to or other modification of the terms of the Contract or of the Works to be performed thereunder or of any of the Contract document which may be made between the Employer and the Contractor shall in any way release us from any liability under this guarantee, and we hereby waive notice or any such change, addition or modification.

No drawings may be made by the Employer under this guarantee until we have received notice in writing from the Employer that an advance payment of the amount listed above has been paid to the Contractor pursuant to the Contract.

This guarantee shall remain valid and in full effect from the date of the advance payment received by the Contractor under the Contract until the Employer receives full repayment of the same amount from the Contractor.

Signature and the Seal of the Guarantor : .....

Name of the Bank : .....

Address.....

Date : .....

Witness : .....

FORM OF RETENTION MONEY GUARANTEE

NUMBER : …… DATE : .....

SUM GUARANTEED : …….

To : **Secretary, Ministry of Defence, Disaster Management Division, Vidya Mawatha, Colombo 07.**
(hereinafter called and referred to as "the Employer")

Whereas, it has been stipulated by the Employer in clause 14.7 of the Contract that he would release to the contractor the full sum mentioned under the contract in pursuance of clause 14.7, on the contractor furnishing an unconditional guarantee acceptable to the Employer to the full value of the retention money, valid upto 28 days beyond the end of the Defects Notification Period.

We.. …… *[name and address of the Guarantor]*

as instructed by the Contractor, unconditionally and irrevocably, guarantee to pay the Employer upon the Employer's first written-demand and without cavil or objection, any sum or sums within the said amount as aforesaid without the Employer's needing to prove or to show grounds or reasons for the Employer's demand for the sum specified therein and the said amount of Rupees. ……*[amount of Guarantee]* ……..…. *[amount in words]* in the event the contractor fails to carry out his obligations to rectify defects which he is responsible to rectify under the contract.

This guarantee shall be valid up-to ……..*[date]*

Signature and Seal of the Guarantor ----------

Name of Bank ----------

Address ----------

Date ----------

Witness ----------

Section- VI

EMPLOYER'S REQUIREMENT

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I. Rockfall Protection Systems

1. Introduction

Rockfalls and rock slides are usually natural processes of mountainous areas. They consist of rock fragments that fall from a cliff, or boulders from a slope that bounce, roll, and slide down a slope and come to a mostly temporary rest when they meet an obstruction. Rockfalls are basically caused by gravitational unbalance and sudden improvement of water pressure within rock discontinuities. Those driving mechanism are further aggravated by weathering, tree root growth, and weakening of support by erosion.

This section describes the anticipated types of Rockfall Protection Systems (RPS) and their general characteristics. RPS have to be considered as key element in the maintenance of rock slope safety. There are 02 types of rock fall countermeasures.

a. Rockfall Prevention (Active System) - Stabilizing the unstable rocks at the existing position.
b. Rockfall Protection (Passive System) - Catching and stopping the rock fall by the structures before they reach the protective target

The recommended countermeasure will have to be decided based on the Geological and Geomorphological conditions at the site.

2. Rockfall Prevention (Active System)

Rockfall prevention (active systems) avoids detachment of rock and/or soil mass and prevents excessive movement of detached rock and/or soil mass once it has occurred. It shall stabilize the surface layer of slope containing potentially unstable rock and/or soil mass.

Rockfall prevention systems are either mesh or non-mesh types.

a. *Mesh Type Systems* – The slope is stabilized using mesh systems reinforced with steel plates and anchor bolts/rock dowels/soil nails at specified spacing. Additional layer of erosion control materials and/or hydroseeding can be allowed.
b. *Non-mesh Type Systems* – The slope is stabilized using steel plates and anchors/dowels/bolts at specified spacing, diameter and length reinforced with wire rope and/or wire mesh. If necessary, the use of steel wire mesh can be allowed as a supplementary member for surface erosion control or surface rock pinning. If required, the use of erosion control materials and/or hydroseeding can be allowed.

3. Rockfall Protection (Passive System)

Passive system aims to contain and intercept falling, sliding and flowing debris. Three major RPS are,

a. *Catch Fences* – Catch fences are tested fence system consisting of posts, base plates, intercepting mesh panels, energy-dissipating devices, and anchor bolts/soil nails. It is a tested and certified system to withstand an energy of designed value as per ETAG027 or similar guidelines.
b. *Other Types of Barriers* – In addition to the catch fences other types of barriers, including but not limited to, earthen barriers, concrete barriers, structural walls, and ditches may be used.
c. *Drapery Systems* – Drapery system refers to a mesh system where mesh is secured with minimal anchors at the crest and toe of the slope. The mesh may be hanged via post at the crest if required. Intermittent plates and anchors may be required according to the slope morphology. Falling rock debris is guided to fall down the slope while being contained safely behind the mesh, and then collected at the toe of the slope.

II. Scope of Work

1. Introduction

The Employer seeks the Contractor to execute following two major components within the scope of work as;

I. design and implementation of RPS for the locations outline in this section and

II. training programme for the National Building Research Organisation (NBRO) technical staff on design and implementation RPS.

The particular requirements under each of the above components are stipulated in this section.

2. Design Requirement

The Contractor shall design counter measures against rockfall and other types of failures for the locations outlined in the Locations and Conceptual Design to eliminate the risk of element at risk at each location. In all cases, site-specific assessments and a detailed engineering designs are required to be undertaken to determine the viability of a protection work for long term rockfall hazard management.

A deterministic and/or probabilistic approach shall be used to demonstrate the effectiveness or otherwise of the proposed Rockfall Protection Structure(s).

Whether or not a rockfall protection system could be used to reduce risk to an acceptable level should be determined by the design team, and confirmed through a review by a qualified Reviewer. The minimum required qualifications of each professional are outlined in Composition of Design Team.

The design of RPS and its structures shall be undertaken by or under the direction of the Senior Design Engineer in accordance with current best practice, which is evolving rapidly. It is the responsibility of the design team to keep appraised of developments and current good practice in the field of RPS.

2.1 Design Guideline

This guideline suggests a design approach for determining the suitable locations and type for Rockfall Protection Structure and outlines the factors that need to be considered in design. Engineer's objective is to ensure that a consistent approach is followed and documented such that consent applications are in a standardized form that makes them easier to assess.

The design shall in accordance with the standards, code of practices and criteria stipulated based on relevant Sri Lankan, European, British or any other acceptable International Standards and stated in following sections.

Site Specific Assessment

The Contractor shall carry out site specific assessments to determine possible protection and/or remedial measures to mitigate the assessed risk for any site, it is necessary to assess the rock source(s)

- Site surveying and mapping: location and type of rock material/ sources (boulder/bluff); location of fallen boulders; slope surface cover characteristics; location and type of vegetation.
  This includes:

  i. Aerial photos or drone survey data
  ii. detailed contour survey data

- Detailed geological and geotechnical assessment: this assessment shall include,
  - An assessment of rockfall/rockslide
  - A comprehensive geological description along with a kinematic analysis and geological mapping of the potential hazard sources.
  - Identification of rockfall/ rockslide type and other possible failures within the location premises.
  - Identification of element at risk (such as human lives, buildings and other infrastructures, transportation corridors, cultivation lands, and socially, environmentally or economically important elements etc.), and evaluation of risk level of each element.
  - Rock Fragment size, including maximum and 95^{th} percentile sizes
  - Details of source areas of rockfall/rockslide.
  - Assessment of likely boulder runout distances and level of damage that a rockfall may induce
  - Assessment of the likely kinetic energy of Rock Fragments at the site
  - Recommendations proposing measures to avoid, remedy or mitigate any geotechnical hazards on the land subject to the application.
  - Details of any subsurface investigations at the site of the proposed RPS
  - The extent of further geotechnical engineering services required at the design stage (including further geotechnical and geological investigations etc).
  - Inspect trees (if present) for bounce-mark scars
  - Identify areas where boulder flux concentrations may be an issue (e.g. gullies or immediately below rock bluffs)

A comprehensive investigation report shall be submitted including all necessary details stipulated above.

Rockfall Analysis

The type of the analysis required varies with the rockfall type and the type of RPS. The Contractor may use manual method or software in the analysis. The Contractor should use recognized, commercially available licensed software for the analyses.

The validity of the manual calculation method or software shall be verified through back analyses. Generally, 2D analyses at multiple critical cross-sections will be required. However, in the case of complex topography, 3D analyses may be required.

The Contractor shall provide perpetual licenses of all the software used for the analysis to NBRO as stipulated under Training Requirement.

Rock fall barrier systems must be designed to withstand multiple impacts from boulders (more than 2 impacts of the 95th percentile Rock fragment for the site without significant loss of capacity or height). Output should include plots of energy and bounce height along slope, and boulder end points. The design must also address environmental effects including erosion potential, any impact on natural surface water flow and the potential for deflection of rocks into nearby properties.

Selection of Rockfall Protection System

Several alternative solutions may be evaluated to eliminate the rockfall risk, and the most appropriate RPS shall be selected considering the factors including, cost, environmental impact, maintenance requirement, and accessibility to the structures. Combination of different types of RPS may be used to achieve most effective and efficient solutions.

Design of Rockfall Protection Structures

The structural analysis and design shall be based on relevant Sri Lankan, European, British or any other acceptable International Standards. In particularly, following component or structure of the RPS shall be designed according to the following code of practices:

- Geotechnical Designs – Eurocode 7 or BS 8002 or equivalent
- Rockfall barriers/fences – ETAG 027
- Concrete Structures – Eurocode 2 or BS 8110 or equivalent
- Steel Structures – Eurocode 3 or BS 5950 or equivalent

In the case of, rockfall barriers/fences it is recommend using MEL (Maximum Energy Level) approach only for low frequency rockfall events; SEL (Service Energy Level) approach is recommended where multiple hits are likely or for sites with difficult access where frequent maintenance is not desirable. Dynamic barriers (fences) should be designed for Service Energy Level (SEL). Rock Fall Barrier/Fence system shall have certification of European Organization for Technical Assistant (EOTA) or any other international Organization acceptable to NBRO

The required capacity of the foundation and tie back systems for rock fences shall be provided by the manufacturer of the rockfall protection system. The foundations and tie backs shall be designed in accordance with the manufacturer's requirements, and shall comply with the conditions of the building consent.

Some unstable rocks may require the installation of temporary fencing or cable ties before permanent stabilisation can be undertaken. Temporary protection shall be specified by the designer when considered necessary.

Other Considerations

- Above-ground structures and easily replaced components (such as posts and mesh but excluding components such as anchors or bolts) shall have a design life of at least 25 years, while the below ground structures and components that are difficult or cannot be replaced shall have a design life of at least 50 years. The total RPS shall have a design life not less than 50 years.

- A maintenances manual shall be submitted by the Contractor before completion of the Work. A comprehensive training on the maintenance shall be provided to a NBRO team as stipulated in the Training Requirement.

- Corrosion protection must be considered as for many RPS it controls the design life.

- Any rockfall protection system shall:
  - be legally and physically accessible for walkover inspection, rock removal and repair without compromising the safety of downhill property or life; and
  - not have its protection effectiveness compromised where gates or access ways are included; and
  - be and remain effective over its design life.
- Rockfall Protection Structures shall require approval from relevant Government agencies (RDA, Wild Life, Forest Department, Local Bodies etc. as required).

2.2 Design Report

The Design Report shall detail the key achievement criteria, methodology, and assumptions, such as the chosen factors of safety, for the geotechnical aspects of the engineering design. It is required to include:

- Assessment of the feasibility and/or suitability of possible protection measures.
- Map showing location and type(s) of proposed protection measures.
- Evaluation of risk level reduction for each element at risk (such as human lives, buildings and other infrastructures, transportation corridors, cultivation lands, and socially, environmentally or economically important elements etc.) with the proposed counter measures.
- Design parameters, quantities, description of selected arrangement(s) for protection and/or mitigation
- An explanation of the rationale for adopting the proposed measures
- Identification of other options that were considered for protection and/or mitigation measures
- Modelling summary output from 2D/3D analysis, including a list of model assumptions and uncertainties
- Constructability assessment, including comments on potential impacts on drainage and erosion
- Statement on the design life, including description of corrosion protection for mechanical elements, design loads and the manufacturer's testing certificates for material properties, to substantiate the design life.
- Spatial information (drone /LiDAR images etc.) and Design drawings
- Methods and frequency of construction control tests to be carried out.
- Construction and Maintenance Specification.
- Design Standard and Codes etc.

2.3 Design Review

Contractor shall provide a Producer Statement PS1 - Design, as set out in Appendix I - Producer Statement PS1 – Design, for the design of RPS and its component.

The design shall be reviewed by a Reviewer, who shall provide a Producer Statement PS2a – Design Review, as set out in Appendix I - Producer Statement PS2a – Design Review.

Design amendments shall also be reviewed by a Reviewer, who shall provide a Producer Statement PS2b – Design Review Amendment, as set out in Appendix I - Producer Statement PS2a – Design Review Amendment.

The standard formats to be used for review and approval of Design, Design Review and Design Review Amendments are given in Appendix 1.

2.4 Proprietary Rights of the Reports and Records

All reports and relevant information such as LiDAR data, maps, diagrams, plans, databases other documents, supporting records or material compiled or prepared by the Contractor /designer in course of the designing and construction shall be confidential and become and remain absolute property of the Employer. The contractor may retain a copy of such documents, data but shall not use same for purposes unrelated to this contract without prior written approval of the Employer.

3. Locations and Conceptual Designs

3.1 Introduction

In recent years, rockfalls in various parts of Sri Lanka have become one of the significant hill slope hazards. They consist of rock fragments that fall from a cliff or boulders from a slope that bounce, roll, slide down and come to a probably a temporary rest when they meet an obstruction. Rockfalls are basically caused by gravitational unbalance and sudden improvement of water pressure within rock discontinuities. Those driving mechanism are further aggravated by weathering, tree root growth, and weakening of toe supports by erosion.

Rockfall protection systems have to be considered as key element in the maintenance of rock slope safety. There are 02 types of rock fall countermeasures.

a) Rock fall protection - Catching and stopping the moving rock fragments by the structures before they reach the protective target
b) Rock fall prevention - Stabilizing the unstable rocks at the position where they are now

The recommended countermeasure will have to be decided based on the Geological and Geometrical settings at that particular rock slope. The proposal for intended countermeasure must address the procedure/method statement or technique that would adopt for the following.

a) Avoidance of sudden increase of water pressure in the discontinuities
b) Removal of unstable rock fragments by chemical/control blasting or stabilized in place based on the location specific situation.
c) Providing passive protection against movements of rock fragments.

In recent years, rockfalls in various parts of Sri Lanka has become one of the significant hill slope hazards. In this context, following Seventeen number of unstable rockfall prone locations were identified between culvert number 17/3 to 61/3 on the Kandy - Mahiyangana road (A026) in Kandy district, based on the information obtained from RDA and NBRO District office.

Occasional rockfalls have been reported in this area over the past few years, with frequent rainfall causing threats to human being, obstructions to transportation and damages to households and infrastructure.

Site No.	**Location**		**GPS Coordinate**	
Site 153 (Kandy Mahiyangana A026 Road - Between Culvert No: 17/3 to 31/9)	L1	Between Culvert No: 17/3 to 17/4 RHS	7°19'11.10"N	80°44'22.87"E
	L2	Between Culvert No: 27 KMP to 28/1 LHS	7°16'54.80"N	80°47'25.93"E
	L3	Between Culvert No: 29/3 to 29/9 LHS	7°16'53.42"N	80°47'49.03"E

	L4	Between Culvert No: 31/1 to 31/2 LHS	7°16'51.27"N	80°48'14.70"E
	L5	Between Culvert No: 31/7 to 31/9 LHS	7°16'53.00"N	80°48'27.10"E
Site 154 (Kandy Mahiyangana A026 Road - Between Culvert No: 35/7 to 56/3)	L1	Between Culvert No: 35/7 to 35/9 RHS	7°17'27.88"N	80°49'31.10"E
	L2	Between Culvert No: 38/4 to 38/5 RHS	7°17'41.88"N	80°50'34.01"E
	L3	Between Culvert No: 38/8 to 38/9	7°17'41.89"N	80°50'45.56"E
	L4	Between Culvert No: 43/8 to 44/1 RHS	7°19'11.10"N	80°44'22.87"E
	L5	Between Culvert No: 46km to 47/1 RHS	7°19'19.55"N	80°53'01.53"E
	L6	Between Culvert No: 54/5 to 54/6 RHS	7°20'6.38"N	80°54'45.99"E
	L7	Between Culvert No: 56km	7°20'53.00"N	80°54'80.81"E
	L8	Between Culvert No: 56/2 to 56/3 LHS	7°16'54.80"N	80°47'25.93"E
Site 155 (Kandy Mahiyangana A026 Road - Between Culvert No: 58/4 to 61/3)	L1	Between Culvert No: 58/4 to 58/5 LHS	7°16'53.42"N	80°47'49.03"E
	L2	Between Culvert No: 59/6 – 08 Bend RHS	7°16'53.00"N	80°48'27.10"E
	L3	Between Culvert No: 60km –10 Bend RHS	7°17'41.88"N	80°50'34.01"E
	L4	Between Culvert No:61km to 61/3 RHS	7°21'07.42"N	80°55'06.13"E


Maho
Dambulla
Polonnaruwa
Wellkanda
Nikaweratiya
Galewela
Oddamavadi
Aralaganwila
Chilaw
Eravur
Batticaloa
Kattankudy
Kuliyapitiya
Marawila
Kurunegala
Hettipola
Matale
L16
L1
L10
L13
L3
L9
L7
L11
L2
L6
L8
Katugastota
Kandy
Mahiyanganaya
Kalmunai
Negombo
Sammanthurai
Ampara
Gampola
Gampaha
Bibile
Akkaraipattu
Kadawatha
Colombo
Avissawella
Pidurutalagala
Badulla
Nuwara Eliya
Hatton
Piliyandala
Ella
Monaragala
Panadura
Bandarawela
Pottuvil
Ratnapura
Wellawaya
Buttala
Kalutara
Balangoda
Panama
Okanda
Image Landsat / Copernicus

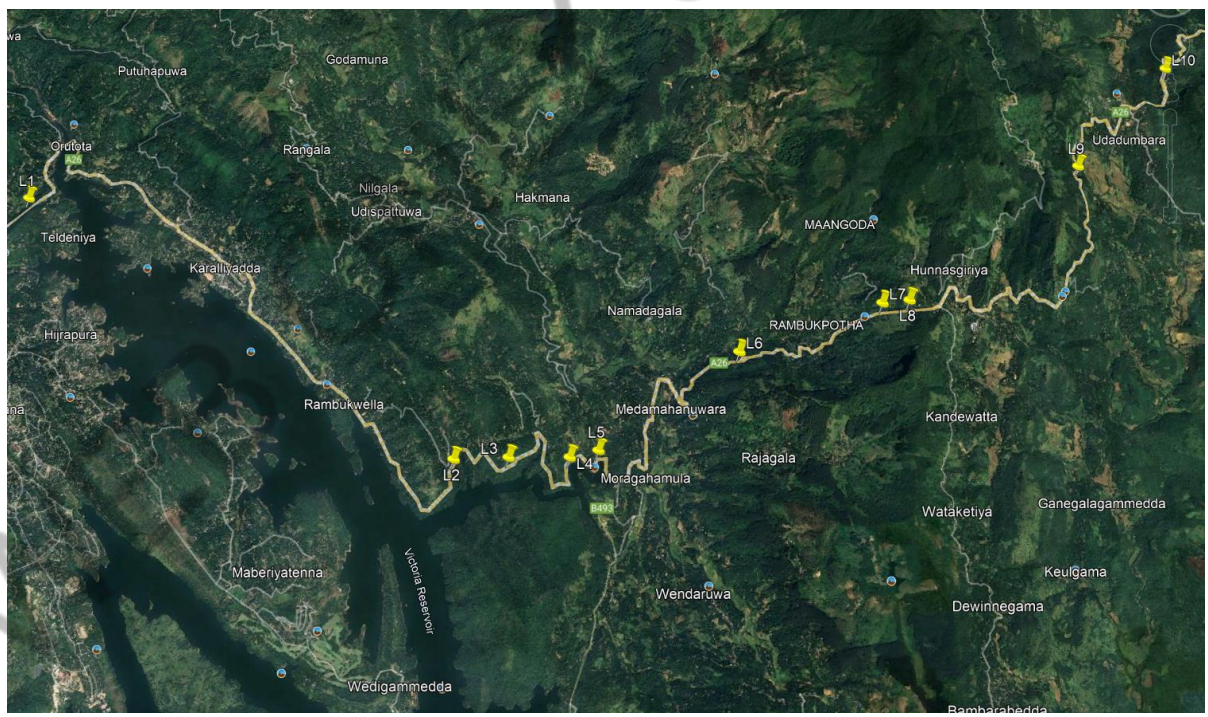

Godamuna
Putuhapuwa
L10
A26
Udadumbara
L9
Orutota
Rangala
L1
Nilgala
Hakmana
Udispattuwa
MAANGODA
Teldeniya
Karalliyadda
Hunnasgiriya
L7
L8
Namadagala
Hirapura
RAMBUKPOTHA
L6
A26
Rambukwella
Medamahanuwara
Kandewatta
L5
L3
L4
L2
Rajagala
Moragahamula
B492
Wataketiya
Ganegalagammedda
Victoria Reservoir
Maberiyatenna
Keuligama
Wendaruwa
Dewinnegama
Wedigammedda

Fig. 3.1 Location map of rock fall sites

3.2 Site 153 - Kandy Mahiyangana Road (A026) Between Culvert No:17/3 to 31/9

3.2.1 Between Culvert No: 17/3 to 17/4 RHS (Site 153 L1)

Fig. 3.2: View of the unstable boulders between Culvert No. 17/3 to 17/4

3.2.1.1 Current State of Slope Stability

- Bedrock is exposed at the upper area of the road cut within the stretch between culvert number 17/3 to 17/4 at RHS on the Kandy Mahiyangana road (A026). This was identified to be an escarp slope and foliation is nearly vertical, moderately weathered and exhibits several discontinuities.
- A residual soil overburden of around 4m in thickness could be observed at the middle to bottom part of the failed slope. Moreover, due to the presence of discontinuities, several rock fragments have detached from the parent rock and remained on the slope in an unstable condition that may eventually fall or topple on to the road during an event of rain.
- Based on the kinematic analysis, the slope exhibits a potential for planar type sliding and Direct Toppling of joints falling within the critical zone, while wedge type sliding, and flexural toppling show no kinematic instability, indicating that planar type sliding and toppling are the possible primary failure modes at this site.
- The rock fall affecting length along the road is approximately 40m.

3.2.1.2 Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- Detached boulders resting on the slope, debris and unstable hanging rock fragments should be removed using mechanical breaking/ chemical blasting techniques, ensuring that debris removal is conducted safely and without damaging to road users.
- Rock fragments with large dimensions that could detach due to weathering in the future should also be stabilized by anchoring them with rock bolts.
- To prevent further collapse of weathered rock fragments from the exposed bedrock, it is recommended to seal open fractures using cement grout including addition of non-shrink grout, based on a suitable mix design.
- Improving the surface drainage at the cut slope should also be implemented. Construction of a surface drainage network with cascade drains should be constructed for a proper rain water drainage.
- Also, horizontal sub surface drains should be installed and the discharged water should be properly remove through surface drains.

Fig 3.3: Extend of slope to be rectified between Culvert No. 17/3 to 17/4 (Aerial View)

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

3.2.2 Between Culvert No: 27 KMP to 28/1 LHS (Site 153 L2)

Fig 3.4: View of the collapsed slope and unstable boulders between 27 km post to culvert number 28/1

3.2.2.1 Current State of Slope Stability

- Bedrock is exposed at escarp slope in the road cut between 27 km post to 28/1 LHS on the Kandy - Mahiyangana road (A026). A thin (<1m) residual overburden could be observed at the upper and lower parts of the slope.
- Several rock fragments that were collapsed during the torrential rainfall and the debris were accumulated at the toe of the slope.
- Another rock segment with daylight condition, was observed at the upper part of the slope segment.
- Water seeping was observed throughout the slope.
- The rock fall affecting length along the road is approximately 25m.
- Based on the kinematic analysis, the slope exhibits potential for planar and wedge type failure and Direct Toppling of joints and their intersections falling within the critical zone, while flexural toppling show no kinematic instability, indicating that planar sliding, wedge sliding and toppling are the primary failure modes at this site.

3.2.2.2. Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- Debris, hanging rock fragments and detached boulders resting on the slope should be removed using excavation.

- Rock segment with daylight condition should be removed using chemical/controlled blasting techniques as appropriate, ensuring that debris removal is conducted safely without affecting the road users.

- Improving the surface drainage of the cut slope should also be executed. Construction of a surface drainage network with cascade drains should be done for a proper drainage.

- To prevent further collapse of weathered rock fragments from the exposed bedrock, it is recommended to seal open fractures using cement grout including addition of non-shrink grout, based on a suitable mix design.

Fig 3.5: Extend of slope to be rectified between 27 km post to 28/1 LHS

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

3.2.3 Between Culvert No: 29/3 to 29/9 LHS (Site 153 L3)

Fig 3.6: View of the unstable boulders

3.2.3.1 Current State of Slope Stability

- Bedrock which is in intermediate slope is exposed at the road cut between 29/3 km to 29/9 LHS of the Kandy - Mahiyangana road (A026). The exposed rock is well interbedded and exhibits several discontinuities.
- There is a high potential to detach several rock fragments from the parent rock along discontinuities and that may eventually fall or topple on to the road.
- Water seeping was observed throughout the slope.
- The rock fall prone length along the road is approximately 700m
- Based on the kinematic analysis, the slope exhibits potential for planar and wedge type sliding and direct toppling of joints and their intersections falling within the critical zone, while flexural toppling show no kinematic instability, indicating that planar sliding, wedge sliding and toppling are the primary failure modes at this site.

3.2.3.2 Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- Detachable rock fragments on the rocky slope should be removed using chemical/control blasting techniques, ensuring that debris removal is conducted safely and without damaging to road users.

- As a method of minimizing the damage of possible toppling failure of rock blocks/wedges, a curtain type rock net is proposed to install along the road, where the highly jointed rock slope cut is exists.

- To prevent further collapse of weathered rock fragments from the exposed bedrock, it is recommended to seal open fractures using cement grout including addition of non-shrink grout, after performing a suitable mix design.

- Improving surface drainage of the slope should also be executed. Construction of a surface drainage network with cascade drains should be made to convey the intercepted surface water towards the lower slope.

Fig 3.7: Extend of slope to be rectified between 29/3 km to 29/9 LHS

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

3.2.4 Between Culvert No: 31/1 to 31/2 LHS (Site 153 L4)

Fig 3.8: View of the unstable boulders

3.2.4.1 Current State of Slope Stability

- The bedrock is exposed to make a escarp slope condition at the road cut between 31/1 to 31/2 LHS along the Kandy - Mahiyangana road (A026). The exposed rock is highly jointed and exhibits several discontinuities. A thin residual overburden (<2m) could be observed at the top part of the slope.
- As observed, several rock planes had been slid down and There is a high potential to detach several rock fragments from the parent rock along the discontinuities.
- The rock fall prone length along the road is approximately 30m
- Based on the kinematic analysis, the slope exhibits a potential for planar and wedge type sliding condition and direct toppling of joints and their intersections falling within the critical zone, while flexural toppling show no kinematic instability, indicating that planar and wedge type sliding and toppling are the primary failure mode at this site.

3.2.4.2 Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- Detachable rock fragments on the rocky slope should be removed using chemical/control blasting techniques, ensuring that debris removal is conducted safely and without damaging to road users.

- To prevent further collapse of weathered rock fragments from the exposed bedrock, it is recommended to seal open fractures using cement grout including addition of non-shrink grout, based on a suitable mix design.

- Improving surface drainage of the slope should also be executed. Construction of a surface drainage network with cascade drains should be made for a proper drainage.

Fig 3.9: Extend of slope to be rectified

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

3.2.5 Between Culvert No: 31/7 to 31/9 LHS (Site 153 L5)

Fig 3.10: View of the unstable boulders

3.2.5.1 Current State of Slope Stability

- Bedrock is exposed at the road cut between 31/7 km to 31/9 LHS on the Kandy - Mahiyangana road (A026). The bedding planes of exposed rock is in intermediate condition, moderately weathered in the down slope and highly weathered in the upper slope and exhibits several discontinuities including joints and fractures.
- There is a high potential to detach several rock fragments from the parent rock along discontinuities and that may eventually fall or topple on to the road.
- Based on the kinematic analysis, the slope exhibits a potential for planar type sliding and direct toppling of joints falling within the critical zone, while flexural toppling and wedge sliding show no kinematic instability, indicating that planar and wedge type sliding and toppling are the primary failure modes at this site.

3.2.5.2 Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- To minimize the potential damage from rockfalls along the rock slope between culvert 31/7 to 31/9, it is proposed to install a rope net. The approximate area where the rope net should be installed is 300 m2.

- To prevent further collapse of weathered rock fragments from the exposed bedrock, it is recommended to seal open fractures using cement grout including addition of non-shrink grout, based on a suitable mix design.

- Improving surface drainage of the slope should also be executed. Construction of a surface drainage network with cascade drains should be made for a proper drainage.

Fig 3.11: Extend of slope to be rectified

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

3.3 Site 154 - Kandy Mahiyangana Road (A026) Between Culvert No:35/7 to 56/3

3.3.1 Between Culvert No: 35/7 to 35/9 RHS (Site 154 L1)

Fig 3.12: View of the unstable slope

3.3.1.1 Current State of Slope Stability

- Moderately weathered bedrock is exposed in an intermediate slope with a top thin residual overburden (<4m). There are several unstable detached rock fragments and several hanging trees present over the slope situated within slope segment in between Culvert No. 35/7 to 35/9.

- Water seeping was observed throughout the slope.

- Based on the kinematic analysis, the slope exhibits potential for wedge type failure, while toppling and planar sliding show no kinematic instability, indicating that wedge type failure would be the primary failure mode of at this site.

3.3.1.2 Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- To minimize the potential damage from rockfalls along the slope situated between Culvert No. 35/7 to 35/9, it is proposed to reshape and remove the loose rock fragments.

- Horizontal drains should be installed at first 50m starting from Culvert No.35/7 and discharged water should be properly drained out using surface drains

- Improving surface drainage of the cut slope should also be done. Construction of a surface drainage network with cascade drains should be made to convey the intercepted surface water towards the lower slope.

Fig 3.13: Extend of slope to be rectified

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

3.3.2 Between Culvert No: 38/4 to 38/5 RHS (Site 154 L2)

Fig 3.14: View of the unstable slope

3.3.2.1 Current State of Slope Stability

- Dip slope condition is exposed at the road cut situated between culvert No. 38/4 to 38/5 RHS along the Kandy - Mahiyangana road (A026). The exposed rock is highly interbedded and exhibits several discontinuities. A residual overburden exists with 1.5m -3m thickness. Exposed road cut shows weathering profile from residual overburden to fresh rock in different degree of weathering.

- A rock wedge type failure has been occurred during the torrential rainfall, damaging the existing cut-off drain at the crest of the slope. Road is slightly damaged and debris have been accumulated at the toe of the slope.

- There is a potential to further detachment of rock fragments from the parent rock along discontinuities and that may eventually slide or topple towards the road.

- The rock fall affecting length along the road is approximately 45m.

- Water seepages could be observed along the slope.

- Based on the kinematic analysis of the slope situated between culvert No: 38/4 to 38/5 RHS, the slope exhibits potential for planar type sliding and direct toppling of joints falling within the critical zone, while flexural toppling and wedge sliding show no instability, indicating that planar and wedge type sliding and toppling are the primary failure mode observed at this site.

3.3.2.2 Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- Debris, hanging rock fragments and detached rock boulders resting on the slope should be removed carefully with minimal disturbances to the existing slope.

- Unstable rock segment should be stabilized by rock bolts designed to be reinforced the unstable rock to a firm rock.

- To prevent further collapse of slightly detached weathered rock fragments from the exposed bedrock, it is recommended to seal open fractures with the use of cement grout non-shrinkable mix design (Joint sealing).

- The toe of slope should be stabilized by a retaining wall with a height of 3 to 4 meters. The approximate length of the wall shall be 45 meters.

- Improving the surface drainage of the cut slope should also be implemented. Re-construction of a surface drainage network with cascade drains should be done for proper draining of rain water.

Fig 3.15: Extend of slope to be rectified (Aerial view)

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

3.3.3 Between Culvert No: 38/8 to 38/9 RHS (Site 154 L3)

Fig 3.16: View of the unstable rock fragment between culvert No 38/8to 39/9.

3.3.3.1 Current State of Slope Stability

- Highly to completely weathered rock slope is exposed in escarp slope condition at the road cut between culvert No. 38/8 to 38/9 along the Kandy - Mahiyangana road (A026).

- A cutting failure has occurred during the torrential rainfall, and the topsoil layer of the slope now consists of loose soil and rock fragments

- There is a potential for further detachment of the rock fragments from the parent rock along discontinuities and that might eventually slide or topple on to the road.

- The rock fall affecting length along the road is approximately 30m

- Based on the kinematic analysis of the slope between culvert No: 38/8 to 38/9, the slope exhibits potential for planar type failure and direct toppling of joints falling within the critical zone, while flexural toppling and wedge type failure show no kinematic instability, indicating that planar sliding, wedge sliding and toppling are the primary failure mode of concern at this site.

3.3.3.2 Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- Debris, hanging and detached rock fragments resting on the slope should be removed using excavation.

- It is proposed to stabilize the slope closed to Culvert No 38/9 by inserting short soil nails. The approximate length where the soil nails to be installed is 15m.

- To prevent further collapse of weathered rock fragments from the exposed bedrock, it is recommended to seal open fractures with use of cement grout with a suitable mix design (Joint sealing).

- Improving the surface drainage of the cut slope should also be implemented. Re-construction of a surface drainage network with cascade drains should be constructed to convey the rain runoff out of the slope.

Fig 3.17: Extend of slope to be rectified between culvert No. 38/8 to 38/9

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

3.3.4 Between Culvert No: 43/8 to 44/1 RHS (Site 154 L4)

Fig 3.18: Photographs of the unstable rock slope at Culvert No: 43/8

Fig 3.19: Photographs of the newly failed location at Culvert No: 44/1

Fig 3.20: Presence of unstable boulders at 44/1 (Aerial View)

3.3.4.1 Current State of Slope Stability

- Bedrock is exposed at the road cut between culvert number 43/8 to 43/9 LHS on the Kandy - Mahiyangana road (A026). The rock is exposed in escarp slope condition is moderately weathered consisting of several discontinuities.

- In the upper slope, there are several detached rock fragments (in-situ) formed due to the presence of discontinuities and the debris from upper slope failures (thickness varied 6m-10m) are remained on the down slope in an unstable condition. The orientation of the discontinuities leads the rock blocks to frequent rock fall or toppling.

- The rock fall affecting length along the road is approximately 62 m.

- At Culver number 44/1: On January 18, 2025, a rockfall failure was occurred near the 44/1 Culvert on the Kandy–Mahiyangana road followed by a heavy rainfall. This incident obstructed transportation and putting two houses at risk.

- Affecting length along the road is approximately 75m.

- Based on the kinematic analysis at 43/8 to 44/1 RHS, the slope exhibits potential for planar and wedge type sliding and direct toppling of joints and their intersections falling within the critical zone, while flexural toppling show no kinematic instability, indicating that planar sliding, wedge sliding and toppling are the possible primary failure modes at this site.

3.3.4.2 Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- Detached boulders resting on the slope, unstable hanging parts and debris of the collapsed section should be removed ensuring that removal is conducted safely and without harming the road users.

- To minimize the possible rockfall threat further at culvert number 43/8 to 43/9 it is proposed to install a rope net. The approximate area where the rope net should be installed is 500m2.

- Proposed to stabilize the unstable rock fragments resting at the crest region of the slope near culvert number: 44/1 by installing rope hooking and rock anchoring.

- Improving the surface drainage over cut slope should also be done. Construction of a surface drainage network with cascade drains should be carried for a proper drainage out from the cut slope.

Fig 3.21: Extend of slope to be rectified at 43/8 to 43/9 (Aerial View)

Fig 3.22: View of newly failed location (Aerial View)

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

3.3.5 Between Culvert No: 46KM to 47/1 RHS (Site 154 L5)

Fig 3.23: Photographs of the unstable rock slope at Culvert No: 46km to 47/1

3.3.5.1 Current State of Slope Stability

- Completely weathered to highly weathered Quartzite rock blocks were observed at the top layer of the slope situated in-between culvert number 46/1 to 47/1 along the Kandy - Mahiyangana road (A026). There is a top residual overburden around 4m in thickness is resting on the road cut.

- The rock fall affecting length along the road is approximately 50 m.

3.3.5.2 Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- Detached boulders resting on the slope, unstable hanging parts and debris of the collapsed section should be removed ensuring that removal is conducted safely and without damaging to road users.

- Improving the surface drainage of the cut slope should also be implemented. Construction of a surface drainage network with cascade drains should be carried out to convey the rain runoff out of the slope.

Fig 3.24: Extend of slope to be rectified at 46km to 47/1 RHS

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

3.3.6 Between Culvert No: 54/5 to 54/6 RHS (Site 154 L6)

Fig 3.25: Photographs of the unstable rock slope at Culvert No: 54/5 to 54/6

3.3.6.1 Current State of Slope Stability

- Bedrock is exposed under escarp slope condition slope at the road cut near culvert No. 54/5 to 54/6 RHS along the Kandy - Mahiyangana road (A026). A portion of topsoil has been collapsed, and still in unstable condition. If a failure is occurred, both road below the slope and a house situated above the slope are at risk.

- The rock fall affecting length along the road is approximately 30m

- Based on the kinematic analysis conducted at 54/5 to 54/6 RHS, the slope exhibits potential for planar and wedge type sliding condition and direct toppling; of joints and their intersections falling within the critical zone, while flexural toppling show no kinematic instability, indicating that planar, wedge and toppling type failure conditions at this site.

3.3.6.2 Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- The slope must be excavated and trimmed to a safe angle in accordance with the design drawings, and appropriate erosion control measures must be applied

- Improving the surface drainage of the cut slope should also be implemented. Establishment of a surface drainage system shall be done for a proper drainage.

Fig 3.26: Extend of slope to be rectified at 54/5 to 54/6 RHS

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

3.3.7 Between Culvert No: 56KM (Site 154 L7)

Fig 3.27: Photographs of the unstable rock slope at 56 km

3.3.7.1 Current State of Slope Stability

- Bed rock is exposed at the road cut near 56 km along the Kandy - Mahiyangana road (A026). The exposed rock is moderately weathered and exhibits several discontinuities.
- As shown in the figure rocky slope is fractured into several blocks and situated in unstable condition.
- The rock fall affecting length along the road is approximately 75 m.
- Based on the kinematic analysis at 56km, the slope exhibits potential for direct toppling of joints falling within the critical zone, while sliding and flexural type toppling condition show no kinematic instability, indicating that direct toppling is the primary failure mode of concern at this site.

3.3.7.2 Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- Proposed to stabilize the unstable rock fragments at the slope near 56km by installing rope hooking and rock anchoring.

- To prevent further collapse of weathered rock fragments from the exposed bedrock, it is recommended to seal open fractures with the use of cement grout including addition of non-shrink grout (Joint sealing).

- Improving the surface drainage of the cut slope should also be implemented. Re-construction of a surface drainage system should be done for a proper drainage.

Fig 3.28: Extend of slope to be rectified at 56 km (aerial View)

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

3.3.8 Between Culvert No: 56/2 to 56/3 LHS (Site 154 L8)

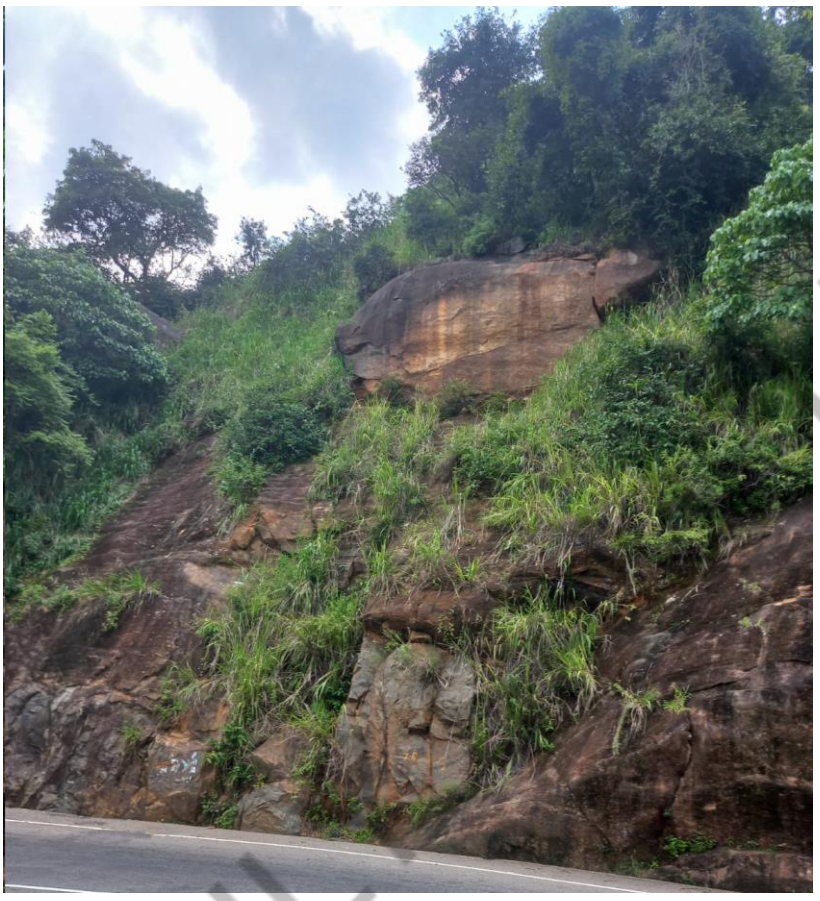


Fig 3.29: View of the unstable boulders

3.3.8.1 Current State of Slope Stability

- Bedrock is exposed at the road cut between culvert number 56/2 to 56/3 along the Kandy - Mahiyangana road (A026).

- At top of the exposed rock there is a detached massive scale rock boulder and associated small boulders which are in unstable condition.

- Based on the kinematic analysis conducted at between culvert No: 56/2 to 56/3 LHS, the slope exhibits potential for planar sliding and direct toppling of joints falling within the critical zone, while flexural toppling and wedge type failure condition show no kinematic instability, indicating that planar sliding, wedge sliding and toppling are the primary failure mode of concern at this site.

3.3.8.2 Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- Detached massive scale boulder resting on the slope should be removed using chemical blasting technique, ensuring that debris removal is conducted safely and without causing possible damages to road users

- Approximate volume of the rock boulder to be removed is 150m^2.

- Improving the surface drainage of the cut slope should also be done. Construction of a surface drainage system should also be done for a proper drainage.

Fig 3.30: Extent of slope to be rectified (Aerial View)

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

3.4 Site 155 - Kandy Mahiyangana Road (A026) Between Culvert No:58/4 to 61/3

3.4.1 Between Culvert No: 58/4 to 58/5 LHS (Site 155 L1)

Fig 3.31: View of the collapsed slope between culvert number 58/4 to 58/5

3.4.1.1 Current State of Slope Stability

- Slope failure and rockfall had been happened at the culvert number 58/4 to 58/5 due to the prevailing heavy rainfall and this incidence obstructed transportation.
- Some unstable trees and rock hanging parts were observed.
- Water seeping was observed throughout the slope.
- The rock fall affecting length along the road is approximately 40m

3.4.1.2 Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- Debris, hanging rock fragments, detached boulders resting on the slope and unstable trees should be removed.

- It is proposed to stabilize the upper slope by a reinforcement and toe of the slope should be stabilized by a Retaining structure with a height of 5 to 6 meters. The approximate length of the wall is 20 meters.

- Improving the surface drainage of the cut slope should also be implemented. Construction of a surface drainage system shall be done for proper drainage out from the slope.

Fig 3.32: Extent of slope to be rectified between culvert number 58/4 to 58/5 (Aerial View)

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

3.4.2 Between 59/6 – 08th Bend RHS (Site 155 L2)

Fig 3.33: View of the unstable rock slope between culvert number 59/6

3.4.2.1 Current State of Slope Stability

- Bedrock is exposed at the road cut near culvert number 59/6 RHS. The exposed rock is moderately weathered, highly banded and exhibits several discontinuities

- There is a high potential to detach several rock fragments from the parent rock along discontinuities and that may eventually fall or topple on to the road.

- Water seeping was observed throughout the slope.

- Based on the kinematic analysis at between culvert No: 59/6 – (08th bend RHS), the slope exhibits potential for planar type failure condition and toppling type condition of joints falling within the critical zone, while flexural toppling and wedge type failure condition show no kinematic instability, indicating that planar, wedge and toppling type failure condition are the primary failure mode of concern at this site.

3.4.2.2 Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- To minimize the damage from falling detached rock fragments near culvert number 5,9/6, high-intensity rockfall protection net should be installed along the edge of the road for an approximate length of 105 meters.

- The approximate length where the rectification should be done is about 105 m.

- Improving the surface drainage of the cut slope should also be implemented. Re-construction of a surface drainage system should be done for proper drainage.

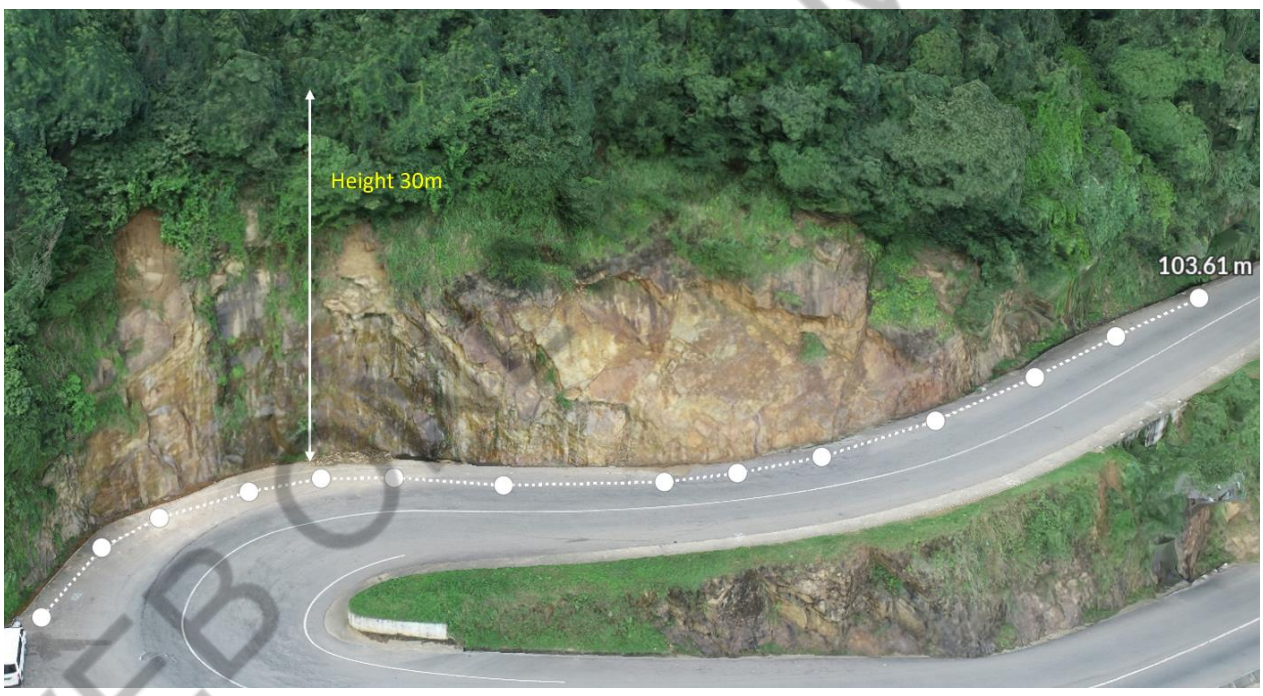


Fig 3.34: Extent of slope to be rectified

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

3.4.3 Between Culvert No: 60KM – 10 Bend RHS (Site 155 L3)

Fig 3.35: View of the unstable slope at culvert No. 60

3.4.3.1 Current State of Slope Stability

- Bedrock is exposed at the road cut near culvert No. 60 RHS along the Kandy - Mahiyangana road (A026).

- The topsoil overburden above the exposed rock has been collapsed during the torrential rainfall, and still it is in unstable condition. If failure occurred, both roads above and below the cut slope are at high risk.

- The minimum distance to the upper road from the scarp of the failure is about 3m.

- The rock fall affecting length along the road is approximately 50m

3.4.3.2 Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- As an immediate temporary measure, it was proposed to construct a curb drain at top of the slope, to divert the rain runoff.

- As a long-term measure, it is proposed to stabilize the slope by a reinforcement method. The approximate area of proposed soil nailing is 220m2

- Improving the surface drainage of the cut slope should also be implemented. Re-construction of a surface drainage network with cascade drains should be constructed to convey the rain runoff out of the slope.

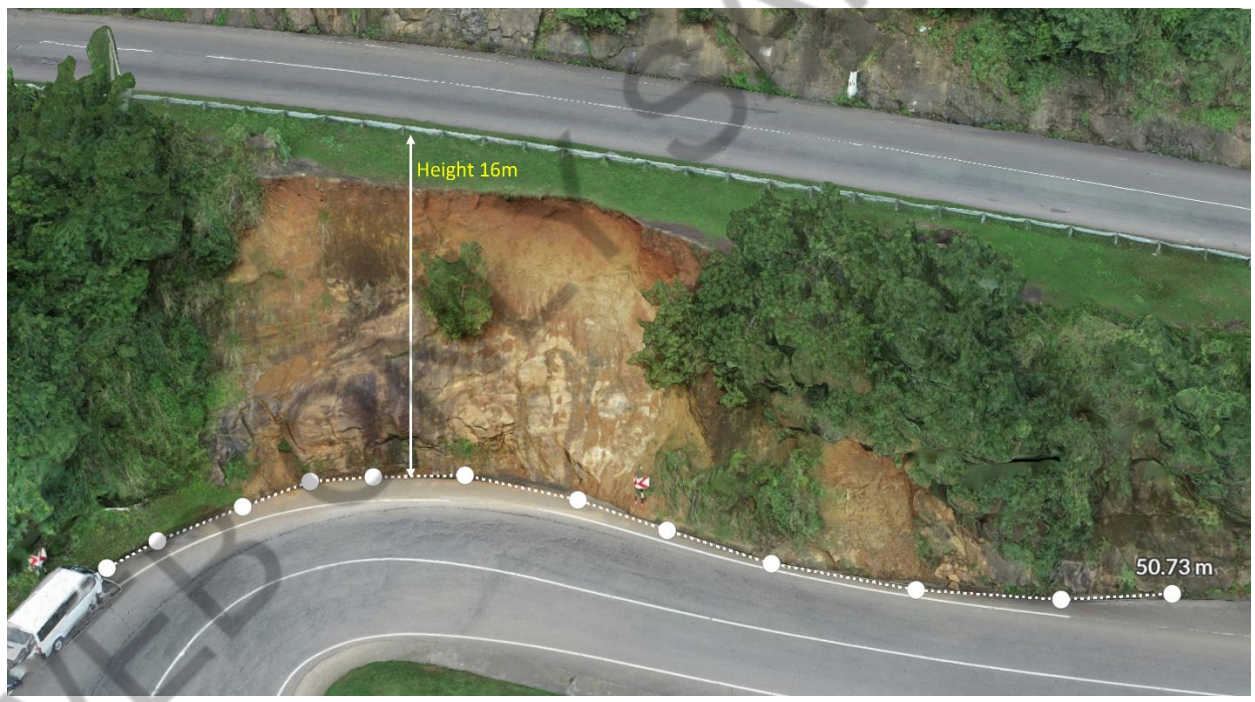


Fig 3.36: Extent of slope to be rectified

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

3.4.4 Between Culvert No: 61KM to 61/3 RHS (Site 155 L4)

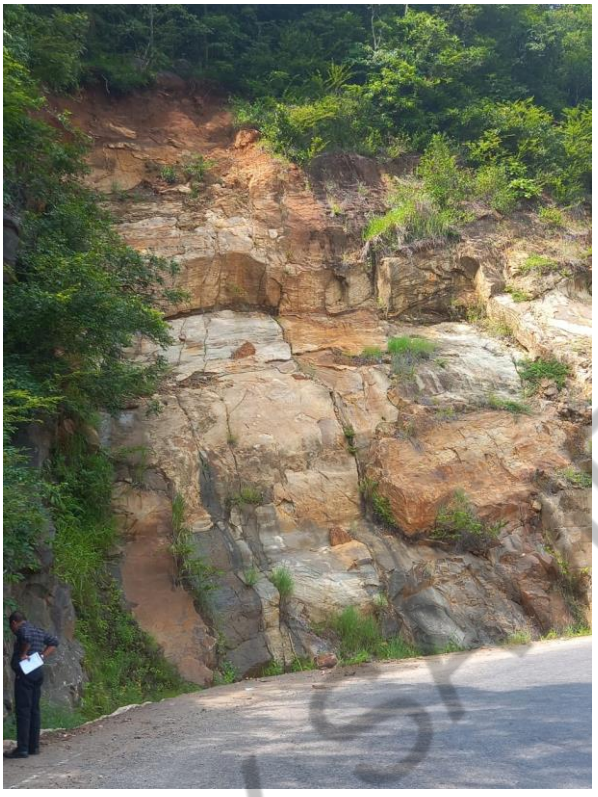


Fig 3.37: View of the unstable boulders at 61km

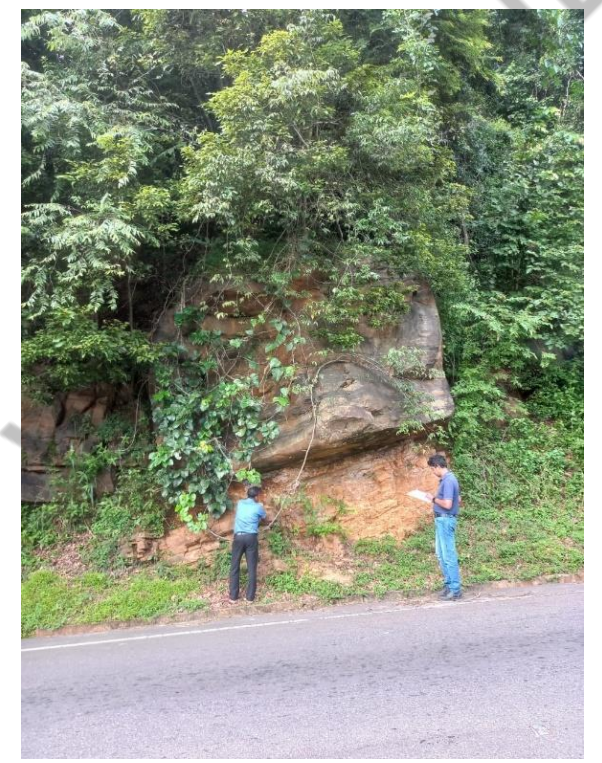


Fig 3.38: View of the unstable boulders at 61/2 to 61/3 RHS

3.4.4.1 Current State of Slope Stability

- Bedrock is exposed at the road cut between 61 km to 61/3 RHS along the Kandy - Mahiyangana road (A026).

- The exposed rock is in escarp slope and there is a high potential to detach several rock fragments from the parent rock along discontinuities and that may eventually fall or topple on to the road.

- At 61 km post, some detached, unstable rock boulders were also observed at the top of the rocky slope

- At culvert No: 61/2 to 61/3 rock is interbedded with Biotite Gneiss, Quartzite and Calcite.

- Based on the kinematic analysis at between culvert No:61km to 61/3 RHS, the slope exhibits potential for planar and direct toppling type failure condition of joints falling within the critical zone, while flexural toppling and wedge type failure condition show no kinematic instability, indicating that planar, wedge and toppling type failure condition are the primary failure mode of concern at this site.

3.4.4.2 Conceptual Design Criteria

Based on the observations, the following rectification measures are proposed for site to maintain required slope stability.

- Detached boulders resting on the slope, debris and unstable hanging rock fragments should be removed using mechanical breaking/ chemical blasting techniques, ensuring that debris removal is conducted safely and without damaging to road users.

- To prevent further collapse of slightly detached weathered rock fragments from the exposed bedrock, it is recommended to seal open fractures using cement grout including addition of non-shrink grout, after performing a suitable mix design.

- Improving the surface drainage of the cut slope should also be implemented. Construction of a surface drainage system should be done for a proper drainage.

Fig 3.39: Extent of slope to be rectified

Note:

The above is a conceptual design relevant to this site. The ultimate purpose is to come up with a suitable rectification design that will completely protect the people, infrastructure and other elements at the lower slope from possible damage caused by rockfall from the upper slope. Therefore, the items given above may be altered as appropriate.

4. Requirements for Schedule B 2 - "Contractor's Proposal"

The following details shall be included in the "Contractor's Proposal" according to ITB 19.3.

- Preliminary assessment of the hazard and element at risk
- Design approach including;
    - Descriptive design methodology
    - Design standards
- Conceptual mitigation measures and examples of previous applications (Proof documents to be provided for previous applications)

5. Programme of Works

The programme of work shall be divided into several steps and the required period for each step shall be detailed in order to complete the work in the given time; The total duration of design and construction shall be 9 months until completion of the Pre-commissioning, adhering to the time frames stipulated in each step. Below mentioned Steps shall be clearly stated for the two work areas, namely:

Location 01(site no. 153)

1. Between Culvert No: 17/3 to 17/4 RHS on Kandy Mahiyangana Road (A026)
2. Between Culvert No: 27 KMP to 28/1 LHS on Kandy Mahiyangana Road (A026)
3. Between Culvert No: 29/3 to 29/9 LHS on Kandy Mahiyangana Road (A026)
4. Between Culvert No: 31/1 to 31/2 LHS on Kandy Mahiyangana Road (A026)
5. Between Culvert No: 31/7 to 31/9 LHS on Kandy Mahiyangana Road (A026)

Location 02(site no. 154)

1. Between Culvert No: 35/7 to 35/9 RHS on Kandy Mahiyangana Road (A026)
2. Between Culvert No: 38/4 to 38/5 RHS on Kandy Mahiyangana Road (A026)
3. Between Culvert No: 38/8 to 38/9 on Kandy Mahiyangana Road (A026)
4. Between Culvert No: 43/8 to 44/1 RHS on Kandy Mahiyangana Road (A026)
5. Between Culvert No: 46Km to 47/1 RHS on Kandy Mahiyangana Road (A026)
6. Between Culvert No: 54/5 to 54/6 RHS on Kandy Mahiyangana Road (A026)
7. Between Culvert No: 56Km on Kandy Mahiyangana Road (A026)
8. Between Culvert No: 56/2 to 56/3 LHS on Kandy Mahiyangana Road (A026)

Location 03(site no. 155)

1. Between Culvert No: 58/4 to 58/5 LHS on Kandy Mahiyangana Road (A026)
2. Between Culvert No: 59/6 – 08 Bend RHS on Kandy Mahiyangana Road (A026)
3. Between Culvert No: 60Km – 10 Bend RHS on Kandy Mahiyangana Road (A026)
4. Between Culvert No: 61Km to 61/3 RHS on Kandy Mahiyangana Road (A026)

- **Step 1 – Preliminary investigation and design concept** – The contractor shall conduct a preliminary investigation at each location and submit a preliminary investigation report along with design concepts for the approval of the Engineer within 14 days calculated from the start date. The Engineer will comment and give the determination on the report within 7 days. The contractor shall commence the detailed investigation and design works upon receiving the approval from the Engineer.
- **Step 2 – Detailed Investigation –** The Contractor shall conduct a detailed investigation, produce a detailed investigation report submit for Engineer's approval within two months calculated from the start date. The Engineer will comment and give the determination on the report within 14 days.
- **Step 3 – Detailed Design Report –** Design of the works including submission of Design, Design Report and Construction Documents for review to the Engineer within three months calculated from the start date. Following details shall be submitted together with this document;
    - Specifications and standards for works
    - Construction programme
    - Detailed cost breaks down for mitigation works

  The Engineer will give the comments within 14 days. The Contractor shall revise the Design and Design Report within 7 days. Then the Engineer give and give the determination on the report within 7 days.
- **Step 4 – Supply and Construction of RPS –** The Contractor shall commence the construction activities upon receiving the approval from the Engineer.
- **Step 5 – Maintenance and Defect Liability –** Maintenance and defect liability shall commence after the Completion of the work.

6. Training Requirement

The Contractor shall provide, design and construction related services as per the table-02.

Service	Description of Service	Quantity	Unit	Place where Services shall be performed	Final Completion Date(s) of Services
1	Supply and Installation of required software* product/Products and perpetual licenses shall be installed in NBRO office Computers.	10	Nr	NBRO Head Office, Colombo	Before commencement of the construction
2	Training on software product/Products including designing for Rock netting and Rock fencing.	10	Persons	NBRO Head Office, Colombo or Suitable place in Colombo	Before commencement of the construction
3	On-site Training during construction	10	Persons	At Construction site	During Construction

*Software used by the Contractor for rockfall / stability analysis and any other relevant software

III. Qualification of Design and Construction Team

1. Composition of Design Team

Item No	Position	Role, Education and Experience	
01	Design Team Leader	Role	Managing the detailed design process of the rock slope protection systems
		Qualification	Bachelor's Degree in the Civil/Earth Resource Engineering and Professional qualification (Corporate/Chartered). Additionally, (Masters in Geotechnical Engineering or equivalent field is preferred)
		Experience	10 years of total experience after graduation of which minimum 03 years experience in designing of rock slope protection systems including fencing/netting /bolting etc. He/she should have carried out designs within last 10 years, of at least one work of a nature and complexity equivalent to task of proposed work
02	Geologist/	Role	Engage in detailed design process of rock slope protection systems by defining types of rock/soil and other geological settings of the site and identifying the failure types.
		Education	Bachelor's Degree in the Science/Specialized in Geology and Professional qualification (Chartered) Additionally, (Masters degree in Engineering geology or equivalent is preferred)
		Experience	At least 10 years total experience after graduation at least 03 years in designing of rock slope protection systems including fencing/netting /bolting etc. He/she should have carried out designs within last 10 years, of at least one work of a nature and complexity equivalent to task of proposed work.

1.1 Qualification of Reviewer

Item No	Position	Role, Education and Experience	
01	Reviewer	Role	Review the detailed design of the rock slope protection systems
		Qualification	Bachelor's Degree in the Civil/Earth Resource Engineering and Professional qualification (Corporate/Chartered) and Masters in Geotechnical Engineering or equivalent PhD in Geotechnical Engineering or equivalent field is preferable
		Experience	Fifteen years of total experience after graduation of which minimum 05 years experience in designing and reviewing of rock slope protection systems including fencing/netting /bolting etc. He/she should have carried out design review within last 10 years, of at least one work of a nature and complexity equivalent to task of proposed work

2. Composition of Construction Team

2.1 Key Personnel

Item No.	Position/specialization	Number of Persons required	Relevant academic qualifications	Minimum years of relevant work experience
1	Project Manager / Contractor's representative	01	B.Sc. Civil Engineering degree or equivalent with Chartered/Corporate membership of a recognized professional institution/Postgraduate degree in Engineering.	Minimum 10 years of post-qualification experience of which minimum 3 years should be in slope stabilization work.
2	Geotechnical Engineer	01	B.Sc. Civil / Earth Resource Engineering degree or equivalent	Minimum 03 years of post-qualification experience of which minimum 1 years should be in slope stabilization work.

Item No.	Position/specialization	Number of Persons required	Relevant academic qualifications	Minimum years of relevant work experience
3	Site Engineers	01	B.Sc. Civil Engineering degree or equivalent	Minimum 03 years of post qualification experience of which minimum 1 years should be in slope stabilization work.
			NDT/NDES/HNDE Civil or equivalent with the certificate of Member of IIESL and ECSL Registration as an Incorporate Engineer.	Minimum 10 years of post qualification experience of which minimum 1 years should be in slope stabilization work.
4	Technical Officer	06	NDT/NDES/HNDE/NCT(NVQ-5) Civil or equivalent	Minimum 01years of post qualification experience
5	Surveyor	01	Bachelor Degree of Surveying from a recognized university or Licensed Surveyor or equivalent	Minimum 02 years of post qualification experience
6	QA/QC Engineer	01	B.Sc. Civil Engineering degree or equivalent	Minimum 03 years of post qualification experience of which minimum of 03 years experience in QA&QC Works, and 01 years should be in slope stabilization work.
			NDT/NDES/HNDE Civil or equivalent with the certificate of Member of IIESL and ECSL Registration as an Incorporate Engineer.	Minimum 10 years of post qualification experience of which minimum of 06 years experience in QA&QC Works, and 01 years should be in slope stabilization work.
7	Quantity Surveyor	01	B.Sc. degree in the Quantity Surveying or equivalent	Minimum 01 year of post qualification in Quantity Surveying
			NVQ level 06	Minimum of 05 years of post-qualification experience out of which 03 years as Contractors Quantity Surveyor.
			NVQ level 05	Minimum of 08 years of post-qualification experience out of which 03 years as Contractors Quantity Surveyor

Item No.	Position/specialization	Number of Persons required	Relevant academic qualifications	Minimum years of relevant work experience
			NVQ level 04	Minimum of 10 years of post-qualification experience out of which 03 years as Contractors Quantity Surveyor
8	Environmental & Social Officer	01	B.Sc / BA. degree in related area or equivalent	Minimum of 03 years of post qualification in environmental & social field.
9	Health & Safety Officer	01	B.Sc. degree or equivalent	Minimum of 3 years of post qualification in Health & Safety
			NVQ level 06	Minimum of 5 years of post-qualification in Health & Safety
			NVQ level 05	Minimum of 8 years of post-qualification in Health & Safety
			NVQ level 04	Minimum of 10 years of post-qualification in Health & Safety

3. Involvement of Design and Construction Teams

The Design Team shall be available on full-time basis until the approval is granted for the detailed design by the Engineer.

During construction period, the Design Team shall be available as necessary.

The construction team shall be available on full-time basis during the construction period.

APPENDIX 1. Producer Statement PS1 – Design 6

This Producer Statement is for the design of support or protection devices for the rockfall and boulder roll hazards under Package 10A (RLVMMP/WORKS/10A) It applies to construction consented by the Engineer.

DESIGNED BY: _____
(Approved Designer)

ISSUED BY: _____
(Design Firm)

TO: _____
(Employer)

OWNERS: _____
(Registered owners shown on the Certificate of Title. Individuals, trusts, Trustees, Company Directors)

Consenting Authority – National Building Reasearch Organization, Sri Lanaka

Appointed Peer Reviewer _____
(Approved Geoprofessional and signatory to a Producer Statement PS2- Review)

Description of Work _____

_____
(Describe the work covered by this Producer Statement in detail)

At _____ (Address)

Lot Number _____ **DP**_____ **C/T Number**_____

Description of Design Services Undertaken _____

_____

Inputs to the Design _____
(Standards and codes used)

_____
(Rockfall Energy used and its derivation/supply)

_____
(other)

Design Life _____ **Expected Service Life** _____
(To take account of the environmental setting)

Name any Proprietary System_____

Test Level for Proprietary System Used _____**Certificate Number** _____
(Current test level certificate)

The works covered by this Producer Statement are **described** in calculations titled

_____

All details are given on drawings **titled** _____

I _____
(the designer)

being a Chartered Civil Engineer Engineer and an Approved Design team leader ,I **believe** on reasonable grounds the works designed by me, if constructed according to the details shown on the drawings, in the specification and any other accompanying documents will perform to the design intent as set down by the Engineer in a consent to construct. The work covered by this Statement will be observed as it is constructed according to:

- (Relevant Design Codes to be inserted)

This statement is endorsed by_____
(Director and/share holder)

of_____
(Design Firm)

and the employer of the Designer.

I/we are member(s) of----------, hold Professional Indemnity insurance of no less than the amount as per the Conditions of Contract and accept that liability under this statement accrues to the Design Firm only.

Signed by the Designer _____ (Signature)

_____ (Date)

Signed on behalf of the Design Firm_____ (Signature)

_____ (Date)

NOTES AND REQUIREMENTS FOR PS1 - DESIGN

1. This Producer Statement shall provide the Engineer with reasonable grounds to issue consent for construction of the work without the need for duplicate and independent design checking.

2. PS1 - Design is required from an Approved Design team leader.

3. The Designer shall have signing authority delegated by the Design Firm. By signing the PS1 – Design the Designer warrants that she/he has:

a. delegated authority from a Director of the Design Firm to undertake the design and develop the construction details;

b. a directory role in the gathering of site data, establishing the design inputs overseeing the design process, checking the outputs from design, arranging and signing off internal verification, developing the work specification, overseeing the drawing of details and shall be fully satisfied that the documents accompanying the PS1 – Design are completed and relevant to the stabilization of rock fall or protection of life and/or property from rockfall or boulder roll.

4. The Designer shall employ an Approved Design reviewer, to independently review the design and to provide a Producer Statement PS2a – Design Review. The costs associated with the design review shall be borne in full by the Design Firm. Issues of disputed design shall be resolved by the Designer and Design Reviewer to enable the PS1 – Design to be signed unconditionally. Engineer will not accept a PS1 with conditions.

5. The PI Insurance minimum stated on the PS1 shall be current at the time of submission to Engineer. A certificate of currency shall be appended by the Design firm to the Statement.

6. In the case where a Design Firm ceases to trade within 10 years of the construction of the designed work, the Director(s) shall maintain “run-on” insurance to the full value of total Contract sum for the balance of time to 10 years from completion of construction.

Producer Statement PS2a – Design Review [7]

This Producer Statement is for the design review of support or protection devices for the rockfall and boulder roll hazards under Package 10A (RLVMMP/WORKS/10A).. It applies to construction consented by the Engineer..

APPOINTED DESIGN REVIEWER: _____
(Approved Design reviewer named on the Producer Statement PS1 - Design)

ISSUED BY: _____
(Design Reviewer Firm)

TO: _____
(Designer)

OF: _____
(Design Firm)

OWNERS: _____
(Registered owners shown on the Certificate of Title. Individuals, trusts, Trustees, Company Directors)

Consenting Authority – National Building Reasearch Organization, Sri Lanaka

Description of Work _____

_____
(Describe the work covered by this Producer Statement in detail)

At _____ (Address)

Lot Number _____ **DP**_____ **C/T Number**_____

I _____ (Design Reviewer) have been engaged

by _____ (Design Firm) to review all of the work included by the design calculations, specification and drawings

Calculations titled _____ dated _____

Specification titled _____ dated _____

Drawings titled _____ dated _____

Drawing number _____ Revision numbers _____

I _____
(the Design Reviewer)

being an Approved Design reviewer, I have reviewed the design and construction documents supplied by the Designer and agree all matters of difference between the Designer and myself are satisfactorily resolved.

I believe on reasonable grounds the design work reviewed by me, if constructed according to the details shown on the drawings, in the specification and any other accompanying documents will perform to the design intent determined by the Designer as set down by the Engineer in the consent to construct.

I have sighted the signed Producer Statement PS1 and confirm that the Statement is complete and correct.

This statement is endorsed by_____
(Director and/share holder)

of_____
(Design Firm)

and the employer of the Designer Reviewer.

I/we are member(s) of----------, hold Professional Indemnity insurance of no less than the amount as per the Conditions of Contract and accept that liability under this statement accrues to the Design Firm only.

Signed by the Designer _____ (Signature)

_____ (Date)

Signed on behalf of the Design Review Firm_____ (Signature)

_____(Date)

Notes And Requirements For PS2a – Design Review

1. This Producer Statement shall provide the Engineer reasonable grounds to issue consent for construction of the work. It shall be based on an independent review of the design covered by PS1 – Design.

2. PS2a - Design Review is required from the Design Reviewer who shall be Approved by the Engineer.

3. The Design Reviewer shall be a person and not a Firm and shall have signing authority delegated to him/her from a Director of the Design Reviewer's Firm to undertake the review and sign the PS2a.

4. The Design Reviewer is engaged by the Design Firm to undertake a review of the documents representing the design work. Engineer is not responsible in any part for the commercial arrangements between the Design Firm and the Design Reviewer.

5. From time to time differences of opinion will arise between the Design Reviewer and Designer of the work. Both parties are expected to work together to resolve any difference so that the PS1 and PS2 Statements are submitted to Engineer without conditions.

6. The PI Insurance minimum stated on the PS2a shall be current at the time of submission to Engineer. A certificate of currency shall be appended by the Design Reviewer Firm to the Statement.

7. In the case where a Design Reviewer Firm ceases to trade within 10 years of the construction of the designed work, the Director(s) shall maintain "run-on" insurance to the full value of total Contract sum for the balance of time to 10 years from completion of construction.

Producer Statement PS2b – Design Review Amendment

8

Producer Statement PS2b – Design Review Amendment

This Producer Statement is a variation to PS2a to cover variation to the design content arising out of construction of rockfall support or protection devices for rockfall and boulder roll hazards under Package 10A (RLVMMP/WORKS/10A).. It applies to construction consented by the Engineer.

APPOINTED DESIGN REVIEWER: _____
(Approved Design reviewer named on the Producer Statement PS1 - Design)

ISSUED BY: _____
(Design Reviewer Firm)

TO: _____
(Designer)

OF: _____
(Design Firm)

OWNERS: _____
(Registered owners shown on the Certificate of Title. Individuals, trusts, Trustees, Company Directors)

Consenting Authority – National Building Reasearch Organization, Sri Lanaka

The amendment to the work _____

_____
(Describe the work covered by this Producer Statement in detail)

At _____ (Address)

Lot Number _____ **DP**_____ **C/T Number**_____

I _____ (Design Reviewer) have been engaged

by _____ (Design Firm) to review all of the work included by the design calculations, specification and drawings

VARIATION TO DESIGN CONTENT

Variation No_____
Description_____Date_____

Variation No_____
Description_____Date_____

Variation No_____
Description_____Date_____

Variation No_____
Description_____Date_____

I _____
(the Design Reviewer)

Being an Approved Design reviewer I have reviewed the amendments to the design reviewed under PS2a and viewed the variations at the place of construction.

I believe on reasonable grounds the amendments to the design work reviewed by me, as constructed, will perform to the design intent determined by the Designer as set down by the Engineer in the consent to construct.

I have sighted the signed Producer Statement PS1 and PS4 and confirm that the Statements are complete and correct.

This statement is endorsed by_____
(Director and/share holder)

of_____
(Design Review Firm)

and the employer of the Designer Reviewer.

I/we are member(s) of …….. , hold Professional Indemnity insurance of no less than the amount as per the Conditions of Contract and accept that liability under this statement accrues to the Design Firm only.

Signed by the Design Reviewer _____ (Signature)

_____ (Date)

Signed on behalf of the Design Review Firm_____ (Signature)

_____ (Date)

Notes and Requirements for PS2b – Design Review

1. This Producer Statement shall show the NBRO that variation to the content of the design work which arises out of its construction does not alter the design intent and the basis of the design review. It shall be based on an independent check of the variation to the design covered by the PS2a – Design Review.

2. PS2b - Design Review Amendment is required from the Design Amendment Reviewer and signatory to the PS2a, who shall be an Approved Design reviewer.

3. The Design Amendment Reviewer shall be a person and not a Firm and shall have signing authority delegated to him/her from a Director of the Design Reviewer's Firm to undertake the review and sign the PS2b.

4. The Design Amendment Reviewer is engaged by the Design Firm to undertake a review of the documents representing the design work. NBRO is not responsible in any part for the commercial arrangements between the Design Firm and the Design Amendment Reviewer.

5. The PI Insurance minimum stated on the PS2b shall be current at the time of submission to NBRO. A certificate of currency shall be appended by the Design Amendment Reviewer Firm to the Statement.

6. In the case where a Design Amendment Reviewer Firm ceases to trade within 10 years of the construction of the designed work, the Director(s) shall maintain "run-on" insurance to the full value of total Contract sum for the balance of time to 10 years from completion of construction

SPECIFICATIONS

for

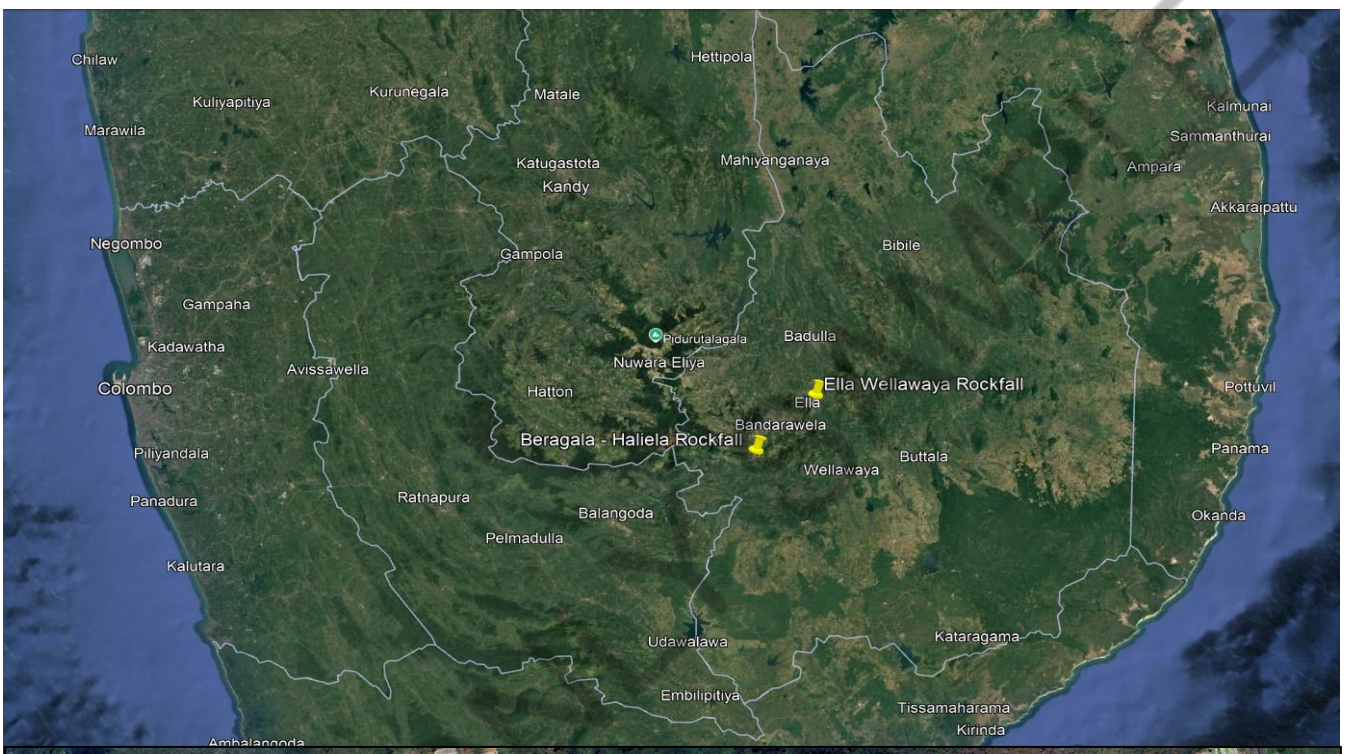
Design and Construction of Rock Fall Protection Works at 03 Locations in Badulla District (Site No. 153, 154,156) under Package 10A of Reduction of Landslide Vulnerability by Mitigation Measures Project (RLVMMP)

(RLVMMP/WORKS/10A)

Note:
This section annexed in a Separate Folder

SITE MAP

No.	District	Site No.	Location	
1	Badulla	157-L1	Beragala-Haliela Road (A016) Between 3.85 Km - Culvert No: 5/8	Between 3.85-4.2 km
		157-L2		Between Culvert No: 5/2-5/6
		157-L3		Between Culvert No: 5/6-5/8)
2	Badulla	156	Ella-Wellawaya Road (A023) Near Culvert 25/1	



No	Location	GPS Coordinate	
156		6.861447° N,	81.054344° E
157-L1	Beragala-Haliela Road (Between 3.85-4.2 km)	6° 45' 32.56" N	80° 56' 48.55" E
157-L2	Beragala-Haliela Road (Between Cul. 5/2-5/6)	6° 55' 39.51"N	80° 56' 53.89" E
157-L3	Beragala-Haliela Road (Between Cul. 5/6-5/8)	6° 45' 43.15" N	80° 57' 01.53" E

Section- VII

FORM OF BID, FORM OF DESIGN/TECHNICAL PROPOSAL, FORM OF PRICE PROPOSAL AND AIIB's COVENANT OF INTEGRITY

FORM OF BID

NAME OF CONTRACT: **Design and Construction of Rock Fall Protection Works on Landslide Mitigation Measures At 03 Locations in Kandy District (Site No. 153, 154, 155) under Package 10A of Reduction of Landslide Vulnerability By Mitigation Measures Project (RlVMMP)**

Contract No: **RLVMMP/WORKS/10A**

To: **The Secretary, Ministry of Defence, Disaster Management Division, Vidya Mawatha, Colombo 07.**

We have examined the Conditions of Contract, Employer's Requirements, Schedules and Addenda Nos. …… for the execution of the above-named Works. We accordingly offer to design, execute and complete the said Works and remedy any defects fit for the purpose, in conformity with the Bidding Documents and the enclosed Proposal, at the lump sum stated in the Form of Price Proposal included in a separate envelope and submitted with this bid, or other such sums as may be determined in accordance with the terms and conditions of the Contract.

We confirm that our bid includes this General Information, Price Proposal, and Design/Technical Proposal sealed under three separate envelopes.

We agree to abide by this Bid until **…….** and it shall remain binding upon us and may be accepted at any time before that date.

We confirm that, we (including all members of a joint venture and subcontractors) are not associated, directly or indirectly, with the consultant or any other entity in preparation of the design, specifications, and other documents for the Contract.

If this offer is accepted, we will provide the specified Performance Security, commence the Works as soon as reasonably practicable after the Commencement Date, and complete the Works in accordance with the above-named documents within the Time for Completion. We will ensure that works will be done in conformity with the contract.

Unless and until a formal Agreement is prepared and executed this Bid, together with your written acceptance thereof, shall constitute a binding Contract between us.

We understand that you are not bound to accept the lowest offer or any other bid you may receive.

Signature of the persons duly authorized to sign documents for and on behalf of

Address:

Date:

FORM OF DESIGN/TECHNICAL PROPOSAL

NAME OF CONTRACT: **Design and Construction of Rock Fall Protection Works on Landslide Mitigation Measures At 03 Locations in Kandy District (Site No. 153, 154, 155) under Package 10A of Reduction of Landslide Vulnerability By Mitigation Measures Project (RlVMMP)**

Contract No: **RLVMMP/WORKS/10A**

To: **The Secretary, Ministry of Defence, Disaster Management Division, Vidya Mawatha, Colombo 07.**

We have examined the Conditions of Contract, Employer's Requirements, Schedules, and Addenda Nos.---------- for the execution of the above-named Works.

We accordingly offer to design, execute and complete the said Works and remedy any defects, fit for purpose in conformity with these Bidding Documents and the enclosed proposal. We are hereby submitting our Bid, which includes this Design/Technical Proposal, General Information and a Financial Proposal sealed under a separate envelopes.

We understand that you are not bound to accept the lowest offer or any other bid you may receive.

Signature of the persons duly authorized to sign documents for and on behalf of

Address:

Date:

FORM OF PRICE PROPOSAL

NAME OF CONTRACT: **Design and Construction of Rock Fall Protection Works on Landslide Mitigation Measures At 03 Locations in Kandy District (Site No. 153, 154, 155) under Package 10A of Reduction of Landslide Vulnerability By Mitigation Measures Project (RlVMMP)**

Contract No: **RLVMMP/WORKS/10A**

To: **The Secretary, Ministry of Defence, Disaster Management Division, Vidya Mawatha, Colombo 07.**

We have examined the Conditions of Contract, Employer's Requirements, Schedules and Addenda Nos. ---------- for the execution of the above-named Works. We accordingly offer to design, execute and complete the said Works and remedy any defects fit for the purpose, in conformity with the Bidding Documents and the enclosed Proposal, for the fix lump sum of ---------- ---------- or other such sums as may be determined in accordance with the terms and conditions of the Contract. The above amounts are in accordance with the Price Schedules herewith and are made part of this bid. We confirm that our bid includes this Price Proposal, Design/Technical Proposal, and General Information sealed under a separate envelopes.

We accept your suggestions for the appointment of the Adjudicator, as set out in Bidding Data.

We agree to abide by this Bid until **……** and it shall remain binding upon us and may be accepted at any time before that date.

We confirm that, we (including all members of a joint venture and subcontractors) are not associated, directly or indirectly, with the consultant or any other entity in preparation of the design, specifications, and other documents for the Contract.

If this offer is accepted, we will provide the specified Performance Security, commence the Works as soon as reasonably practicable after the Commencement Date, and complete the Works in accordance with the above-named documents within the Time for Completion. We will ensure that works will be done in conformity with the contract.

Unless and until a formal Agreement is prepared and executed this Bid, together with your written acceptance thereof, shall constitute a binding Contract between us.

We understand that you are not bound to accept the lowest offer or any other bid you may receive.

Signature of the persons duly authorized to sign documents for and on behalf of

Address:

Date:

* If the Bidder does not accept, this paragraph it may be deleted and replaced with:

We do not accept your suggestion for the appointment of the Adjudicator. We have included our suggestion in the Bid, but this suggestion is not a condition of this offer. If this suggestion is not acceptable to you, we propose that the Adjudicator be jointly appointed in accordance with Sub-Clause 35 of the Instructions to Bidders.

ANNEX -X

AIIB's COVENANT OF INTEGRITY

Invitation of Bids/Proposals/Contract No._____

To:_____

We declare and undertake that neither we nor anyone, including any member of our joint venture or any of our suppliers, contractors, sub-contractors, consultants, sub-consultants, and service providers, where these exist, acting on our behalf with due authority or with our knowledge or consent, or facilitated by us, has engaged, or will engage, in any activity prohibited under AIIB's Policy on Prohibited Practices (AIIB's Policy) in connection with the present procurement process and (in case of award) the execution of the above-referenced contract ("Contract"), including any amendments thereto.

We acknowledge that AIIB's participation in the financing of the Contract is subject to AIIB's Policy. As such, we acknowledge that AIIB will not be able to participate in the financing of the Contract if we, including any member of our joint venture, or any of our suppliers, contractors, sub-contractors, consultants, sub-consultants, and service providers, are ineligible as a result of a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations or are on any of the following lists (AIIB's Sanction Lists):

[add lists and websites]

www.aiib.org/debarment

We shall permit, and shall cause our officers, employees, agents, suppliers, contractors, subcontractors, consultants, sub-consultants, and service providers, to permit the AIIB to inspect all accounts, records, and other documents relating to the procurement process and/or Contract execution (in the case of award), and to have them audited by auditors appointed by AIIB.

Name: _____ In the capacity of: _____

Duly empowered to sign in the name and on behalf of[1]: _____

Signature_____ _____

Dated:_____

[1] In case of joint venture, the name of the joint venture shall be inserted here, and the Covenant shall be signed by the person duly authorized to sign the application, bid or proposal on behalf of the applicant, proposer, bidder or consultant.

Section-VIII

SCHEDULES

Schedule A1 – Preliminary Information

(enclose this Schedule in the envelope marked, "Envelope 1 – General Information")

(i) If pre-qualification is done the bidders are required to include information subsequent to that submitted with the pre-qualification application

(ii) For joint ventures, each joint venture partner shall furnish information separately

ITB clause reference	Description	Information (to be filled by the Bidder)	Remarks
3.1	**ICTAD Registration**		Provide certified copies and label them as attachment to Clause 3.1
	Registration number		
	Grade		
	Spatiality		
	Expiry Date		
3.2	**NCCASL Membership**		Provide certified copies and label them as attachment to Clause 3.2
	Number		
	Expiry Date		
4.1 (a)	**Legal Status**		
	If a Joint Venture, names and addresses of Joint venture partners	1. ---------- 2. ---------- 3. ----------	Provide a certified copy of the Joint Venture Agreement.
	If a Joint Venture, name of the Lead Partner		
	For joint ventures, each joint venture partner shall furnish Legal Status separately		
	Name (Lead partner)		Provide certified copies and label them as attachment
	Legal status		

	Place of registration		to Clause 4.1 (a)
	Principal place of business		
	Written power of attorney of the signatory to the Bid	Provide original or certified copy of the power of attorney attested by a Notary and label them as attachment to Clause 4.1 (a)	
	VAT Registration Number		
	Name (Partner 2)		Provide certified copies and label them as attachment to Clause 4.1 (a)
	Legal status		
	Place of registration		
	Principal place of business		
	Written power of attorney of the signatory to the Bid	Provide original or certified copy of the power of attorney attested by a Notary and label them as attachment to Clause 4.1 (a)	
	VAT Registration Number		
	Name (Partner 3)		Provide certified copies and label them as attachment to Clause 4.1 (a)
	Legal status		
	Place of registration		
	Principal place of business		
	Written power of attorney of the signatory to the Bid	Provide original or certified copy of the power of attorney attested by a Notary and label them as attachment to Clause 4.1 (a)	
	VAT Registration Number		

Schedule A2 – Annual Turn-over Information

(a) (Construction only – Last five years)

(enclose this schedule in envelope marked, " Envelope 1 – General Information")

(i) If pre-qualification is done the bidders are required to include information subsequent to that submitted with the pre-qualification application..

(ii) For joint ventures, each joint venture partner shall furnish information separately.

Year	Turn-over (LKR)	Remarks
1		Attach audited reports and label them as attachment to Clause 4.1 (c) (i)
2		
3		
4		
5		

Schedule A3 – Adequacy of Working Capital

(enclose this schedule in envelope marked, " Envelope 1 – General Information)

If pre-qualification is done the bidders are required to include information subsequent to that submitted with the pre-qualification application

Source of credit line	**Amount (LKR)**	**Remarks**
		Provide documentary evidence and label them as attachment to Clause 4.1(c)(ii)
Total		

b) Schedule A4 – Construction Experience in last five years

(enclose this schedule in envelope marked, " Envelope 1 – General Information)

(i) If pre-qualification is done the bidders are required to include information subsequent to that submitted with the pre-qualification application.

(ii) For joint ventures, each joint venture partner shall furnish information separately.

(iii) List similar works first.

Year	Employer	Description of Works	Amount (LKR)	Contractor's Responsibility (%)
		Total		

c) Schedule A5 – Design Experience in last five years

(enclose this schedule in envelope marked, " Envelope 1 – General Information)

(i) If pre-qualification is done the bidders are required to include information subsequent to that submitted with the pre-qualification application.

(ii) For joint ventures, each joint venture partner shall furnish information separately.

(iii) List similar works first.

Year	Employer	Description of Works	Construction Cost Amount (LKR)	consultancy fee Amount (LKR)	Responsibility (%)
		Total			

Schedule A6 – Major Items of Construction Equipment Proposed

(enclose this schedule in envelope marked,"Envelope1–General Information")

Type	***Capacity***

Schedule B1 – Comments and Suggestions on Employer's Requirements

(enclose this schedule in envelope marked,"Envelope 2–Design and Technical Proposal")

Bidders may include observations made on Employer's Requirements and any suggestions for consideration.

d) Schedule B2 – Contractor's Proposal

(enclose in envelope marked, " Envelope 2 – Design and Technical Proposal")

Sheet 1 of ....

This schedule should be competed considering all the requirements given in the Employer's Requirements, including design criteria, specifications and technical data. (use additional pages if necessary)

Schedule B3 – Team Composition and Task Assignment

(enclose this schedule in envelope marked, " Envelope 2 – Design and Technical Proposal)

A. Design Staff

Name	Position	Task

B. Construction Management Staff

Name	Position	Task

Schedule B4 – Curriculum Vitae of Key Staff *(enclose Curriculum Vitae in envelope marked, " Envelope 2 – Design and Technical Proposal")*	
Proposed Position:	
Name of Staff:	
Profession:	
Date of Birth:	
Membership in Professional Societies:	
Detailed Tasks Assigned:	
Key Qualifications:	*Give an outline of staff members experience most perlinent to tasks or assignment. Describe degree of responsibility held by staff member on relevant previous assignments and give dates and locations. Use half a page.*
Education:	
Employment Record:	
Certification:	*I, the undersigned, certify that to the best of my knowledge and belief,, the information is correct.*
Signature of staff member Date	

*****Important** Relevant proof documents for Professional and Educational Qualifications shall be attached with the CV***

Schedule B5 – Time Schedule for Key Staff

(enclose this schedule in envelope marked, " Envelope 2 – Design and Technical Proposal)

			Months (in the Form of a Bar Chart)															
Name	**Position**	**Activities**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**…**	**21**	**Number of Months**

Full-time:……. Part-time: ……..

Schedule B6 – Work Program (Design Related Activities) *(enclose in envelope marked, " Envelope 2 – Design and Technical Proposal)*															
	[1st, 2nd, etc. are months from the Start Date.]														
Design Activity	1st	2nd	3rd	4th	5th	6th	7th	8th	9th						

Schedule B7 – Work Program (Construction Related Activities)

(enclose this schedule in envelope marked, " Envelope 2 – Design and Technical Proposal)

Sheet 1 of ……

	[1st, 2nd, etc. are months from the Start Date.]														
Construction Activity	1st	2nd	3rd	4th	5th	6th	7th	8th	9th						

Schedule C1 – Price Schedule

(enclose all price schedules in envelope marked, " Envelope 3 – Financial Proposal")

Sheet 1 of …..

Activity 1: Preliminaries

BOQ ITEM	PAY ITEM	DESCRIPTION	UNIT	QTY	RATE (LKR)	AMOUNT (LKR)
1.1		**CONTRACTOR'S SITE ESTABLISHMENT**				
1.1.1	106.4(1)	Mobilization of Contractor's Facilities and Plant/ Equipment	Item	LS		
1.1.2	106.4(2)	De-mobilization of Contractor's Facilities and Plant/Equipment	Item	LS		
1.1.3	106.4(3)	Maintenance of Site establishment for the Contractor	mth	9		
1.2		**TRAFFIC SAFETY & CONTROL**				
1.2.1	101(2)	Management, Safety & Control & Temporary Diversion of Traffic, including provision of a general traffic management plan	**PS**			**12,000,000.00**
1.3		**QUALITY STANDARD & PROGRESS**				
1.3.1	106.5(1)	Monthly Progress Reports	mth	9		
1.4		**PROJECT NAME BOARDS/ PLAQUES**				
1.4.1	106.6(1)	Provide and Maintain project Name Boards	nr	4		
1.4.2	106.6(2)	Project Inauguration Plaque and related services	**PS**			**600,000.00**
1.5		**SERVICES**				
1.5.1	110(1)	Temporary supporting and protecting public utility services during execution of works	**PS**			**3,000,000.00**
1.6		**FACILITIES FOR THE ENGINEER, AND THE EMPLOYER**				
1.6.1		Provision of Engineer's /Employers facilities	**PS**			**5,000,000.00**
1.7		**ENVIRONMENTAL MANAGEMENT**				
1.7.1	2000 (1)	Submission of satisfactory Site Specific Environmental and Social Management Action Plans (SS-ESMAP) and on-site arrangement before commencing	Item	LS		

Schedule C1 – Price Schedule

(enclose all price schedules in envelope marked, " Envelope 3 – Financial Proposal")

Sheet 1 of …..

Activity 1: Preliminaries

BOQ ITEM	PAY ITEM	DESCRIPTION	UNIT	QTY	RATE (LKR)	AMOUNT (LKR)
		the project actions				
1.7.2	2000(2)	Baseline Environmental Monitoring and submission of the report	Item	LS		
1.7.3	2000(4)	Monitoring Environmental Quality Parameters and implementation of Environmental mitigation measures during construction	**PS**			**12,000,000.00**
1.7.4	2000(3)	ESMP Monthly Progress Reports	mth	9		
1.8		**HEALTH & SAFETY**				
1.8.1	2003(1)	Health & Safety measures during construction confirming to the latest industrial standards	mth	9		
1.8.2	2003(2)/ 2003(3)	Awareness Programme for STDs and First Aid and/or any other as instructed by the Engineer	**PS**			**1,500,000.00**
1.9		**UTILITY RELOCATION**				
1.9.1	203(1)	Relocation of utility services as per requirements of the utility service agency	**PS**			**1,500,000.00**
1.10		**CONSTRUCTION MANAGEMENT & STAFF**				
1.10.1	120(1)	Employing all necessary construction management staff & technical supervisory staff	mth	9		
1.11		**DEVELOPMENT OF ACCESS ROADS, REHABILITATION OF ROADS & EXISTING DRAINAGE**				

Schedule C1 – Price Schedule

(enclose all price schedules in envelope marked, " Envelope 3 – Financial Proposal")

Sheet 1 of …..

Activity 1: Preliminaries

BOQ ITEM	PAY ITEM	DESCRIPTION	UNIT	QTY	RATE (LKR)	AMOUNT (LKR)
1.11.1		Development of access roads & Rehabilitation of Road Pavement, drainage and relevant work (items under this work shall comply with CIDA publication SCA - 05 - Second edition [STANDARD SPECIFICATION FOR CONSTRUCTION AND MAINTENANCE OF ROADS AND BRIDGES]	**PS**			**3,000,000.00**
1.12		**TRAINING**				
1.12.1		Conducting necessary training as per the Employer's Requirement	**PS**			**15,000,000.00**
	Total of Bill No 1 - Preliminaries (Transfer to Summary of Bills of Quantities)					

Schedule C1 – Price Schedule

(enclose all price schedules in envelope marked, " Envelope 3 – Financial Proposal")

Sheet 2 of …..

Activity 2: Design

Item No:	Sub-activity description	Amount (LKR)
2.1	**Delivery of Survey and Investigation report**	
	Site 153 - Kandy Mahiyangana Road (A026) Culvert No:17/3 to 31/9	
2.1.1	Between Culvert No: 17/3 to 17/4 RHS (Site 153 L1)	
2.1.2	Between Culvert No: 27 KMP to 28/1 LHS (Site 153 L2)	
2.1.3	Between Culvert No: 29/3 to 29/9 LHS (Site 153 L3)	
2.1.4	Between Culvert No: 31/1 to 31/2 LHS (Site 153 L4)	
2.1.5	Between Culvert No: 31/7 to 31/9 LHS (Site 153 L5)	
	Site 154 - Kandy Mahiyangana Road (A026) Between Culvert No:35/7 to 56/3	
2.1.6	Between Culvert No: 35/7 to 35/9 RHS (Site 154 L1)	
2.1.7	Between Culvert No: 38/4 to 38/5 RHS (Site 154 L2)	
2.1.8	Between Culvert No: 38/8 to 38/9 RHS (Site 154 L3)	
2.1.9	Between Culvert No: 43/8 to 44/1 RHS (Site 154 L4)	
2.1.10	Between Culvert No: 46Km to 47/1 RHS (Site 154 L5)	
2.1.11	Between Culvert No: 54/5 to 54/6 RHS (Site 154 L6)	
2.1.12	Between Culvert No: 56KM (Site 154 L7)	
2.1.13	Between Culvert No: 56/2 to 56/3 LHS (Site 154 L8)	

Item No:	Sub-activity description	Amount (LKR)
	Site 155 - Kandy Mahiyangana Road (A026) Between Culvert No:58/4 to 61/3	
2.1.14	Between Culvert No: 58/4 to 58/5 LHS (Site 155 L1)	
2.1.15	Between 59/6 – 08th Bend RHS (Site 155 L2)	
2.1.16	Between Culvert No: 60KM – 10 Bend RHS (Site 155 L3)	
2.1.17	Between Culvert No: 61KM to 61/3 RHS (Site 155 L4)	
2.2	**Delivery of Design reports and Detailed drawings**	
	Site 153 - Kandy Mahiyangana Road (A026) Culvert No:17/3 to 31/9	
2.2.1	Between Culvert No: 17/3 to 17/4 RHS (Site 153 L1)	
2.2.2	Between Culvert No: 27 KMP to 28/1 LHS (Site 153 L2)	
2.2.3	Between Culvert No: 29/3 to 29/9 LHS (Site 153 L3)	
2.2.4	Between Culvert No: 31/1 to 31/2 LHS (Site 153 L4)	
2.2.5	Between Culvert No: 31/7 to 31/9 LHS (Site 153 L5)	
	Site 154 - Kandy Mahiyangana Road (A026) Between Culvert No:35/7 to 56/3	
2.2.6	Between Culvert No: 35/7 to 35/9 RHS (Site 154 L1)	
2.2.7	Between Culvert No: 38/4 to 38/5 RHS (Site 154 L2)	
2.2.8	Between Culvert No: 38/8 to 38/9 RHS (Site 154 L3)	
2.2.9	Between Culvert No: 43/8 to 44/1 RHS (Site 154 L4)	
2.2.10	Between Culvert No: 46Km to 47/1 RHS (Site 154 L5)	

Item No:	Sub-activity Description	Amount (LKR)
2.2.11	Between Culvert No: 54/5 to 54/6 RHS (Site 154 L6)	
2.2.12	Between Culvert No: 56KM (Site 154 L7)	
2.3.13	Between Culvert No: 56/2 to 56/3 LHS (Site 154 L8)	
	Site 155 - Kandy Mahiyangana Road (A026) Between Culvert No:58/4 to 61/3	
2.1.14	Between Culvert No: 58/4 to 58/5 LHS (Site 155 L1)	
2.1.15	Between 59/6 – 08th Bend RHS (Site 155 L2)	
2.1.16	Between Culvert No: 60KM – 10 Bend RHS (Site 155 L3)	
2.1.17	Between Culvert No: 61KM to 61/3 RHS (Site 155 L4)	
Total for Activity 2 carried to summary		

Schedule C1 – Price Schedule

(enclose all price schedules in envelope marked, "Envelope 3 – Financial Proposal")

Sheet 3 of …..

Activity 3: Construction of Rockfall Mitigation Measures

Item No:	Sub-activity Description	Amount (LKR)
3.1	**Construction of Rockfall Mitigation Measures**	
	Site 153 - Kandy Mahiyangana Road (A026) Culvert No:17/3 to 31/9	
3.1.1	Between Culvert No: 17/3 to 17/4 RHS (Site 153 L1)	
3.1.2	Between Culvert No: 27 KMP to 28/1 LHS (Site 153 L2)	
3.1.3	Between Culvert No: 29/3 to 29/9 LHS (Site 153 L3)	
3.1.4	Between Culvert No: 31/1 to 31/2 LHS (Site 153 L4)	
3.1.5	Between Culvert No: 31/7 to 31/9 LHS (Site 153 L5)	
	Site 154 - Kandy Mahiyangana Road (A026) Between Culvert No:35/7 to 56/3	
3.1.6	Between Culvert No: 35/7 to 35/9 RHS (Site 154 L1)	
3.1.7	Between Culvert No: 38/4 to 38/5 RHS (Site 154 L2)	
3.1.8	Between Culvert No: 38/8 to 38/9 RHS (Site 154 L3)	
3.1.9	Between Culvert No: 43/8 to 44/1 RHS (Site 154 L4)	
3.1.10	Between Culvert No: 46Km to 47/1 RHS (Site 154 L5)	
3.1.11	Between Culvert No: 54/5 to 54/6 RHS (Site 154 L6)	
3.1.12	Between Culvert No: 56KM (Site 154 L7)	
3.1.13	Between Culvert No: 56/2 to 56/3 LHS (Site 154 L8)	

Item No:	Sub-activity Description	Amount (LKR)
	Site 155 - Kandy Mahiyangana Road (A026) Between Culvert No:58/4 to 61/3	
3.1.14	Between Culvert No: 58/4 to 58/5 LHS (Site 155 L1)	
3.1.15	Between 59/6 – 08th Bend RHS (Site 155 L2)	
3.1.16	Between Culvert No: 60KM – 10 Bend RHS (Site 155 L3)	
3.1.17	Between Culvert No: 61KM to 61/3 RHS (Site 155 L4)	
3.2	**Construction of Surface Drain and Subsurface Drain**	
	Site 153 - Kandy Mahiyangana Road (A026) Culvert No:17/3 to 31/9	
3.2.1	Between Culvert No: 17/3 to 17/4 RHS (Site 153 L1)	
3.2.2	Between Culvert No: 27 KMP to 28/1 LHS (Site 153 L2)	
3.2.3	Between Culvert No: 29/3 to 29/9 LHS (Site 153 L3)	
3.2.4	Between Culvert No: 31/1 to 31/2 LHS (Site 153 L4)	
3.2.5	Between Culvert No: 31/7 to 31/9 LHS (Site 153 L5)	
	Site 154 - Kandy Mahiyangana Road (A026) Between Culvert No:35/7 to 56/3	
3.2.6	Between Culvert No: 35/7 to 35/9 RHS (Site 154 L1)	
3.2.7	Between Culvert No: 38/4 to 38/5 RHS (Site 154 L2)	
3.2.8	Between Culvert No: 38/8 to 38/9 RHS (Site 154 L3)	
3.2.9	Between Culvert No: 43/8 to 44/1 RHS (Site 154 L4)	
3.2.10	Between Culvert No: 46Km to 47/1 RHS (Site 154 L5)	
3.2.11	Between Culvert No: 54/5 to 54/6 RHS (Site 154 L6)	

Item No:	Sub-activity Description	Amount (LKR)
3.2.12	Between Culvert No: 56KM (Site 154 L7)	
3.2.13	Between Culvert No: 56/2 to 56/3 LHS (Site 154 L8)	
	Site 155 - Kandy Mahiyangana Road (A026) Between Culvert No:58/4 to 61/3	
3.2.14	Between Culvert No: 58/4 to 58/5 LHS (Site 155 L1)	
3.2.15	Between 59/6 – 08th Bend RHS (Site 155 L2)	
3.2.16	Between Culvert No: 60KM – 10 Bend RHS (Site 155 L3)	
3.2.17	Between Culvert No: 61KM to 61/3 RHS (Site 155 L4)	
Total for Activity 3 carried to summary		

Schedule C2 – Price Schedule

(enclose all price schedules in envelope marked, "Envelope 3 – Financial Proposal")

Sheet … of …..

Dayworks

Item No:	Description	Unit	Qty	Rate (Rs)	Amount (Rs)
	LABOUR				
D.1	Skilled Labour	Hr	300		
D.2	Unskilled Labour	Hr	300		
D.3	Mason	Hr	100		
D.4	Carpenter	Hr	100		
D.5	Steel fixer	Hr	100		
D.6	Mechanic	Hr	100		
D.7	Welder, Fitter	Hr	100		
D.8	Driver	Hr	100		
D.9	Site Supervisor	Hr	100		
D.10	Steel fixer	Hr	100		
D.11	Mechanic	Hr	100		
	MATERIAL				
D.12	Cement	50Kg Bag	50		
D.13	Sand	m^3	25		
D.14	20 mm aggregate	m^3	25		
D.15	Imported soil (Type I)	m^3	25		
D.16	Imported soil (Type II)	m^3	25		
D.17	Gravel (20-200mm)	m^3	25		
D.18	Aggregate (12.5mm)	m3	25		
D.19	Mild steel reinforcement	Kg	2000		
D.20	Tor steel reinforcement	Kg	300		
D.21	PVC pipes 90mm	m	30		
D.22	PVC Pipes 75 mm	m	50		
D.23	Random Rubble (100mm)	m^3	5		

Item No:	Description	Unit	Qty	Rate (Rs)	Amount (Rs)
D.24	Random Rubble (225mm)	m^3	5		
D.25	Timber plywood sheet(12mm)	m^2	10		
D.26	Grade 25 Readymix Concrete	m^3	5		
	PLANT				
D.27	Hydraulic Excavator 130 HP	Hr	50		
D.28	Hydraulic Excavator 200HP	Hr	50		
D.29	Dump Truck/Tipper 20T	Km	1000		
D.30	Tractor/Trailer 100HP	Hr	50		
D.31	Concrete Mixer	Hr	50		
D.32	Air Compressor	Hr	50		
D.33	Soil nailing machine with accessories	Hr	50		
D.34	Crew cab	Hr	50		
D.35	Boom truck	Hr	50		
D.36	Jack hammer	Hr	50		
Total for Day works carried to summary					

Schedule C3 – Percentage for Overheads and profits for Plant, Materials or services to be purchased by the Contractor (if any) under Provisional Sums, in accordance with Sub-Clause 13.4 of Conditions of Contract.

(enclose this schedule in envelope marked, "Envelope 3 – Financial Proposal")

Item Number **(1)**	**Amount of Provisional Sum** **(Rs)** **(2)**	**Percentage** **(%)** *(to be filled by the Bidder)* **(3)**	**Amount of Overhead and Profit** *(to be filled by the bidder)* **(4) = (2) * (3)/100**
Activity 1: Preliminaries			
1.2.1	12,000,000.00		
1.4.2	600,000.00		
1.5.1	3,000,000.00		
1.6.1	5,000,000.00		
1.7.3	12,000,000.00		
1.8.2	1,500,000.00		
1.9.1	1,500,000.00		
1.11.1	3,000,000.00		
1.12.1	15,000,000.00		
Total Overheads and Profits carried to summary			

Schedule C4 – Price Schedule

(enclose this schedule in envelope marked, " Envelope 3 – Financial Proposal")

Sheet … of …..

Summary

Activity No:	Activity description	Amount (Rs)
C1-Activity 1	Preliminaries	
C1-Activity 2	Design	
C1-Activity 3	Construction of Rockfall Mitigation Measures	
	Sub Total	
	Discounts (if Any)	
C2	**Add Day Work Schedule**	
C3	**Add overhead and Profits for Provisional Sums**	
	Add Contingencies 10%	
	Amount carried to Form of Bid (Excluding VAT)	
	Add VAT	
	Total Price (Including VAT)	