



## **GOVERNMENT OF THE DEMOCRATIC SOCIALIST REPUBLIC OF SRI LANKA**

Ministry of Local Government and Provincial Councils  
Eastern Provincial Council  
World Bank Funded Provincial Roads Project  
(The Credit number is 4630 LK)

Bidding Documents  
For  
Package A - Contract No.: EP/ 01  
“( one of two contracts)”

### **Rehabilitation and Improvement of**

Natpaddimunai Pandiruppu Boundary Road	EPAMC 006.
Thuraipathi Amman Kovil Road.	EPAMC 007
Sainthamaruthu Kalmunaikudy Boundary Road	EPAMC 016.
Malwatta - Surippodai Road.	EPAMC 039

# Standard Bidding Document

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## **PART 1 – Bidding Procedures**



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# Section 1 - Instructions to Bidders

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# Section I - Instructions to Bidders

## A. General

1. Scope of Bid
  - 1.1 The Employer, as **indicated in the BDS**, issues this Bidding Document for the procurement of the Works as specified in Section 6 (Employer's Requirements). The name, identification, and number of contracts of this bidding are **provided in the BDS**.
  - 1.2 Throughout this Bidding Document:
    - (a) the term "in writing" means communicated in written form and delivered against receipt;
    - (b) except where the context requires otherwise, words indicating the singular also include the plural and words indicating the plural also include the singular; and
    - (c) "day" means calendar day.
2. Source of Funds
  - 2.1 The Borrower or Recipient (hereinafter called "Borrower") **indicated in the BDS** has applied for or received financing (hereinafter called "funds") from the World Bank (hereinafter called "the Bank") toward the cost of the project **named in the BDS**. The Borrower intends to apply a portion of the funds to eligible payments under the contract(s) for which this Bidding Document is issued.
  - 2.2 Payments by the Bank will be made only at the request of the Borrower and upon approval by the Bank in accordance with the terms and conditions of the financing agreement between the Borrower and the Bank (hereinafter called the Loan Agreement), and will be subject in all respects to the terms and conditions of that Loan Agreement. No party other than the Borrower shall derive any rights from the Loan Agreement or have any claim to the funds.
3. Fraud and Corruption
  - 3.1 It is the Bank's policy to require that Borrowers (including beneficiaries of Bank loans), as well as bidders, suppliers, and contractors and their subcontractors under Bank-financed contracts, observe the highest standard of ethics during the

procurement and execution of such contracts.<sup>1</sup> In pursuance of this policy, the Bank:

- (a) defines, for the purposes of this provision, the terms set forth below as follows:
  - (i) “corrupt practice”<sup>2</sup> is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;
  - (ii) “fraudulent practice”<sup>3</sup> is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
  - (iii) “collusive practice”<sup>4</sup> is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;
  - (iv) “coercive practice”<sup>5</sup> is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
  - (v) “obstructive practice” is
    - (aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to

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<sup>1</sup> In this context, any action taken by a bidder, supplier, contractor, or a sub-contractor to influence the procurement process or contract execution for undue advantage is improper.

<sup>2</sup> “another party” refers to a public official acting in relation to the procurement process or contract execution]. In this context, “public official” includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.

<sup>3</sup> a “party” refers to a public official; the terms “benefit” and “obligation” relate to the procurement process or contract execution; and the “act or omission” is intended to influence the procurement process or contract execution.

<sup>4</sup> “parties” refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non competitive levels.

<sup>5</sup> a “party” refers to a participant in the procurement process or contract execution.

the investigation or from pursuing the investigation; or

(bb) acts intended to materially impede the exercise of the Bank's inspection and audit rights provided for under sub-clause 3.1 (e) below.

- (b) will reject a proposal for award if it determines that the bidder recommended for award has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for the contract in question;
- (c) will cancel the portion of the loan allocated to a contract if it determines at any time that representatives of the Borrower or of a beneficiary of the loan engaged in corrupt, fraudulent, collusive, or coercive practices during the procurement or the execution of that contract, without the Borrower having taken timely and appropriate action satisfactory to the Bank to address such practices when they occur;
- (d) will sanction a firm or individual, including declaring ineligible, either indefinitely or for a stated period of time, to be awarded a Bank-financed contract if it at any time determines that the firm has, directly or through an agent, engaged in corrupt, fraudulent, collusive, coercive or obstructive practices in competing for, or in executing, a Bank-financed contract; and
- (e) will have the right to require that a provision be included in bidding documents and in contracts financed by a Bank loan, requiring bidders, suppliers, and contractors and their sub-contractors to permit the Bank to inspect their accounts and records and other documents relating to the bid submission and contract performance and to have them audited by auditors appointed by the Bank.

3.2 Furthermore, bidders shall be aware of the provision stated in GCC Sub-Clauses 22.2 and 56.2 (h).

#### 4. Eligible Bidders

4.1 A Bidder may be a *natural person*, private entity, or government-owned entity—subject to ITB 4.6—or any combination of them in the form of a joint venture, under an existing agreement, or with the intent to constitute a legally-enforceable joint venture. Unless otherwise **stated in the BDS**, all partners shall be jointly and severally liable for the execution of the Contract in accordance with the Contract terms.

- 4.2 A Bidder, and all parties constituting the Bidder, shall have the nationality of an eligible country, in accordance with Section 5 (Eligible Countries). A Bidder shall be deemed to have the nationality of a country if the Bidder is a citizen or is constituted, or incorporated, and operates in conformity with the provisions of the laws of that country. This criterion shall also apply to the determination of the nationality of proposed subcontractors or suppliers for any part of the Contract including related services.
- 4.3 A Bidder shall not have a conflict of interest. All Bidders found to have a conflict of interest shall be disqualified. A Bidder may be considered to have a conflict of interest with one or more parties in this bidding process, if :
  - (a) they have a controlling partner in common; or
  - (b) they receive or have received any direct or indirect subsidy from any of them; or
  - (c) they have the same legal representative for purposes of this bid; or
  - (d) they have a relationship with each other, directly or through common third parties, that puts them in a position to have access to information about or influence on the Bid of another Bidder, or influence the decisions of the Employer regarding this bidding process; or
  - (e) a Bidder participates in more than one bid in this bidding process. Participation by a Bidder in more than one Bid will result in the disqualification of all Bids in which the party is involved. However, this does not limit the inclusion of the same subcontractor in more than one bid; or
  - (f) a Bidder or any of its affiliates participated as a consultant in the preparation of the design or technical specifications of the contract that is the subject of the Bid; or
  - (g) a Bidder, or any of its affiliates has been hired (or is proposed to be hired) by the Employer or Borrower as Engineer for the contract.
- 4.4 A firm that is under a declaration of ineligibility by the Bank in accordance with *ITB 3 or by the Employer in accordance with ITB 19.8*, at the date of the deadline for bid submission or thereafter, shall be disqualified.
- 4.5 A firm that has been determined to be ineligible by the Bank in relation to the Bank Guidelines On Preventing and Combating

Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants shall be not be eligible to be awarded a contract

- 4.6 Government-owned enterprises in the *Employer*'s country shall be eligible only if they can establish that they are legally and financially autonomous and operate under commercial law, and that they are not a dependent agency of the *Employer*.
- 4.7 Bidders shall provide such evidence of their continued eligibility satisfactory to the *Employer*, as the *Employer* shall reasonably request.
- 4.8 In case a prequalification process has been conducted prior to the bidding process, this bidding is open only to prequalified Bidders.
- 4.9 Firms shall be excluded if:
  - (a) as a matter of law or official regulation, the Borrower's country prohibits commercial relations with that country, provided that the Bank is satisfied that such exclusion does not preclude effective competition for the supply of goods or related services required; or
  - (b) by an act of compliance with a decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower's country prohibits any import of goods or contracting of works or services from that country or any payments to persons or entities in that country.

## 5. Eligible Materials, Equipment and Services

- 5.1 The materials, equipment and services to be supplied under the Contract shall have their origin in eligible source countries as defined in ITB 4.2 above and all expenditures under the Contract will be limited to such materials, equipment, and services. At the *Employer*'s request, Bidders may be required to provide evidence of the origin of materials, equipment and services.
- 5.2 For purposes of ITB 5.1 above, "origin" means the place where the materials and equipment are mined, grown, produced or manufactured, and from which the services are provided. Materials and equipment are produced when, through manufacturing, processing, or substantial or major assembling of components, a commercially recognized product results that differs substantially in its basic characteristics or in purpose or utility from its components.

## B. Contents of Bidding Document

### 6. Sections of Bidding Document

- 6.1 The Bidding Document consist of Parts 1, 2, and 3, which include all the Sections indicated below, and should be read in conjunction with any Addenda issued in accordance with ITB 8.

#### PART 1 Bidding Procedures

- Section I - Instructions to Bidders (ITB)
- Section II - Bid Data Sheet (BDS)
- Section III - Evaluation and Qualification Criteria
- Section IV - Bidding Forms
- Section V - Eligible Countries

#### PART 2 Requirements

- Section VI - Works Requirements

#### PART 3 Conditions of Contract and Contract Forms

- Section VII - General Conditions (GC)
- Section VIII - Particular Conditions (PC)
- Section IX - Contract Forms

### 7. Clarification of Bidding Document, Site Visit, Pre-Bid Meeting

- 6.2 The Invitation for Bids issued by the *Employer* is not part of the Bidding Document.
- 6.3 The *Employer* is not responsible for the completeness of the Bidding Document and their Addenda, if they were not obtained directly from the source stated by the *Employer* in the Invitation for Bids.
- 6.4 The Bidder is expected to examine all instructions, forms, terms, and specifications in the Bidding Document. Failure to furnish all information or documentation required by the Bidding Document may result in the rejection of the bid.
- 7.1 A prospective Bidder requiring any clarification of the Bidding Document shall contact the *Employer* in writing at the *Employer*'s address **indicated in the BDS** or raise his inquiries during the pre-bid meeting if provided for in accordance with ITB 7.4. The *Employer* will respond in writing to any request for clarification, provided that such request is received prior to the deadline for submission of bids, within a period **given in the BDS**. The *Employer* shall forward copies of its response to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3, including a description of the inquiry but without identifying its source. Should the *Employer* deem it necessary to amend the Bidding Document as a result of a request for clarification, it shall do so following the procedure under ITB 8 and ITB 22.2.

- 7.2 The Bidder is encouraged to visit and examine the Site of Works and its surroundings and obtain for itself, on its own risk and responsibility, all information that may be necessary for preparing the bid and entering into a contract for construction of the Works. The costs of visiting the Site shall be at the Bidder's own expense.
  - 7.3 The Bidder and any of its personnel or agents will be granted permission by the *Employer* to enter upon its premises and lands for the purpose of such visit, but only upon the express condition that the Bidder, its personnel, and agents will release and indemnify the *Employer* and its personnel and agents from and against all liability in respect thereof, and will be responsible for death or personal injury, loss of or damage to property, and any other loss, damage, costs, and expenses incurred as a result of the inspection.
  - 7.4 The Bidder's designated representative is invited to attend a pre-bid meeting, if **provided for in the BDS**. The purpose of the meeting will be to clarify issues and to answer questions on any matter that may be raised at that stage.
  - 7.5 The Bidder is requested, as far as possible, to submit any questions in writing, to reach the *Employer* not later than one week before the meeting.
  - 7.6 Minutes of the pre-bid meeting, including the text of the questions raised, without identifying the source, and the responses given, together with any responses prepared after the meeting, will be transmitted promptly to all Bidders who have acquired the Bidding Document in accordance with ITB 6.3. Any modification to the Bidding Document that may become necessary as a result of the pre-bid meeting shall be made by the *Employer* exclusively through the issue of an addendum pursuant to ITB 8 and not through the minutes of the pre-bid meeting.
  - 7.7 Nonattendance at the pre-bid meeting will not be a cause for disqualification of a Bidder.
- 8. Amendment of Bidding Document**
- 8.1 At any time prior to the deadline for submission of bids, the *Employer* may amend the Bidding Document by issuing addenda.
  - 8.2 Any addendum issued shall be part of the Bidding Document and shall be communicated in writing to all who have obtained the Bidding Document from the *Employer* in accordance with ITB 6.3.

- 8.3 To give prospective Bidders reasonable time in which to take an addendum into account in preparing their bids, the *Employer* may, at its discretion, extend the deadline for the submission of bids, pursuant to ITB 22.2

### C. Preparation of Bids

- 9. Cost of Bidding** 9.1 The Bidder shall bear all costs associated with the preparation and submission of its Bid, and the *Employer* shall in no case be responsible or liable for those costs, regardless of the conduct or outcome of the bidding process.
- 10. Language of Bid** 10.1 The Bid, as well as all correspondence and documents relating to the bid exchanged by the Bidder and the *Employer*, shall be written in the language **specified in the BDS**. Supporting documents and printed literature that are part of the Bid may be in another language provided they are accompanied by an accurate translation of the relevant passages in the language **specified in the BDS**, in which case, for purposes of interpretation of the Bid, such translation shall govern.
- 11. Documents Comprising the Bid** 11.1 The Bid shall comprise the following:
- (a) Letter of Bid;
  - (b) completed Schedules, in accordance with ITB 12 and 14, or **as stipulated in the BDS**;
  - (c) Bid Security or Bid Securing Declaration, in accordance with ITB 19;
  - (d) alternative bids, at Bidder's option and if permissible, in accordance with ITB 13;
  - (e) written confirmation authorizing the signatory of the Bid to commit the Bidder, in accordance with ITB 20.2;
  - (f) documentary evidence in accordance with ITB 17 establishing the Bidder's qualifications to perform the contract;
  - (g) Technical Proposal in accordance with ITB 16;
  - (h) In the case of a bid submitted by a joint venture (JV), the JV agreement, or letter of intent to enter into a JV including a draft agreement, indicating at least the parts of the Works to be executed by the respective partners; and

(i) Any other document **required in the BDS**.

- 12. Letter of Bid and Schedules** 12.1 The Letter of Bid, Schedules, and all documents listed under Clause 11, shall be prepared using the relevant forms in Section *IV* (Bidding Forms), if so provided. The forms must be completed without any alterations to the text, and no substitutes shall be accepted. All blank spaces shall be filled in with the information requested.
- 13. Alternative Bids** 13.1 Unless otherwise **indicated in the BDS**, alternative bids shall not be considered.
- 13.2 When alternative times for completion are explicitly invited, a statement to that effect will be **included in the BDS**, as will the method of evaluating different times for completion.
- 13.3 When **specified in the BDS** pursuant to ITB 13.1, and subject to ITB 13.4 below, Bidders wishing to offer technical alternatives to the requirements of the Bidding Document must first price the *Employer*'s design as described in the Bidding Document and shall further provide all information necessary for a complete evaluation of the alternative by the *Employer*, including drawings, design calculations, technical specifications, breakdown of prices, and proposed construction methodology and other relevant details. Only the technical alternatives, if any, of the lowest evaluated Bidder conforming to the basic technical requirements shall be considered by the *Employer*.
- 13.4 When **specified in the BDS**, Bidders are permitted to submit alternative technical solutions for specified parts of the Works. Such parts will be **identified in the BDS** and described in Section *VI* (*Employer*'s Requirements). The method for their evaluation will be stipulated in Section *III* (Evaluation and Qualification Criteria).
- 14. Bid Prices and Discounts** 14.1 The prices and discounts quoted by the Bidder in the Letter of Bid and in the Schedules shall conform to the requirements specified below.
- 14.2 The Bidder shall submit a bid for the whole of the works described in ITB 1.1 by filling in prices for all items of the Works, as identified in Section *IV*, Bidding Forms. In case of admeasurement contracts, the Bidder shall fill in rates and prices for all items of the Works described in the Bill of Quantities. Items against which no rate or price is entered by the Bidder will not be paid for by the *Employer* when executed and shall be deemed covered by the rates for other items and prices in the Bill of Quantities.

- 14.3 The price to be quoted in the Letter of Bid shall be the total price of the Bid, excluding any discounts offered.
- 14.4 Unconditional discounts, if any, and the methodology for their application shall be quoted in the Letter of Bid, in accordance with ITB 12.1.
- 14.5 If so indicated in ITB 1.1, bids are invited for individual contracts or for any combination of contracts (packages). Bidders wishing to offer any price reduction for the award of more than one Contract shall specify in their bid the price reductions applicable to each package, or alternatively, to individual Contracts within the package. Price reductions or discounts shall be submitted in accordance with ITB 14.3, provided the bids for all contracts are submitted and opened at the same time.
- 14.6 Unless otherwise **provided in the BDS** and the Conditions of Contract, the prices quoted by the Bidder shall be fixed. If the prices quoted by the Bidder are subject to adjustment during the performance of the Contract in accordance with the provisions of the Conditions of Contract, the Bidder shall furnish the indices and weightings for the price adjustment formulae in the Schedule of Adjustment Data in Section IV (Bidding Forms) and the Employer may require the Bidder to justify its proposed indices and weightings.
- 14.7 All duties, taxes, and other levies payable by the Contractor under the Contract, or for any other cause, as of the date 28 days prior to the deadline for submission of bids, shall be included in the rates and prices and the total bid price submitted by the Bidder.

## **15. Currencies of Bid and Payment**

- 15.1 The currency(ies) of the bid shall be as **specified in the BDS**.
- 15.2 Bidders may be required by the Employer to justify, to the Employer's satisfaction, their local and foreign currency requirements, and to substantiate that the amounts included in the prices shown in the appropriate form(s) of Section IV, in which case a detailed breakdown of the foreign currency requirements shall be provided by Bidders.

## **16. Documents Comprising the Technical Proposal**

- 16.1 The Bidder shall furnish a Technical Proposal including a statement of work methods, equipment, personnel, schedule and any other information as stipulated in Section IV (Bidding Forms), in sufficient detail to demonstrate the adequacy of the Bidders' proposal to meet the work requirements and the completion time.

- 17. Documents Establishing the Qualifications of the Bidder**
- 17.1 To establish its qualifications to perform the Contract in accordance with Section *III* (Evaluation and Qualification Criteria) the Bidder shall provide the information requested in the corresponding information sheets included in Section *IV* (Bidding Forms).
- 17.2 Domestic Bidders, individually or in joint ventures, applying for eligibility for a 7½-percent margin of domestic preference shall supply all information required to satisfy the criteria for eligibility as described in ITB 33.
- 18. Period of Validity of Bids**
- 18.1 Bids shall remain valid for the period **specified in the BDS** after the bid submission deadline date prescribed by the *Employer*. A bid valid for a shorter period shall be rejected by the *Employer* as nonresponsive.
- 18.2 In exceptional circumstances, prior to the expiration of the bid validity period, the *Employer* may request Bidders to extend the period of validity of their bids. The request and the responses shall be made in writing. If a bid security is requested in accordance with ITB 19, it shall also be extended for a corresponding period. A Bidder may refuse the request without forfeiting its bid security. A Bidder granting the request shall not be required or permitted to modify its bid.
- 18.3 In the case of fixed price contracts, if the award is delayed by a period exceeding fifty-six (56) days beyond the expiry of the initial bid validity, the Contract price shall be adjusted by a factor specified in the request for extension. Bid evaluation shall be based on the Bid Price without taking into consideration the above correction.
- 19. Bid Security**
- 19.1 Unless otherwise **specified in the BDS**, the Bidder shall furnish as part of its bid, in original form, either a Bid Securing Declaration or a bid security **as specified in the BDS**. In the case of a bid security, *the amount shall be as specified in the BDS*.
- 19.2 A Bid Securing Declaration shall use the form included in Section IV Bidding Forms.
- 19.3 *If a bid security is specified pursuant to ITB 19.1, the bid security shall be, at the Bidder's option, in any of the following forms:*
- (a) an unconditional guarantee, issued by a bank *or surety*;
- (b) an irrevocable letter of credit;

- (c) a cashier's or certified check; or
- (d) another security **indicated in the BDS**.

from a reputable source from an eligible country. *If the unconditional guarantee is issued by an insurance company or bonding company located outside the Employer's Country, it shall have a correspondent financial institution located in the Employer's Country.* In the case of a bank guarantee, the bid security shall be submitted either using the Bid Security Form included in Section IV (Bidding Forms) or in another substantially similar format approved by the Employer prior to bid submission. In either case, the form must include the complete name of the Bidder. The bid security shall be valid for twenty-eight days (28) beyond the original validity period of the bid, or beyond any period of extension if requested under ITB 18.2.

- 19.4 Any bid not accompanied by an enforceable and *substantially* compliant bid security or *Bid Securing Declaration*, if required in accordance with ITB 19.1, shall be rejected by the Employer as nonresponsive.
- 19.5 If a bid security is specified pursuant to ITB 19.1, the bid security of unsuccessful Bidders shall be returned as promptly as possible upon the successful Bidder's furnishing of the performance security pursuant to ITB 41.
- 19.6 If a bid security is specified pursuant to ITB 19.1, the bid security of the successful Bidder shall be returned as promptly as possible once the successful Bidder has signed the Contract and furnished the required performance security.
- 19.7 The bid security may be forfeited or the Bid Securing Declaration executed:
  - (a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letter of Bid, except as provided in ITB 18.2 or
  - (b) if the successful Bidder fails to:
    - (i) sign the Contract in accordance with ITB 40; or
    - (ii) furnish a performance security in accordance with ITB 41.
- 19.8 The Bid Security or the Bid Securing Declaration of a JV shall be in the name of the JV that submits the bid. If the JV has not been

constituted into a legally-enforceable *JV*, at the time of bidding, the Bid Security or the Bid Securing Declaration shall be in the names of all future partners as named in the letter of intent mentioned in ITB 4.1.

19.9 If a bid security is **not required in the BDS**, and

- (a) if a Bidder withdraws its bid during the period of bid validity specified by the Bidder on the Letter of Bid Form, except as provided in ITB 18.2, or
- (b) if the successful Bidder fails to: sign the Contract in accordance with ITB 40; or furnish a performance security in accordance with ITB 41;

the Borrower may, **if provided for in the BDS**, declare the Bidder disqualified to be awarded a contract by the Employer for a period of time **as stated in the BDS**.

**20. Format and Signing of Bid**

- 20.1 The Bidder shall prepare one original of the documents comprising the bid as described in ITB 11 and clearly mark it "ORIGINAL". Alternative bids, if permitted in accordance with ITB 13, shall be clearly marked "ALTERNATIVE". In addition, the Bidder shall submit copies of the bid in the number **specified in the BDS**, and clearly mark each of them "COPY." In the event of any discrepancy between the original and the copies, the original shall prevail.
- 20.2 The original and all copies of the bid shall be typed or written in indelible ink and shall be signed by a person duly authorized to sign on behalf of the Bidder. This authorization shall consist of a written confirmation as **specified in the BDS** and shall be attached to the bid. The name and position held by each person signing the authorization must be typed or printed below the signature.
- 20.3 Any amendments such as interlineations, erasures, or overwriting shall be valid only if they are signed or initialed by the person signing the bid.

**D. Submission and Opening of Bids**

**21. Sealing and Marking of Bids**

- 21.1 Bidders may always submit their bids by mail or by hand. When so **specified in the BDS**, bidders shall have the option of submitting their bids electronically. Procedures for submission, sealing and marking are as follows:
  - (a) Bidders submitting bids by mail or by hand shall enclose the

original and each copy of the Bid, including alternative bids, if permitted in accordance with ITB 13, in separate sealed envelopes, duly marking the envelopes as "ORIGINAL", "ALTERNATIVE" and "COPY." These envelopes containing the original and the copies shall then be enclosed in one single envelope. The rest of the procedure shall be in accordance with ITB sub-Clauses 22.2 and 22.3.

- (b) Bidders submitting bids electronically shall follow the electronic bid submission procedures **specified in the BDS**.

21.2 The inner and outer envelopes shall:

- (a) bear the name and address of the Bidder;
- (b) be addressed to the Employer as **provided in the BDS** pursuant to ITB 22.1;
- (c) bear the specific identification of this bidding process indicated in accordance with ITB 1.1; and
- (d) bear a warning not to open before the time and date for bid opening.

21.3 If all envelopes are not sealed and marked as required, the *Employer* will assume no responsibility for the misplacement or premature opening of the bid.

## 22. Deadline for Submission of Bids

22.1 Bids must be received by the *Employer* at the address and no later than the date and time **indicated in the BDS**.

22.2 The *Employer* may, at its discretion, extend the deadline for the submission of bids by amending the Bidding Document in accordance with ITB 8, in which case all rights and obligations of the *Employer* and Bidders previously subject to the deadline shall thereafter be subject to the deadline as extended.

## 23. Late Bids

23.1 The *Employer* shall not consider any bid that arrives after the deadline for submission of bids, in accordance with ITB 22. Any bid received by the *Employer* after the deadline for submission of bids shall be declared late, rejected, and returned unopened to the Bidder.

## 24. Withdrawal, Substitution, and Modification of Bids

24.1 A Bidder may withdraw, substitute, or modify its bid after it has been submitted by sending a written notice, duly signed by an authorized representative, and shall include a copy of the authorization in accordance with ITB 20.2, (except that withdrawal notices do not require copies). The corresponding

substitution or modification of the bid must accompany the respective written notice. All notices must be:

- (a) prepared and submitted in accordance with ITB 20 and ITB 21 (except that withdrawal notices do not require copies), and in addition, the respective envelopes shall be clearly marked "WITHDRAWAL," "SUBSTITUTION," "MODIFICATION;" and
- (b) received by the Employer prior to the deadline prescribed for submission of bids, in accordance with ITB 22.

24.2 Bids requested to be withdrawn in accordance with ITB 24.1 shall be returned unopened to the Bidders.

24.3 No bid may be withdrawn, substituted, or modified in the interval between the deadline for submission of bids and the expiration of the period of bid validity specified by the Bidder on the Letter of Bid or any extension thereof.

## 25. Bid Opening

25.1 The *Employer* shall open the bids in public at the address, date and time **specified in the BDS** in the presence of Bidders' designated representatives and anyone who choose to attend. Any specific electronic bid opening procedures required if electronic bidding is permitted in accordance with ITB 21.1, shall be as **specified in the BDS**.

25.2 First, envelopes marked "WITHDRAWAL" shall be opened and read out and the envelope with the corresponding bid shall not be opened, but returned to the Bidder. No bid withdrawal shall be permitted unless the corresponding withdrawal notice contains a valid authorization to request the withdrawal and is read out at bid opening. Next, envelopes marked "SUBSTITUTION" shall be opened and read out and exchanged with the corresponding bid being substituted, and the substituted bid shall not be opened, but returned to the Bidder. No bid substitution shall be permitted unless the corresponding substitution notice contains a valid authorization to request the substitution and is read out at bid opening. Envelopes marked "MODIFICATION" shall be opened and read out with the corresponding bid. No bid modification shall be permitted unless the corresponding modification notice contains a valid authorization to request the modification and is read out at bid opening. Only envelopes that are opened and read out at bid opening shall be considered further.

25.3 All other envelopes shall be opened one at a time, reading out: the name of the Bidder and the Bid Price(s), including any discounts and alternative bids and indicating whether there is a modification; the presence of a bid security or Bid securing

Declaration, if required; and any other details as the *Employer* may consider appropriate. Only discounts and alternative offers read out at bid opening shall be considered for evaluation. No bid shall be rejected at bid opening except for late bids, in accordance with ITB 23.1.

25.4 The *Employer* shall prepare a record of the bid opening that shall include, as a minimum: the name of the Bidder and whether there is a withdrawal, substitution, or modification; the Bid Price, per contract if applicable, including any discounts and alternative offers; and the presence or absence of a bid security, if one was required. The Bidders' representatives who are present shall be requested to sign the record. The omission of a Bidder's signature on the record shall not invalidate the contents and effect of the record. A copy of the record shall be distributed to all Bidders.

## **E. Evaluation and Comparison of Bids**

### **26. Confidentiality**

26.1 Information relating to the examination, evaluation, comparison, and postqualification of bids and recommendation of contract award, shall not be disclosed to Bidders or any other persons not officially concerned with such process until information on Contract award is communicated to all Bidders.

26.2 Any attempt by a Bidder to influence the Employer in the evaluation of the bids or Contract award decisions may result in the rejection of its bid.

26.3 Notwithstanding ITB 25.2, from the time of bid opening to the time of Contract award, if any Bidder wishes to contact the *Employer* on any matter related to the bidding process, it may do so in writing.

### **27. Clarification of Bids**

27.1 To assist in the examination, evaluation, and comparison of the bids, and qualification of the Bidders, the *Employer* may, at its discretion, ask any Bidder for a clarification of its bid. Any clarification submitted by a Bidder that is not in response to a request by the *Employer* shall not be considered. The *Employer*'s request for clarification and the response shall be in writing. No change in the prices or substance of the bid shall be sought, offered, or permitted, except to confirm the correction of arithmetic errors discovered by the *Employer* in the evaluation of the bids, in accordance with ITB 31.

27.2 If a Bidder does not provide clarifications of its bid by the date and time set in the *Employer*'s request for clarification, its bid

may be rejected.

- 28. Deviations, Reservations, and Omissions** 28.1 During the evaluation of bids, the following definitions apply:
- (a) “Deviation” is a departure from the requirements specified in the Bidding Document;
  - (b) “Reservation” is the setting of limiting conditions or withholding from complete acceptance of the requirements specified in the Bidding Document; and
  - (c) “Omission” is the failure to submit part or all of the information or documentation required in the Bidding Document.
- 29. Determination of Responsiveness** 29.1 The *Employer*’s determination of a bid’s responsiveness is to be based on the contents of the bid itself, as defined in ITB11.
- 29.2 A substantially responsive bid is one that meets the requirements of the Bidding Document without material deviation, reservation, or omission. A material deviation, reservation, or omission is one that,
- (a) if accepted, would:
    - (i) affect in any substantial way the scope, quality, or performance of the Works specified in the Contract; or
    - (ii) limit in any substantial way, inconsistent with the Bidding Document, the *Employer*’s rights or the Bidder’s obligations under the proposed Contract; or
  - (b) if rectified, would unfairly affect the competitive position of other Bidders presenting substantially responsive bids.
- 29.3 The *Employer* shall examine the technical aspects of the bid submitted in accordance with ITB 16, Technical Proposal, in particular, to confirm that all requirements of Section 6 (*Employer*’s Requirements) have been met without any material deviation, reservation or omission.
- 29.4 If a bid is not substantially responsive to the requirements of the Bidding Document, it shall be rejected by the *Employer* and may not subsequently be made responsive by correction of the material deviation, reservation, or omission.
- 30. Nonconformities, Errors, and Omissions** 30.1 Provided that a bid is substantially responsive, the *Employer* may waive any nonconformities in the bid.

- 30.2 Provided that a bid is substantially responsive, the *Employer* may request that the Bidder submit the necessary information or documentation, within a reasonable period of time, to rectify nonmaterial nonconformities in the bid related to documentation requirements. Requesting information or documentation on such nonconformities shall not be related to any aspect of the price of the bid. Failure of the Bidder to comply with the request may result in the rejection of its bid.
- 30.3 Provided that a bid is substantially responsive, the *Employer* shall rectify quantifiable nonmaterial nonconformities related to the Bid Price. To this effect, the Bid Price may be adjusted, for comparison purposes only, to reflect the price of a missing or non-conforming item or component. The adjustment shall be made using the methods indicated in Section III (Evaluation and Qualification Criteria).
- 31. Correction of Arithmetical Errors**
- 31.1 Provided that the bid is substantially responsive, the *Employer* shall correct arithmetical errors on the following basis:
- (a) only for unit price contracts, if there is a discrepancy between the unit price and the total price that is obtained by multiplying the unit price and quantity, the unit price shall prevail and the total price shall be corrected, unless in the opinion of the Employer there is an obvious misplacement of the decimal point in the unit price, in which case the total price as quoted shall govern and the unit price shall be corrected;
  - (b) if there is an error in a total corresponding to the addition or subtraction of subtotals, the subtotals shall prevail and the total shall be corrected; and
  - (c) if there is a discrepancy between words and figures, the amount in words shall prevail, unless the amount expressed in words is related to an arithmetic error, in which case the amount in figures shall prevail subject to (a) and (b) above.
- 31.2 If the Bidder that submitted the lowest evaluated bid does not accept the correction of errors, its bid shall be declared non-responsive.
- 32. Conversion to Single Currency**
- 32.1 For evaluation and comparison purposes, the currency(ies) of the bid shall be converted into a single currency as **specified in the BDS**.
- 33. Margin of Preference**
- 33.1 A margin of preference shall not apply, **unless otherwise specified in the BDS**.

33.2 Domestic bidders shall provide all evidence necessary to prove that they meet the following criteria to be eligible for a 7½ percent margin of preference in the comparison of their bids with those of bidders who do not qualify for the preference. They should:

- (a) be registered within the country of the Employer's country ;
- (b) have majority ownership by nationals of the country of the Employer's country ;
- (c) not subcontract more than 10 percent of the Contract Price, excluding provisional sums, to foreign contractors.

33.3 The following procedure shall be used to apply the margin of preference:

- (a) Responsive bids shall be classified into the following groups:
  - (i) Group A: bids offered by domestic bidders and joint ventures meeting the criteria of ITB Sub-Clause 33.2; and
  - (ii) Group B: all other bids.
- (b) For the purpose of further evaluation and comparison of bids only, an amount equal to 7½ percent of the evaluated Bid prices determined in accordance with ITB Sub-Clause 33.2 shall be added to all bids classified in Group B.

#### **34. Evaluation of Bids**

34.1 The *Employer* shall use the criteria and methodologies listed in this Clause. No other evaluation criteria or methodologies shall be permitted.

34.2 To evaluate a bid, the *Employer* shall consider the following:

- (a) the bid price, excluding Provisional Sums and the provision, if any, for contingencies in the Summary Bill of Quantities for admeasurement contracts or Schedule of Prices for lump sum contracts, but including Daywork items, where priced competitively;
- (b) price adjustment for correction of arithmetic errors in accordance with ITB 31.1;
- (c) price adjustment due to discounts offered in accordance with ITB 14.3;
- (d) converting the amount resulting from applying (a) to (c) above,

- if relevant, to a single currency in accordance with ITB 32;
- (e) adjustment for nonconformities in accordance with ITB 30.3;
  - (f) application of all the evaluation factors indicated in Section III (Evaluation and Qualification Criteria);
- 34.3 The estimated effect of the price adjustment provisions of the Conditions of Contract, applied over the period of execution of the Contract, shall not be taken into account in bid evaluation.
- 34.4 If this Bidding Document allows Bidders to quote separate prices for different contracts, and to award multiple contracts to a single Bidder, the methodology to determine the lowest evaluated price of the contract combinations, including any discounts offered in the Letter of Bid, is specified in Section III (Evaluation and Qualification Criteria).
- 34.5 If the bid for an admeasurement contract, which results in the lowest Evaluated Bid Price, is seriously unbalanced, front loaded or substantially below updated estimates in the opinion of the *Employer*, the *Employer* may require the Bidder to produce detailed price analyses for any or all items of the Bill of Quantities, *to demonstrate the internal consistency of those prices with the construction methods and schedule proposed. After evaluation of the price analyses, taking into consideration the schedule of estimated Contract payments, the Employer may require that the amount of the performance security be increased at the expense of the Bidder to a level sufficient to protect the Employer against financial loss in the event of default of the successful Bidder under the Contract.*
- 35. Comparison of Bids**
- 35.1 The *Employer* shall compare all substantially responsive bids in accordance with ITB 34.2 to determine the lowest evaluated bid.
- 36. Qualification of the Bidder**
- 36.1 The *Employer* shall determine to its satisfaction whether the Bidder that is selected as having submitted the lowest evaluated and substantially responsive bid meets the qualifying criteria specified in Section III (Evaluation and Qualification Criteria).
- 36.2 The determination shall be based upon an examination of the documentary evidence of the Bidder's qualifications submitted by the Bidder, pursuant to ITB 17.1.
- 36.3 An affirmative determination of qualification shall be a prerequisite for award of the Contract to the Bidder. A negative determination shall result in disqualification of the bid, in which event the *Employer* shall proceed to the next lowest evaluated

bid to make a similar determination of that Bidder's qualifications to perform satisfactorily.

- 37. Employer's Right to Accept Any Bid, and to Reject Any or All Bids** 37.1 The *Employer* reserves the right to accept or reject any bid, and to annul the bidding process and reject all bids at any time prior to contract award, without thereby incurring any liability to Bidders. In case of annulment, all bids submitted and specifically, bid securities, shall be promptly returned to the Bidders.

## F. Award of Contract

- 38. Award Criteria** 38.1 *Subject to ITB 37.1*, the *Employer* shall award the Contract to the Bidder whose offer has been determined to be the lowest evaluated bid and is substantially responsive to the Bidding Document, provided further that the Bidder is determined to be qualified to perform the Contract satisfactorily.
- 39. Notification of Award** 39.1 Prior to the expiration of the period of bid validity, the *Employer* shall notify the successful Bidder, in writing, via the Letter of Acceptance included in the Contract Forms, that its bid has been accepted. At the same time, the *Employer* shall also notify all other Bidders of the results of the bidding, and shall publish in UNDB online and in the dgMarket the results identifying the bid and lot numbers and the following information: (i) name of each Bidder who submitted a Bid; (ii) bid prices as read out at Bid Opening; (iii) name and evaluated prices of each Bid that was evaluated; (iv) name of bidders whose bids were rejected and the reasons for their rejection; and (v) name of the winning Bidder, and the Price it offered, as well as the duration and summary scope of the contract awarded.
- 39.2 Until a formal contract is prepared and executed, the notification of award shall constitute a binding Contract.
- 39.3 The Employer shall promptly respond in writing to any unsuccessful Bidder who, after notification of award in accordance with ITB 39.1, requests in writing the grounds on which its bid was not selected.
- 40. Signing of Contract** 40.1 Promptly upon notification, the *Employer* shall send the successful Bidder the Contract Agreement.
- 40.2 Within twenty-eight (28) days of receipt of the Contract Agreement, the successful Bidder shall sign, date, and return it to the *Employer*.

- 41. Performance Security**
- 41.1 Within twenty-eight (28) days of the receipt of notification of award from the *Employer*, the successful Bidder shall furnish the performance security in accordance with the conditions of contract, subject to ITB 34.5, using for that purpose the Performance Security Form included in Section IX (Contract Forms), or another form acceptable to the *Employer*. *If the performance security furnished by the successful Bidder is in the form of a bond, it shall be issued by a bonding or insurance company that has been determined by the successful Bidder to be acceptable to the Employer. A foreign institution providing a bond shall have a correspondent financial institution located in the Employer's Country.*
- 41.2 Failure of the successful Bidder to submit the above-mentioned Performance Security or to sign the Contract Agreement shall constitute sufficient grounds for the annulment of the award and forfeiture of the bid security. In that event the *Employer* may award the Contract to the next lowest evaluated Bidder whose offer is substantially responsive and is determined by the *Employer* to be qualified to perform the Contract satisfactorily.
- 41.3 The above provision shall also apply to the furnishing of a domestic preference security if so required.
- 42. Adjudicator**
- 42.1 The Employer proposes the person **named in the BDS** to be appointed as Adjudicator under the Contract, at the hourly fee **specified in the BDS**, plus reimbursable expenses. If the Bidder disagrees with this proposal, the Bidder should so state in his Bid. If, in the Letter of Acceptance, the Employer does not agree on the appointment of the Adjudicator, the Employer will request the Appointing Authority designated in the Particular Conditions of Contract (PCC) pursuant to Clause 23.1 of the General Conditions of Contract (GCC), to appoint the Adjudicator.

## Section II - Bid Data Sheet (BDS)

### A. Introduction

<b>ITB 1.1</b>	<p>The Employer is <i>Eastern Provincial Council, Trincomalee, Sri Lanka.</i></p> <p><b>Telephone:</b> 026-2223915-20</p> <p><b>Facsimile Number:</b> 026-2220000</p> <p><b>Electronic mail address:</b> <a href="mailto:epcs@sltnet.lk">epcs@sltnet.lk</a></p>										
<b>ITB 1.1</b>	<p>The name of the NCB is: Rehabilitation and Improvement of the Roads in the Eastern Province as mentioned below under Package A.</p> <p>Under Package A, bids are being invited for two contracts as mentioned below in slice and package. Bidding documents will be issued separately for each package.</p> <p>The identification numbers of the NCB is: Package A – EP-01 &amp; EP-04</p> <p>The numbers and identification of Contracts comprising this NCB is:</p> <p>Contract 1.- Package A -EP-01</p> <table> <tr> <td>Natpaddimunai Pandiruppu Boundary Road</td> <td>EPAMC 006</td> </tr> <tr> <td>Thuraipathi Amman Kovil road</td> <td>EPAMC 007</td> </tr> <tr> <td>Sainthamaruthu Kalmunaikudy Boundary Road</td> <td>EPAMC 016.</td> </tr> <tr> <td>Malwatta - Surippodai Road.</td> <td>EPAMC 039</td> </tr> </table> <p>Contract 2- Package A- EP-04</p> <table> <tr> <td>Damana - Ambalanoya - Pannalgama Road.</td> <td>EPAMC130</td> </tr> </table>	Natpaddimunai Pandiruppu Boundary Road	EPAMC 006	Thuraipathi Amman Kovil road	EPAMC 007	Sainthamaruthu Kalmunaikudy Boundary Road	EPAMC 016.	Malwatta - Surippodai Road.	EPAMC 039	Damana - Ambalanoya - Pannalgama Road.	EPAMC130
Natpaddimunai Pandiruppu Boundary Road	EPAMC 006										
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Sainthamaruthu Kalmunaikudy Boundary Road	EPAMC 016.										
Malwatta - Surippodai Road.	EPAMC 039										
Damana - Ambalanoya - Pannalgama Road.	EPAMC130										
<b>ITB 2.1</b>	The Borrower is: <b>Government of the Democratic Socialist Republic of Sri Lanka</b>										
<b>ITB 2.1</b>	The name of the Project is: <b>Provincial Roads Project,</b>										
<b>ITB 4.1</b>	The individuals or firms in a JV “ <b>shall</b> ” be jointly and severally liable.										

### B. Bidding Documents

<b>ITB 7.1</b>	<p>For <b>clarification purposes</b> only, the Employer's address is:</p> <p>Attention: Provincial Director, Road Development Department ,</p> <p>Street Address: Green Road</p> <p>Floor/Room number:</p> <p>City: Trincomalee</p>
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	<p>ZIP Code:</p> <p>Country: Sri Lanka</p> <p>Telephone: : <b>026-2220685, 077-3876361</b></p> <p>Facsimile number: <b>026-2222878</b></p> <p>Electronic mail address: <b><i>eproad@slt.net.lk</i></b></p> <p>Requests for clarification should be received by the Employer no later than: <b>Nine(9) days prior to the deadline for submission of bids</b></p>
<b>ITB 7.4</b>	<p>A Pre-Bid meeting “<b>shall</b>” take place at the following date, time and place:</p> <p>Date : 12.05.2011</p> <p>Time: 1000Hrs</p> <p>Place: Provincial Director’s Office, Road Development Department , Green Road, Trincomalee</p> <p>A site visit conducted by the Employer “<b>shall be</b>” organized.</p>

### C. Preparation of Bids

<b>ITB 10.1</b>	The language of the bid is: <b><i>English</i></b>
<b>ITB 11.1 (b)</b>	<p>The following schedules shall be submitted with the bid:</p> <p><i>i) Priced Bill of Quantities</i></p>
<b>ITB 11.1</b>	<p>The Bidder shall submit with its bid the following additional documents:</p> <p><b>i) A copy of the valid certificate of registration from the deadline for submission of bids until the expiry of the original validity of the bid, with the Institute for Construction training and Development (ICTAD), Sri Lanka under grade C2 in the field of Highways. (Applicable to all the national bidders and to all the national contractors who are partners or intended partners of a Joint Venture).</b></p> <p><b>ii) Evidence of VAT registration number (The bidders not registered for VAT should produce a letter to that effect from the Inland Revenue Department)</b></p>
<b>ITB 13.1</b>	Alternative bids “ <b>shall not be</b> ” permitted.
<b>ITB 13.2</b>	<p>Alternative times for completion “<b>shall not be</b>” permitted.</p> <p>If alternative times for completion are permitted, the evaluation method will be as specified in Section III (Evaluation and Qualification Criteria):</p>

	<b>Not applicable</b>
<b>ITB 13.4</b>	Alternative technical solutions shall be permitted for the following parts of the Works: <b>None</b>  If alternative technical solutions are permitted, the evaluation method will be as specified in Section III (Evaluation and Qualification Criteria).: <b>Not applicable</b>
<b>ITB 14.6</b>	The prices quoted by the Bidder " <b>shall be</b> " subject to adjustment during the performance of the Contract.
<b>ITB 15.1</b>	The prices shall be quoted by the bidder in: <b>Sri Lankan Rupees</b>
<b>ITB 18.1</b>	The bid validity period shall be: <b>119 days</b> after the bid submission deadline date.
<b>ITB 19.1</b>	The Bidder shall furnish a bid security in the amount of SLRs 6 Mil (Sri Lankan Rupees six million). A Bid Securing Declaration shall not be acceptable.
<b>ITB 19.3(a)</b>	The bid security shall:  (a) be issued by a commercial bank registered with the Central Bank of Sri Lanka and located in Sri Lanka.  b) in the case of a bank guarantee, be in accordance with the form of Bid Security included in section IV – "Bidding Forms".  c) Remain valid for a period of 28 days beyond the validity period of the bids; <b>i.e up to 3<sup>rd</sup> November 2011</b>
<b>ITB 19.3 (d)</b>	Other types of acceptable bid securities: <b>None</b>
<b>ITB 20.1</b>	In addition to the original of the bid, the number of copies is: <b>Two</b>
<b>ITB 20.2</b>	The written confirmation of authorization to sign on behalf of the Bidder shall indicate:  (a) Legal Power of Attorney of the signatory of the Bid to commit the Bidder  b) <i>In the case of Bids submitted by an existing or intended JV an undertaking signed by all parties (i) stating that all parties shall be jointly and severally liable, if so required in accordance with ITB 4.1 and (ii) nominating a Representative who shall have the authority to conduct all business for and on behalf of any and all the parties of the JV during the bidding process and, in the event the JV is awarded the Contract, during contract execution."</i>

#### D. Submission and Opening of Bids

<b>ITB 21.1</b>	Bidders “ <i>shall not</i> ” have the option of submitting their bids electronically.
<b>ITB 21.1 (b)</b>	If bidders shall have the option of submitting their bids electronically, the electronic bidding submission procedures shall be: <i>Not applicable</i>
<b>ITB 22.1</b>	<p>For <b><u>bid submission purposes</u></b> only, the Employer’s address is:</p> <p>Attention: Provincial Director, Road Development Department ,  Street Address:Green Road  Floor/Room number: -  City: Trincomalee  ZIP Code:  Country: Sri Lanka</p> <p><b>The deadline for bid submission is:</b></p> <p>Date: 9<sup>th</sup> June 2011  Time: 1400 Hrs</p>
<b>ITB 25.1</b>	<p>The bid opening shall take place at: <b><i>the office of the Provincial Director, Roads Development Department</i></b></p> <p>Street Address: Green Road  Floor/Room number: -  City: Trincomalee  Country:Sri Lanka  Date: 9<sup>th</sup> June 2011  Time: 1400 Hrs</p>
<b>ITB 25.1</b>	If electronic bid submission is permitted in accordance with ITB 21.1, the specific bid opening procedures shall be: <i>Not applicable</i>

#### E. Evaluation and Comparison of Bids

<b>ITB 32.1</b>	<b>Not applicable.</b>
<i>ITB 33.1</i>	<b><i>A margin of preference “shall not” apply.</i></b>

<b>ITB 34.4</b>	In reference to ITB 1.1, bidders to quote separately for each contract under Package A, and the methodology to determine the lowest evaluated price of the contract combinations, including any discounts offered in the Letter of Bid Form, is specified in Section III, Evaluation and Qualification Criteria
<b>ITB 40.2</b>	<p>Delete sub clause 40.2 and insert as follows.</p> <p><b>Signing of the Contract shall be done within 28 days of receipt of the contract agreement, jointly by the Employer and the successful Bidder at a place, date and time to be decided by the Employer.</b></p> <p><b>The cost of stamp duty and similar charges if any imposed by law in connection with entry into the Contract Agreement shall be borne by the Contractor.</b></p>
ITB 42.1	<p>The Adjudicator proposed by the Employer is: <b>The adjudicator shall be appointed by the Institute for Construction Training and Development (ICTAD), Sri Lanka, at the request of either the Employer or the Contractor. The hourly fee reimbursable for the Adjudicator will be Rs.5000.00. Hourly fee shall be shared equally by Employer and Contractor.</b></p> <p><b>The appointing authority of the Adjudicator is the Institute for Construction Training and Development (ICTAD), Sri Lanka.</b></p>



## Section III - Evaluation and Qualification Criteria

This section contains all the criteria that the Employer shall use to evaluate bids and qualify Bidders if the bidding was not preceded by a prequalification exercise and post qualification is applied. In accordance with ITB 34 and ITB 36, no other methods, criteria and factors shall be used. The Bidder shall provide all the information requested in the forms included in Section 4, Bidding Forms.

The bidder shall satisfy the requirements given under this section separately for each contract. **The details given in this contract are applicable only to Package A-Contract EP-01.**

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## 1. Evaluation

In addition to the criteria listed in ITB 34.1 (a) – (e) the following criteria shall apply:

### 1.1 Adequacy of Technical Proposal

Evaluation of the Bidder's Technical Proposal will include an assessment of the Bidder's technical capacity to mobilize key equipment and personnel for the contract consistent with its proposal regarding work methods, scheduling, and material sourcing in sufficient detail and fully in accordance with the requirements stipulated in Section VI (Employer's Requirements).

### 1.2 Multiple Contracts

Works are grouped in multiple contracts and pursuant to sub clause 34.4 of the Instructions to Bidders, the employer will evaluate and compare Bids simultaneously on the basis of a contract, or a combination of contracts so as to determine the bid or combination of bids offering the lowest evaluated cost to the Employer by taking into account discount or cross- discount offered by Bidders, if any. For award of multiple contracts to a Bidder, the evaluation will include an assessment of the Bidder's capacity to meet aggregated requirement regarding:

- Financial situation
- Experience
- Current contract commitments (bid capacity)
- Cash-flow capacity
- Equipment to be allocated and
- Personnel to be fielded

### 1.3 Completion Time

An alternative Completion Time, if permitted under ITB 13.2, will be evaluated as follows: **Not Applicable**

### 1.4 Technical Alternatives

Technical alternatives, if permitted under ITB 13.4, will be evaluated as follows: **Not Applicable**

### 1.5 Margin of Preference [Applicable for ICB only]

If a margin of preference shall apply under ITB 33.1, the procedure will be as follows as: **Not Applicable**

## 2. Qualification

Factor	2.1 Eligibility						
Sub-Factor	Requirement	Criteria				Documentation Required	
		Bidder			Joint Venture, Consortium or Association		
		Single Entity	All partners combined	Each partner	At least one partner		
2.1.1 Nationality	Nationality in accordance with ITB 4.2.	Must meet requirement	Existing or intended JV must meet requirement	Must meet requirement	N / A	Form ELI –1.1 and 1.2, with attachments	
2.1.2 Conflict of Interest	No- conflicts of interests as described in ITB 4.3.	Must meet requirement	Existing or intended JV must meet requirement	Must meet requirement	N / A	Letter of Bid	
2.1.3 Bank Ineligibility	Not having been declared ineligible by the Bank as described in ITB 4.4 and 4.5.	Must meet requirement	Existing JV must meet requirement	Must meet requirement	N / A	Letter of Bid	
2.1.4 Government Owned Entity	Compliance with conditions of ITB 4.6	Must meet requirement	Must meet requirement	Must meet requirement	N / A	Form ELI –1.1 and 1.2, with attachments	
2.1.5 Ineligibility based on a United Nations resolution or Borrower's country law	Not having been excluded as a result of the Borrower's country laws or official regulations, or by an act of compliance with UN Security Council resolution, in accordance with ITB 4.9	Must meet requirement	Existing JV must meet requirement	Must meet requirement	N / A	Letter of Bid	

Factor	2.2 Historical Contract Non-Performance					
Sub-Factor	Requirement	Criteria				Documentation Required
		Bidder				
		Single Entity	Joint Venture, Consortium or Association	All partners combined	Each partner	At least one partner
2.2.1 History of non-performing contracts	Non-performance of a contract did not occur within the last five (5) years prior to the deadline for bid submission, based on all information on fully settled disputes or litigation. A fully settled dispute or litigation is one that has been resolved in accordance with the Dispute Resolution Mechanism under the respective contract, and where all appeal instances available to the bidder have been exhausted.	Must meet requirement by itself or as partner to past or existing JV	N / A	Must meet requirement by itself or as partner to past or existing JV	N / A	Form CON - 2
2.2.2 Pending Litigation	All pending litigation shall in total not represent more than fifty percent (50%) of the Bidder's net worth and shall be treated as resolved against the Bidder.	Must meet requirement by itself or as partner to past or existing JV	N / A	Must meet requirement by itself or as partner to past or existing JV	N / A	Form CON – 2

Factor	2.3 Financial Situation						
Sub-Factor	Requirement	Criteria				Documentation Required	
		Bidder			Joint Venture, Consortium or Association		
		Single Entity	All partners combined	Each partner	At least one partner		
2.3.1 Historical Financial Performance	Submission of audited balance sheets or if not required by the law of the bidder's country, other financial statements acceptable to the Employer, for the last five (5) years to demonstrate the current soundness of the bidders financial position and its prospective long term profitability.	Must meet requirement	N / A	Must meet requirement	N / A	Form FIN – 3.1 with attachments	
2.3.2. Average Annual Turnover	Minimum average annual turnover of LKR three hundred and fifty million (LKR 350 million), calculated as total certified payments received for contracts in progress or completed, within the last five(5 ) years	Must meet requirement	Must meet requirement	Must meet fourty percent (40%) of the requirement	Must meet sixty percent (60%) of the requirement	Form FIN –3.2	

Factor	2.3 Financial Situation						
Sub-Factor	Requirement	Criteria				Documentation Required	
		Bidder			Joint Venture, Consortium or Association		
		Single Entity	All partners combined	Each partner	At least one partner		
2.3.3. Financial Resources	<p>The Bidder must demonstrate access to, or availability of, financial resources such as liquid assets, unencumbered real assets, lines of credit, and other financial means, other than any contractual advance payments to meet:</p> <p>(i) The minimum amount of financial resources access to or available of shall be LKR fourty million (LKR 40 million) <b><i>net of other commitments</i></b></p> <p>(ii) Bid Capacity: Bid capacity at the time of bidding shall be more than the Bid Value of the works being bid here. The available bid capacity will be calculated as under:</p> <p>Assessed Available Bid Capacity = <math>(A * N * 1.5 - B)</math> where</p> <p>A = Maximum value of works executed in any one year</p>	Must meet requirement	Must meet requirement	Must meet 40 percent (40%) of the requirement	Must meet 60 percent (60%) of the requirement	Form FIN –3.3	

Factor	2.3 Financial Situation						
Sub-Factor	Criteria				Documentation Required		
	Requirement	Bidder					
		Single Entity	Joint Venture, Consortium or Association	All partners combined	Each partner	At least one partner	
	<p>during the last five years which will take into account the completed as well as works in progress.</p> <p>B = Value at current price level of the existing commitments and on-going works to be completed during the next 12 (twelve) months.</p> <p>N = Number of years prescribed for completion of the works for which the Bids are invited.</p>						

<b>Factor</b>	<b>2.4 Experience</b>						<b>Documentation Required</b>				
	<b>Sub-Factor</b>	<b>Criteria</b>				<b>Bidder</b>					
<b>Requirement</b>		<b>Joint Venture, Consortium or Association</b>			<b>Single Entity</b>						
		<b>All partners combined</b>	<b>Each partner</b>	<b>At least one partner</b>							
2.4.1 General Experience	Experience under contracts in the role of contractor, subcontractor, or management contractor for at least the last five [5] years prior to the applications submission deadline.	Must meet requirement	N / A	Must meet requirement	N / A		Form EXP-4.1				
2.4.2 Specific Experience	(a)Participation as contractor, management contractor, or subcontractor, in at least one (1) contracts within the last five (5 ) years , each with a value of at least Sri Lankan Rupees three hundred and fifty million (LKR 350 Mn), that have been successfully and substantially completed and that are similar to the proposed Works. The similarity shall be based on the physical size, complexity, methods/technology or other characteristics as described in Section VI, Employer's Requirements.	Must meet requirement	Must meet requirements for all characteristics	Must meet 50 percent (50%) of the requirement	N / A		Form EXP 2.4.2(a)				

<i>Factor</i>	<i>2.4 Experience</i>						
	<i>Sub-Factor</i>	<i>Criteria</i>				<i>Documentation Required</i>	
		<i>Requirement</i>	<i>Bidder</i>				
			<i>Single Entity</i>	<i>Joint Venture, Consortium or Association</i>			
				<i>All partners combined</i>	<i>Each partner</i>	<i>At least one partner</i>	
2.4.2 Specific Experience		b) For the above or other contracts executed during the period stipulated in 2.4.2(a) above, a minimum experience in the following key activities:	Must meet requirements	Must meet requirements	Fourty percent (40% )of the requirement	Sixty percent (60%) of the requirement	Form EXP-2.4.2(b)
		Concrete works: 6000 m <sup>3</sup>					
		DBST works: 12000 m <sup>2</sup>					
		ABC Construction: 12000 m <sup>2</sup>					

## 2.5 Personnel

The Bidder must demonstrate that it has the personnel for the key positions that meet the following requirements:

No.	Position	Total Work Experience (years)	In Similar Works Experience (years)
1	Project Manager (Charted Engneer-Civil) one (1)	Ten (10)years (in road works)	Three(3) years experience in DBST works surfacing and aggregate base course)
2	Site Engineer (B.Sc or equivalent –Civil) one(1)	Five (05)years (in road works, and in surveying work)	Two(2) years experience in DBST works surfacing and aggregate base course
3	Environmental and social specialist <b>B.Sc or equivalent (one)</b>	Five (05)years (Environment and social work handling experience)	Two(2) years experience in road work.
4	Site Engineer (B.Sc or equivalent –Civil) one(1)	Five (05)years (Structural /Bridge work experience-)	Two(2) years experience in structural work
5	Site Engineer (B.Sc or equivalent –Civil) one(1)	Five (05)years (Experience in Quality Control work)	Two(2) years experience in DBST works surfacing aggregate base course and structural works
6	Senior Technical officer (NDT /NCT with five years experience or equivalent) One (1) nos	Five(05)years (Note: One technical officer shall have bridge/structural work experience)	Two (02)years experience in bridge/structural work experience
7	Senior Technical officer (NDT /NCT with five years experience or equivalent) Two (02) Nos.	Five(05)years (Note: One technical officer shall have road work experience)	Two (02)years Experience in DBST surfacing and aggregate base course
8	Material technician one	Five (05) years experience of testing in road and structural work.	Two(2) years experience of testing in DBST works surfacing aggregate base course and structural works

The Bidder shall provide details of the proposed personnel and their experience records in the relevant Forms included in Section IV, Bidding Forms.

## 2.6 Equipment

The Bidder must demonstrate that it will have access to the key Contractor's equipment listed hereafter:

### Other Equipment for Road Works

S/No	List of Machineries & Construction Equipments	Qty.
01	Motor Grader – 3m blade minimum 120hp	01 No
03	Tandem Rollers – 7-10 Tons	02 Nos
04	Double Drum Roller – 1-3 Tons	02 Nos
05	Water Bowsers – 6000-10000 Ltrs	02 Nos
06	Tractor mounted Power Broom	01 No
07	JCBs / Backhoe Loaders	03 Nos
08	Excavators – 12 Tons – 20 Tons	02 Nos
09	Farm Tractor Trailer	02 Nos
10	Tippers – Not allowed to transport more than 12 Tons or 5 m <sup>3</sup> of materials. (Applicable only on C,D,E & Local Government roads .However this limitation does not apply to the road under construction under this contract)	04 Nos
11	Compressor – 175 cfm	01 No
12	Tampers – 60-80 Kg	03 Nos
13	Chip Spreader	01 Nos
14	Bitumen Spreader	01 Nos
15	Pneumatic Roller	02 Nos

The Bidder shall provide further details of proposed items of equipment using the relevant Form in Section IV.

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## Section IV - Bidding Forms

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## Letter of Bid

Date: \_\_\_\_\_  
Bidding No.: \_\_\_\_\_  
Invitation for Bid No.: \_\_\_\_\_

To:

We, the undersigned, declare that:

- (a) We have examined and have no reservations to the Bidding Documents, including Addenda issued in accordance with Instructions to Bidders (ITB) Clause 8;
- (b) We offer to execute in conformity with the Bidding Document the following Works:  
(Delete what is inapplicable)

Contract 1. EP-01

Natpaddimunai Pandiruppu Boundary Road	EPAMC 006
Thuraipathi Amman Kovil road.	EPAMC 007
Sainthamaruthu Kalmunaikudy Boundary Road	EPAMC 016
Malwatta - Surippodai Road.	EPAMC 039

Contract 2. -EP-04

Damana - Ambalanoya - Pannalgama Road. EPAMC130

- (c) The total price(s) of our Bid(s), excluding any discounts offered in item  
(d) below is(are): (Bidder to fill as applicable)

➤ Contract 1 (EP-01) – Rupees .....  
.....  
Rs..... )

➤ Contract 2 (EP – 04) – Rupees  
.....  
.....  
Rs. .... )

The discounts offered and the methodology for their application are: \_\_\_\_\_;

- (d) Our bid shall be valid for a period of 119 days from the date fixed for the bid submission deadline in accordance with the Bidding Documents, and it shall remain binding upon us and may be accepted at any time before the expiration of that period;
- (e) If our bid is accepted, we commit to obtain a performance security in accordance with the Bidding Document;
- (f) Our firm, including any subcontractors or suppliers for any part of the Contract, have nationalities from eligible countries;
- (g) We, including any subcontractors or suppliers for any part of the contract, do not have any conflict of interest in accordance with ITB 4.3;
- (h) We are not participating, as a Bidder or as a subcontractor, in more than one bid in this bidding process in accordance with ITB 4.3, other than alternative offers submitted in accordance with ITB 13;
- (i) Our firm, its affiliates or subsidiaries, including any Subcontractors or Suppliers for any part of the contract, has not been declared ineligible by the Bank, under the Employer's country laws or official regulations or by an act of compliance with a decision of the United Nations Security Council;
- (j) We are not a government owned entity / We are a government owned entity but meet the requirements of ITB 4.5;<sup>6</sup>
- (k) We have paid, or will pay the following commissions, gratuities, or fees with respect to the bidding process or execution of the Contract: <sup>7</sup>

Name of Recipient	Address	Reason	Amount
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

- (l) We understand that this bid, together with your written acceptance thereof included in your notification of award, shall constitute a binding contract between us, until a formal contract is prepared and executed;
  - (m) We understand that you are not bound to accept the lowest evaluated bid or any other bid that you may receive; and
  - (n) If awarded the contract, the person named below shall act as Contractor's Representative:
- \_\_\_\_\_

<sup>6</sup> Use one of the two options as appropriate.

<sup>7</sup> If none has been paid or is to be paid, indicate "none".

Name: .....

In the capacity of: .....

Signed: .....

Duly authorized to  
sign the Bid for and on  
behalf of: .....

Date: .....

## **Schedules**

### **Bill of Quantities/ Schedules of Prices**

**Bills of Quantities**

## **BILL OF QUANTITIES**

### **PREAMBLE TO BILL OF QUANTITIES**

1. The Bill of Quantities shall be read in conjunction with the Instructions to Bidders, General and Special Conditions of Contract, Technical Specifications, and Drawings.
2. The quantities given in the Bill of Quantities are estimated and provisional, and are given to provide a common basis for bidding. The basis of payment will be the actual quantities of work ordered and carried out, as measured by the Contractor and verified by the Engineer and valued at the rates and prices given in the priced Bill of Quantities, where applicable, and otherwise at such rates and prices as the Engineer may fix within the terms of the Contract.
3. General directions and descriptions of work and materials are not necessarily repeated nor summarized in the Bill of Quantities. References to the relevant sections of the Contract documentation shall be made before entering prices against each item in the priced Bill of Quantities.
4. Any arithmetic errors in computation or summation will be corrected by the Employer as follows:
  - (a) where there is a discrepancy between amounts in figures and in words, the amount in words will govern; and
  - (b) where there is a discrepancy between the unit rate and the total amount derived from the multiplication of the unit price and the quantity, the unit rate as quoted will govern, unless in the opinion of the Employer, there is an obviously gross misplacement of the decimal point in the unit price, in which event the total amount as quoted will govern and the unit rate will be corrected.
5. In the Bill of Quantities the item description identifies the work covered by the respective items, but the exact nature, location and extent of the work to be performed is to be ascertained by references to the Drawings, Specification and Conditions of Contract as the case may be, read in conjunction with the relevant measurement clauses and confirmed by the Engineer.
6. The rates and prices entered in the Bill of Quantities shall be deemed to be the full inclusive value of the Works covered by the items in the Bill of Quantities including but not limited to the following unless expressly stated otherwise:
  - (a) The supply of labour equipment and all costs in connection therewith;
  - (b) The supply of materials, goods, storage, handling and cost in connection therewith including waste and delivery to site;

- (c) Setting out, providing and maintaining of all survey markers, monuments etc.
  - (d) Establishment and operation of all types of quarries borrow pits etc. and their maintenance and reinstatement of these including expenses connected with royalties, compensation etc.
  - (e) Testing of materials including transport, sampling and submission of test reports.
  - (f) All temporary works:
  - (g) Repairs to any damages caused due to weather or other effects.
  - (h) Maintenance of the works and portions of the site taken over by the Contractor.
  - (i) All general obligations, liabilities and risks involved in the execution of the Works as set out in the Contract Documents:
  - (j) Establishment charges, overheads and profits.
  - (k) All duties, taxes and other levies payable by the Contractor under the Contract, or for any other cause, prevailing 28 days prior to the closing date for Submission of Tenders.
  - (l) Expenditure required for establishment of quality assurance system.
  - (m) Construction and maintenance of any deviation or access roads and all expenses incurred due to passing of the traffic through or around the Site:
  - (n) Cost of negotiations for any land required by the Contractor in addition to that made available to him free of charge;
  - (o) The subsequent removal of the Contractor's site accommodation and quarrying facilities and the reinstatement of the area on completion of the Contract;
  - (p) Water supply and services.
7. A price or rate shall be entered against each quantified or lump sum item, in the Bill of Quantities. The value of items, for which quantities are given, against which no price is entered shall be considered to be covered by or included in other prices or rates entered in the priced Bill of Quantities.
8. A rate shall not be entered against items for which quantities are not provided.

9. Value Added Tax (VAT) shall not be included in the rates or prices to be quoted. A provision shall be made for VAT in the summary sheet of the Bill of Quantities (BOQ). VAT shall not be considered in the evaluation of Bids.
10. A tender which groups several items together in the Bill of Quantities under one price, will not be accepted for evaluation.
11. The Engineer shall, except as otherwise stated, ascertain and determine the value of the Works by measuring net in the units of Bills of Quantities the actual quantities of the Permanent Works as have been executed strictly in accordance with the Contract Documents or further instructions issued by the Engineer. No Works shall be valued which have been executed in excess of the dimension shown on the Drawings or ordered by the Engineer. In particular no working space, temporary works or the operation of constructional plant will be considered unless otherwise directed or shown or detailed in the Contract Documents and Drawings. The measurement of all completed Works shall be as detailed in the Specification and elsewhere in the Contract Documents. The quantity of Work satisfactorily completed under the various items of the Bill of Quantities shall be agreed between the Contractor and the Engineer. Failing such agreement the quantities as determined by the Engineer shall be final and binding on the Contractor and payment shall be made accordingly.
12. Items marked "Provisional" in the Bills of Quantities are provisional and shall not be executed unless instructed by the Engineer. They may be expended wholly or in part as instructed by the Engineer (Sub Clause 13.5 of General Conditions refers).
13. Measurement in longitudinal direction for area or volume shall be taken along the centre line of the road. For areas of one square metre or less there shall not be deduction for individual fixtures in the pavement. Measurement in transverse direction for area or volume shall be taken horizontally as indicated in the Drawings or as determined by the Engineer.
  - (a) Unless otherwise provided measurements for structures shall be in accordance with dimensions shown on the Drawings or as determined by the Engineer.
  - (b) While computing volumes for excavation, embankment and borrow, the average end area method shall be applied and the intervals of sections, unless specified, shall be agreed by the Contractor and the Engineer as reasonably representing the shape.
  - (c) Where the Pay Unit for any structure is specified as a lump sum, such lump sum will be payable in respect of each specified structure constructed. The Contractor shall submit a schedule showing the breakdown for stage payment of all Lump sum items for the approval of the Engineer. The Engineer shall accept or vary the Contractor's submission and his decision on the breakdown of Lump Sum items shall be final.

- (d) Where units of measurements are given in months or weeks, the rate quoted shall be for a full calendar month or week. A part of a month or of a week shall be determined based on the number of calendar days in the particular month or week under consideration.

14. The units of measurement described in the Bill of Quantities are metric units.

Abbreviations used in the Bill of Quantities are as follows :

km	Kilometre
L. m.	Linear metre
cm	Centimetre
mm	Millimetre
Sq. m.	Square metre
Cu. m.	Cubic metre
Nos.	Number
kg	Kilogram
M.T.	Tonne (1000 Kilograms)
Ltr.	Litre
ha.	Hectare
hrs.	Hours
L.S.	Lump Sum
P.S.	Provisional Sum
km. wk	Kilometre Week

15. The schedule of Rates for Labour, Equipment and Materials for Day works shall be for Payment for Works instructed to be performed under the provisions of Contract Conditions Sub Clause 13.6 Day works. The rates shall be payable only for actual labour and equipment time worked and materials used.

- (a) The Rates for Labour and equipment shall include all supervision, tools, consumables (including fuel and lubricants), overtime premiums, overheads, profit and all other costs. The rates for equipment shall include provision of driver, operator or attendant, servicing and maintenance. Actual working time of equipment shall not include periods when the equipment is being transported or is moving to the site of the works or is standing idling or is broken down (i.e. non operational)
- (b) The Rates for Material shall include the cost of purchase, including any customs duty, freight, handling, transportation and all expenses incurred bringing the material to site but exclusive of VAT. Payment for materials actually used in Day works shall be at the schedule Unit Rates and at the percentage rate stated which shall be in respect of all other costs incurred

and profit. The percentage rate is applicable to the Materials rate only and is not applicable to Labour or Equipment Rates.

16. In the event the Contract overruns the stipulated time for completion due to any fault of the Contractor, and it is required to continue with the contract for an extended period, all facilities required for the Engineer and his staff, such as office, housing, vehicles, laboratory testing facilities etc, shall continue to be provided by the Contractor at his own cost. And all actions required to comply with clause 131, General environmental requirements, of the special specification and sub section 6.5, supplementary Information, of section 6 shall be taken by the Contractor at his own cost. Cost of all extensions required for Insurance, Bonds etc shall be borne by the Contractor.
17. The Bidder shall be deemed to have satisfied himself as to the correctness and to the sufficiency of his Bid and the rates and prices quoted in the Bill of Quantities, all of which shall, except in so far as it is otherwise provided in the contract, cover all his obligations under the contract and all matters and things necessary for the proper execution and completion of the works and the remedying of any defects
18. The Contractor shall execute all work required to remedy defects or damage, as may be notified by the employer on or before the expiry date of the Defects Notificatioon Period for the works. Bidder shall be aware that the Performance Certificate will be issued only on satisfactory completion of the Defects Notification Period.
19. The Contractor's attention is drawn to the Central Environmental Authority, terms and conditions, as given in the attached appendix Nos. SP - 11(i), SP -11(ii), SP - 11(iii) etc to the Special Provisions to the Specifications. He shall ensure compliance with these terms and conditions for which no additional payment will be made.
  - (a) The Contractor shall adhere to all environmental requirements given in section 6.5 supplementary information- Part B Environment Management Plan (EMP). If the Contractor fails to comply with these requirements, the Engineer may order a third party to rectify the shortcomings and the Employer shall recover the cost of such works from the Contractor. The Contractor shall ensure compliance with the Terms and Conditions, issued by the Central Environmental Authority when granting clearance for the works to be done. The civil works items in the annexures I, II, III, IV and V of the Environment Management Plan shall be carried out only on the instructions of the Engineer.
20. The Contractor is required to carry out information and education campaign on sexually transmitted decease and HIV/AIDS for the workers. The Contractor, in consultation with the local health authorities, shall also carry out information and education campaigns for the local community including the families of the workers at site with respect to health. Particular reference shall be made with regard to HIV/AIDS and other sexually communicable deceases in these campaigns. The community shall be educated to refrain from activities that can lead to getting infected with any sexually

transmitted deceases. Payment for these activities are deemed to be included within the Contractors rates. (Sub Clause 6.7 of general conditions refers)

21. Should the contractor for the purpose of the Contract desire to provide temporary moorings for his craft and floating plant, he will be allowed to do so in positions and manners approved by the Engineer. The Contractor shall not lay such mooring so as to interfere with the traffic in the waterways and such moorings shall be removed if and when required by the Engineer.
22. The Contractor shall not enter or carry out any work in a place where entry to such places is prohibited by the government eg; forest reserves etc.

**Rehabilitation of Roads – Ampara District**  
**Package A; Contract No. EP-01**

**Bill of Quantities****Summary Sheet**

BILL	DESCRIPTION OF BILL	SUM (Rs.)
1	PRELIMINARY AND GENERAL ITEMS	
2	SITE CLEARANCE	
3	EARTH WORKS	
4	ROAD WORKS	
5	DRAINAGE AND STRUCTURES	
6	INCIDENTALS	
8	BRIDGES AND OTHER STRUCTURES	
	<b>SUB TOTAL - A ( BILL NO: 1 TO 8)</b>	
	<b>ADD : 10% CONTINGENCIES</b>	
	<b>ADD : 20% PRICE CONTINGENCIES</b>	
7	DAY WORKS	
	<b>SUB TOTAL - B</b>	
	<b>TOTAL FOR SPECIFIED PROVINCIAL SUMS</b>	
	<b>GRAND TOTAL - C</b>	
	TO BE CARRIED TO BID SUBMISSION SHEET GIVEN IN SECTION IV - BIDDING FORMS	
	ADD VAT 12%	
	(VAT NO.....)	
	CERTIFIED COPY OF THE VAT REGISTRATION CERTIFICATE SHALL BE ATTACHED	
	<b>BID TOTAL</b>	

Bid total in words :

Name and Address of the Tenderer :

.....  
Signature of the Tenderer.....  
Date

**PROVINCIAL ROADS IMPROVEMENT PROJECT**  
**EASTERN PROVINCE**  
**CONTRACT PACKAGE NO: EP 01**  
**SUMMARY OF PROVISIONAL SUM**

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
1.02	112 (2)	<b><u>RELOCATION OF UTILITIES</u></b>				
2.13		Allow for relocation of public utilities.	P.S.	Sum	238,750.00	238,750.00
2.14						
1.48	134 b (1)	<b><u>GENERAL ENVIRONMENTAL AND SOCIAL REQUIREMENTS</u></b>				
2.11		General Social Requirements	P.S.	Sum	1,000,000.00	1,000,000.00
2.15						
8.01.1	135 (1)	<b><u>BRIDGES AND OTHER STRUCTURES</u></b> <b><u>GENERAL</u></b>				
		Provisional sum for additional boreholes, DCP testing and other bridge investigation work required to preparing bridge working drawings to be approved by the engineer.	P.S.	Sum	500,000.00	500,000.00
8.01.2		Provisional sum for surveys, design calculations and bridge working drawings to be approved by the engineer.	P.S.	Sum	1,200,000.00	1,200,000.00
8.08	302(7)	<b><u>EXCAVATION AND BACKFILLING OF STRUCTURES</u></b>				
		Dewatering	P.S.	Sum	1,500,000.00	1,500,000.00
8.07	302(6)	Construction coffer dam including cribs, sheeting, shoring, bracing and their subsequent removal.	P.S.	Sum	1,000,000.00	1,000,000.00
1.49	135 (1)	<b><u>CONTINGENCY</u></b>				
		Allow for any special tests including site investigations (Provisional Sum).	P.S.	Sum	28,750.00	28,750.00
1.5		Allow for contractor's overheads and profit for above provisional sum items(1.02,1.48, 1.49, 2.11,2.13,2.14,2.15,8.01.1,8.01.2,8.07,8.08).	% of P.S. Items	5,467,500.00		
		<b><u>BILL 01 - TOTAL CARRIED FORWARD TO SUMMARY</u></b>				

**PROVINCIAL ROADS IMPROVEMENT PROJECT**  
**EASTERN PROVINCE**  
**CONTRACT PACKAGE NO: EP 01**

**BILL NO: 1 - PRELIMINARY AND GENERAL ITEMS**

<b>Bill Item</b>	<b>Pay Item/ Spec Ref.</b>	<b>Description</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate (Rs.)</b>	<b>Amount (Rs.)</b>
1.01	103 (1)	<b>TRAFFIC SAFETY AND CONTROL</b> Traffic safety and control.	Month	18.00		
1.02	112 (2)	<b>RELOCATION OF UTILITIES</b> Allow for relocation of public utilities (Provisional Sum).	P.S.	<b>Please see summary of Provisional Sum</b>		
1.03	117 (1)	<b>SETTING OUT, CROSS SECTION SURVEY &amp; DRAWINGS</b> Setting out of proposed centre line of carriage way.	km	18.30		
1.04	117 (2)	Provide cross section survey, longitudinal survey and drawings for road (Scale 1:50).	No.	1,850.00		
1.05	118 (1)	<b>PROJECT SIGN BOARD</b> Provide, maintain and final removal of project signboards (Qty. based on 2 per road).	No.	8.00		
1.06	119 (1)	<b>INSURANCES AND BONDS</b> Provide Insurance of Works.	L.S.	Sum		
1.07	119 (1)	Provide Third Party Insurance.	L.S.	Sum		
1.08	119 (1)	Provide Workman's Compensation Insurance.	L.S.	Sum		
1.09	119 (1)	Provide Insurance of Contractor's Equipment, Materials and Plant (Including against civil disorder risk).	L.S.	Sum		
1.10	119 (2)	Provide Performance Bond.	L.S.	Sum		
1.11	119 (2)	Provide Bank Guarantee for Advance Payment.	L.S.	Sum		
<b>ACCOMMODATION FOR THE TEAM LEADER AND STAFF</b>						
1.12	119 (1)	Accommodation for the Engineer's Representatives. (02 Nos for Phase1 & Phase2)	House Month	N/A		
1.13	119 (2)	Maintenance for the above accommodation.	Week	N/A		
1.14	119 (3)	Providing security for the above accommodation and premises.	Week	N/A		
1.15	119 (4)	Furniture for the above accommodation.	L.S.	N/A		
		<b>To Collection</b>				-

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
1.16	123 (1)	<b>ACCOMMODATION FOR THE ENGINEER'S REPRESENTATIVE STAFF</b> Accommodation for the Engineer's Representative staff.	House Month	18.00		
1.17	123 (2)	Maintenance for the above accommodation.	Week	78.00		
1.18	123 (3)	Providing security for the above accommodation.	Week	78.00		
1.19	123 (4)	Furniture for the above accommodation.	L.S.	Sum		
		<b>OFFICE FOR THE TEAM LEADER AND HIS STAFF</b>				
1.20	121 (1)	Office for the Engineer's Representative and his staff.	House Month	N/A		
1.21	121 (2)	Maintenance for the above office.	Week	N/A		
1.22	121 (3)	Providing security for the above office.	Week	N/A		
1.23	121 (4)	Furniture for the above office.	L.S.	N/A		
		<b>SITE OFFICE FOR THE ENGINEER'S STAFF</b>				
1.24	125 (1)	Site office for the Engineer's staff.	Month	18.00		
1.25	125 (2)	Maintenance for the above office.	Week	78.00		
1.26	125 (3)	Providing security for the above office.	Week	78.00		
1.27	125 (4)	Furniture for the above office.	L.S.	Sum		
		<b>TESTING LABORATORY FOR THE TEAM LEADER'S STAFF</b>				
1.28	124 (1)	Testing Laboratory for the Team Leader's staff.	Month	N/A	-	-
1.29	124 (2)	Maintenance for the above laboratory.	Week	N/A	-	-
1.30	124 (3)	Providing security for the above laboratory.	Week	N/A	-	-
1.31	124 (4)	Furniture for the above laboratory.	L.S.	N/A	-	-
1.32	124 (5)	Testing Equipment as required by Engineer.	P.S.	N/A	-	-
		<b>OTHER FACILITIES FOR THE TEAM LEADER</b>				
1.33	125 (1)	Providing stationary for the Engineer's Representative staff (Provisional Sum).	P.S.	N/A		
1.34	125 (1)	Providing survey equipment for the Team Leader and his staff The Equipments will be the property of employer after completion of work.	P.S.	N/A		
		<b>To Collection</b>				-

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
<b>VEHICLES FOR THE TEAM LEADER, TWO ENGINEER'S REPRESENTATIVES AND HIS STAFF</b>						
1.35	127 (1)	Supply of new 2- wheel drive diesel double cabin pick-up air conditioned, 4 doors as per the document (type 01) (Become the property of the employer at the completion of contract) (01 No)	No	N/A		
1.36	127 (2)	Provide and maintain 2- wheel drive diesel double cabin pick-up as per document with driver - Type 02. Maximum usage 3000Km/ Month - 3Nos (for Team Leader and his staff).	Vehicle Month	N/A		
1.37	130 (2)	Provide and maintain 2- wheel drive diesel double cabin pick-up as per document with driver - Type 01. Usage 3000Km/ Month - 02 Nos.	Vehicle Month	36.00		
1.38	127 (4)	Provide and maintain initially new and 2- wheel driver Van 2500cc (mini) diesel engine air conditioned, 4 doors with driver, fuel etc. Usage maximum 2500Km/ Month (Vehicle type 04) - 01No	Vehicle Month	N/A		
1.39	130 (5)	Provide and maintain initially new and 100cc (minimum) petrol engine motor cycle with fuel service etc. Usage 2500Km/ Month - 02 Nos.	Vehicle Month	36.00		
1.40	127 (6)	Maintenance of above vehicle type 01. vehicle with driver fuel service etc. Maximum usage 3000Km/ Month	Vehicle Month	N/A		
1.41	127 (7)	Mileage excess run by the above type 01vehicle	km	N/A		
1.42	127 (8)	Maintenance of above vehicle Type 03 with driver, fuel, services, replacement of tyres etc.	Vehicle Month	N/A		
1.43	127 (9)	Mileage excess run by the above type 01vehicle	km	N/A		
1.44	130 (7)	Mileage excess run by the above type 02vehicle	km	20,000.00		
1.45	130 (9)	Mileage excess run by the above motor cycle	km	12,000.00		
	<b>To Collection</b>					-

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
1.46	131 (1)	<b>SUPPLY OF CONTRACT PHOTOGRAPHS</b> Album with photographs (minimum 60) and soft copies.	Nos	2.00		
1.47	134 a (1)	<b>GENERAL ENVIRONMENTAL REQUIREMENTS</b> Compliance with the requirements of Section 131: General Environmental Requirements.	Month	18.00		
1.48	134 b (1)	General Social Requirements.	P.S.	<b>Please see summary of Provisional Sum</b>		
1.49	135 (1)	<b>CONTINGENCY</b> Allow for any special tests including site investigations (Provisional Sum).	P.S.	<b>Please see summary of Provisional Sum</b>		
		<b>To Collection</b>				
		<b>PAGE NO 01</b>			<b>Rs.</b>	
		<b>PAGE NO 02</b>			<b>Rs.</b>	
		<b>PAGE NO 03</b>			<b>Rs.</b>	
		<b>PAGE NO 04</b>			<b>Rs.</b>	
		<b>BILL 01 - TOTAL CARRIED FORWARD TO SUMMARY</b>			<b>Rs.</b>	

**PROVINCIAL ROADS IMPROVEMENT PROJECT**  
**EASTERN PROVINCE**  
**CONTRACT PACKAGE NO: EP 01**  
**ROAD NAME: SAINTHAMARUTHU KALMUNAIKUDY BOUNDARY ROAD**

ROAD NO:EPAMC016  
 ROAD LENGTH: 1.05km

**BILL NO: 2 - SITE CLEARANCE**

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
2.01	201(1)	<b>CLEARING AND GRUBBING</b> Clearing and grubbing.	Sq.m	2,870.00		
2.02	201(2)	Removal of trees 300 - 600 mm in girth.	No.	6.00		
2.03	201(3)	Removal of trees 600 - 1200 mm in girth.	No.	15.00		
2.04	201(4)	Removal of trees 1200 - 2000 mm in girth.	No.	6.00		
2.05	201 (5)	Removal of trees over 2000 mm in girth.	No.	NA		
2.06	201 (6)	trees girth 300 to 600mm.	No.	NA		
2.07	201 (7)	Removal of stumps and roots of previously felled trees girth 600 to 1200mm.	No.	NA		
2.08	201 (10)	Removal of over hanging branches girth 300mm and over	No.	NA		
2.09	201(10)b	Removal and disposal of branches girth exceeding 600mm	No.	NA		
2.10	202 (1)	Dismantle the existing brick masonry structures and culvert pipes.(Culvert dismantling measured separately)	Cu.m	N/A		
2.11	134 b (1)	Removing & Reconstruction of Building & other structures	PS	<b>Please see summary of Provisional Sum</b>		
2.12	112 (2)	Removal of existing buildings	Sq.m	N/A		
2.13	112 (2)	Removing & Reconstruction of Electricity Post	PS	<b>Please see summary of Provisional Sum</b>		
2.14	112 (2)	Removing & Reconstruction of Telecom Post	PS	<b>Please see summary of Provisional Sum</b>		
2.15	134 b (1)	Compansation of property	PS	<b>Please see summary of Provisional Sum</b>		
<b>BILL 02 - TOTAL CARRIED FORWARD TO SUMMARY</b>						-

**PROVINCIAL ROADS IMPROVEMENT PROJECT  
EASTERN PROVINCE  
CONTRACT PACKAGE NO: EP 01  
ROAD NAME: SAINTHAMARUTHU KALMUNAIKUDY BOUNDARY ROAD**

**BILL NO: 3 - EARTHWORKS**

ROAD NO:EPAMC016  
ROAD LENGTH: 1.05km

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b><u>ROADWAY EXCAVATION</u></b>				
3.01	301 (1)	Roadway excavation in unclassified soil.	Cu.m	138.00		
3.02	301 (2) a	Roadway excavation in classified soil.	Cu.m	504.00		
3.03	301 (3) a	Roadway excavation in classified soft rock.	Cu.m	14.00		
3.04	301 (3) b	Roadway excavation in classified hard rock.	Cu.m	20.00		
3.05	301 (4)	Roadway excavation in marshy materials.	Cu.m	69.00		
3.06	301 (2) b	Excavation of top soil for re-use.	Cu.m	50.00		
3.07	301 (5)	Dewatering .	Item	Sum		
		<b><u>COMPACTION OF SURFACES</u></b>				
3.08	304 (3)	Compact surfaces exposed by excavation 100% MDD.	Sq.m	1,650.00		
		<b><u>EMBANKMENT</u></b>				
3.08	304 (6)	Replacement of unsuitable material using rock fill.	Cu.m	20.00		
3.10	304 (2) b	Supply, place and compact selected fill material Type I to lines and grades.	Cu.m	50.00		
3.12	304 (2)a	Supply, place and compact selected fill material Type II to lines and grades.	Cu.m	50.00		
3.13	304 (3)	Trimming, levelling and compact existing sub-grade.	Sq.m	100.00		

**PROVINCIAL ROADS IMPROVEMENT PROJECT**  
**EASTERN PROVINCE**  
**CONTRACT PACKAGE NO: EP 01**  
**ROAD NAME: SAINTHAMARUTHU KALMUNAIKUDY BOUNDARY ROAD**

ROAD NO:EPAMC016

ROAD LENGTH: 1.05km

**BILL NO: 4 - ROADWORKS**

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
4.01	401 (1)	<b>SUB-BASE</b> Provide, place, shape and compact sub-base Type I.	Cu.m	413.00		
4.02	401 (1)	Provide, place, shape and compact sub-base Type II.	Cu.m	50.00		
4.03	405 (1)	<b>GRADED AGGREGATE BASE</b> Supply, place, shape and compact dense graded aggregate base (37.5mm maximum size).	Cu.m	1,033.00		
4.04	408 (1), 408 (2), 408 (3)	<b>RECONSTRUCTION OF EXISTING PAVEMENT</b> Scarify shape, supply material and reconstruct existing base.	Sq.m	3,630.00		
4.05	409 (1)	Trench excavation to existing pavement edge repair strengthening treatment and/ or widening including compaction of excavated surface.	Cu.m	220.00		
4.06	409(1)	<b>SHOULDER CONSTRUCTIONS</b> Supply, place, shape and compact materials to	Cu.m	50.00		
4.07	1201(2)	Scarify, trim, shape and compact existing road	Sq.m	100.00		
4.08	409 (3)	Providing filter drains as shown on drawings	L.m	50.00		
4.09	501 (2)	<b>PAVEMENT SURFACING</b> Apply asphaltic prime coat using MC30 cutback bitumen.	Sq.m	5,570.00		
4.10	505 (3) a	SBST with 60/70 bitumen with 20mm aggregate.	Sq.m	N/A		
4.11	505 (3)	DBST with 60/70 bitumen and 14mm and 20mm aggregate.	Sq.m	5,570.00		
4.12	1101 (1)	Surface regulating using Premix (Cold mix MC 30)	Cu.m	N/A		
4.13	502 (2)	Apply asphaltic tack coat.	Sq.m	N/A		
4.14	506 (2) a	Asphalt binding course.	Cu.m	N/A		
4.15	506 (2) b	Asphalt wearing course.	Cu.m	N/A		
<b>BILL 04 - TOTAL CARRIED FORWARD TO SUMMARY</b>						

**PROVINCIAL ROADS IMPROVEMENT PROJECT  
EASTERN PROVINCE  
CONTRACT PACKAGE NO: EP 01  
ROAD NAME:SANTHAMARUTHU KALMUNAIKUDY BOUNDARY ROAD**

ROAD NO:EPAMC016  
ROAD LENGTH: 1.05km

**BILL NO: 5 - DRAINAGE AND STRUCTURES**

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b><u>DRAINAGE</u></b> <b><u>CHANNEL EXCAVATION AND CLEANING</u></b>				
5.01	1303 (1)	Clearing and repairing of culverts including minor repairs as per specification.	No.	5.00		
5.02	701 (1) a	Drain excavation in unclassified soil.	Cu.m	50.00		
5.03	701 (1) b	Drain excavation in classified soft rock	Cu.m	5.00		
5.04	701 (1) c	Drain excavation in classified hard rock	Cu.m	5.00		
5.05	302 (2) a	Excavation for concrete drains in unclassified soil including backfilling.	Cu.m	999.00		
		<b><u>DISMANTLING</u></b>				
5.06	202 (6) a	Removal and disposal of any or all parts of the existing culverts requiring reconstruction, including all necessary measures for maintaining traffic during dismantling or reconstruction.	L.S.	Sum		
5.07	202 (6) b	Removal and disposal of any or all parts of the existing culverts requiring extension, including all necessary measures for maintaining traffic during dismantling.	L.S.	Sum		
		<b><u>EXCAVATION AND BACKFILL FOR STRUCTURE</u></b>				
5.08	302 (1)	Excavation in unclassified soil of structures including backfill for retaining walls, culvert head walls and abutments.	Cu.m	57.00		
5.09	302 (4)	Excavation in marshy materials below the underside of foundations including backfill as directed by the Engineer.	Cu.m	5.00		
		<b><u>CEMENT CONCRETE STRUCTURES</u></b>				
5.10	1001 (2) a	Concrete class B (Grade 25/20) in capping beam, wing walls, culvert's head walls and abutments (Including form work).	Cu.m	12.00		
5.11	1001 (2) b	Concrete class B (Grade 25/20) in extending culvert deck slab and cover slabs (Including form work).	Cu.m	104.00		
5.12	1001 (2) c	retaining walls, culvert headwalls and abutments, drop inlet/outlets to culverts, catchpits, base of RRM drain and other structures (Including form work).	Cu.m	1.00		

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
5.13	1001 (2) d	Concrete class B (Grade 20/20) to collar/ joint between existing culvert and new pipe culvert and in concrete steps, (Including form work).	Cu.m	1.00		
5.14	1001 (3)	Concrete class C (Grade 15/40) in screed and abutment walls (Including form work).	Cu.m	15.00		
5.15	701 (4) a	Construct built-up road side drains (Concrete U drain) complete as detail on drawing (Including formwork, reinforcement and all other necessary work as shown).	Cu.m	444.00		
5.16	701 (4) b	Construct concrete kerb and channel along edges of road formation complete as detail on drawing (Including excavation, formwork, reinforcement and all other necessary work as shown on drawings).	Cu.m	10.00		
5.17	701 (4) c	Construct concrete dish channel along edges of road formation complete as detail on drawing (Including excavation, formwork, reinforcement and all other necessary work as shown on drawings).	Cu.m	95.00		
<b><u>MASONRY WORK</u></b>						
5.18	1006 (1)	Random rubble masonry in retaining walls, head walls, abutments, drainage structure and other structures or part of structures.	Cu.m	15.00		
5.19	1006 (3)	Plastering 20 mm thick cement mortar 1:3 to exposed faces of concrete/ R.R.M walls.	Sq.m	44.00		
<b><u>MISCELLANEOUS</u></b>						
5.20	302 (7)	Dewatering	Item	Sum		
5.21	302 (6)	Construction coffer dam including cribs, sheeting, shoring, bracing and their subsequent removal.	Item	Sum		
<b><u>REINFORCEMENT</u></b>						
5.22	1002 (1) a	Mild steel bars grade 250 in foundation slabs, capping beams, retaining walls, abutments head walls, concrete drains and cover slabs.	M.T.	5.03		
5.23	1002 (1) b	Cold or hot rolled High yield steel bars grade 410 in R.C. foundations of retaining walls, head walls, abutments, deck slabs, concrete drains and cover slabs.	M.T.	1.86		

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
5.24	705 (2) a	<b>POROUS BACKFILL MATERIALS</b> Porous backfill material Type F, (50-150mm), behind abutments and wingwalls.	Cu.m	5.00		
5.25	705 (2) b	Porous backfill material Type G, (4.75-37.5mm) behind Type F porous backfill.	Cu.m	6.00		
5.26	705 (3)	Impervious material clay paddled as drainage cut off under porous backfill, behind abutments, wingwalls and retaining walls.	Sq.m	10.00		
5.27	<b>REINFORCED CONCRETE PIPE CULVERT</b> <u>excavation, backfill materials, formwork, reinforcement and all necessary work as shown on the drawings.</u>					
	Reinforced concrete pipe culvert with reinforced concrete surround as per drawing,					
	707 (3)	i) 450mm diameter pipe.	L.m	NA		
	707 (3)	ii) 600mm diameter pipe.	L.m	NA		
	707 (3)	iii) 900 mm diameter pipe.	L.m	NA		
	707 (3)	iv) 1200 mm diameter pipe.	L.m	NA		
	707 (3)	v) 600 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vi) 900 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vii) 600 mm diameter pipe - Thipple type.	L.m	NA		
	707 (3)	viii) 900 mm diameter pipe - Thipple type.	L.m	NA		
	707 (3)	ix) 900 mm diameter pipe - Four pipe line.	L.m	NA		
	707 (3)	x) 900 mm diameter pipe - Five pipe line.	L.m	NA		
	707 (3)	xi) 900 mm diameter pipe - Six pipe line.	L.m	NA		
5.28	Reinforced concrete pipe culvert with concrete surround as per drawing,				NA	
	707 (3)	i) 450mm diameter pipe.	L.m	NA		
	707 (3)	ii) 600mm diameter pipe.	L.m	NA		
	707 (3)	iii) 900 mm diameter pipe.	L.m	NA		
	707 (3)	iv) 1200 mm diameter pipe.	L.m	NA		
	707 (3)	v) 600 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vi) 900 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vii) 600 mm diameter pipe - Thipple type.	L.m	NA		
	707 (3)	viii) 900 mm diameter pipe - Thipple type.	L.m	NA		
	707 (3)	ix) 900 mm diameter pipe - Four pipe line.	L.m	NA		
	707 (3)	x) 900 mm diameter pipe - Five pipe line.	L.m	NA		
	707 (3)	xi) 900 mm diameter pipe - Six pipe line.	L.m	NA		
5.29	Reinforced concrete pipe culvert with concrete craddle as per drawing (Excluding collar/ Joint),					
	707 (3)	i) 450mm diameter pipe.	L.m	NA		
	707 (3)	ii) 600mm diameter pipe.	L.m	NA		
	707 (3)	iii) 900 mm diameter pipe.	L.m	NA		
	707 (3)	iv) 1200 mm diameter pipe.	L.m	NA		
	707 (3)	v) 600 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vi) 900 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vii) 600 mm diameter pipe - Thipple type.	L.m	NA		

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
	707 (3)	viii) 900 mm diameter pipe - Thipple type.	L.m	NA		
	707 (3)	ix) 900 mm diameter pipe - Four pipe line.	L.m	NA		
	707 (3)	x) 900 mm diameter pipe - Five pipe line.	L.m	NA		
	707 (3)	xi) 900 mm diameter pipe - Six pipe line.	L.m	NA		
5.30	706 (1)	<b>WEEPHOLES</b>	L.m	12.00		
		Weepholes in retaining walls, head walls and abutments, finished with drip ledge and surround - 75mm dia.				
<b>To Collection</b>						
		<b>COLLECTION</b>			<b>Rs.</b>	
		<b>PAGE NO 01</b>			<b>Rs.</b>	
		<b>PAGE NO 02</b>			<b>Rs.</b>	
		<b>PAGE NO 03</b>			<b>Rs.</b>	
		<b>PAGE NO 04</b>			<b>Rs.</b>	
<b>BILL 05 - TOTAL CARRIED FORWARD TO SUMMARY</b>					<b>Rs.</b>	

**PROVINCIAL ROADS IMPROVEMENT PROJECT  
EASTERN PROVINCE  
CONTRACT PACKAGE NO: EP 01  
ROAD NAME:SANTHAMARUTHU KALMUNAIKUDY BOUNDARY ROAD**

ROAD NO:EPAMC016  
ROAD LENGTH: 1.05km

**BILL NO: 6 - INCIDENTALS**

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
6.01	802 (4)	<b><u>ENVIRONMENTAL REQUIREMENT</u></b> Grassing for embankment slope.	Sq.m	-		
6.02	803 (1)	Plant supplied (shading and ornamental plants).	Nos.	11.00		
6.03	803 (2)	fertilizing and maintained during establishment period.	Nos.	11.00		
6.04	804 (1) a	Rip rap rubble paving for culvert outlets as shown on drawing.	Cu.m	1.00		
6.05	804 (1) b	Rip rap rubble paving as a slope protection as shown on drawings.	Cu.m	NA		
6.06	804 (1) c	Dumped rip rap rubble paving as a slope protection as shown on drawings.	Cu.m	NA		
6.07	805 (1)	Supply and construct gabion walls as detail on drawing.	Cu.m	NA		
6.08	808 (1)	<b><u>MISCELLANEOUS</u></b> Guard rail (Road side)	L.m	NA		
6.09	808 (2)	Provide and install guard stone, complete as shown on drawing including all necessary work or as directed by the Engineer.	No.	8.00		
6.10	810 (1)	Reflectorised Thermoplastic Road Markings.	Sq.m	10.00		
6.11	811 (2)	Single pole, sign area upto $0.5\text{ m}^2$	No.	2.00		
6.12	811 (3)	Double pole, sign area upto $2.0\text{ m}^2$	No.			
6.13	819 (1)	Provide, install and paint new km posts in any soil (As per drawing).	No.	1.00		
6.14	1406 (7)	White washing culvert headwalls (Two coats) & stencilling culvert number etc.	Sq.m	NA		
6.15	806 (1), 806(2), 806(3), 806(4)	Supply and laying pre-cast concrete Footway Type Slabs including supply, spreading and levelling sand as shown on drawing.	Sq.m	NA		
6.16	807 (1)	Supply and laying pre-cast concrete kerb Type B as shown on drawing.	L.m	NA		

**PROVINCIAL ROADS IMPROVEMENT PROJECT  
EASTERN PROVINCE  
CONTRACT PACKAGE NO: EP 01  
ROAD NAME: MALWATTA SURIPPODAI**

ROAD NO: EPAMC039

ROAD LENGTH: 5.200km

**BILL NO: 2 - SITE CLEARANCE**

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
2.01	201(1)	<b><u>CLEARING AND GRUBBING</u></b> Clearing and grubbing.	Sq.m	12,730.00		
2.02	201(2)	Removal of trees 300 - 600 mm in girth.	No.	3.00		
2.03	201(3)	Removal of trees 600 - 1200 mm in girth.	No.	11.00		
2.04	201(4)	Removal of trees 1200 - 2000 mm in girth.	No.	5.00		
2.05	201 (5)	Removal of trees over 2000 mm in girth.	No.	NA		
2.06	201 (6)	trees girth 300 to 600mm.	No.	NA		
2.07	201 (7)	Removal of stumps and roots of previously felled trees girth 600 to 1200mm.	No.	NA		
2.08	201 (10)	Removal of over hanging branches girth 300mm and over	No.	NA		
2.09	201(10)b	Removal and disposal of branches girth exceeding 600mm	No.	NA		
2.10	202 (1)	Dismantle the existing brick masonry structures and culvert pipes.(Culvert dismantling measured separately)	Cu.m	N/A		
2.11	134 b (1)	Removing & Reconstruction of Building & other structures	PS	<b>Please see summary of Provisional Sum</b>		
2.12	202(4)	Removal of existing buildings	Sq.m	N/A		
2.13	112 (2)	Removing & Reconstruction of Electricity Post	PS	<b>Please see summary of Provisional Sum</b>		
2.14	112(2)	Removing & Reconstruction of Telecom Post	PS	<b>Please see summary of Provisional Sum</b>		
2.15	134 b (1)	Compansation of property	NoPS	<b>Please see summary of Provisional Sum</b>		

**PROVINCIAL ROADS IMPROVEMENT PROJECT  
EASTERN PROVINCE  
CONTRACT PACKAGE NO: EP9 01  
ROAD NAME: MALWATTA SURIPPODAI**

ROAD NO: EPAMC039  
ROAD LENGTH: 5.200km

**BILL NO: 3 - EARTHWORKS**

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b><u>ROADWAY EXCAVATION</u></b>				
3.01	301 (1)	Roadway excavation in unclassified soil.	Cu.m	192.06		
3.02	301 (2) a	Roadway excavation in classified soil.	Cu.m	2,052.68		
3.03	301 (3) a	Roadway excavation in classified soft rock.	Cu.m	48.02		
3.04	301 (3) b	Roadway excavation in classified hard rock.	Cu.m	72.02		
3.05	301 (4)	Roadway excavation in marshy materials.	Cu.m	36.01		
3.06	301 (2) b	Excavation of top soil for re-use.	Cu.m	234.00		
3.07	301 (5)	Dewatering .	Item	Sum		
		<b><u>EMBANKMENT</u></b>				
3.08	304 (6)	Replacement of unsuitable material using rock fill.	Cu.m	910.00		
3.09	304 (2) b	Supply, place and compact selected fill material Type I to lines and grades.	Cu.m	4,625.20		
3.10	304 (2)a	Supply, place and compact selected fill material Type II to lines and grades.	Cu.m	6,849.00		
3.11	304 (3)	Trimming, levelling and compact existing sub-	Sq.m	130.00		

**PROVINCIAL ROADS IMPROVEMENT PROJECT**  
**EASTERN PROVINCE**  
**CONTRACT PACKAGE NO: EP 01**  
**ROAD NAME: MALWATTA SURIPPODAI**

ROAD NO: EPAMC039  
 ROAD LENGTH: 5.200km

**BILL NO: 4 - ROADWORKS**

<b>Bill Item</b>	<b>Pay Item/ Spec Ref.</b>	<b>Description</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate (Rs.)</b>	<b>Amount (Rs.)</b>
4.01	401 (1)	<b>SUB-BASE</b> Provide, place, shape and compact sub-base Type I.	Cu.m	1,449.00		
4.02	401 (1)	Provide, place, shape and compact sub-base Type II.	Cu.m	N/A		
4.03	405 (1)	<b>GRADED AGGREGATE BASE</b> Supply, place, shape and compact dense graded aggregate base (37.5mm maximum size).	Cu.m	3,236.54		
4.04	408 (1), 408 (2), 408 (3)	<b>RECONSTRUCTION OF EXISTING PAVEMENT</b> Scarify shape, supply material and reconstruct existing base.	Sq.m	130.00		
4.05	409 (1)	Trench excavation to existing pavement edge repair strengthening treatment and/ or widening including compaction of excavated surface.	Cu.m	110.50		
4.06	409(1)	<b>SHOULDER CONSTRUCTIONS</b> Supply, place, shape and compact materials to	Cu.m	1,820.00		
4.07	1201(2)	Scarify, trim, shape and compact existing road	Sq.m	10,820.50		
4.08	409 (3)	Providing filter drains as shown on drawings	L.m	N/A		
4.09	501 (2)	<b>PAVEMENT SURFACING</b> Apply asphaltic prime coat using MC30 cutback bitumen.	Sq.m	22,500.00		
4.10	505 (3) a	SBST with 60/70 bitumen with 20mm aggregate.	Sq.m	N/A		
4.11	505 (3)	DBST with 60/70 bitumen and 14mm and 20mm aggregate.	Sq.m	22,500.00		
		<b>RIGID PAVEMENT</b>				
4.13	901B(1)	Concrete pavement thickness 200 mm	cu.m	180.00		
4.14	901B(3)a	Transverse joints	l.m	200.00		
4.15	901B(3)b	Longitudinal joints	lm	200.00		
		<b>BILL 04 - TOTAL CARRIED FORWARD TO SUMMARY</b>				

**PROVINCIAL ROADS IMPROVEMENT PROJECT  
EASTERN PROVINCE  
CONTRACT PACKAGE NO: EP 01  
ROAD NAME: MALWATTA SURIPPODAI**

**BILL NO: 5 - DRAINAGE AND STRUCTURES**

ROAD NO: EPAMC039  
ROAD LENGTH: 5.200km

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b><u>DRAINAGE</u></b> <b><u>CHANNEL EXCAVATION AND CLEANING</u></b>				
5.01	1303 (1)	Clearing and repairing of culverts including minor repairs as per specification.	No.	5.00		
5.02	701 (1) a	Drain excavation in unclassified soil.	Cu.m	26.22		
5.03	701 (1) b	Drain excavation in classified soft rock	Cu.m	0.28		
5.04	701 (1) c	Drain excavation in classified hard rock	Cu.m	1.10		
5.05	302 (2) a	Excavation for concrete drains in unclassified soil including backfilling.	Cu.m	27.41		
		<b><u>DISMANTLING</u></b>				
5.06	202 (6) a	Removal and disposal of any or all parts of the existing culverts requiring reconstruction, including all necessary measures for maintaining traffic during dismantling or reconstruction.	L.S.	Sum		
5.07	202 (6) b	Removal and disposal of any or all parts of the existing culverts requiring extension, including all necessary measures for maintaining traffic during dismantling.	L.S.	Sum		
		<b><u>EXCAVATION AND BACKFILL FOR STRUCTURES</u></b>				
5.08	302 (1)	Excavation in unclassified soil of structures including backfill for retaining walls, culvert head walls and abutments.	Cu.m	207.61		
5.09	302 (4)	Excavation in marshy materials below the underside of foundations including backfill as directed by the Engineer.	Cu.m	N/A		
		<b><u>CEMENT CONCRETE STRUCTURES</u></b>				
5.10	1001 (2) a	Concrete class B (Grade 25/20) in capping beam, wing walls, culvert's head walls and abutments (Including form work).	Cu.m	3.24		
5.11	1001 (2) b	Concrete class B (Grade 25/20) in extending culvert deck slab and cover slabs (Including form work).	Cu.m	9.58		
5.12	1001 (2) c	retaining walls, culvert headwalls and abutments, drop inlet/outlets to culverts, catchpits, base of RRM drain and other structures (Including form work).	Cu.m	57.94		

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
5.13	1001 (2) d	Concrete class B (Grade 20/20) to collar/ joint between existing culvert and new pipe culvert and in concrete steps, (Including form work).	Cu.m	N/A		
5.14	1001 (3)	Concrete class C (Grade 15/40) in screed and abutment walls (Including form work).	Cu.m	19.97		
5.15	701 (4) a	Construct built-up road side drains (Concrete U drain) complete as detail on drawing (Including formwork, reinforcement and all other necessary work as shown).	Cu.m	12.18		
5.16	701 (4) b	Construct concrete kerb and channel along edges of road formation complete as detail on drawing (Including excavation, formwork, reinforcement and all other necessary work as shown on drawings).	Cu.m	N/A		
5.17	701 (4) c	Construct concrete dish channel along edges of road formation complete as detail on drawing (Including excavation, formwork, reinforcement and all other necessary work as shown on drawings).	Cu.m	N/A		
<b><u>MASONRY WORK</u></b>						
5.18	1006 (1)	Random rubble masonry in retaining walls, head walls, abutments, drainage structure and other structures or part of structures.	Cu.m	134.38		
5.19	1006 (3)	Plastering 20 mm thick cement mortar 1:3 to exposed faces of concrete/ R.R.M walls.	Sq.m	179.49		
<b><u>MISCELLANEOUS</u></b>						
5.20	302 (7)	Dewatering	Item	Sum		
5.21	302 (6)	Construction coffer dam including cribs, sheeting, shoring, bracing and their subsequent removal.	Item	Sum		
<b><u>REINFORCEMENT</u></b>						
5.22	1002 (1) a	Mild steel bars grade 250 in foundation slabs, capping beams, retaining walls, abutments head walls, concrete drains and cover slabs.	M.T.	0.031		
5.23	1002 (1) b	Cold or hot rolled High yield steel bars grade 410 in R.C. foundations of retaining walls, head walls, abutments, deck slabs, concrete drains and cover slabs.	M.T.	1.436		

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
5.24	705 (2) a	<b>POROUS BACKFILL MATERIALS</b> Porous backfill material Type F, (50-150mm), behind abutments and wingwalls.	Cu.m	28.83		
5.25	705 (2) b	Porous backfill material Type G, (4.75-37.5mm) behind Type F porous backfill.	Cu.m	14.41		
5.26	705 (3)	Impervious material clay paddled as drainage cut off under porous backfill, behind abutments, wingwalls and retaining walls.	Sq.m	47.70		
		<b>REINFORCED CONCRETE PIPE CULVERT</b> <u>excavation, backfill materials, formwork, reinforcement and all necessary work as shown on the drawings.</u>				
5.27		Reinforced concrete pipe culvert with reinforced concrete surround as per drawing,				
	707 (3)	i) 450mm diameter pipe.	L.m	N/A		
	707 (3)	ii) 600mm diameter pipe.	L.m	7.00		
	707 (3)	iii) 900 mm diameter pipe.	L.m	N/A		
	707 (3)	iv) 1200 mm diameter pipe.	L.m	N/A		
	707 (3)	v) 600 mm diameter pipe - Twin type.	L.m	N/A		
	707 (3)	vi) 900 mm diameter pipe - Twin type.	L.m	N/A		
	707 (3)	vii) 600 mm diameter pipe - Tripple type.	L.m	N/A		
	707 (3)	viii) 900 mm diameter pipe - Tripple type.	L.m	N/A		
	707 (3)	ix) 900 mm diameter pipe - Battery of four pipes.	L.m	N/A		
	707 (3)	x) 900 mm diameter pipe - Battery of five pipes.	L.m	N/A		
	707 (3)	xi) 900 mm diameter pipe - Battery of six pipes.	L.m	N/A		
5.28		Reinforced concrete pipe culvert with concrete surround as per drawing,				
	707 (3)	i) 450mm diameter pipe.	L.m	N/A		
	707 (3)	ii) 600mm diameter pipe.	L.m	N/A		
	707 (3)	iii) 900 mm diameter pipe.	L.m	N/A		
	707 (3)	iv) 1200 mm diameter pipe.	L.m	N/A		
	707 (3)	v) 600 mm diameter pipe - Twin type.	L.m	N/A		
	707 (3)	vi) 900 mm diameter pipe - Twin type.	L.m	N/A		
	707 (3)	vii) 600 mm diameter pipe - Tripple type.	L.m	N/A		
	707 (3)	viii) 900 mm diameter pipe - Tripple type.	L.m	N/A		
	707 (3)	ix) 900 mm diameter pipe - Battery of four pipes.	L.m	N/A		
	707 (3)	x) 900 mm diameter pipe - Battery of five pipes.	L.m	N/A		
	707 (3)	xi) 900 mm diameter pipe - Battery of six pipes.	L.m	N/A		
5.29		Reinforced concrete pipe culvert with concrete craddle as per drawing(Excluding collar/ Joint),				
	707 (3)	i) 450mm diameter pipe.	L.m	N/A		
	707 (3)	ii) 600mm diameter pipe.	L.m	N/A		
	707 (3)	iii) 900 mm diameter pipe.	L.m	N/A		
	707 (3)	iv) 1200 mm diameter pipe.	L.m	N/A		
	707 (3)	v) 600 mm diameter pipe - Twin type.	L.m	N/A		
	707 (3)	vi) 900 mm diameter pipe - Twin type.	L.m	N/A		
	707 (3)	vii) 600 mm diameter pipe - Tripple type.	L.m	N/A		

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
	707 (3)	viii) 900 mm diameter pipe - Tripple type.	L.m	N/A		
	707 (3)	ix) 900 mm diameter pipe - Battery of four pipes.	L.m	N/A		
	707 (3)	x) 900 mm diameter pipe - Battery of five pipes.	L.m	N/A		
	707 (3)	xi) 900 mm diameter pipe - Battery of six pipes.	L.m	N/A		
5.30	706 (1)	<b>WEEPHOLES</b> Weepholes in retaining walls, head walls and abutments, finished with drip ledge and surround - 75mm dia.	L.m	128.20		-
<b>To Collection</b>						
		<b>COLLECTION</b>				
		PAGE NO 01			Rs.	
		PAGE NO 02			Rs.	
		PAGE NO 03			Rs.	
		PAGE NO 04			Rs.	
<b>BILL 05 - TOTAL CARRIED FORWARD TO SUMMARY</b>					<b>Rs.</b>	

**PROVINCIAL ROADS IMPROVEMENT PROJECT**  
**EASTERN PROVINCE**  
**CONTRACT PACKAGE NO: EP 01**  
**ROAD NAME: MALWATTA SURIPPODAI**

BILL NO : 08 BRIDGES AND OTHER STRUCTURES

ROAD NO: EPAMC 039  
LENGTH: 5.20 km

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b><u>GENERAL</u></b>				
8.01.1	135 (1)	Provisional sum for additional boreholes, DCP testing and other bridge investigation work required to preparing bridge working drawings to be approved by the engineer.	P.S.		<b>Please see summary of Provisional Sum</b>	
8.01.2		Provisional sum for surveys, design calculations and bridge working drawings to be approved by the engineer.	P.S.		<b>Please see summary of Provisional Sum</b>	
		<b><u>REMOVAL OF STRUCTURES AND OBSTRUCTIONS</u></b>				
8.02	202(1)	Removal of Structures and Obstructions	L.S.	Sum		
		<b><u>EXCAVATION AND BACKFILLING OF STRUCTURES</u></b>				
8.03	302(1)	Excavation in unclassified soil and backfill of structures	Cu.m	800.00		
8.04	302(3)	Excavation in classified rock (soft or hard) and backfill of structures	Cu.m	N/A		
8.05	302(4)	Excavation in marshy material and backfill of structures	Cu.m	225.00		
8.07	302(6)	Construction of necessary coffer dams, cribs sheeting shoring and bracing and their subsequent removal	P.S.		<b>Please see summary of Provisional Sum</b>	
8.08	302(7)	Dewatering	P.S.		<b>Please see summary of Provisional Sum</b>	
		<b><u>TACK COAT</u></b>				
8.09	502(2)	Bituminous emulsion tack coat carriageway surfaces of deck and approach slabs at 0.5 litres/sq.m	Sq.m	480.00		
		<b><u>ASPHALTIC CONCRETE SURFACING</u></b>				
8.10	506(3)	Asphaltic surfacing, compacted in position (measured by taking levels) to deck slab 50mm thick	Cu.m	27.00		
<b>To Collection</b>						

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b><u>DRAINAGE BACKFILL BEHIND EARTH RETAINING STRUCTURES</u></b>				
8.11	705(1)	Aggregate backfill behind retaining walls	Cu.m	10.00		
8.12	705(2)	Granular Filter Medium	Cu.m	10.00		
		<b><u>WEEPHOLES FOR EARTH RETAINING STRUCTURES</u></b>				
8.13	706(1)	Weepholes using pipes (110 mm dia. PVC)	L.m	42.50		
		<b><u>PIPE CULVERTS (CAUSEWAYS)</u></b>				
8.14	707(3)	Supplied, laid and jointed reinforced concrete pipes 900 dia. to SLS 452	L.m	N/A		
		<b><u>RIP RAP PROTECTION FOR EMBANKMENT SLOPES</u></b>				
8.15.1	804(1a)	Dumped Rip Rap Protection	Cu.m	N/A		
8.15.2	804(1b)	Enclosed Rip Rap Protection	Cu.m	N/A		
8.15.3	804(1c)	Grouted Rip Rap Protection	Cu.m	N/A		
		<b><u>PRECAST CONCRETE KERBS AND CHANNELS</u></b>				
8.16	807(1)	Supply and lay new precast kerb	L.m	172.00		
8.17	1001(2)	150x50 insitu lower kerb in con. gr. 20 /14 as detailed on drawing	L.m	184.00		
		<b><u>GUARD RAILS AND WALLS, GUARD STONES AND GUIDE POSTS</u></b>				
8.18	808(2)	Guard Stones	No.	40.00		
8.19	808(3)	Marker Posts as per detailed drawing	No.	N/A		
		<b><u>CONCRETE KERB INLETS</u></b>				
8.20	817(1)	Precast conc. kerb Inlets supply and fixed	No	20.00		
<b>To Collection</b>						

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
<b><u>CONCRETE FOR STRUCTURES</u></b>						
8.21.1	1001(1a)	Concrete Class A Grade 40 with 20 mm aggregate size a) Substructure	Cu.m	125.00		
8.21.2	1001(1b)	Concrete Class A Grade 30 with 20 mm aggregate size a) Substructure	Cu.m	532.40		
8.22.1	1001(2a)	Concrete Class B Grade 25 with 20 mm aggregate size a) Superstructure	Cu.m	30.00		
8.22.2	1001(2b)	Concrete Class B Grade 20 with 20 mm aggregate size a) Superstructure	Cu.m	N/A		
8.23	1001(3 )	Concrete Class C Grade 15 with 37.5 mm aggregate size a) Substructure	Cu.m	50.00		
<b><u>STEEL REINFORCEMENT FOR CONCRETE STRUCTURES</u></b>						
		Steel Reinforcement (Grade 460 to BS 4449 deformed Type 2 bars)				
8.24.1	1002(1a)	(i) 25 mm Diameter a) In Superstructure	M.T.	N/A		
8.24.2	1002(1b)	b) In Substructure	M.T.	1.40		
8.25.1	1002(1a)	(ii) 20 mm Diameter a) In Superstructure	M.T.	0.40		
8.25.2	1002(1b)	b) In Substructure	M.T.	0.70		
8.26.1	1002(1a)	(iii) 16 mm Diameter a) In Superstructure	M.T.	3.00		
8.26.2	1002(1b)	b) In Substructure	M.T.	30.00		
8.27.1	1002(1a)	iv) 12 mm Diameter a) In Superstructure	M.T.	50.00		
8.27.2	1002(1b)	b) In Substructure	M.T.	30.00		
8.28.1	1002(1a)	v) 10 mm Diameter a) In Superstructure	M.T.	3.20		
8.28.2	1002(1b)	b) In Substructure	M.T.	6.00		
		Steel Reinforcement(Grade 250 to BS 4449 plane rounded bars)				
8.29.1	1002(1a)	a) 20 mm Diameter	M.T.	1.90		
8.29.2	1002(1b)	b) 16 mm Diameter	M.T.	0.15		
8.29.3	1002(1c)	c) 10 mm Diameter	M.T.	N/A		
<b>To Collection</b>						

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b><u>PRESTRESSING FOR STRUCTURES</u></b>				
		Precast Pretensioned concrete Beams supplied on site				
8.30.1	1003(1a)	a) 16.5 m long unit -(6.16 tons)	No.	11.00		
8.30.2	1003(1b)	b) 15.5 m long unit -(5.44 tons)	No.	N/A		
8.30.3	1003(1c)	c) 11.5 m long unit -(3.21 tons)	No.	22.00		
		Precast Pretensioned concrete Beams launched in to position				
8.31.1	1003(2a)	a) 16.5 m long unit -(6.16 tons)	No.	11.00		
8.31.2	1003(2b)	b) 15.5 m long unit -(5.44 tons)	No.	N/A		
8.31.3	1003(2c)	c) 11.5 m long unit -(3.21 tons)	No.	22.00		
		Precast Post-tensioned Beams cast at site including anchors, cables and stressing				
8.32.1	1003(8a)	a) Type III- 20 m long unit as per drg.	No.	N/A		
8.32.2	1003(8b)	b) Type III- 21 m long unit as per drg.	No.	N/A		
8.32.3	1003(8c)	c) Type IV- 22.5 m long unit as per drg.	No.	N/A		
		Precast Post-tensioned Beams transported, moved at site and launched into position				
8.33.1	1003(9a)	a) Type III- 20 m long unit as per drg.	No.	N/A		
8.33.2	1003(9b)	b) Type III- 21 m long unit as per drg.	No.	N/A		
8.33.3	1003(9c)	c) Type IV- 22.5 m long unit as per drg.	No.	N/A		
		<b><u>PILE FOUNDATIONS</u></b>				
8.34	1004(1)	400x400 Square precast piles, supplied and stacked	L.m	N/A		
8.35	1004(2)	400x400 Square precast piles, driven	L.m	N/A		
		<b><u>FORMWORK FOR STRUCTURES</u></b>				
8.36.1	1008(1)	Formwork, smooth finish	Sq.m	425.00		
8.36.2	1008(2)	Formwork, rough finish	Sq.m	2,670.00		
		<b>To Collection</b>				

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b><u>BRIDGE EXPANSION JOINTS</u></b>				
8.37	1009(1)	Standard expansion joint as per detailed drawing	L.m	18.60		
		<b><u>BRIDGE BEARINGS</u></b>				
		300x300x25mm Laminated Strip bearing pads for				
8.38.1	1010(1a)	a) 20 m long post-tensioned girder.	No.		N/A	
8.38.2	1010(1b)	b) 21 m long post-tensioned girder.	No.		N/A	
8.38.3	1010(1c)	c) 22.5 m long post-tensioned girder.	No.		N/A	
8.38.4	1010(1d)	150x13 mm Elastomeric bearing strip	L.m	18.60		
		<b><u>MILD STEEL DOWELS SUPPLIED, FIXED AND GROUTED FOR THE APPROACH SLABS</u></b>				
8.39	1011(1)	Mild Steel Dowels 25 mm dia. 300 mm long	No.	120.00		
		<b><u>STAINLESS STEEL DOWELS SUPPLIED FIXED AND GROUTED AT FIXED ENDS</u></b>				
8.4	1012(1)	Stainless Steel Dowels 20 mm dia. 600 mm long	No.	30.00		
		<b><u>BITUMINOUS SEALING FELT UNDER BEAMS AT ENDS TO PREVENT GROUT LEAK ON TO CAPPING BEAM</u></b>				
8.41	1013(1)	Bituminous sealing felt on Capping beams of abutments	L.m	38.00		
		<b><u>BITUMINOUS SEALING FELT UNDER APPROACHED SLABS AT ABUTMENT ENDS TO PREVENT BITUMEN RUNNING ON TO THE CORBEL</u></b>				
8.42	1014(1)	Bituminous sealing felt under the approach slabs	L.m	62.00		
		<b><u>POLYTHENE DISPLACERS FILLED WITH SAW DUST OR SIMILAR LIGHT MATERIAL IN DECK</u></b>				
8.43.1	1015 (1a)	a) 225 dia. Displacers	L.m	155.00		
8.43.2	1015 (1b)	b) 150 dia. Displacers	L.m	N/A		
<b>To Collection</b>						

**CONTRACT PACKAGE NO: EP 01**  
**ROAD NAME: MALWATTA SURIPPODAI**

**BILL NO : 08 BRIDGES AND OTHER STRUCTURES**

ROAD NO: EPAMC 039  
 LENGTH: 5.20 km

<b>Bill Item</b>	<b>Pay Item/ Spec Ref.</b>	<b>Description</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate (Rs.)</b>	<b>Amount (Rs.)</b>
		<b><u>COVER SLABS FOR SERVICE DUCTS</u></b>				
8.44	1017(1)	Supply and install 450x50 thk. Con.cover slabs for service ducts	L.m	N/A		
		<b><u>PRECAST REINFORCED CONCRETE RAILINGS AND UPRIGHTS</u></b>				
8.45	1018(1)	Precast r/f con. Railings & Uprights in concrete class A	L.m	143.00		
		<b><u>END PILLASTERS IN CONCRETE</u></b>				
8.46	1019(1)	End Pillasters in concrete grade 25/20	No.	24.00		
		<b><u>PVC RAINWATER OUTLETS SUPPLIED AND FIXED THROUGH DECK AND SERVICE DUCTS</u></b>				
8.46.1	1020(1a)	50 mm Dia P.V.C. rain water outlets	No.	8.00		
8.46.2	1020(1b)	110 mm Dia P.V.C. rain water outlets	No.	36.00		
		<b><u>MAINTENANCE OF BRIDGES</u></b>				
8.48	1401(3)	Steel Reinforcement in concrete infill in carriageway deck including welding	M.T.	N/A		
8.49	1401(8)	Painting 2 coats of enamel to Steel members	Sq.m	N/A		
8.5	1403(5)	Replace/New Steel Handrails	L.m	N/A		
8.51	1403(8)	Repair hand rails	L.m	N/A		
		<b><u>SPECIAL CONCRETE REPAIR METHODS</u></b>				
8.52	1407(1)	Sealing of Cracks wider than 10mm using cement, sand 1:3 dry mix	L.m	N/A		
8.53	1407(2)	Sealing of Cracks wider than 1mm to 10mm using cement, sand 1:3 dry mix	L.m	N/A		
8.54	1407(4)	Repair of spalled concrete deeper than 25mm using cement sand mortar	Sq.m	N/A	-	-
8.55	1407(5)	Repair of spalled concrete less than 12mm deep using polymer modified mortar	Sq.m	N/A	-	-
<b>To Collection</b>						-

**PROVINCIAL ROADS IMPROVEMENT PROJECT**  
**EASTERN PROVINCE**  
**CONTRACT PACKAGE NO: EP 01**  
**ROAD NAME: MALWATTA SURIPPDAI**

BILL NO : 08 BRIDGES AND OTHER STRUCTURES

ROAD NO: EPAMC 039  
LENGTH: 5.20 km

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b>APPROACH ROAD</b>				
8.56	201 (2)	<b>CLEARING AND GRUBBING</b> Clearing and grubbing	Sq.m	2,000.00		
		<b>ROADWAY EXCAVATION</b>				
8.57	301 (1)	Roadway excavation in unclassified soil.	Cu.m	12.50		
8.58	301 (2)	Roadway excavation in classified soil.	Cu.m	12.50		
8.59	301 (3)	Roadway excavation in classified soft rock.	Cu.m	2.50		
8.60	301 (3)	Roadway excavation in classified hard rock.	Cu.m	2.50		
		<b>EMBANKMENT</b>				
8.62	304 (2)	Supply, place and compact selected fill material Type I to lines and grades.	Cu.m	12.50		
8.63	304 (1)	Supply, place and compact selected fill material Type II to lines and grades.	Cu.m	12.50		
8.64	304 (3)	Trimming, levelling and compact existing sub-grade.	Sq.m	25.00		
		<b>SUB-BASE</b>				
8.65	401 (1)	Provide, place, shape and compact sub-base Type I.	Cu.m	277.50		
		<b>GRADED AGGREGATE BASE</b>				
8.66	405 (1)	Supply, place, shape and compact dense graded aggregate base (37.5mm maximum size).	Cu.m	555.00		
		<b>RECONSTRUCTION OF BASE</b>				
8.67	408 (3)	Scarify, shape, supply material and reconstruct existing pavement.	Sq.m	925.00		
		<b>SHOULDER CONSTRUCTIONS</b>				
8.68	409(1)	Supply, place, shape and compact materials to reinstate gravel shoulders.	Cu.m	25.00		
8.69	1201(2)	Scarify, trim, shape and compact existing road shoulders.	Sq.m	500.00		
		<b>PAVEMENT SURFACING</b>				
8.70	501 (2)	Apply asphaltic prime coat using MC30 cutback bitumen.	Sq.m	925.00		
8.71	506 (3)	Asphalt wearing course depth 50mm.	Cu.m	185.00		
8.72	502 (2)	Apply asphaltic tack coat.	Sq.m	2,775.00		
		<b>CEMENT CONCRETE STRUCTURES</b>				
8.73	701 (4)	Construct built-up road side drains (Concrete U drain) complete as detail on drawing (Including formwork, reinforcement and all other necessary work as shown).	Cu.m	15.00		
		<b>To Collection</b>				

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b><u>COLLECTION</u></b>			Rs.	
		PAGE 1 OF 8			Rs.	
		PAGE 2 OF 8			Rs.	
		PAGE 3 OF 8			Rs.	
		PAGE 4 OF 8			Rs.	
		PAGE 5 OF 8			Rs.	
		PAGE 6 OF 8			Rs.	
		PAGE 7 OF 8			Rs.	
<b>BILL 08 - TOTAL CARRIED FORWARD TO SUMMARY</b>					Rs.	



**PROVINCIAL ROADS IMPROVEMENT PROJECT  
EASTERN PROVINCE  
CONTRACT PACKAGE NO: EP 01  
ROAD NAME: MALWATTA SURIPPODAI**

ROAD NO: EPAMC039  
ROAD LENGTH: 5.200km

**BILL NO: 6 - INCIDENTALS**

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
6.01	802 (4)	<b><u>ENVIRONMENTAL REQUIREMENT</u></b> Grassing for embankment slope.	Sq.m	624.00		
6.02	803 (1)	Plant supplied (shading and ornamental plants).	Nos.	52.00		
6.03	803 (2)	Preparation of soil and plants planted, nurtured, fertilizing and maintained during establishment period.	Nos.	52.00		
6.04	804 (1) a	Rip rap rubble paving for culvert outlets as shown on drawing.	Cu.m	N/A		
6.05	804 (1) b	Rip rap rubble paving as a slope protection as shown on drawings.	Cu.m	N/A		
6.06	804 (1) c	Dumped rip rap rubble paving as a slope protection as shown on drawings.	Cu.m	N/A		
6.07	805 (1)	Supply and construct gabion walls as detail on drawing.	Cu.m	N/A		
		<b><u>MISCELLANEOUS</u></b>				
6.08	808 (1)	Guard rail (Road side)	L.m	4.20		
6.09	808 (2)	Provide and install guard stone, complete as shown on drawing including all necessary work or as directed by the Engineer.	No.	60.00		
6.10	810 (1)	Reflectorised Thermoplastic Road Markings.	Sq.m	9.50		
6.11	811 (2)	Single pole, sign area upto 0.5 m <sup>2</sup>	No.	11.00		
6.12	811 (3)	Double pole, sign area upto 2.0 m <sup>2</sup>	No.	11.00		
6.13	819 (1)	Provide, install and paint new km posts in any soil (As per drawing).	No.	5.00		
6.14	1406 (7)	White washing culvert headwalls (Two coats) & stencilling culvert number etc.	Sq.m	43.20		
6.15	806 (1), 806(2), 806(3), 806(4)	Supply and laying pre-cast concrete Footway Type Slabs including supply, spreading and levelling sand as shown on drawing.	Sq.m	N/A		
6.16	807 (1)	Supply and laying pre-cast concrete kerb Type B as shown on drawing.	L.m	N/A		

**PROVINCIAL ROADS IMPROVEMENT PROJECT  
EASTERN PROVINCE  
CONTRACT PACKAGE NO: EP 01  
ROAD NAME:NATPADDIMUNAI PANDIRUPPU BOUNDARY ROAD**

**BILL NO: 2 - SITE CLEARANCE**

ROAD NO:EPAMC006  
ROAD LENGTH: 2.1km

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b><u>CLEARING AND GRUBBING</u></b>				
2.01	201(1)	Clearing and grubbing.	Sq.m	7,599.00		
2.02	201(2)	Removal of trees 300 - 600 mm in girth.	No.	6.00		
2.03	201(3)	Removal of trees 600 - 1200 mm in girth.	No.	15.00		
2.04	201(4)	Removal of trees 1200 - 2000 mm in girth.	No.	6.00		
2.05	201 (5)	Removal of trees over 2000 mm in girth.	No.	NA		
2.06	201 (6)	trees girth 300 to 600mm.	No.	NA		
2.07	201 (7)	Removal of stumps and roots of previously felled trees girth 600 to 1200mm.	No.	NA		
2.08	201 (10)	Removal of over hanging branches girth 300mm and over	No.	NA		
2.09	201(10)b	Removal and disposal of branches girth exceeding 600mm	No.	NA		
2.10	202 (1)	Dismantle the existing brick masonry structures and culvert pipes.(Culvert dismantling measured separately)	Cu.m	N/A		
2.11	134 b (1)	Removing & Reconstruction of Building & other structures	PS	<b>Please see summary of Provisional Sum</b>		
2.12	202(4)	Removal of existing buildings	Sq.m	N/A		
2.13	112(2)	Removing & Reconstruction of Electricity Post	PS	<b>Please see summary of Provisional Sum</b>		
2.14	112(2)	Removing & Reconstruction of Telecom Post	PS	<b>Please see summary of Provisional Sum</b>		
2.15	134 b (1)	Compansation of property	PS	<b>Please see summary of Provisional Sum</b>		

**PROVINCIAL ROADS IMPROVEMENT PROJECT  
EASTERN PROVINCE  
CONTRACT PACKAGE NO: EP 01  
ROAD NAME:NATPADDIMUNAI PANDIRUPPU BOUNDARY ROAD**

**BILL NO: 3 - EARTHWORKS**

ROAD NO:EPAMC006  
ROAD LENGTH: 2.1km

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b><u>ROADWAY EXCAVATION</u></b>				
3.01	301 (1)	Roadway excavation in unclassified soil.	Cu.m	435.00		
3.02	301 (2) a	Roadway excavation in classified soil.	Cu.m	1,690.00		
3.03	301 (3) a	Roadway excavation in classified soft rock.	Cu.m	44.00		
3.04	301 (3) b	Roadway excavation in classified hard rock.	Cu.m	66.00		
3.05	301 (4)	Roadway excavation in marshy materials.	Cu.m	50.00		
3.06	301 (2) b	Excavation of top soil for re-use.	Cu.m	100.00		
3.07	301 (5)	Dewatering .	Item	Sum		
		<b><u>COMPACTION OF SURFACES</u></b>				
3.08	304 (3)	Compact surfaces exposed by excavation 100% MDD.	Sq.m	4,658.00		
		<b><u>EMBANKMENT</u></b>				
3.08	304 (6)	Replacement of unsuitable material using rock fill.	Cu.m	50.00		
3.09	304 (2) b	Supply, place and compact selected fill material Type I to lines and grades.	Cu.m	50.00		
3.10	304 (2)a	Supply, place and compact selected fill material Type II to lines and grades.	Cu.m	50.00		
3.11	304 (3)	Trimming, levelling and compact existing sub-grade.	Sq.m	100.00		

**PROVINCIAL ROADS IMPROVEMENT PROJECT**  
**EASTERN PROVINCE**  
**CONTRACT PACKAGE NO: EP 01**  
**ROAD NAME:NATPADDIMUNAI PANDIRUPPU BOUNDARY ROAD**

ROAD NO:EPAMC006  
 ROAD LENGTH: 2.1km

**BILL NO: 4 - ROADWORKS**

Bill Item	Pay Item/Spec	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
4.01	401 (1)	<b><u>SUB-BASE</u></b> Provide, place, shape and compact sub-base Type I.	Cu.m	916.00		
4.02	401 (1)	Provide, place, shape and compact sub-base Type II.	Cu.m	100.00		
4.03	405 (1)	<b><u>GRADED AGGREGATE BASE</u></b> Supply, place, shape and compact dense graded aggregate base (37.5mm maximum size).	Cu.m	1,971.00		
4.04	408 (1), 408 (2), 408 (3)	<b><u>RECONSTRUCTION OF EXISTING PAVEMENT</u></b> Scarify shape, supply material and reconstruct existing base.	Sq.m	7,770.00		
4.05	409 (1)	Trench excavation to existing pavement edge repair strengthening treatment and/ or widening including compaction of excavated surface.	Cu.m	420.00		
4.06	409(1)	<b><u>SHOULDER CONSTRUCTIONS</u></b> Supply, place, shape and compact materials to gravel shoulders.	Cu.m	50.00		
4.07	1201(2)	shoulders.	Sq.m	100.00		
4.08	409 (3)	geotextile.	L.m	20.00		
4.09	501 (2)	<b><u>PAVEMENT SURFACING</u></b> Apply asphaltic prime coat using MC30 cutback bitumen.	Sq.m	11,181.00		
4.10	505 (3) a	SBST with 60/70 bitumen with 20mm aggregate.	Sq.m	N/A		
4.11	505 (3)	DBST with 60/70 bitumen and 14mm and 20mm aggregate.	Sq.m	11,181.00		
4.13	901B(1)	<b><u>RIGID PAVEMENT</u></b> Concrete pavement thickness 200 mm	cu.m	180.00		
4.14	901B(3)a	Transverse joints	l.m	200.00		
4.15	901B(3)b	Longitudinal joints	lm	200.00		
		<b>BILL 04 - TOTAL CARRIED FORWARD TO SUMMARY</b>				

**PROVINCIAL ROADS IMPROVEMENT PROJECT  
EASTERN PROVINCE  
CONTRACT PACKAGE NO: EP 01  
ROAD NAME:NATPADDIMUNAI PANDIRUPPU BOUNDARY ROAD**

**BILL NO: 5 - DRAINAGE AND STRUCTURES**

ROAD NO:EPAMC006  
ROAD LENGTH: 2.1km

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b>DRAINAGE CHANNEL EXCAVATION AND CLEANING</b>				
5.01	1303 (1)	Clearing and reparing of culverts including minor repairs as per specification.	No.	5.00		
5.02	701 (1) a	Drain excavation in unclassified soil.	Cu.m	50.00		
5.03	701 (1) b	Drain excavation in classified soft rock	Cu.m	5.00		
5.04	701 (1) c	Drain excavation in classified hard rock	Cu.m	3.00		
5.05	302 (2) a	Excavation for concrete drains in unclassified soil including backfilling.	Cu.m	1.00		
		<b>DISMANTLING</b>				
5.06	202 (6) a	Removal and disposal of any or all parts of the existing culverts requiring reconstruction, including all necessary measures for maintaining traffic during dismantling or reconstruction.	L.S.	Sum		
5.07	202 (6) b	Removal and disposal of any or all parts of the existing culverts requiring extension, including all necessary measures for maintaining traffic during dismantling.	L.S.	Sum		
		<b>EXCAVATION AND BACKFILL FOR STRUCTURE</b>				
5.08	302 (1)	Excavation in unclassified soil of structures including backfill for retaining walls, culvert head walls and abutments.	Cu.m	254.00		
5.09	302 (4)	Excavation in marshy materials below the underside of foundations including backfill as directed by the Engineer.	Cu.m	26.00		
		<b>CEMENT CONCRETE STRUCTURES</b>				
5.10	1001 (2) a	Concrete class B (Grade 25/20) in capping beam, wing walls, culvert's head walls and abutments (Including form work).	Cu.m	64.00		
5.11	1001 (2) b	Concrete class B (Grade 25/20) in extending culvert deck slab and cover slabs (Including form work).	Cu.m	108.00		
5.12	1001 (2) c	retaining walls, culvert headwalls and abutments, drop inlet/outlets to culverts, catchpits, base of RRM drain and other structures (Including form work).	Cu.m	3.00		

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
5.13	1001 (2) d	Concrete class B (Grade 20/20) to collar/ joint between existing culvert and new pipe culvert and in concrete steps, (Including form work).	Cu.m	1.00		
5.14	1001 (3)	Concrete class C (Grade 15/40) in screed and abutment walls (Including form work).	Cu.m	21.00		
5.15	701 (4) a	Construct built-up road side drains (Concrete U drain) complete as detail on drawing (Including formwork, reinforcement and all other necessary work as shown).	Cu.m	576.00		
5.16	701 (4) b	Construct concrete kerb and channel along edges of road formation complete as detail on drawing (Including excavation, formwork, reinforcement and all other necessary work as shown on drawings).	Cu.m	10.00		
5.17	701 (4) c	Construct concrete dish channel along edges of road formation complete as detail on drawing (Including excavation, formwork, reinforcement and all other necessary work as shown on drawings).	Cu.m	248.00		
<b><u>MASONRY WORK</u></b>						
5.18	1006 (1)	Random rubble masonry in retaining walls, head walls, abutments, drainage structure and other structures or part of structures.	Cu.m	72.00		
5.19	1006 (3)	Plastering 20 mm thick cement mortar 1:3 to exposed faces of concrete/ R.R.M walls.	Sq.m	127.00		
<b><u>MISCELLANEOUS</u></b>						
5.20	302 (7)	Dewatering	Item	Sum		
5.21	302 (6)	Construction coffer dam including cribs, sheeting, shoring, bracing and their subsequent removal.	Item	Sum		
<b><u>REINFORCEMENT</u></b>						
5.22	1002 (1) a	Mild steel bars grade 250 in foundation slabs, capping beams, retaining walls, abutments head walls, concrete drains and cover slabs.	M.T.	3.31		
5.23	1002 (1) b	Cold or hot rolled High yield steel bars grade 410 in R.C. foundations of retaining walls, head walls, abutments, deck slabs, concrete drains and cover slabs.	M.T.	3.22		

To Collection

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b>POROUS BACKFILL MATERIALS</b>				
5.24	705 (2) a	Porous backfill material Type F, (50-150mm), behind abutments and wingwalls.	Cu.m	23.00		
5.25	705 (2) b	Porous backfill material Type G, (4.75-37.5mm) behind Type F porous backfill.	Cu.m	31.00		
5.26	705 (3)	Impervious material clay paddled as drainage cut off under porous backfill, behind abutments, wingwalls and retaining walls.	Sq.m	50.00		
		<b>REINFORCED CONCRETE PIPE CULVERT</b> <u>excavation, backfill materials, formwork, reinforcement and all necessary work as shown on the drawings.</u>				
5.27		Reinforced concrete pipe culvert with reinforced concrete surround as per drawing,				
	707 (3)	i) 450mm diameter pipe.	L.m	NA		
	707 (3)	ii) 600mm diameter pipe.	L.m	NA		
	707 (3)	iii) 900 mm diameter pipe.	L.m	NA		
	707 (3)	iv) 1200 mm diameter pipe.	L.m	NA		
	707 (3)	v) 600 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vi) 900 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vii) 600 mm diameter pipe - Thipple type.	L.m	NA		
	707 (3)	viii) 900 mm diameter pipe - Thipple type.	L.m	NA		
	707 (3)	ix) 900 mm diameter pipe - Four pipe line.	L.m	NA		
	707 (3)	x) 900 mm diameter pipe - Five pipe line.	L.m	NA		
	707 (3)	xi) 900 mm diameter pipe - Six pipe line.	L.m	NA		
5.28		Reinforced concrete pipe culvert with concrete surround as per drawing,				
	707 (3)	i) 450mm diameter pipe.	L.m	NA		
	707 (3)	ii) 600mm diameter pipe.	L.m	NA		
	707 (3)	iii) 900 mm diameter pipe.	L.m	NA		
	707 (3)	iv) 1200 mm diameter pipe.	L.m	NA		
	707 (3)	v) 600 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vi) 900 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vii) 600 mm diameter pipe - Thipple type.	L.m	NA		
	707 (3)	viii) 900 mm diameter pipe - Thipple type.	L.m	NA		
	707 (3)	ix) 900 mm diameter pipe - Four pipe line.	L.m	NA		
	707 (3)	x) 900 mm diameter pipe - Five pipe line.	L.m	NA		
	707 (3)	xi) 900 mm diameter pipe - Six pipe line.	L.m	NA		
5.29		Reinforced concrete pipe culvert with concrete craddle as per drawing(Excluding collar/ Joint),				
	707 (3)	i) 450mm diameter pipe.	L.m	NA		
	707 (3)	ii) 600mm diameter pipe.	L.m	NA		
	707 (3)	iii) 900 mm diameter pipe.	L.m	NA		
	707 (3)	iv) 1200 mm diameter pipe.	L.m	NA		
	707 (3)	v) 600 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vi) 900 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vii) 600 mm diameter pipe - Thipple type.	L.m	NA		

To Collection

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
	707 (3)	viii) 900 mm diameter pipe - Thipple type.	L.m	NA		
	707 (3)	ix) 900 mm diameter pipe - Four pipe line.	L.m	NA		
	707 (3)	x) 900 mm diameter pipe - Five pipe line.	L.m	NA		
	707 (3)	xi) 900 mm diameter pipe - Six pipe line.	L.m	NA		
<b>WEEPHOLES</b>						
5.30	706 (1)	Weepholes in retaining walls, head walls and abutments, finished with drip ledge and surround - 75mm dia.	L.m	55.00		
<b>To Collection</b>						
		<u>COLLECTION</u>			Rs.	
		PAGE NO 01			Rs.	
		PAGE NO 02			Rs.	
		PAGE NO 03			Rs.	
		PAGE NO 04			Rs.	
<b>BILL 05 - TOTAL CARRIED FORWARD TO SUMMARY</b>					<b>Rs.</b>	

**PROVINCIAL ROADS IMPROVEMENT PROJECT  
EASTERN PROVINCE  
CONTRACT PACKAGE NO: EP 01  
ROAD NAME:NATPADDIMUNAI PANDIRUPPU BOUNDARY ROAD**

**BILL NO: 6 - INCIDENTALS**

ROAD NO:EPAMC006  
ROAD LENGTH: 2.1km

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
6.01	802 (4)	<b>ENVIRONMENTAL REQUIREMENT</b> Grassing for embankment slope.	Sq.m	1,225.00		
6.02	803 (1)	Plant supplied (shading and ornamental plants).	Nos.	21.00		
6.03	803 (2)	fertilizing and maintained during establishment period.	Nos.	21.00		
6.04	804 (1) a	Rip rap rubble paving for culvert outlets as shown on drawing.	Cu.m	3.00		
6.05	804 (1) b	Rip rap rubble paving as a slope protection as shown on drawings.	Cu.m	-		
6.06	804 (1) c	Dumped rip rap rubble paving as a slope protection as shown on drawings.	Cu.m	-		
6.07	805 (1)	Supply and construct gabion walls as detail on drawing.	Cu.m	10.00		
<b>MISCELLANEOUS</b>						
6.08	808 (1)	Guard rail (Road side)	L.m	10.00		
6.09	808 (2)	Provide and install guard stone, complete as shown on drawing including all necessary work or as directed by the Engineer.	No.	40.00		
6.10	810 (1)	Reflectorised Thermoplastic Road Markings.	Sq.m	100.00		
6.11	811 (2)	Single pole, sign area upto $0.5\text{ m}^2$	No.	20.00		
6.12	811 (3)	Double pole, sign area upto $2.0\text{ m}^2$	No.			
6.13	819 (1)	Provide, install and paint new km posts in any soil (As per drawing).	No.	2.00		
6.14	1406 (7)	White washing culvert headwalls (Two coats) & stencilling culvert number etc.	Sq.m	100.00		
6.15	806 (1), 806(2), 806(3), 806(4)	Supply and laying pre-cast concrete Footway Type Slabs including supply, spreading and levelling sand as shown on drawing.	Sq.m	20.00		
6.16	807 (1)	Supply and laying pre-cast concrete kerb Type B as shown on drawing.	L.m	20.00		

**PROVINCIAL ROADS IMPROVEMENT PROJECT  
EASTERN PROVINCE  
CONTRACT PACKAGE NO: EP 01  
ROAD NAME: THURAIPATHI AMMAN KOVIL ROAD**

**BILL NO: 2 - SITE CLEARANCE**

ROAD NO:EPAMC007  
ROAD LENGTH: 1.36km

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b><u>CLEARING AND GRUBBING</u></b>				
2.01	201(1)	Clearing and grubbing.	Sq.m	2,574.00		
2.02	201(2)	Removal of trees 300 - 600 mm in girth.	No.	6.00		
2.03	201(3)	Removal of trees 600 - 1200 mm in girth.	No.	15.00		
2.04	201(4)	Removal of trees 1200 - 2000 mm in girth.	No.	6.00		
2.05	201 (5)	Removal of trees over 2000 mm in girth.	No.	NA		
2.06	201 (6)	trees girth 300 to 600mm.	No.	NA		
2.07	201 (7)	Removal of stumps and roots of previously felled trees girth 600 to 1200mm.	No.	NA		
2.08	201 (10)	Removal of over hanging branches girth 300mm and over	No.	NA		
2.09	201(10)b	Removal and disposal of branches girth exceeding 600mm	No.	NA		
2.10	202 (1)	Dismantle the existing brick masonry structures and culvert pipes.(Culvert dismantling measured separately)	Cu.m	N/A		
2.11	134 b (1)	Removing & Reconstruction of Building & other structures	PS	<b>Please see summary of Provisional Sum</b>		
2.12	202(4)	Removal of existing buildings	Sq.m	N/A		
2.13	112(2)	Removing & Reconstruction of Electricity Post	PS	<b>Please see summary of Provisional Sum</b>		
2.14	112(2)	Removing & Reconstruction of Telecom Post	PS	<b>Please see summary of Provisional Sum</b>		
2.15	134 b (1)	Compansation of property	PS	<b>Please see summary of Provisional Sum</b>		

**PROVINCIAL ROADS IMPROVEMENT PROJECT  
EASTERN PROVINCE  
CONTRACT PACKAGE NO: EP 01  
ROAD NAME: THURAIPATHI AMMAN KOVIL ROAD**

**BILL NO: 3 - EARTHWORKS**

ROAD NO:EPAMC007  
ROAD LENGTH: 1.36km

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b><u>ROADWAY EXCAVATION</u></b>				
3.01	301 (1)	Roadway excavation in unclassified soil.	Cu.m	115.00		
3.02	301 (2) a	Roadway excavation in classified soil.	Cu.m	357.00		
3.03	301 (3) a	Roadway excavation in classified soft rock.	Cu.m	12.00		
3.04	301 (3) b	Roadway excavation in classified hard rock.	Cu.m	18.00		
3.05	301 (4)	Roadway excavation in marshy materials.	Cu.m	50.00		
3.06	301 (2) b	Excavation of top soil for re-use.	Cu.m	50.00		
3.07	301 (5)	Dewatering .	Item	Sum		
		<b><u>COMPACTION OF SURFACES</u></b>				
3.08	304 (3)	Compact surfaces exposed by excavation 100% MDD.	Sq.m	1,137.00		
		<b><u>EMBANKMENT</u></b>				
3.08	304 (6)	Replacement of unsuitable material using rock fill.	Cu.m	20.00		
3.09	304 (2) b	Supply, place and compact selected fill material Type I to lines and grades.	Cu.m	20.00		
3.10	304 (2)a	Supply, place and compact selected fill material Type II to lines and grades.	Cu.m	50.00		
3.11	304 (3)	Trimming, levelling and compact existing sub-	Sq.m	50.00		

**PROVINCIAL ROADS IMPROVEMENT PROJECT**  
**EASTERN PROVINCE**  
**CONTRACT PACKAGE NO: EP 01**  
**ROAD NAME: THURAIPATHI AMMAN KOVIL ROAD**

ROAD NO:EPAMC007  
 ROAD LENGTH: 1.36km

**BILL NO: 4 - ROADWORKS**

<b>Bill Item</b>	<b>Pay Item/ Spec Ref.</b>	<b>Description</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate (Rs.)</b>	<b>Amount (Rs.)</b>
4.01	401 (1)	<b>SUB-BASE</b> Provide, place, shape and compact sub-base Type I.	Cu.m	215.00		
4.02	401 (1)	Provide, place, shape and compact sub-base Type II.	Cu.m	50.00		
4.03	405 (1)	<b>GRADED AGGREGATE BASE</b> Supply, place, shape and compact dense graded aggregate base (37.5mm maximum size).	Cu.m	1,112.00		
4.04	408 (1), 408 (2), 408 (3)	<b>RECONSTRUCTION OF EXISTING PAVEMENT</b> Scarify shape, supply material and reconstruct existing base.	Sq.m	4,927.00		
4.05	409 (1)	Trench excavation to existing pavement edge repair strengthening treatment and/ or widening including compaction of excavated surface.	Cu.m	272.00		
4.06	409(1)	<b>SHOULDER CONSTRUCTIONS</b> Supply, place, shape and compact materials to	Cu.m	50.00		
4.07	1201(2)	Scarify, trim, shape and compact existing road	Sq.m	100.00		
4.08	409 (3)	Providing filter drains as shown on drawings	L.m	20.00		
4.09	501 (2)	<b>PAVEMENT SURFACING</b> Apply asphaltic prime coat using MC30 cutback bitumen.	Sq.m	5,956.00		
4.10	505 (3) a	SBST with 60/70 bitumen with 20mm aggregate.	Sq.m	N/A		
4.11	505 (3)	DBST with 60/70 bitumen and 14mm and 20mm aggregate.	Sq.m	5,956.00		
4.12	1101 (1)	Surface regulating using Premix (Cold mix MC 30)	Cu.m	104.00		
		<b>RIGID PAVEMENT</b>				
4.13	901B(1)	Concrete pavement thickness 200 mm	cu.m	90.00		
4.14	901B(3)a	Transverse joints	l.m	100.00		
4.15	901B(3)b	Longitudinal joints	lm	100.00		
		<b>BILL 04 - TOTAL CARRIED FORWARD TO SUMMARY</b>				

**PROVINCIAL ROADS IMPROVEMENT PROJECT  
EASTERN PROVINCE  
CONTRACT PACKAGE NO: EP 01  
ROAD NAME: THURAIPATHI AMMAN KOVIL ROAD**

**BILL NO: 5 - DRAINAGE AND STRUCTURES**

ROAD NO:EPAMC007  
ROAD LENGTH: 1.36km

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b><u>DRAINAGE</u></b> <b><u>CHANNEL EXCAVATION AND CLEANING</u></b>				
5.01	1303 (1)	Clearing and repairing of culverts including minor repairs as per specification.	No.	1.00		
5.02	701 (1) a	Drain excavation in unclassified soil.	Cu.m	50.00		
5.03	701 (1) b	Drain excavation in classified soft rock	Cu.m	5.00		
5.04	701 (1) c	Drain excavation in classified hard rock	Cu.m	5.00		
5.05	302 (2) a	Excavation for concrete drains in unclassified soil including backfilling.	Cu.m	510.00		
		<b><u>DISMANTLING</u></b>				
5.06	202 (6) a	Removal and disposal of any or all parts of the existing culverts requiring reconstruction, including all necessary measures for maintaining traffic during dismantling or reconstruction.	L.S.	Sum		
5.07	202 (6) b	Removal and disposal of any or all parts of the existing culverts requiring extension, including all necessary measures for maintaining traffic during dismantling.	L.S.	Sum		
		<b><u>EXCAVATION AND BACKFILL FOR STRUCTURE</u></b>				
5.08	302 (1)	Excavation in unclassified soil of structures including backfill for retaining walls, culvert head walls and abutments.	Cu.m	50.00		
5.09	302 (4)	Excavation in marshy materials below the underside of foundations including backfill as directed by the Engineer.	Cu.m	10.00		
		<b><u>CEMENT CONCRETE STRUCTURES</u></b>				
5.10	1001 (2) a	Concrete class B (Grade 25/20) in capping beam, wing walls, culvert's head walls and abutments (Including form work).	Cu.m	1.00		
5.11	1001 (2) b	Concrete class B (Grade 25/20) in extending culvert deck slab and cover slabs (Including form work).	Cu.m	186.00		
5.12	1001 (2) c	retaining walls, culvert headwalls and abutments, drop inlet/outlets to culverts, catchpits, base of RRM drain and other structures (Including form work).	Cu.m	1.00		

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
5.13	1001 (2) d	Concrete class B (Grade 20/20) to collar/ joint between existing culvert and new pipe culvert and in concrete steps, (Including form work).	Cu.m	1.00		
5.14	1001 (3)	Concrete class C (Grade 15/40) in screed and abutment walls (Including form work).	Cu.m	1.00		
5.15	701 (4) a	Construct built-up road side drains (Concrete U drain) complete as detail on drawing (Including formwork, reinforcement and all other necessary work as shown).	Cu.m	228.00		
5.16	701 (4) b	Construct concrete kerb and channel along edges of road formation complete as detail on drawing (Including excavation, formwork, reinforcement and all other necessary work as shown on drawings).	Cu.m	10.00		
5.17	701 (4) c	Construct concrete dish channel along edges of road formation complete as detail on drawing (Including excavation, formwork, reinforcement and all other necessary work as shown on drawings).	Cu.m	141.00		
<b><u>MASONRY WORK</u></b>						
5.18	1006 (1)	Random rubble masonry in retaining walls, head walls, abutments, drainage structure and other structures or part of structures.	Cu.m	10.00		
5.19	1006 (3)	Plastering 20 mm thick cement mortar 1:3 to exposed faces of concrete/ R.R.M walls.	Sq.m	20.00		
<b><u>MISCELLANEOUS</u></b>						
5.20	302 (7)	Dewatering	Item	Sum		
5.21	302 (6)	Construction coffer dam including cribs, sheeting, shoring, bracing and their subsequent removal.	Item	Sum		
<b><u>REINFORCEMENT</u></b>						
5.22	1002 (1) a	Mild steel bars grade 250 in foundation slabs, capping beams, retaining walls, abutments head walls, concrete drains and cover slabs.	M.T.	5.65		
5.23	1002 (1) b	Cold or hot rolled High yield steel bars grade 410 in R.C. foundations of retaining walls, head walls, abutments, deck slabs, concrete drains and cover slabs.	M.T.	3.26		

Bill Item	Pay Item/ Spec	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		<b><u>POROUS BACKFILL MATERIALS</u></b>				
5.24	705 (2) a	Porous backfill material Type F, (50-150mm), behind abutments and wingwalls.	Cu.m	10.00		
5.25	705 (2) b	Porous backfill material Type G, (4.75-37.5mm) behind Type F porous backfill.	Cu.m	10.00		
5.26	705 (3)	Impervious material clay paddled as drainage cut off under porous backfill, behind abutments, wingwalls and retaining walls.	Sq.m	10.00		
		<b><u>REINFORCED CONCRETE PIPE CULVERT</u></b>				
		<u>Complete as show on drawings including excavation, backfill materials, formwork, reinforcemnt and all necessary work as shown</u>				
5.27		Reinforced concrete pipe culvert with reinforced concrete surround as per drawing,				
	707 (3)	i) 450mm diameter pipe.	L.m	NA		
	707 (3)	ii) 600mm diameter pipe.	L.m	NA		
	707 (3)	iii) 900 mm diameter pipe.	L.m	NA		
	707 (3)	iv) 1200 mm diameter pipe.	L.m	NA		
	707 (3)	v) 600 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vi) 900 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vii) 600 mm diameter pipe - Thipple type.	L.m	NA		
	707 (3)	viii) 900 mm diameter pipe - Thipple type.	L.m	NA		
	707 (3)	ix) 900 mm diameter pipe - Four pipe line.	L.m	NA		
	707 (3)	x) 900 mm diameter pipe - Five pipe line.	L.m	NA		
	707 (3)	xi) 900 mm diameter pipe - Six pipe line.	L.m	NA		
5.28		Reinforced concrete pipe culvert with concrete surround as per drawing,				
	707 (3)	i) 450mm diameter pipe.	L.m	NA		
	707 (3)	ii) 600mm diameter pipe.	L.m	NA		
	707 (3)	iii) 900 mm diameter pipe.	L.m	NA		
	707 (3)	iv) 1200 mm diameter pipe.	L.m	NA		
	707 (3)	v) 600 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vi) 900 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vii) 600 mm diameter pipe - Thipple type.	L.m	NA		
	707 (3)	viii) 900 mm diameter pipe - Thipple type.	L.m	NA		
	707 (3)	ix) 900 mm diameter pipe - Four pipe line.	L.m	NA		
	707 (3)	x) 900 mm diameter pipe - Five pipe line.	L.m	NA		
	707 (3)	xi) 900 mm diameter pipe - Six pipe line.	L.m	NA		
5.29		Reinforced concrete pipe culvert with concrete craddle as per drawing(Excluding collar/ Joint),				
	707 (3)	i) 450mm diameter pipe.	L.m	NA		
	707 (3)	ii) 600mm diameter pipe.	L.m	NA		
	707 (3)	iii) 900 mm diameter pipe.	L.m	NA		
	707 (3)	iv) 1200 mm diameter pipe.	L.m	NA		
	707 (3)	v) 600 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vi) 900 mm diameter pipe - Twin type.	L.m	NA		
	707 (3)	vii) 600 mm diameter pipe - Thipple type.	L.m	NA		

<b>Bill Item</b>	<b>Pay Item/ Spec Ref.</b>	<b>Description</b>	<b>Unit</b>	<b>Quantity</b>	<b>Rate (Rs.)</b>	<b>Amount (Rs.)</b>
	707 (3)	viii) 900 mm diameter pipe - Thipple type.	L.m	NA		
	707 (3)	ix) 900 mm diameter pipe - Four pipe line.	L.m	NA		
	707 (3)	x) 900 mm diameter pipe - Five pipe line.	L.m	NA		
	707 (3)	xi) 900 mm diameter pipe - Six pipe line.	L.m	NA		
5.30	706 (1)	<b>WEEPHOLES</b> Weepholes in retaining walls, head walls and abutments, finished with drip ledge and surround - 75mm dia.	L.m	50.00		
<b>To Collection</b>						
		<b>COLLECTION</b>				
		<b>PAGE NO 01</b>			<b>Rs.</b>	
		<b>PAGE NO 02</b>			<b>Rs.</b>	
		<b>PAGE NO 03</b>			<b>Rs.</b>	
		<b>PAGE NO 04</b>			<b>Rs.</b>	
<b>BILL 05 - TOTAL CARRIED FORWARD TO SUMMARY</b>					<b>Rs.</b>	

**PROVINCIAL ROADS IMPROVEMENT PROJECT  
EASTERN PROVINCE  
CONTRACT PACKAGE NO: EP 01  
ROAD NAME: THURAIPATHI AMMAN KOVIL ROAD**

**BILL NO: 6 - INCIDENTALS**

ROAD NO:EPAMC007  
ROAD LENGTH: 1.36km

Bill Item	Pay Item/Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
6.01	802 (4)	<b><u>ENVIRONMENTAL REQUIREMENT</u></b> Grassing for embankment slope.	Sq.m	160.00		
6.02	803 (1)	Plant supplied (shading and ornamental plants).	Nos.	14.00		
6.03	803 (2)	fertilizing and maintained during establishment period.	Nos.	14.00		
6.04	804 (1) a	Rip rap rubble paving for culvert outlets as shown on drawing.	Cu.m	10.00		
6.05	804 (1) b	Rip rap rubble paving as a slope protection as shown on drawings.	Cu.m	-		
6.06	804 (1) c	Dumped rip rap rubble paving as a slope protection as shown on drawings.	Cu.m	-		
6.07	805 (1)	Supply and construct gabion walls as detail on drawing.	Cu.m	10.00		
6.08	808 (1)	<b><u>MISCELLANEOUS</u></b> Guard rail (Road side)	L.m	20.00		
6.09	808 (2)	Provide and install guard stone, complete as shown on drawing including all necessary work or as directed by the Engineer.	No.	8.00		
6.10	810 (1)	Reflectorised Thermoplastic Road Markings.	Sq.m	100.00		
6.11	811 (2)	Single pole, sign area upto $0.5\text{ m}^2$	No.	10.00		
6.12	811 (3)	Double pole, sign area upto $2.0\text{ m}^2$	No.			
6.13	819 (1)	Provide, install and paint new km posts in any soil (As per drawing).	No.	1.00		
6.14	1406 (7)	White washing culvert headwalls (Two coats) & stencilling culvert number etc.	Sq.m	50.00		
6.15	806 (1), 806(2), 806(3), 806(4)	Supply and laying pre-cast concrete Footway Type Slabs including supply, spreading and levelling sand as shown on drawing.	Sq.m	20.00		
6.16	807 (1)	Supply and laying pre-cast concrete kerb Type B as shown on drawing.	L.m	20.00		

**PROVINCIAL ROADS IMPROVEMENT PROJECT**  
**EASTERN PROVINCE**  
**CONTRACT PACKAGE NO: EP 01**

**BILL NO: 7 - DAYWORKS**

Bill Item	Pay Item/ Spec Ref.	Description	Unit	Quantity	Rate (Rs.)	Amount (Rs.)
		Note : Quantities of all Items are Provisional				
		<b><u>LABOUR</u></b>				
7.01		Unskilled Labour	hrs.	55.00		
7.02		Semi-skilled labour	hrs.	31.00		
7.03		Skilled labour	hrs.	25.00		
7.04		Surveyor, local	hrs.	31.00		
		<b><u>MATERIALS(Rate excluding Overheads and Profits)</u></b>				
7.05		Cement ordinary	kg	45.45		
7.06		Cement Rapid hardening	kg	10.65		
7.07		Bitumen MC 30	Ltr.	35.00		
7.08		Bitumen 80/100	Ltr.	60.00		
7.09		Bituminous emulsion RS-1	Ltr.	60.00		
7.10		Cold mix	Cu.m	0.15		
7.11		Aggregate for asphalt	Cu.m	0.91		
7.12		Aggregate for base material	Cu.m	2.50		
7.13		Coarse aggregate for concrete	Cu.m	2.90		
7.14		Fine aggregate for concrete and blotting/ binding of road	Cu.m	3.20		
7.15		Formwork timber (for each use) including supports, bearers, bracing etc.	Sq.m	4.80		
7.16		Reinforcement in bars	kg	63.64		
		<b>Add Overheads and Profits for above Materials - .....%</b>				
		<b><u>PLANT</u></b>				
7.17		Tractor Cat D6 or Equivalent	hrs.	2.05		
7.18		Tractor Cat D8 or Equivalent	hrs.	1.37		
7.19		Wheel loader Cat 966 or equivalent	hrs.	1.37		
7.20		Motor Grader	hrs.	4.45		
7.21		Self propelled vibrating steel roller 10T	hrs.	2.10		
7.22		Self propelled pneumatic roller 12 T	hrs.	2.30		
7.23		Tipper truck 16 T	km	3.20		
7.24		Lorry 10T	km	3.20		
7.25		Hand compactor self propelled vibrator	hrs.	4.50		
7.26		Agricultural tractor with trailer	hrs.	4.10		
7.27		Self propelled water bowser with spray bar 5000 litre	hrs.	2.10		
7.28		Bitumen distributor	hrs.	2.20		
7.29		Self propelled chipping spreader	hrs.	3.41		
7.30		Concrete mixer set 400 Ltr.	hrs.	4.50		
7.31		Concrete vibrator set	hrs.	4.50		
7.32		Hydraulic crane 18 T self propelled	hrs.	3.41		
7.33		Air compressor set 9 cum/hr	hrs.	0.68		
7.34		Water pump set 10 cum/hr	hrs.	3.41		
7.35		Sludge pump set 10 cum/hr	hrs.	3.41		
7.36		Generator set 80 Kw & electric welding set	hrs.	1.37		
7.37		Bitumen spraying equipment 4000 lit	hrs.	2.20		
7.38		Backhoe 0.75 cum	hrs.	1.85		
		<b>BILL 07 - TOTAL CARRIED FORWARD TO SUMMARY</b>				

## Form of Bid Security (Bank Guarantee)

\_\_\_\_\_ *[Bank's Name, and Address of Issuing Branch or Office]*

**Beneficiary:** \_\_\_\_\_ *[Name and Address of Employer]*

**Date:** \_\_\_\_\_

**BID GUARANTEE No.:** \_\_\_\_\_

We have been informed that \_\_\_\_\_ *[name of the Bidder]* (hereinafter called "the Bidder") has submitted to you its bid dated \_\_\_\_\_ (hereinafter called "the Bid") for the execution of \_\_\_\_\_ *[name of contract]* under Invitation for Bids No. \_\_\_\_\_ ("the IFB").

Furthermore, we understand that, according to your conditions, bids must be supported by a bid guarantee.

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

- (a) has withdrawn its Bid during the period of bid validity specified by the Bidder in the Form of Bid; or
- (b) 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 will expire: (a) if the Bidder is the successful Bidder, upon our receipt of copies of the contract signed by the Bidder and the performance security issued to you upon the instruction of the Bidder; and (b) if the Bidder is not the successful Bidder, upon the earlier of (i) our receipt of a copy your notification to the Bidder of the name of the successful Bidder; or (ii) twenty-eight days after the expiration of the Bidder's bid.

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

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

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[signature(s)]

## **Technical Proposal**

### **Technical Proposal Forms**

**Personnel**

**Equipment**

**Site Organization**

**Method Statement**

**Mobilization Schedule**

**Construction Schedule**

**Others**

## Forms for Personnel

### Form PER – 1: Proposed Personnel

Bidders should provide the names of suitably qualified personnel to meet the specified requirements for each of the positions listed in Section III (Evaluation and Qualification Criteria). The data on their experience should be supplied using the Form below for each candidate.

1.	<b>Title of position</b>
	<b>Name</b>
2.	<b>Title of position</b>
	<b>Name</b>
3.	<b>Title of position</b>
	<b>Name</b>
4.	<b>Title of position</b>
	<b>Name</b>
5.	<b>Title of position</b>
	<b>Name</b>
6.	<b>Title of position</b>
	<b>Name</b>
etc.	<b>Title of position</b>
	<b>Name</b>

## **Form PER – 2: Resume of Proposed Personnel**

The Bidder shall provide all the information requested below. Fields with asterix (\*) shall be used for evaluation.

<b>Position*</b>		
<b>Personnel information</b>	<b>Name *</b>	<b>Date of birth</b>
	<b>Professional qualifications</b>	
<b>Present employment</b>	<b>Name of Employer</b>	
	<b>Address of Employer</b>	
	<b>Telephone</b>	<b>Contact (manager / personnel officer)</b>
	<b>Fax</b>	<b>E-mail</b>
	<b>Job title</b>	<b>Years with present Employer</b>

Summarize professional experience in reverse chronological order. Indicate particular technical and managerial experience relevant to the project.

## Forms for Equipment

The Bidder shall provide adequate information to demonstrate clearly that it has the capability to meet the requirements for the key equipment listed in Section III (Evaluation and Qualification Criteria). A separate Form shall be prepared for each item of equipment listed, or for alternative equipment proposed by the Bidder. The Bidder shall provide all the information requested below, to the extent possible. Fields with asterisk (\*) shall be used for evaluation.

<b>Type of Equipment*</b>		
<b>Equipment Information</b>	<b>Name of manufacturer</b>	<b>Model and power rating</b>
	<b>Capacity*</b>	<b>Year of manufacture*</b>
<b>Current Status</b>	<b>Current location</b>	
	<b>Details of current commitments</b>	
<b>Source</b>	<b>Indicate source of the equipment</b> <input type="checkbox"/> Owned <input type="checkbox"/> Rented <input type="checkbox"/> Leased <input type="checkbox"/> Specially manufactured	

The following information shall be provided only for equipment not owned by the Bidder.

<b>Owner</b>	<b>Name of owner</b>	
	<b>Address of owner</b>	
	<b>Telephone</b>	<b>Contact name and title</b>
	<b>Fax</b>	<b>Telex</b>
<b>Agreements</b>	<b>Details of rental / lease / manufacture agreements specific to the project</b>	

## **Bidder's Qualification**

To establish its qualifications to perform the contract in accordance with Section III (Evaluation and Qualification Criteria) the Bidder shall provide the information requested in the corresponding Information Sheets included hereunder

**Form ELI 1.1****Bidder Information Sheet**

Date: \_\_\_\_\_

Bidding No.: \_\_\_\_\_

Invitation for Bid No.: \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_ pages

1. Bidder's Legal Name
2. In case of JV, legal name of each party:
3. Bidder's actual or intended Country of Registration:
4. Bidder's Year of Registration:
5. Bidder's Legal Address in Country of Registration:
6. Bidder's Authorized Representative Information Name: Address: Telephone/Fax numbers: Email Address:
7. Attached are copies of original documents of: <input type="checkbox"/> Articles of Incorporation or Registration of firm named in 1, above, in accordance with ITB Sub-Clauses 4.1 and 4.2. <input type="checkbox"/> In case of JV, letter of intent to form JV including a draft agreement, or JV agreement, in accordance with ITB Sub-Clauses 4.1 <input type="checkbox"/> In case of government owned entity from the Employer's country, documents establishing legal and financial autonomy and compliance with the principles of commercial law, in accordance with ITB Sub-Clause 4.5.

**Form ELI 1.2****Party to JV Information Sheet**

Date: \_\_\_\_\_  
Bidding No.: \_\_\_\_\_  
Invitation for Bid No.: \_\_\_\_\_  
Page \_\_\_\_\_ of \_\_\_\_\_ pages

1. Bidder's Legal Name:
2. JV's Party legal name:
3. JV's Party Country of Registration:
4. JV's Party Year of Registration:
5. JV's Party Legal Address in Country of Registration:
6. JV's Party Authorized Representative Information Name: Address: Telephone/Fax numbers: Email Address:
7. Attached are copies of original documents of: <input checked="" type="checkbox"/> Articles of Incorporation or Registration of firm named in 1, above, in accordance with ITB Sub-Clauses 4.1 and 4.2. <input type="checkbox"/> In case of government owned entity from the Purchaser's country, documents establishing legal and financial autonomy and compliance with the principles of commercial law, in accordance with ITB Sub-Clause 4.5.

**Form CON – 2****Historical Contract Non-Performance**

Bidder's Legal Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 JV Partner Legal Name: \_\_\_\_\_ Bidding No.: \_\_\_\_\_  
 \_\_\_\_\_  
 Page \_\_\_\_\_ of \_\_\_\_\_ pages

Non-Performing Contracts in accordance with (Evaluation and Qualification Criteria)			
Year	Outcome as Percent of Total Assets	Contract Identification	Total Contract Amount (current value, US\$ equivalent)
_____	_____	Contract Identification: Name of Employer: Address of Employer: Matter in dispute:	_____
Pending Litigation, in accordance with Section III (Evaluation and Qualification Criteria)			
<input type="checkbox"/> No pending litigation in accordance with Sub-Factor 2.2.2 of Section III(Evaluation and Qualification Criteria) <input type="checkbox"/> Pending litigation in accordance with Sub-Factor 2.2.2 of Section III(Evaluation and Qualification Criteria), as indicated below			
Year	Outcome as Percent of Total Assets	Contract Identification	Total Contract Amount (current value, US\$ equivalent)
_____	_____	Contract Identification: Name of Employer: Address of Employer: Matter in dispute:	_____
_____	_____	Contract Identification: Name of Employer: Address of Employer: Matter in dispute:	_____

**Form CCC****Current Contract Commitments / Works in Progress**

Bidders and each partner to a JV should provide information on their current commitments on all contracts that have been awarded, or for which a letter of intent or acceptance has been received, or for contracts approaching completion, but for which an unqualified, full completion certificate has yet to be issued.

Name of contract	Employer, contact address/tel/fax	Value of outstanding work (Sri Lankan Rupee equivalent)	Estimated completion date	Average monthly invoicing over last six months (Sri Lankan Rupees/month)
1.				
2.				
3.				
4.				
5.				
etc.				

## Financial Situation

### Historical Financial Performance

Bidder's Legal Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 JV Partner Legal Name: \_\_\_\_\_ Bidding No.: \_\_\_\_\_  
 \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_ pages

To be completed by the Bidder and, if JV, by each partner

Financial information in Sri Lankan Rupee equivalent	Historic information for previous _____ (____) years (Sri Lankan Rupee equivalent in 000s)						
	Year 1	Year 2	Year 3	Year ...	Year n	Avg.	Avg. Ratio
<b>Information from Balance Sheet</b>							
Total Assets (TA)							
Total Liabilities (TL)							
Net Worth (NW)							
Current Assets (CA)							
Current Liabilities (CL)							
<b>Information from Income Statement</b>							
Total Revenue (TR)							
Profits Before Taxes (PBT)							

Attached are copies of financial statements (balance sheets, including all related notes, and income statements) for the years required above complying with the following conditions:

- Must reflect the financial situation of the Bidder or partner to a JV, and not sister or parent companies
- Historic financial statements must be audited by a certified accountant
- Historic financial statements must be complete, including all notes to the financial statements
- Historic financial statements must correspond to accounting periods already completed and audited (no statements for partial periods shall be requested or accepted)

**Form FIN – 3.2**  
**Average Annual Turnover**

Bidder's Legal Name: \_\_\_\_\_ Date: \_\_\_\_\_  
JV Partner Legal Name: \_\_\_\_\_ Bidding No.: \_\_\_\_\_  
Page \_\_\_\_\_ of \_\_\_\_\_ pages

Annual turnover data (construction only)		
Year	Amount and Currency	Sri Lankan Rupee equivalent
*Average Annual Construction Turnover		

\*Average annual turnover calculated as total certified payments received for work in progress or completed over the number of years specified in Section III (Evaluation and Qualification Criteria), Sub-Factor 2.3.2, divided by that same number of years.

**Form FIN3.3**  
**Financial Resources**

Specify proposed sources of financing, such as liquid assets, unencumbered real assets, lines of credit, and other financial means, net of current commitments, available to meet the total construction cash flow demands of the subject contract or contracts as indicated in Section III (Evaluation and Qualification Criteria)

Source of financing	Amount (Sri Lankan Rupee equivalent)
1.	
2.	
3.	
4.	

## Experience

### General Experience

Bidder's Legal Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 JV Partner Legal Name: \_\_\_\_\_ Bidding No.: \_\_\_\_\_  
 \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_ pages

Starting Month / Year	Ending Month / Year	Years*	Contract Identification	Role of Bidder
			Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	
			Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	
			Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	
			Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	
			Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	
			Contract name: Brief Description of the Works performed by the Bidder: Name of Employer: Address:	

\*List calendar year for years with contracts with at least nine (9) months activity per year starting with the earliest year

**Form EXP – 2.4.2(a)**  
**Specific Experience**

Bidder's Legal Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 JV Partner Legal Name: \_\_\_\_\_ Bidding No.: \_\_\_\_\_

Page \_\_\_\_\_ of \_\_\_\_\_ pages

<b>Similar Contract Number:</b> ___/insert specific number/ of ___/insert total number of contracts required.	<b>Information</b>		
Contract Identification			
Award date			
Completion date			
Role in Contract	<input type="checkbox"/> Contractor	<input type="checkbox"/> Management Contractor	<input type="checkbox"/> Subcontractor
Total contract amount			LKRs
If partner in a JV or subcontractor, specify participation of total contract amount	%		LKRs
Employer's Name:			
Address:			
Telephone/fax number:			
E-mail:			

**Form EXP – 2.4.2(a) (cont.)**  
**Specific Experience (cont.)**

Bidder's Legal Name: \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_ pages  
JV Partner Legal Name: \_\_\_\_\_

<b>Similar Contract No. <i>[insert specific number]</i> of <i>[insert total number of contracts]</i> required</b>	<b>Information</b>
Description of the similarity in accordance with Sub-Factor 2.4.2a) of Section III (Evaluation and Qualification Criteria):	
Amount	
Physical size	
Complexity	
Methods/Technology	
Physical Production Rate	

**Form EXP – 2.4.2(b)**  
**Specific Experience in Key Activities**

Bidder's Legal Name: \_\_\_\_\_ Date: \_\_\_\_\_  
 JV Partner Legal Name: \_\_\_\_\_ Bidding No.: \_\_\_\_\_  
 Subcontractor's Legal Name: \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_ pages

Information			
Contract Identification			
Award date Completion date			
Role in Contract	<input type="checkbox"/> Contractor	<input type="checkbox"/> Management Contractor	<input type="checkbox"/> Subcontractor
Total contract amount			LKR
If partner in a JV or subcontractor, specify participation of total contract amount	%		LKR
Employer's Name:			
Address:			
Telephone/fax number:			
E-mail:			

**Form EXP – 2.4.2 (b)(cont.)**  
**Specific Experience in Key Activities (cont.)**

Bidder's Legal Name: \_\_\_\_\_ Page \_\_\_\_\_ of \_\_\_\_\_ pages  
JV Partner Legal Name: \_\_\_\_\_  
Subcontractor's Legal Name: \_\_\_\_\_

	Information
Description of the key activities in accordance with Sub-Factor 2.4.2b) of Section III (Evaluation and Qualification Criteria):	



## Section V - Eligible Countries

### Eligibility for the Provision of Goods, Works and Services in Bank-Financed Procurement

1. In accordance with Para 1.8 of the Guidelines: Procurement under IBRD Loans and IDA Credits, dated May 2004, the Bank permits firms and individuals from all countries to offer goods, works and services for Bank-financed projects. As an exception, firms of a Country or goods manufactured in a Country may be excluded if:

Para 1.8 (a) (i): as a matter of law or official regulation, the Borrower's Country prohibits commercial relations with that Country, provided that the Bank is satisfied that such exclusion does not preclude effective competition for the supply of the Goods or Works required, or

Para 1.8 (a) (ii): by an Act of Compliance with a Decision of the United Nations Security Council taken under Chapter VII of the Charter of the United Nations, the Borrower's Country prohibits any import of goods from that Country or any payments to persons or entities in that Country.

2. For the information of borrowers and bidders, at the present time firms, goods and services from the following countries are excluded from this bidding:

(a) With reference to paragraph 1.8 (a) (i) of the Guidelines:

*[insert list of countries prohibited under official regulations of the country]*

(b) With reference to paragraph 1.8 (a) (ii) of the Guidelines:

*[insert list of countries which are barred under UN Security Council Chapter VII]*

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## **PART 2 – Employer’s Requirements**





## **Section VI - Employer's Requirements**

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## 6.1 PRELIMINARY AND GENERAL

### SECTION A – LOCATION MAP OF THE WORKS

Executive Engineer Division is Kalmunai.

The structures to be improved are located along the following roads:

Natpaddimunai Pandiruppu Boundary Road	EPAMC 006.
Thuraipathi Amman Kovil Road.	EPAMC 007
Sainthamaruthu Kalmunaikudy Boundary Road	EPAMC 016.
Malwatta - Surippodai Road.	EPAMC 039

### SECTION B – DESCRIPTION OF THE WORK

#### 1. Scope of the Works

**1.1** The works, intended to effect improvements to the existing provincial roads and structures to be carried out under this Contract are broadly classified and described below. The scope of the Works shall not be limited by such descriptions.

The Works shall, inter alia, include the following:

(a) Preliminary and General Works:

- i. Providing and maintaining facilities to the Engineer and Engineer's Representative staff consisting of housing, offices, laboratory, vehicle, survey equipment, support staff, etc as per contract provisions.

(b) Survey of Existing Road:

- ii. True and proper setting-out and layout of the works including detail survey works as required.
- iii. Cross-section of existing roads.
- iv. Construction of bench marks, survey beacons and reference pillars.

(c) Road Works

Rehabilitation and Improvement of Project Roads comprising the following:

- i. Site clearance and dismantling of obstructions, existing pavement, removal of utilities etc before construction.
- ii. Repairing surface defects, potholes and irregularities.
- iii. Regulating the road profile to provide given cross falls and super elevation.

- iv. Surface regulating course and granular overlay.
- v. Double surface bituminous surfacing.

(d) Drainage Works

- i. Improvements of existing side drains.
- ii. Construction of new side drains (lined, unlined and covered).
- iii. Rehabilitation, repair and modification of existing culverts and drainage structures.
- iv. Construction of new culvert and drainage structures with provisions for scour protection at inlet and outlet.

(e) Miscellaneous Structures

- i. Rehabilitation, repair and modification of existing structures.
- ii. Construction of retaining walls and other structures.
- iii. Construction of access to properties adjacent to the project.

(f) Incidental Construction

- i. Top soiling, grassing and tree planting.
- ii. Slope protection measures as specified or as directed.
- iii. Guard rails, walls and fences.
- iv. Road markings, kilometre posts and signs.

(g) Construction and maintenance of diversion roads/structures for maintaining uninterrupted flow of traffic

(h) All aspects of quality control (including test loading) of various components of roads, culverts and other structural works as specified or as directed.

(i) Clearing of site, cleaning of existing culverts which are blocked/silted making good the utilities if any and handing over the works as specified or as directed.

(j) Maintenance of the existing road section under the contract to the satisfaction of the Engineer so as to keep the traffic running smoothly throughout the contract period.

(k) Preparation and submission of 'as built' drawings and other related documents as specified.

(l) Any other item of work as may be required to be carried out for completing the works in all respects in accordance with the provisions of the Contract and/or to ensure the structural stability and safety of the works during and after construction.

## **1.2 Maintenance of roads Under Construction**

Contractor shall ensure that all roads or sections of roads taken over for rehabilitation are kept in proper road worthy condition by carrying out regular and prompt maintenance up to the time the works are completed and handed over.

## **1.3 Environmental Management Plan**

The Contractor shall abide by the conditions stipulated in Section 6.5, Environmental Management Plan.

#### **1.4 Removal and Relocation of Existing Utilities.**

The Contractor shall take appropriate action in coordination with the relevant agencies concerned to identify and relocate any utility services that need to be relocated. He shall follow the procedure given in Section 113 of the Special Provisions of the Specification.

### **2. Road and Drainage Works**

The Bidder shall recognize the varied nature of the road and miscellaneous structures and rehabilitation work to be performed under the Contract and that the Bid Drawings show typical details only of the rehabilitation scope of work.

Detail Tender drawings for roads and structures will be classified as level 1 and level 2.

Under level 1, the details provided shall include plan drawing, longitudinal profile and cross sections which may be at regular intervals or typical cross-sections for each homogeneous section of road.

Under level 2, the details provided shall be limited to only typical cross-sections for each homogeneous section of road.

The actual details of the road and drainage works and structures to be constructed will be given in Construction Drawings issued by the Engineer during the execution of the Contract. The details in the Construction Drawings will be based on the cross-section data and survey information provided by the Contractor.

Geotechnical investigations have been carried out for project preparation and those reports shall be available with the Engineer and may be referred to as and when necessary. However, because of site shifting or constraints, further exploratory soil exploration before execution may require to be done by the Contractor.

### **3. Contractor's Responsibility for Geotechnical Tests and Working Drawings for Bridges**

#### **3.1 Standard Design Details**

Bridge Standard Design Details have been prepared by the Consultant and are included in the Bid Drawings. These bridge designs are for standard structures and are intended as indicative only. The Road Number and location where it is anticipated that each of the standards will be used is referenced in the Bid Drawings.

#### **3.2 Geotechnical Tests**

The Contractor is required to carry out a bore-hole at every alternate support location of bridges as described in the Technical Specifications. Depth of boreholes shall be 1.5 times the width of foundation below the founding level mentioned in the bridge drawings.

### **3.2 Preparation of Bridge Working Drawings**

The preparation of actual working drawings to suit site conditions will be the responsibility of the Contractor. This will be done using an approved Professional Engineer with adequate knowledge and experience of bridge design.

Bridge working drawings may be based on the Standard Details adjusted to allow for but not inclusive of:

- Variation in the height of structure
- Angle of skew and alignment
- Foundation conditions with possible associated revision of span configuration
- Changes to carriageway and sidewalk dimensions
- Alternative structural and foundation design proposals

Proposed changes to the Standard Details and acceptance of final working drawings will be subject to approval by the Engineer.

### **3.3 Payment for Geotechnical Tests and Bridge Working Drawings**

Subject to approval by the Engineer, payment will be made to the Contractor for documented expenses incurred in preparation of acceptable geotechnical tests and Bridge Working Drawings. These payments will be made from Provisional Sums and will include profit and overheads.

## **4. Road Setting Out and Survey Work**

Drawings for roads, bridges and other structures will be provided as indicated in Section 129 of the Special Provisions of the Specification. Additional drawings as required at asphalt / concrete paved urban sections and other locations as decided by the Engineer will be considered as a subsidiary obligation of the Contractor, the price of which shall be included in other pay items.

All information required for the setting out of the road centerline etc. is provided in Section 114 of the Special Provisions to the Specification. Setting out for the structures shall be done according to the drawings. Payment for survey and setting out will be considered as a subsidiary obligation of the contractor, the price of which is being included in other pay items except otherwise provided

## **SECTION C – GENERAL REQUIREMENTS**

### **1. General**

The Technical Specifications contained herein shall be read in conjunction with the other Bidding Documents. The Works shall be constructed and completed by the Contractor in accordance with the Technical Specifications and the Drawings.

The Works shall be executed in accordance with good practices followed for achieving high standards of workmanship, thus ensuring safety and durability of the construction. All codes and standards published by ASTM, BS and Sri Lanka standard referred to in these specifications shall be the latest edition thereof, unless otherwise stated.

### **2. Inclusive Documents**

The provisions of general / special conditions of contract, those specified elsewhere in the bidding document, as well as execution drawings and notes, or other specifications issued in writing by the Engineer shall form part of the technical specifications of this project.

The attention of the contractor is drawn to those clauses of codes which require supporting specification either by the Engineer or by 'Mutual-agreement between the supplier and purchaser'. In such cases, it is the responsibility of the Bidder/Contractor to seek clarification on any uncertainty and obtain prior approval of the Engineer before taking up the supply/construction. In absence of such prior clarification, the Engineer's choice/design will be final and binding on the contractor without involving separately any additional payment.

### **3. Measurement and Payment**

The methods of measurement and payment shall be as described under various items and in the Bill of Quantities. Where specific definitions are not given, the methods described in Code of AASHTO, BSI, ASTM and Sri Lanka Standard Publication will be followed. Should there be any detail of construction or materials which has not been referred to in the Specification or in the Bill of Quantities and Drawings but the necessity for which may be implied or inferred there from, or which is usual or essential to the completion of the work in the trades, the same shall be deemed to be included in the rates and prices entered by the contractor in the Bill of Quantities.

### **4. Defective Works**

All defective works are liable to be demolished, rebuilt and defective materials replaced by the Contractor at his own cost. In the event of such works being accepted by carrying out repairs etc, as specified by the Engineer, the cost of repairs will be borne by the Contractor.

## **SECTION D – TECHNICAL SPECIFICATIONS**

The Technical Specifications shall comprise the Standard Specifications, the Special Provisions and the Supplemental Specifications.

### **1. Standard Specifications**

The Standard Specifications refer to the “Standard Specifications for Construction and Maintenance of Roads and Bridges” issued under the authority of the General Manager, Road Development Authority, Ministry of Highways, Sri Lanka and reprinted and published in June 2009 by the Institute for Construction Training and Development.

### **2. Special Provisions**

The Special Provisions comprise various amendments and additions to the Standard Specifications which are specific to the Works in this contract.

### **3. Supplemental Specifications**

The Supplemental Specifications comprise various amendments and additions to the Standard Specifications which are general to road and bridge construction works.

The Contractor should follow the Standard Specifications in conjunction with the Special Provisions and Supplemental Specifications. The amendments contained in the Special Provisions and Supplemental Specifications shall take precedence over the Standard Specifications. In the event of any ambiguity between the Special Provisions and either the Standard Specifications or the Supplemental Specifications, then the Special Provisions shall prevail. If any uncertainty exists, the Engineer shall decide and instruct the Contractor accordingly.

### **4. Additional Explanation**

The table following cross-references the clauses in the Standard Specifications with the amendments or additional clauses in the Special Provisions and Supplemental Specifications and lists the page number in each document.

In the absence of any definite provisions on any particular issue in the aforesaid Technical Specifications, reference may be made to the latest codes and specifications of BS and SRI Lankan Code. Where even these are silent, the construction and completion of the works shall conform to sound engineering practice as approved by the Engineer and in case of any dispute arising out of the interpretation of the above, the decision of the Engineer shall be final and binding on the Contractor.

For items requiring provision of warranty/guarantee by the bidder regarding structural/technical adequacy conformance to laid down specifications of the item extending much beyond the period of completion of the project, the contractor shall provide warranty/guarantee jointly with the manufacturer stating that both shall be jointly and severally responsible for repair/replacement of the item free of cost during the warranty/guarantee period as required.

**CROSS-REFERENCE OF AMENDMENTS AND ADDITIONS TO THE STANDARD SPECIFICATIONS CONTAINED IN  
THE SPECIAL PROVISIONS AND SUPPLEMENTAL SPECIFICATIONS**

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## **6.2 STANDARD SPECIFICATIONS**

The Standard Specifications refer to the “Standard Specification for Construction and Maintenance of Roads and Bridges” issued under the authority of the General Manager, Road Development Authority, Ministry of Highways, Sri Lanka and reprinted and published in June 2009 by the Institute for Construction Training and Development (ICTAD).

Bidders need to obtain this document from ICTAD.

It is observed that there are printing and spelling mistakes in this document. These will have to be corrected by the users of the document.

## **PART 2 –Requirements**

### **6.3 - SPECIAL PROVISIONS**

## **ICTAD STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF ROADS AND BRIDGES**

### **SPECIAL PROVISIONS**

#### **100 GENERAL**

Insert General Comments as follows

##### **100.1 General Requirements**

These specifications should be read in conjunction with all the rest of the contract documents, namely, Standard Specifications for Construction and Maintenance of Roads and Bridges published by the Institute of Construction Training and Development – June 2009 edition, Supplemental Specifications, Additional Specifications, the Instructions to Tenderers, Conditions of Contract, Bill of Quantities, Drawings, any Addenda that are issued etc.

All works should be carried out and completed in accordance with these documents and to the full satisfaction of the Engineer and the Employer.

In this specification singular words shall include their plural and plural words shall include their singular.

##### **100.2 Location of Works**

Please refer Section 6 Sub-Section 6.1 A

##### **100.3 Description of the Works**

Please refer Section 6 Sub-Section 6.1 B

#### **102 DEFINITIONS**

Make changes as follows

Super Structure - Delete the word “bearings” at the end of the sentence and insert the word “sub structure”

Insert the following items into the list of definitions

Pay Item - An item of payment described and shown as such in the specifications with Pay Item Number and Description

Selected sub-grade - Where unsuitable sub grade material is removed and refilled with acceptable material and compacted in accordance with these specifications. application or aggregate bases or bitumen-aggregate mixtures or concrete.

## **103 ARRANGEMENTS FOR TRAFFIC WITH SAFETY PRECAUTIONS DURING REHABILITATION OR CROSSING OF EXISTING ROADS**

### **103.3 Temporary Diversions**

Include an additional Para after the first Para as follows

If the contractor propose to use the existing road system for temporary diversions he should obtain the approval of the respective road authority and keep the Engineer informed and obtain his approval for such arrangement.

### **103.4 Traffic Safety and Control**

Add a Para at the end as follows

The contractor shall keep the traffic police informed of the arrangements of his works and the traffic safety methods he would use and get the police to agree and to be in attendance when required.

### **103.4 Measurement and Payment**

#### **(a) Measurement**

Detours and traffic diversions shall not be measured separately. Any compensation for these shall deem to be included in the relevant bid rates. Works required to be carried with respect to traffic safety and control shall be measured as the number of weeks the Contractor complies with the specification.

#### **(b) Payment**

Payment for traffic safety and control shall include for the provision, maintenance and subsequent removal of all signs, lights barriers, markings etc. It shall be full compensation for all material transport, labour, equipment and all requirements to be met under sub section 106.3.

## **104 CONTROL OF WORKS**

**Delete Sub Section 104.3 and Add New Sub Sections 104.3 and 104.4**

### **104.3 Construction Programming**

The contractor's work programme shall be in accordance with the Contract conditions and shall be submitted to the Engineer, for his perusal and consent, before commencing on any works. His work sequence and the progress to be made should be in accordance of his work programme. His working arrangements should not disturb, as far as practicable, the normal use of the road.

In order to achieve this, the contractor should arrange to complete the works on stretches of road of length around one kilometer by one kilometer. All works to be carried out within the selected kilometer, which shall be approved by the engineer, should be completed before moving on to another stretch.

The contractor should arrange to work only on one side of the road at any given time, and keep the other side open for traffic with the necessary controls. The working length of road at any given time should be kept to a maximum distance of three hundred meters (300m).

If the contractor so wishes the Engineer may permit him to work on another 300m length along the same side of the road and within the same kilometer length. However this 300m length should be separated from the first 300m by a minimum distance of 150m.

Other constructions such as structural work, for bridges, extensions to culverts, construction of retaining walls, drainage works or other works which can be carried out without disruption to traffic may be undertaken outside these limits after proper programming and with the approval of the Engineer.

The contractor should ensure to see that his working methods and the sequence of work items are so arranged that it will cause the least disruption or inconvenience to the vehicular traffic and other uses. The works shall be properly protected from damage due to inclement weather conditions or any other cause. Any damages caused due to any such cause, or due to the movement of traffic on a completed section or a partly completed section of road shall be removed and reconstructed properly to the satisfaction of the Engineer. These conditions should apply to road works as well as at bridge sites, culvert locations etc. where reconstruction works, extensions or remedial works are to be done.

The contractor should provide suitable mechanical equipment in adequate quantities for the work to be done according to the specifications. All equipment brought for site use shall be checked and approved by the Engineer. During non working time all equipment shall be parked in a yard outside the working area, which the contractor should arrange at his own cost, and brought to the site when required. Equipment brought for the works shall not be removed unless its use is no longer required and without the permission of the Engineer.

#### **104.4 Measurement and Payment**

No separate payment shall be made for complying with this clause. All expenses found necessary in this respect shall be deemed to be included in other rates.

#### **105 CONTROL OF MATERIALS**

Insert a new Para at the end of last Para as follows

Materials such as steel, reinforcement, cement in bags and others which are susceptible to humidity or moisture should be stored well above ground, a minimum

of 300mm, on a suitably erected platform. Cement delivered in bulk should be stored in silos or other air tight containers until their use.

All material should be used in the first in first out basis. Any aged material should not be used. Such material may be checked by the Engineer and tested and if found to be satisfactory it may be accepted for use.

**Insert a new sub section as follows**

### **105.8 Materials to be Imported**

Any materials to be imported should be obtained from a source country approved by the funding agency

## **GENERAL RULES FOR MEASUREMENT AND PAYMENT**

Insert two new Para at the end of last Para as follows.

All measurements shall be taken of completed works after ascertaining their acceptability. Only works accepted by the Engineer shall be measured for payment. Works pending acceptance shall not be paid in full. A lesser percentage, to be decided by the Engineer in consultation with the employer, may be paid for works pending acceptance, provided the Engineer is satisfied that the contractor will finally complete these works satisfactorily.

Quantities for making payments on completed works shall be computed in accordance with the provisions made for the respective items. In the event of any situation where such compliance is not possible a decision of the Engineer should be obtained.

### **106.1 Lead for Material**

Delete this sub section and insert as follows.

No additional payment will be made for haulage or transport of any materials. The contractor's rate quoted for each item should include for procurement, transport and incorporation of it in to the works and all incidentals there to.

### **106.2 Measurement for Area and Volume Based Payment**

#### **(a) Area basis**

Para one - Insert a sentence at the end of the Para as follows. "As a minimum, one check shall be done for each 500 Sq.m area after compaction of each layer."

### **106.3 Scope of Rates for Different Items of Work**

Delete this sub section and insert it as follows.

The rates quoted by the contractor for each item in the bills of quantities (BOQ), shall be the full compensation to carry out all works required to be done with respect to that item, including for providing all material, labour, equipment, transport, temporary works, wastage, overheads and for meeting all obligations and risks arising out of the conditions of contract or any other contract document and for meeting all legal requirements of the country. It shall also include for any shoring and dewatering where required, and not provided otherwise.

This sub section shall apply to all items of work in this contract irrespective of whether it is mentioned under any item or not.

#### **106.4 Facilities for Verification of Measurements**

Para one - Delete the words “officer of the client organization” at the end of Para one insert the word “Engineer” in its place.

**Insert a new subsection as follows:**

#### **106.7 Units of Measurement**

All dimensions shown on the drawings stated in the specifications or on the bills of quantities are in the metric system, and this system shall be used throughout the contract.

Any reference to measurements in any of the submissions such as reports, construction drawings etc. to be made by the contractor to the Engineer or the Employer shall be in the metric or the S.I. system

### **INSERT THE FOLLOWING ADDITIONAL SECTIONS 108 TO 132 AS FOLLOWS**

#### **108 INFORMATION FURNISHED BY THE EMPLOYER**

Certain information contained in the contract documents or provided separately prior to tender by the employer is being offered in good faith and no guarantee can be given that any or all of the information is correct or representative of the actual conditions.

The employer accepts no liability for the correctness or otherwise of the information supplied or for the resulting damages, whether direct or consequential, should it prove during the course of the contract that the information supplied is either not correct or not representative. Any reliance which the contractor places on this information shall be at his own risk and the contractor shall be deemed to have checked the correctness of the information prior to submission of the tender.

**Delete para 109 entirely and insert a new para as follows.**

#### **109 WORKMANSHIP AND QUALITY CONTROL OF WORKS**

##### **109.1 Quality Control of Materials and Works.**

The quality of materials and works shall be maintained continually in accordance with these specifications. The Contractor should ensure that the quality, of all works, materials, and workmanship are in compliance with the relevant sections of the specification. The engineers' approval shall be obtained for all testing done in this regard. The Contractor shall be required to provide all testing equipment, test samples, laboratory staff, transport and all incidentals and costs relating to testing.

The Contractor should arrange a system of quality control for works and materials to enable the quality of these to be monitored by him and the Engineer. The quality control system to be kept in place shall be such that it conforms to the tests, testing methods and procedures specified in these specifications under the relevant sections. All required documentation should be produced by the Contractor and the Engineers' approval should be obtained for same. All test data and test results should be submitted to the Engineer for scrutiny and approval.

The Engineer shall maintain his own laboratory in order to enable him to do any further testing when necessary. These tests shall be done in the presence of the contractors' laboratory staff and they should also attest to the test records produced as a result of these tests.

The Contractor shall keep the Engineer always informed, when material samples for testing are to be collected, when material testing are proposed to be done, where the material testing are to be carried out etc. so that the Engineer or his representative can be present at these events..

For materials such as cement, steel reinforcement, bitumen, bridge bearings etc. the contractor should submit manufacturer's certificate together with proper and current test records. If necessary the Engineer may require further testing or additional tests to be done either at the Engineers' laboratory, Contractors' laboratory or at any other approved laboratory.

The Contractor shall notify the Engineer, at least two days in advance, before any works, such as foundations are covered up, and before the concreting of any structure, reinforced or un-reinforced, is carried out. The Engineer shall inspect and approve such works before covering up. If the Contractor carries out such works without giving notice, the Engineer may require the Contractor to excavate or demolish such works and re-construct.

Any approvals given by the Engineer shall not relieve the Contractor of his contractual responsibility and obligations towards the satisfactory fulfillment of the contract.

#### 111 NOT USED

Insert a new section as follows

### **111 WORK EXECUTED BY THE EMPLOYER OR OTHER CONTRACTORS**

The Employer reserves the right to execute, on the Site, works not included in the contract and to employ for this purpose either his own employees or other Contractors. The Contractor shall ensure that neither his own operations nor the actions of his employees shall interfere with the operations of the Employer or his Contractors on such works and the same obligations shall be imposed on the Employer and his Contractors in respect of work being executed under the contract.

The Contractor shall provide unhindered access to all parts of the Site to the Employer and authorized representatives of the Employer and of public bodies and corporations and to Contractors employed by the Employer and he shall make available to such authorized persons the use of all temporary access tracks in or about the site.

In the event the contractor's working is affected due to the presence of another contractor or the employer carrying out other works, he shall inform the engineer and arrange a programme of works in coordination and in consultation with the other party and the employer, so that the contractors work can proceed without inconvenience.

## **112 SERVICES**

**Delete Entire Section and Insert a new section as follows**

### **112 DEALING WITH EXISTING UTILITY SERVICE**

#### **112.1 General**

Contractor should be aware that there could be overhead and underground utility services within the site or the working area. He should be mindful of this and take suitable measures to deal with them without causing disruption to the services provided by them.

During construction operations, the contractor should take care of all utility services so that they are not in any way adversely affected. All service facilities such as berried water pipes electrical and telecom cables etc should be protected from any damage. If any services are exposed in the cause of the work he should immediately inform the Engineer and the utility authority concerned and follow their advice on how to proceed with the work.

Before commencing work on a particular length of road, the contractor should obtain full information regarding the position of any utility services underground or overhead. The contractor is fully responsible for making appropriate arrangements with the utility authority concerned for the relocation or any other work that need to be done with the respective utility service concerned. The contractor should obtain the cost estimate for relocating any utility services or any other work from the utility authorities and submit the estimate to the Engineer to obtain the client approval for the cost for relocation of any utility service. This shall be borne by the client..

If in the course of the contractors site operations any damage is caused to any of the utility services, he shall immediately inform the Engineer and the utility agency concerned. In such event the utility authority may undertake to repair the damage or to take remedial action or else instruct the contractor to attend to the damage, especially damages to small diameter (less than 50mm diameter) water pipes, under the supervision of the utility agency concerned. In either case the cost of rectification of the damage shall be borne by the contractor.

The employer shall not be held liable or responsible for any delay in completion of the works under the contract which may occur due to relocation of any utility service or damage occurred in consequence of contractors operations. The contractor shall not be entitled for any claim for damages or extension of time due to such cause.

## 112.2 Payment

Work for protecting the utility services by providing temporary supports etc during the execution of the works shall be deemed to be included in the contractor's rates and no extra payment shall be made for the same.

The contractor may be instructed by the Engineer to assist in the demolition and or rebuilding of property within or outside the right of way. In such event the amount of work involved at site shall be determined by the contractor with supporting data and as instructed by the Engineer. Payment for such work shall be under a provisional sum and shall be based upon rates to be determined by the Engineer in accordance with the conditions of contract.

The pay item shall be:

Item No.	Description	Pay Unit
112 (1)	Demolition and rebuilding of property	Provisional sum
112 (2)	Relocation of services	Provisional sum
112 (3)	Mark up for Contractor supervision/Overheads	Percentage
112(4)	Removing & reconstruction of gates	Nos

## 113 NOT USED

**Insert a new section as follows**

## 113 ELECTRICITY, WATER SUPPLY ETC. FOR CONTRACTORS USE AND WASTE MANAGEMENT

The contractor should make his own arrangements for the supply of electrical power, water supply, telephone facilities etc required for all site operations and for his own use.

He should also make his own arrangements for the disposal of all sewage, solid and liquid waste material, any excess material, etc. produced at site in such a manner that will be acceptable to the client and other waste management authorities and also to the satisfaction of the Engineer.

Water for construction works shall be in accordance with the specifications for the relevant section. Overall, water used for construction works shall be clean, free from any organic or inorganic deleterious material. Portable quality water is suitable. Water from other sources should be tested and approved by the Engineer. Special care should be taken with respect to water used for concrete works, so as to ensure no undesirable salts, that can cause harmful reactions in the mix, are present. Contractor is responsible for obtaining acceptable quality water to the site at no extra cost. All costs of procuring, transport, storing and use shall be included in the rates for the respective item

## **117 SETTING OUT, CROSS SECTIONS AND DRAWINGS**

### **117.1 Setting out Centre Line and Cross Section Survey**

The contractor shall be provided with copies of drawings prepared by the employer / design consultant at the tender stage. These drawings shall provide information regarding horizontal and vertical alignment along the proposed centre line of the road and cross sections taken across the road at right angles to this centre line, with respect to some of the road sections. These drawings may include locations of some survey reference control points / bench marks and any available survey data on them. These details are provided only as guidance to the contractor. In some other road sections the drawings will include only typical cross section details and no plan and vertical profile are provided. In these cases the Contractor shall establish the new road centre line on ground at site in coordination with the Engineer.

A fresh survey shall be carried out by the contractor within four weeks of receiving the letter of acceptance. He should verify the accuracy of all the established reference control points / bench marks, and or establish new reference control points / bench marks. It is preferable to have at least four control points / bench marks established within each kilometer length of road. Additional control points / bench marks may be required at locations where work is required to be carried out on structures such as bridges and culverts. All control points / bench marks and any other monuments established shall be maintained and safeguarded by the contractor. Survey data pertaining to these control points / bench marks shall be submitted to the Engineer for verification.

Contractor shall engage well qualified and experienced surveyors, design engineers and computer aided drafting personnel to do the survey works, design and drafting. They shall use modern instruments and equipment and these shall be approved by the Engineer before commencing on the survey and design works.

The contractor shall, in coordination with the Engineer, establish the new centre line of the road on ground at site as closely as practicable in accordance with the supplied drawings or otherwise. At this stage any minor changes found necessary to the existing horizontal or vertical profile shall be examined and incorporated into the construction, and the drawings accordingly revised for the altered section. Based on this established centerline the Contractor shall do a longitudinal profile and cross section surveys at ten metre (10m) intervals, prepare drawings of the longitudinal profile, cross sections and structural drawings for structures along the road and submit to the Engineer for verification, and approval. Cross section survey should be done at 10 meter intervals or at such other closer interval as directed by the Engineer.

Prior to the longitudinal and cross section surveys are done the Contractor shall do and complete all clearing and grubbing works that are required to be done along the road.

## 117.2 Preparation of Construction Drawings

The drawings provided by the contractor shall be checked by the Engineer. Any discrepancies in these drawings shall be corrected in consultation with the contractor and returned to him within two weeks of receipt. Thereafter the Contractor shall do the final design to be used for construction. These working drawings shall be completed and issued to the Engineer within four weeks of receipt of the approved survey drawings. These drawings shall provide all the necessary and adequate details needed for construction. They shall clearly show the structural details across the road; width of carriageway, shoulders, verges and side drains; levels to be maintained at centre line, edges and drain inverts. These final drawings shall be approved by the engineer within two weeks of receipt from the Contractor.

The working drawings thus produced shall be the basis for proceeding with the construction works and also the basis for measurement and making payment.

## 117.3 Measurements and Payments

### (a) Measurement

Quantity to be measured for setting out the centre line shall be the length in kilometers corrected to two decimal places checked and accepted by the engineer. For cross sections, it shall be the number of it checked and approved by the Engineer.

### (b) Payment

Payment for items measured as above shall be made at the unit rates quoted. This shall be the full compensation for all the items including survey, design, structural and other drawings etc. and all expenses with respect to items stipulated under clause 106.3 (scope for rates for different items of work)

The pay items shall be:

Item No.	Description	Pay Unit
117 (1)	Centre line	Kilometre
117 (2)	Cross section	Number

## 119 PROVISION OF INSURANCE, BONDS AND SECURITY

### 119.1 Description

**At the end of the existing para add a new paragraph as follows.**

The contractor shall be responsible for dealing with the insurance company with respect to any claims by third parties. Notification with respect to any damages to a third party shall be communicated to the insurer by the contractor and shall assist the affected party to obtain compensation. A copy of the notification shall be submitted to the Engineer. The contractor shall keep the Engineer informed in writing of all the

incidents, that occur within the project boundaries, causing damage, injury or death to any person, weather of the contractor or not, soon after such incident take place. He shall provide full details of the incident giving the cause of the incident, details of damages, names of affected persons and actions taken etc.

**Insert a new section as follows**

## **120 POSSESSION OF SITE AND MAINTENANCE OF ROADS**

### **120.1 Description**

The Contractor shall take possession of the site in accordance with the general conditions of contract. He shall make an application in writing to the Employer, with copy to the Engineer, requesting for the possession of site.

Before being given possession of any part of Site, a joint condition survey of the road surface, drainage facilities, right of way clearings, shoulders, structures and footways etc. within that part of the Site shall be carried out by the Employer, the Contractor and the Engineer, and a schedule of remedial works, if any, that may be necessary to restore the road to an acceptable agreed condition shall be prepared. If such remedial work is not carried out by the Employer in time to accord with the Contractor's approved programme of work, the Contractor shall carry out such remedial works himself in accordance with the Engineer's directions.

All lengths taken over by the Contractor shall be maintained by him whether work is underway on it or not. It shall be the responsibility of the Contractor to upkeep the roads which are taken into his possession until the works are completed and handed over to the Employer.

Contractor shall not be paid separately for maintaining these roads. It shall deem to be included within the rates of the BOQ items.

All roads taken into the possession of the Contractor shall be maintained in good condition, similar to or better than the condition of the roads at the time of his taking over and to the satisfaction of the Engineer. If the Contractor fails to maintain these roads in a satisfactory condition, the Engineer may arrange other methods to maintain these roads and charge the cost to the Contractor.

Sections of road on which the Contractor has commenced permanent works shall be maintained by the Contractor in a trafficable condition.

In a multi road contract, the Contractor may request for the issue of a Partial Completion Certificate upon the satisfactory completion of at least one of the roads in the contract. Upon such request the engineer shall inspect and if satisfied notify the Employer for a joint inspection of the completed road. If the Engineer and the Employer are satisfied with the completed works the engineer may issue a Partial Completion Certificate for this road and the employer shall take over the road from

that date, Defects liability of the Contractor for that road shall commence from the date of issue of the Partial Completion Certificate.

Roads used as diversion routes for traffic due to the Works shall be considered as part of the Site for the purposes of maintenance.

(i) Measurement and Payment

**a Measurement**

If the Contractor is required to carry out any remedial works on the roads, prior to taking possession of the site, and subsequent to the joint inspection carried out, all such works shall be measured in accordance with the recommendations and approval of the Engineer.

It is not required to take any measurements for the works done on maintenance of the roads.

**b Payment**

**If the Contractor carries out any remedial works prior to Taking possession of the site it shall be paid in accordance with the recommendations and approvals to be made by the Engineer. A provisional sum shall be made available for this purpose.**

Item No.	Description	Pay Unit
120(1)	Attending to rectifications prior to taking possession of the site, if required	Provisional Sum

**Insert a new section as follows**

**121 FACILITIES FOR ENGINEER'S REPRESENTATIVE AND HIS STAFF**

**121 Description**

Following facilities shall be provided by the Contractor for Engineers' use in quantities as stipulated in the relevant appendices and the B.O.Q.

1. Minimum three bed roomed house complete with furniture for the Engineer.
2. Minimum three bed roomed house for Engineers' expatriate and other staff.
3. Site office for the Engineer and his staff
4. Field office for the Engineers' staff
5. Laboratory for the Engineer and his staff
6. Field testing laboratory

The housing to be provided shall be rented building of acceptable standard. Offices and laboratory shall be either rented accommodation or semi permanent construction to an acceptable standard. All buildings should have convenient, motorable access roads and adequate garage or covered parking space. Comprehensive details are provided under their respective sections and these shall be examined before quoting.

The Contractor shall provide and maintain all the buildings, furniture, equipment, and Laboratory equipment as required for each of the buildings and listed under the respective sections.

All facilities shall be provided with the following services in adequate quantities and full time use.

1. Electrical power supply and fittings including ceiling fans.
2. Piped portable water supply
3. Telephone facilities.
4. Toilet and Bathroom facilities.
5. Air conditioning for Engineers, house, office, laboratory and expatriate staff houses.
6. Exhaust fans for the laboratories and offices.
7. Security services
8. Cleaning and maintenance services.

All facilities shall be maintained by the Contractor and any defects that may arise shall be repaired and attended by him without any delay as a part of the maintenance service. Daily cleaning of the offices and the laboratories, including all items of furniture, bathrooms, toilets etc. shall be done. The premises shall be swept and cleaned daily. Cutting of grass and attending to plants shall be done on a weekly basis. Contractor shall arrange a satisfactory sewerage disposal system for all facilities. All consumables for the use of the Engineer shall be supplied by the Contractor on a regular basis.

Security shall be provided for all facilities on a round the clock full time basis. All facilities shall be insured to its full value including any furniture, equipment etc. Fencing around all buildings shall be provided. These shall be 2.5 m high chain link fencing.

All office and laboratory facilities, including laboratory equipment, shall be provided by the Contractor within eight (8) weeks of receiving the letter of acceptance. Housing for the Engineer and his staff, together with all furniture and equipment, shall be provided within six (6) weeks of receiving the letter of acceptance. If there is any delay in providing housing for the Engineer and his staff, the Contractor shall arrange to provide them with hotel or suitable other accommodation, food and beverages like tea, coffee and water acceptable to the Engineer, and shall bear all costs relating to it. Contractor shall not commence any permanent works until the facilities for the Engineer and staff is provided satisfactorily.

The disposal of all discarded material or other items of refuse shall be arranged by the Contractor. All buildings shall be made termite and insect proof by regular treatment. Treatment shall be done at least once in six months.

At the end of the contract, all temporary services provided to the buildings shall be removed by the Contractor. All semi-permanent constructions shall be dismantled and removed and the ground reinstated to its former condition or as instructed by the Engineer. All rented buildings shall be returned to the owners and all matters connected with it shall be handled by the Contractor without the Employer or the Engineer having to intervene.

At the end of the contract the ownership of all furniture and equipment provided for the use of the Engineer and his staff shall be as follows.

No.	Description	Ownership at the end of Contract
1	All Laboratory equipment supplied for the Engineers' Laboratory	Employer
2	Furniture supplied to the Engineers office	Employer
3	Equipment supplied to the Engineers office	Employer
4	Furniture supplied to Engineers' house	Contractor
5	Furniture supplied to Engineers' staff house	Contractor
6	Furniture supplied to the Engineers laboratory	Employer
7	Furniture and equipment supplied to site office	Contractor
8	Furniture supplied to site laboratory	Contractor
9	All Laboratory equipment supplied for the Site Laboratory	Contractor
10	Survey Equipment	Employer

\* Item one of the equipment list, appendix SP – 4, comprising of the network station and the work stations shall be the property of the Contractor. Rest of the items in the list shall be the property of the Employer.

#### Insert a new section as follows

### 122 ACCOMMODATION FOR ENGINEER'S REPRESENTATIVE (*Not Applicable*)

#### 122.1 Description

The housing accommodation to be provided for the engineer's representative shall be a rented building to the approval of the Engineer. It shall be a house with a minimum floor area of 160 m<sup>2</sup>. It shall have at least three bed rooms one of which shall be the master bed room having attached bath and toilet. Other two rooms may have separate or common bath and toilet. The house shall have suitably arranged separate areas for sitting, dining, kitchen, pantry and separate servants' room, bath and toilet.

It shall be provided with all the facilities as stipulated in section 121

The premises shall be fenced.

All doors and windows shall be provided with curtains

Garage or covered parking for minimum of two vehicles shall be provided

List of furniture and equipment is given in appendix SP – 2 shall be provided. This shall be checked and approved by the Engineer. All furniture to be provided shall be strong and durable and able to last the full project period and shall be obtained from a reputed and recognized supplier. The furniture shall be maintained throughout the project period

## **122.2 Measurement and Payment**

### **(a) Measurement**

Housing for the Engineer shall be measured as the number of units provided and accepted by the Engineer.

Furniture for the Engineers' house shall be measured as a lump sum item for each complete set of furniture as indicated in Appendix SP – 2 provided and accepted for each house

### **(b) Payment**

Payment for the housing accommodation to be provided for the Engineers' representative shall be made on a monthly basis. It shall include for providing the house and the facilities, item no.1 to 6 stated in section 118, fencing, access road, parking, disposal of solid and liquid waste including sewerage, termite treatment and the removal of any temporary services or structures provided on completion of the project.

Security services, Cleaning and Maintenance services shall be paid separately on weekly basis.

Payment for furniture shall include for procurement, delivery and installation of all items given in Appendix SP – 2 and their maintenance. Each complete set of furniture shall be paid, 80% upon the delivery and satisfactory installation and acceptance of the Engineer, 20% on completion of the project.

This arrangement of payment for providing house, furniture etc., shall be the full compensation in respect of these items, and the contractor shall have no entitlement for any further compensation irrespective of any increase in the contract period due to any reason.

<b>Item No.</b>	<b>Description</b>	<b>Pay Unit</b>
122 (1) Month	House for the Engineers' Representative(ARE)	House
122 (2)	Maintenance and cleaning of Engineers' representative house(ARE)	Week
122(3)	Providing security for Engineers' Representative house and premises (ARE)	Week
122 (4)	Furniture for Engineers' Representative House (ARE)	Lump Sum

**Insert a new section as follows**

## **123 ACCOMMODATION FOR ENGINEER'S STAFF**

### **123 Description**

The housing accommodation to be provided for the engineer's staff shall be rented buildings to the approval of the Engineer. It shall be houses with a minimum floor area of 130 m<sup>2</sup>. It should have at least three bed rooms one of which should be the master bed room having attached bath and toilet. Other two rooms may have separate or common bath and toilet. The houses should have suitably arranged separate areas for sitting, dining, kitchen, pantry and separate servants' room, bath and toilet.

It shall be provided with all the facilities as stipulated in section 118.

The premises shall be fenced.

All doors and windows should be provided with curtains.

Garage or covered parking for minimum of two vehicles shall be provided. The list of furniture and equipment for the engineer's representative staff houses is given in the appendix SP – 3. This shall be approved by the Engineer before purchase. All furniture to be provided shall be strong and durable and able to last the full project period and shall be obtained from a reputed and recognized supplier. The furniture shall be maintained through out the project period.

#### **123.2 Measurement and Payment**

##### **(a) Measurement**

Housing for the Engineers' Representative shall be measured as the number of housing units provided and accepted by the Engineer.

Furniture for the Engineers' Representative houses shall be measured as a lump sum item for each complete set of furniture as indicated in Appendix SP – 3 provided and accepted by the Engineer for each house.

**(b) Payment**

Payment for the housing accommodation to be provided for the staff of the Engineers' representative shall be made on a monthly basis. It shall include for providing the house and the facilities, item no.1 to 6 stated in section 121 fencing, access road, parking, disposal of solid and liquid waste including sewerage, termite treatment and the removal of any temporary services or structures provided on completion of the project..

Security services, Cleaning and Maintenance services shall be paid separately on weekly basis

Payment for furniture shall include for procurement, delivery and installation of all items given in Appendix SP – 3, and their maintenance. Each complete set of furniture shall be paid, 80% upon the delivery and satisfactory installation and acceptance of the Engineer and 20% on completion of the project.

This arrangement of payment for providing houses, furniture etc., shall be the full compensation in respect of these items, and the contractor shall have no entitlement for any further compensation irrespective of any increase in the contract period due to any reason.

<b>Item No.</b>	<b>Description</b>	<b>Pay Unit</b>
123 (1)	House for the staff of the Engineers' Representative	House Month
123 (2)	Maintenance and cleaning of the house of the Engineers' Representative staff	Week
123 (3)	Providing security for the house and premises of the Engineers' representative staff	Week
123 (4)	Furniture for the house of Engineers' Representative staff	Lump Sum

**Insert a new section as follows**

**124 OFFICE FOR ENGINEER'S REPRESENTATIVE AND STAFF**

**124.1 Description**

Office for the engineer shall be either rented building or of semi-permanent construction. It shall have a floor area not less than 150m<sup>2</sup>. A separate room of area 15 m<sup>2</sup> or larger with attached bath and toilet facilities shall be provided for the Team Leader / Engineers' representative. A space for holding conferences and meetings capable of accommodating a long table and chairs for seating of over 12 persons shall

be provided preferably adjoining the Team Leader's room. Rest of the floor area of the office shall be capable of accommodating the following staff as a minimum.

1. Engineers 2 No.
2. Environment Specialist 1 No.
3. Quantity surveyors 1 No.
4. Land surveyors 1 No.
5. Supporting staff 5 Nos.

There shall be a room for dining, making tea etc. provided with kitchen utensils, water supply for drinking and washing purposes.

Separate toilets for males and females shall be provided each with commode, wash basin, shower, mirror etc.

All services as stipulated in section 121 shall be provided. All rooms or areas shall be adequately illuminated with sufficient number of four foot length fluorescent light fittings. There shall be a sufficient number 15 amp and 5 amp plug points to enable all office equipment to operate properly. There shall be a minimum of five computer work stations, two photocopy / printing machine, plan printer, scanner etc. Ceilings fans shall be provided to use especially at times when an AC fails to function for reasons other than power failure.

The office shall have at least two dedicated telephone lines one of which shall be provided with at least eight intercoms with access to direct dialing.

The list of furniture and equipment to be provided for the Engineers' Representative office is as given in appendix SP – 4. This shall be checked and approved by the Engineer. All furniture to be provided shall be strong and durable and able to last the full project period and shall be obtained from a reputed and recognized supplier. The furniture shall be maintained throughout the project period.

All equipment to be provided shall be of good quality available in the market and of recognized and reputable make. Prior to purchase of any equipment the contractor shall submit its full details and specification to the Engineer for review and approval. All equipment shall be maintained by the Contractor throughout the period of the project.

## **124.2 Measurement and Payment**

### **(a) Measurement**

Office for the Engineer shall be measured as the number of units provided and accepted by the Engineer.

Furniture to the Engineers' office shall be measured as a lump sum item for each complete set of furniture as stipulated in Appendix SP – 4 is supplied, installed and accepted by the Engineer

Equipment for the Engineers' office shall be measured as a lump sum item for each complete set of equipment as stipulated in Appendix SP - 4 supplied, installed and accepted by the Engineer.

**(b) Payment**

Providing office accommodation for the Engineers' representative whether rented or of semipermanent construction shall be paid on monthly basis. The payment shall include for providing the office, and the facilities item 1 to 6 in section 118, fencing, access road, parking, disposal of all solid and liquid waste including sewerage, termite treatment and on completion of the project removal of all temporary services and structures provided.

Security services, Cleaning and Maintenance services shall be paid separately on weekly basis.

If the office is of semi permanent construction the payment shall include for the leasing or renting of the land required for this purpose.

Payment for furniture shall include for procurement, delivery and installation of all items given in Appendix SP – 4, and their maintenance. Each complete set of furniture shall be paid, 80% upon the delivery and satisfactory installation, testing and acceptance of the Engineer and 20% on completion of the project.

Payment for equipment shall include for procurement, delivery and installation of all items given in Appendix SP – 4, and their maintenance. Each complete set of equipment shall be paid, 75% upon the delivery and satisfactory installation and acceptance of the Engineer and 25% on completion of the project.

This arrangement of payment for providing office, furniture, equipment etc., shall be the full compensation in respect of these items, and the contractor shall have no entitlement for any further compensation irrespective of any increase in the contract period due to any reason.

<b>Item No.</b>	<b>Description</b>	<b>Pay Unit</b>
124 (1)	Office for the Engineers' Representative and his staff	House Month
124(2)	Maintenance and cleaning of the office for the Engineers' Representative and staff	Week
124(3)	providing security for the office of the Engineers' representative and his staff	Week
124(4)	Furniture & Equipment for the office of the Engineers' Representative and his staff	Lump Sum

**Insert a new section as follows**

## **125 SITE OFFICE FOR ENGINEER'S STAFF**

### **125.1 Description**

This shall be a building either rented or of semi-permanent construction having a minimum floor area of 50 m<sup>2</sup>. It shall be capable of accommodating the following staff as a minimum. Separate area for dining and making tea etc. shall be provided. Rest of the floor area of the office shall be capable of accommodating the following staff as a minimum

1. Assistant Resident Engineer. 1No.
2. Engineers 1No.
3. Inspectors 3 No.
4. Data entry operator / clerk 1No.
5. Office aid. 1No.

All services as stipulated in section 121 shall be provided as required. One telephone line with telephone shall be provided. A toilet shall be provided with commode, wash basin, shower, mirror etc.

The list of furniture and equipment to be supplied for Engineer's site office is given in appendix SP – 5. This shall be checked and approved by the engineer. All furniture to be provided shall be strong and durable and able to last the full project period and shall be obtained from a reputed and recognized supplier. The furniture shall be maintained throughout the project period

### **125.2 Measurement and Payment**

#### **(a) Measurement**

Site Office for the Engineers' staff shall be measured as the number of units provided and accepted by the Engineer.

Furniture and equipment for the site office of the Engineers' staff shall be measured as a lump sum item for each complete set of furniture and equipment as stipulated in Appendix SP – 5 is supplied, installed and accepted by the Engineer

#### **(b) Payment**

Providing site office for the use of Engineers' staff whether rented or of semi permanent construction shall be paid on monthly basis. The payment shall include for providing the office, and the facilities item 1 to 6 in section 118, fencing, access road, parking, disposal of all solid and liquid waste including sewerage, termite treatment and on completion of the project removal of all temporary services and structures provided.

If the office is of semi permanent construction the payment shall include for the leasing or renting of the land required for this purpose.

Security services, Cleaning and Maintenance services shall be paid separately on weekly basis

Payment for furniture and equipment shall include for procurement, delivery and installation of all items given in Appendix SP – 5, and their maintenance. Each complete set of furniture and equipment shall be paid, 80% upon the delivery and satisfactory installation and acceptance of the Engineer and 20% on completion of the project.

This arrangement of payment for providing site office furniture, equipment etc., shall be the full compensation in respect of these items, and the contractor shall have no entitlement for any further compensation irrespective of any increase in the contract period due to any reason.

<b>Item No.</b>	<b>Description</b>	<b>Pay Unit</b>
125 (1)	Site office for the Engineers' staff	House Month
125 (2)	Maintenance and cleaning of the site office for the Engineers' staff	Week
125 (3)	Providing security for the site office of the Engineers' staff	Week
125 (4)	Furniture and equipment for the site office of the Engineers' staff	Lump Sum

### **Insert a new section as follows**

## **126 TESTING LABORATORY FOR THE ENGINEER'S REPRESENTATIVE**

### **126.1 Description**

The testing laboratory to be provided by the contractor for the use of the Engineer shall be a building which can be either rented or of semi permanent construction at a suitable location to be approved by the Engineer. The laboratory should be made available within eight (8) weeks of issuing the letter of acceptance. The building to be provided shall have a minimum floor area of 100Sq.m. The floor shall be concreted, cement rendered and finished smooth and preferably painted with skid resistant floor paint. The area of the floor supporting the impact, vibrating and loading machines etc. shall be specially constructed with reinforced concrete capable of supporting the anticipated load. The building shall have a main entrance door and at least one rear entrance door opening to an out side compound which shall be used for storing pieces of material after testing and other items. It shall also have an adequate area of glazed windows. A room or an enclosed area of around 12m<sup>2</sup> should be provided for the chief materials engineers' use.

The laboratory should be located near the Engineers' office. If it is to be a rented building it should be together with the Engineer's office or a separate building adjoining to it. In the alternative a semi permanent building may be constructed adjoining the Engineers' office. The contractor shall be fully responsible for arranging the laboratory. All arrangements for lease or rent of land or building shall be done by the contractor, and all expenses connected with such matters shall be within the quoted rates.

The laboratory building shall be provided with all the services, stipulated in section 121

A minimum 10m length of work top tables with cupboards and shelves should be provided in the laboratory. All cupboards shall have lockable doors either hinged or sliding and provided with at least two keys for each lock. The work table shall be 750mm wide and shall be at a height 900mm from the floor level. The cupboards shall have one or two tiers of shelves. A row of upper level cupboards shall be fixed at height of 600mm above the work top. These shall be 300mm deep and 900mm high with one or two tiers of shelves. All cupboards shall have lockable doors either hinged or sliding capable of being closed and locked.

At least one double sink with draining boards and piped portable water connection shall be provided. A tank of adequate capacity for curing concrete cubes and other testing material shall be provided. A special area either within or outside the building shall be provided for handling asphalt related works. If it is an area outside, it shall be properly enclosed and roofed to protect from any inclement weather conditions.

The list of furniture and equipment required to be provided to the Engineer's laboratory is given in appendix SP – 6. This shall be checked and approved by the Engineer. All furniture to be provided shall be strong and durable and able to last the full project period and shall be obtained from a reputed and recognized supplier. The furniture shall be maintained throughout the project period

The contractor shall be responsible for maintaining the laboratory building and the premises. Any defect that arises shall be properly attended immediately. Daily cleaning of the building, furniture, equipment, bathroom and toilets shall be done. The premises shall be attended at least once a week.

The contractor shall be responsible for providing the necessary staff for attending to the material testing tasks. A minimum of two laboratory technicians and a three member work force qualified and experienced in handling laboratory and field testing shall be appointed to work on regular basis. Any additional staff required shall be provided on a day work basis. These staff shall essentially handle the quality control works of the Engineer at the site under the supervision of the Engineer and his staff.

The contractor shall have his own qualified and experienced staff to handle the quality control works at the site under his supervision. The Engineer and his staff shall be supervising and overseeing these works to ensure proper quality control works are carried out.

The contractor shall arrange for the security of the laboratory and the premises. In addition the facility shall be insured to the full value of the building and the equipment etc.

## **126.2 Engineers' Laboratory Test Equipment**

The list of equipment required for the Engineers laboratory is provided in the appendix SP-7 to the special provisions. This list is considered adequate, however it shall be checked by the Engineer and approved or amended as required before placing order or purchase. Additions or deletions considered necessary shall be done and the list appropriately revised before purchase. After completion of the project all the equipments brought to site by the contractor shall becomes the property of the Client.

## **126.3 Measurement and Payment**

### **(a) Measurement**

Laboratory for the Engineer shall be measured as the number of units provided and accepted by the Engineer.

Furniture and equipment to the Engineers' laboratory shall be measured as a lump sum item for each complete set of furniture as stipulated in Appendix SP – 6 is supplied, installed, tested and accepted by the Engineer

Test equipment for the Engineers' laboratory shall be measured as a lump sum item for each complete set of equipment as stipulated in Appendix SP – 7 supplied, installed, tested and accepted by the Engineer.

Staff shall be provided for full time work in the Engineers' laboratory on a daily basis as required.

### **(b) Payment**

Providing laboratory for the Engineers' representative whether in a rented building or of semi permanent construction shall be paid on monthly basis. The payment shall include for providing the laboratory, cupboards, shelves, sinks etc., and the facilities item 1 to 6 in section 118, fencing, access road, parking, disposal of all solid and liquid waste including sewerage, termite treatment and on completion of the project removal of all temporary services and structures provided.

Security services, Cleaning and Maintenance services shall be paid separately on weekly basis.

If the office is of semi permanent construction the payment shall include for the leasing or renting of the land required for this purpose.

Payment for furniture and equipment shall include for procurement, delivery and installation of all items given in Appendix SP – 6, and their maintenance. Each complete set of furniture and equipment shall be paid, 80% upon the delivery and

satisfactory installation, testing and acceptance of the Engineer and 20% on completion of the project.

Payment for test equipment shall include for procurement, delivery and installation of all items given in Appendix SP – 7, and their maintenance. Each complete set of equipment shall be paid, 75% upon the delivery and satisfactory installation, testing and acceptance of the Engineer and 25% on completion of the project.

The list of laboratory test equipment indicated in Appendix SP – 7 shall be checked and reviewed by the Engineer prior to procurement. If any changes are made to this list, the lump sum quoted shall be suitably adjusted to compensate in a proportionate basis.

The payment for the laboratory equipment shall also include for periodical testing and calibration as necessary.

Payment for staff provided to work in the laboratory shall be paid on a daily basis.

This arrangement of payment for the supply of furniture, equipment and test equipment shall be the full compensation in respect of these items, and the contractor shall have no entitlement for any further compensation irrespective of any increase in the contract period due to any reason.

<b>Item No.</b>	<b>Description</b>	<b>Pay Unit</b>
126 (1)	Laboratory for the Engineers' Representative and his staff	Laboratory Month
126 (2)	Maintenance and cleaning of the laboratory for the Engineers' Representative and staff	Week
126 (3)	Providing security for the laboratory of the Engineers' representative and his staff	Week
126 (4)	Furniture for the laboratory of the Engineers' Representative and his staff	Lump Sum
126 (5)	Equipment for the laboratory of the Engineers' Representative and his staff	PS
126 (6)	Providing lab technician	Days
126 (7)	Providing general workers	Days

**Insert a new section as follows**

## 127 SITE TESTING LABORATORY

### 127.1 Description

A site testing laboratory should be provided by the contractor near or attached to the site office, for the use of the site staff. It can be a building which can be either rented or of semi permanent construction at a suitable location to be approved by the Engineer. The laboratory should be made available within four (4) weeks of issuing the letter of acceptance. The building to be provided shall have a minimum floor area of 25Sq.m. The floor shall be concreted, cement rendered and finished smooth and preferably painted with skid resistant floor paint.

The laboratory should be located near the Engineers' site office. If it is to be a rented building it should be together with the Engineer's office or a separate building adjoining to it. In the alternative a semi permanent building may be constructed adjoining the Engineers' office. The contractor shall be fully responsible for arranging the site testing laboratory. All arrangements for lease or rent of land or building shall be done by the contractor, and all expenses connected with such matters shall be within the quoted rates.

The site testing laboratory building shall be provided with all the services as indicated in section 121.

A minimum 3m length of work top tables with cupboards and shelves should be provided in the laboratory. All cupboards shall have lockable doors either hinged or sliding and provided with at least two keys for each lock. The work table shall be 750mm wide and shall be at a height 900mm from the floor level. The cupboards shall have one or two tiers of shelves. At least one sink with draining boards and piped portable water connection shall be provided. A tank of adequate capacity for curing concrete cubes and other testing material shall be provided. A special area either within or outside the building shall be provided for handling asphalt related works. If it is an area outside, it shall be properly enclosed and roofed to protect from any inclement weather conditions.

Furniture required for the Engineers' site office is given in appendix SP – 8. All furniture to be provided shall be strong and durable and able to last the full project period and shall be obtained from a reputed and recognized supplier. The furniture shall be maintained throughout the project period

The contractor shall be responsible for maintaining the laboratory building and the premises. Any defect that arises shall be properly attended immediately.

The contractor shall be responsible for providing the necessary staff for attending to the material testing tasks. One laboratory helper shall be provided to work on regular basis. Any additional staff required shall be provided on a day work basis. These staff shall essentially handle the quality assurance works of the Engineer at the site under the supervision of the Engineer and his staff.

The contractor shall have his own qualified and experienced staff to handle the quality control works at the site under his supervision. The Engineer and his staff shall be supervising and overseeing these works to ensure proper quality control works are carried out.

The contractor shall arrange for the security of the laboratory and the premises. In addition the facility shall be insured to the full value of the building and the equipment etc.

## **127.2 Site Laboratory Test Equipment**

The list of equipment required for the Engineers laboratory is provided in the appendix SP-8 to the special provisions. This list is considered adequate, however it shall be checked by the Engineer and approved or amended as required before placing order or purchase. Additions or deletions considered necessary shall be done and the list appropriately revised before purchase. After completion of the project all the site equipments as per record shall becomes the property of the Client.

## **127.3 Measurement and Payment**

### **(a) Measurement**

Site testing laboratory shall be measured as the number of units provided and accepted by the Engineer.

Furniture to the site laboratory shall be measured as a lump sum item for each complete set of furniture as stipulated in Appendix SP – 8 is supplied, installed, tested and accepted by the Engineer

Test equipment for the site laboratory shall be measured as a lump sum item for each complete set of equipment as stipulated in Appendix SP – 8 supplied, installed, tested and accepted by the Engineer.

Staff shall be provided for full time work in the Engineers' laboratory on a daily basis as required.

### **(b) Payment**

Providing site testing laboratory whether in a rented building or of semi permanent construction shall be paid on monthly basis. The payment shall include for providing the laboratory, cupboards, shelves, sinks etc., and the facilities item 1 to 6 in section 121, fencing, access road, parking, disposal of all solid and liquid waste including sewerage, termite treatment and on completion of the project removal of all temporary services and structures provided.

Security services, Cleaning and Maintenance services shall be paid separately on weekly basis.

If the site laboratory is of semi permanent construction the payment shall include for the leasing or renting of the land required for this purpose.

Payment for furniture shall include for procurement, delivery and installation of all items given in Appendix SP – 8, and their maintenance. Each complete set of furniture and equipment shall be paid, 80% upon the delivery and satisfactory installation, testing and acceptance of the Engineer and 20% on completion of the project.

Payment for test equipment shall include for procurement, delivery and installation and testing of all items given in Appendix SP – 8, and their maintenance. Each complete set of equipment shall be paid, 75% upon the delivery and satisfactory installation, testing and acceptance of the Engineer and 25% on completion of the project.

The list of laboratory test equipment indicated in Appendix SP – 8 shall be checked and reviewed by the Engineer prior to procurement. If any changes are made to this list, the lump sum quoted shall be suitably adjusted to compensate in a proportionate basis.

The payment for the laboratory equipment shall also include for periodical testing and calibration as necessary.

Payment for staff provided to work in the laboratory shall be paid on a daily basis.

This arrangement of payment for the supply of furniture, equipment and test equipment shall be the full compensation in respect of these items, and the contractor shall have no entitlement for any further compensation irrespective of any increase in the contract period due to any reason.

<b>Item No.</b>	<b>Description</b>	<b>Pay Unit</b>
127 (1)	Site laboratory for the Engineers' staff	Laboratory Month
127 (2)	Maintenance and cleaning of the site laboratory for the Engineers' staff	Week
127 (3)	Providing security for the site laboratory of the Engineers' staff	Week
127 (4)	Furniture for the site laboratory of the Engineers' staff	Lump Sum
127(5)	Test equipment for the site laboratory of the Engineers' staff	Lump Sum
127 (6)	Providing general workers	Days

**Insert a new section as follows**

## **128 STATIONARY AND OTHER CONSUMABLES FOR ENGINEERS' REPRESENTATIVE OFFICE AND SITE OFFICES**

### **128.1 Description**

All stationary and other requisites needed for the Engineer's office and the site offices shall be supplied by the Contractor as and when required. The items to be supplied shall be all types of stationary such as printing paper, ball pens, pencils, erasers, clips, files, toner for the photocopy machine etc. and items needed for making tea and coffee.

Replacement of damaged parts of office equipment or office fittings shall not be included. These shall be provided by the Contractor under maintenance.

Office stationary and other consumables to be supplied shall have the prior approval of the Engineer. A provisional sum shall be provided for this purpose.

### **128.2 Measurement and Payment**

#### **(a) Measurement**

Supply of atationary to the Engineer shall not be a measured item. Each and every consignment of stationery supplied as and when required by the Engineer shall be considered for payment..

#### **(b) Payment**

Payment for stationary supplied shall be the actual value based on the net invoiced value (with any discounts deducted) of the items of stationary supplied. An additional amount of ten percent (10%) of the net invoice value shall be included to meet the contractors procurement and delivery costs. Payment of the net invoice amount together with the mark-up of ten percent (10%) shall be the full compensation for providing stationary for the Engineer.

<b>Item No.</b>	<b>Description</b>	<b>Pay Unit</b>
128 (1)	Providing stationary & survey equipment for the Engineer	Provisional sum

**Insert a new section as follows**

## **129 SURVEY EQUIPMENT FOR THE ENGINEER' REPRESENTATIVE AND STAFF**

### **129.1 Description**

The Contractor shall provide the survey equipment as given in Appendix SP - 9 for exclusive use of the engineer and his staff, within 6 weeks of getting the letter of acceptance. The Contractor shall be responsible for maintaining these survey equipment in good working order through out the contract.

All equipment shall be new and shall be accompanied with manufacturers specifications, manuals, operator guides etc.

If any equipment becomes unserviceable, due to damage or any other cause, it shall be immediately replaced by the Contractor so that the progress of work is not disturbed.

At the end of the contract the survey equipment supplied shall become the property of the employer.

## **129.2 Measurement and Payment**

### **(a) Measurement**

Survey equipment to be provided shall be measured as a lump sum item for the complete set of survey equipment listed in Appendix SP – 9, supplied, tested, accepted by the Engineer and maintained through out the contract period.

### **(b) Payment**

Payment for survey equipment shall include for procurement, delivery and testing and acceptance by the Engineer of all items given in Appendix SP – 9 and their maintenance. Each complete set of survey equipment shall be paid, 75% upon the delivery and satisfactory testing and acceptance of the Engineer and 25% on completion of the project.

The list of survey equipment indicated in Appendix SP – 9 shall be checked and reviewed by the Engineer prior to procurement. If any changes are made to this list, the lump sum quoted shall be suitably adjusted to compensate in a proportionate basis.

The payment for the survey equipment shall also include for periodical testing and calibration as necessary.

This arrangement of payment for the supply of survey equipment shall be the full compensation in respect of these items, and the contractor shall have no entitlement for any further compensation irrespective of any increase in the contract period due to any reason.

<b>Item No.</b>	<b>Description</b>	<b>Pay Unit</b>
129(1)	Provide survey equipment for the Engineer	PS

**Insert a new section as follows**

## **130 VEHICLES FOR TEAM LEADER'S STAFF (Type 2 Vehicle)**

### **130.1 Description**

The Contractor shall provide vehicles for the use of the Engineer and his staff. They shall all be plain colour double cabs, two wheel drive or any other type as described in the appendix SP – 10 and approved by the Engineer. All vehicles to be purchased shall be brand new and of current model. Each vehicle shall be provided with a properly licensed driver for full time work as required by the Engineer.

The vehicles provided shall be licensed and comprehensively insured in the name of the Employer for use on any public or private highway, road or elsewhere. The Insurance shall cover driver, authorized passengers and the carriage of any authorized goods.

Fuel for running the vehicles, oil replacements and other maintenance of the vehicle shall be done by the Contractor. The vehicles shall be regularly washed and cleaned on the outside and kept cleaned on the inside.

Vehicles may also be provided on a monthly quoted rate basis if so required by the Contract and provided in the Bill of Quantities. All vehicles supplied on a monthly quoted rate basis shall be new or nearly new (less than three years from the date of manufacture) and shall be maintained by the Contractor with no additional cost. The rate quoted shall include for providing the vehicle, driver on full time basis, fuel, oils, maintenance, cleaning etc. The rate for these vehicles shall include for running 3000 Km. per month per vehicle. Any traveling done in excess of the stipulated 3000Km. will be considered as extra and will be dealt with separately.

If a vehicle is out of service, whether purchased or provided on monthly basis, for whatever reason, a replacement shall be provided by the Contractor within 24 hours of it becoming out of use. Any damages caused to the vehicles shall be quickly repaired by the contractor without any charge to the employer.

Provision of vehicles shall be continued by the contractor until such services are no longer required by the Engineer.

The list of vehicles required is as given in appendix SP – 10

### **130.2 Measurement and Payment**

#### **(a) Measurement**

Vehicles purchased and supplied shall be measured as the number of each type of vehicle procured, licensed, insured and delivered to the Engineer. Crew cabs, cars etc. shall be accompanied with drivers. Maintenance of the vehicle shall be measured as the number of vehicle weeks used by the Engineer.

Vehicles supplied on a monthly quoted rate basis shall be measured as the number of vehicles so supplied.

Extra kilometers run shall be measured as the number of kilometers run in excess of the 3000 Km. stipulated and approved by the Engineer.

**(b) Payment**

Payment for the vehicles purchased and supplied for the Engineers' use shall be made at the unit rate quoted by the Contractor for each type of vehicle. Payment for the vehicle shall include for the supply of the vehicles, license and insurance.

Maintenance of the vehicles purchased shall be paid separately on a vehicle week basis at the rates quoted by the contractor. Maintenance shall include for providing driver, fuel, oils, servicing, and cleaning etc.

Payment for vehicles supplied on a monthly basis shall be made at the monthly rate quoted for each vehicle month. Part of a month shall be paid on a proportionate basis.

Extra kilometers run shall be paid at the rate quoted per kilometre

<b>Item No.</b>	<b>Description</b>	<b>Pay Unit</b>
130 (1)	Supply of vehicle type 1 (double cab)	Number
130 (2)	Provide & Maintain vehicle type 2 (double cab)	Vehicle Month
130 (3)	Provide & Maintain vehicle type 2 (Car)	Number
130 (5)	Provide & Maintain Motor Cycle	Km.
130 (7)	Extra KM run by vehicle type 2	Km
130 (9)	Extra KM run by vehicle type 3	Km

**Insert a new section as follows**

**131 SUPPLY OF CONTRACT PHOTOGRAPHS**

**131.1 Description**

A set of colour photographs of the contract works, taken during the construction process, properly fixed on to a photo album, with proper details of each photograph, shall be submitted by the Contractor at the completion of the contract. The photographs shall be taken using a digital camera of good quality and high resolution. The details to be included with each photograph shall include the date of taking the photograph, location, the activity been done at the time of taking the photograph. This submission shall be to the approval of the Engineer.

The Contractor shall also submit these photographs saved on to an electronic media devise such as a pen drive or a DVD disc as required by the Engineer.

The album shall contain a minimum of sixty photographs of size 10cm x 15cm.

### **131.2 Measurement and Payment**

#### **(a) Measurement**

Measurement for the supply of photographs shall be the number of albums with photographs supplied together with soft copies and approved by the Engineer.

#### **(b) Payment**

Payment shall be made at the unit price quoted for each album with photographs (minimum 60) and soft copies approved by the Engineer and supplied

<b>Item No.</b>	<b>Description</b>	<b>Pay Unit</b>
131 (1)	Album with photographs (minimum 60) and soft copies	Number

**Insert a new section as follows**

### **132 DRAWINGS**

#### **132.1 Description**

Contractor shall be supplied with a set of drawings prepared during the tender stage and made available for the tenderers to examine during the tender period.

A list of these drawings is given with the Bid documents, Part II volume 2 of 2 (drawings).

### **133 AS BUILT DRAWINGS**

#### **133.1 Description**

The Contractor shall submit two sets of as built drawings in hard copy and two sets in soft copy saved on to a pen drive or a DVD to the Engineer for approval and submission to the Employer. All drawings for the whole of the contract shall be submitted.

#### **133.2 Measurement and Payment**

There shall be no separate payment for this item. It shall be included in the contractors bid rates for other items.

**Insert a new section as follows**

## **134 GENERAL ENVIRONMENTAL AND SOCIAL REQUIREMENTS**

### **134.1 Definition of the Site**

The term “Site” shall, for the purposes of these Environmental Requirements, be deemed to include all places where the Contractor carries out construction-related activities including but not limited to site base camps, material and equipment storage areas, temporary access areas, areas occupied by temporary works, and quarries and borrow pits opened by the Contractor to supply materials for use in the Works.

### **134.2 Acts Prejudicial to the Environment**

The Engineer shall have the authority to order an immediate suspension of and/or halt to any activity on the part of the Contractor which, in his opinion, is causing, or is likely to cause, significant environmental damage. The Contractor shall, without undue delay and at his own expense, carry out remediation in accordance with the instructions of the Engineer.

Any consequential delay to execution of the works arising from being ordered to suspend or halt the activity concerned, or in carrying out the remediation, shall not be considered due cause for a claim by the Contractor. The Engineer shall require the summary and permanent dismissal from the site of any member of the Contractor’s workforce who, in his opinion, is committing, or has committed, acts prejudicial to the environment or any of its components, either on site or in vicinity of the site. Such acts shall include, but not be limited to the unsanctioned felling of trees, the theft of or interference with agricultural crops, the theft of or interference with the property of other persons, offensive or threatening behaviour towards other persons, the trapping or killing of wildlife (other than vermin) and the collection of plants.

### **134.3 Contractor to Appoint Public Liaison Officer**

The Contractor shall designate one of his senior site staff as Public Liaison Officer, who shall have responsibility for dealing with complaints from the general public concerning any aspects of the site activities. The Engineer shall be advised of the name of the person so designated, together with details of how he can be contacted during normal working hours, and his usual work location.

The Public Liaison Officer’s contact details shall be displayed on all project sign boards. The Public Liaison Officer shall develop effective procedures for recording public complaints and ensuring that these are dealt with appropriately without undue delay. He shall maintain an up-to-date Register of Public Complaints which is available during normal working hours for inspection by the Engineer. The Register shall be of a form acceptable to the Engineer and shall record such details as the Engineer may require. These shall include, but not be limited to, the name and address of the complainant, the nature of the complaint, the action which has been taken to address the complaint and the name of the person responsible for implementing the action. In the event of no action being considered necessary by the Public Liaison Officer, the Register shall contain a record setting out the reasons for no action being taken. The Public Liaison Officer shall monitor implementation of actions taken in

relation to complaints and shall sign the Register accordingly when he is satisfied that the requisite action has been completed.

#### **134.4 Haulage of Equipment and Construction Materials**

All vehicles used by the Contractor for haulage of equipment and materials on public roads shall be of a type and capacity suitable for the duty they are employed on. They shall be duly licensed, in a roadworthy condition, and shall have a valid test certificate.

All loads shall be properly secured. No load shall be carried that results in an axle loading or MGW (maximum gross weight) that is greater than the limit imposed by law. The tailgates and drop sides of vehicles used to haul loose materials shall be properly secured at all times when travelling on public roads. When loose materials are being transported they shall be covered with a heavy duty load sheet which is adequately fastened down to prevent the emission of dust and load shedding. Loading of loose materials above the level of the truck sides (as provided by the original manufacturer) shall not be permitted. The use of truck side and/or tailgate height extensions to increase carrying capacity shall not be permitted. Haulage vehicles shall be maintained according to the original manufacturer's specifications and manuals. If, in the opinion of the Engineer a haulage vehicle is not in a roadworthy condition, is excessively loaded, or is emitting undue smoke or noise, that vehicle shall immediately be taken out of service and the faults rectified before it shall be permitted to return to site duty. No claim for additional costs associated with such action by the Engineer shall be entertained.

All drivers shall be duly licensed for the category of vehicle they drive. They shall comply at all times with speed limits on public roads which are imposed by law. The Contractor shall dismiss from the site any driver who persistently ignores speed limits or drives in a reckless manner. The Engineer shall have the right to require dismissal from the site and immediate replacement of any driver who, in his opinion persistently engages in speeding or reckless driving. No claim for additional costs associated with such action by the Engineer shall be entertained.

Particular care shall be taken to ensure that concrete mix trucks and fuel tankers are driven in such a manner as will not result in fresh concrete or fuel spilling on public roads. The Contractor shall be responsible, at his own cost, for cleaning up of any such spillage or shedding of other loads without undue delay.

#### **134.5 Naturally-Occurring Construction Materials**

The use of sand or any other material extracted from existing beaches or the beds and/or banks of existing watercourses in any part of the works shall not be permitted, with the exception of material excavated in accordance with the Drawings, which is approved by the Engineer for use elsewhere in the Works, and which would otherwise be disposed of as waste.

All naturally-occurring construction materials supplied for use in the works shall be obtained only from quarries and borrow pits which are in possession of such valid licences, permits and authorisations as may be required under the law for their

operation. The Contractor shall provide the Engineer with copies of such licences etc at the time of seeking approval of material sources.

The Contractor's attention is drawn to the provisions of Article 33 of the Mine and Mineral Act 1993 which requires an application for a licence under the Act to extract and/or process construction materials to be accompanied by an Environmental Impact Assessment and a Certificate of Environmental Clearance. The Contractor is advised that preparation of the required documents and the official procedures relating to their processing are likely to take at least twelve months in total. In the event that the Contractor chooses to open new quarries or borrow pits to supply material for use in the works, he shall note that delays in obtaining the necessary licence shall not be considered a valid reason for a claim for an extension of time to complete the works.

The contractor should obtain Environmental Protection Licence from Geological Survey & Mines Bureau (GS & MB) guidelines for quarry operation which includes mitigation activities of potential environmental impacts such as emission of noise and dust, vibrations, damage to land, other visual impacts, stagnation of water in borrow pits, damage to other roads due to extraction and transportation of construction materials during quarry operation period. Environmental Protection Licence provided by GS & MB is valid for twelve months duration.

#### **134.6 Hot Mix Plant Operation**

Asphalt and other hot-mix bituminous materials supplied for use in the works shall be obtained only from plants which are in possession of such valid licences, permits and authorisations as may be required by law for their operation. The Contractor shall provide the Engineer with copies of such licences etc at the time of seeking approval of material sources.

In the event that the Contractor chooses to employ demountable (moveable) plant for the supply of hot-mix bituminous materials, he shall seek the approval of the Engineer of the location or locations where such plant is to be deployed, prior to commencement of installation. The location shall be deemed part of the site. The Contractor is advised that approval will not normally be given for any installation to be sited within 500m of any dwelling or other occupied buildings. Such plant shall be fitted with dust suppression equipment and shall be operated and maintained in a manner which will minimize emissions of dust and fumes. If, in the opinion of the Engineer, the plant is emitting undue dust or fumes, he shall have the discretion to order immediate shutdown of the plant, until such time as appropriate and effective remedial action has been taken. No valid claim for delay shall arise in such circumstances. The Contractor's attention is drawn to: the National Environmental Act; regulations for noise control of 1996 (Gazette no. 924/12); and proposed vibration, air and emission standards for Sri Lanka stipulated by Central Environmental Authority (CEA) while operating a hot-mix plant. This may result in the need for a Certificate of Environmental Clearance to be issued before a new hot-mix plant can legally be operated. The Contractor is advised that preparation of the required documents and the official procedures relating to their processing may take several months in total. In the event that the Contractor chooses to install a hot-mix plant at a location not currently used for that purpose in order to supply material for

use in the work, he shall note that delays in obtaining the necessary Certificate shall not be considered a valid reason for a claim for an extension of time to complete the works.

#### **134.7 Dust, Noise and Other Nuisances**

The Contractor shall conduct all his activities in a manner which minimizes nuisance to the general public and to the occupiers of premises adjacent to the site.

The Contractor's activities shall be conducted in a manner which complies fully with the relevant provisions of the National Environmental Act; regulations for noise control of 1996 (Gazette no. 924/12). In the case of activities taking place in the vicinity of premises which, in the opinion of the Engineer, are noise sensitive (including but not limited to educational establishments, hospitals and places of worship), or where construction activities take place outside the hours of 7am and 7pm on the same day, the Engineer shall have the discretion to require appropriate measures to be adopted by the Contractor to reduce noise levels.

The Contractor shall take all appropriate measures to minimise the generation of fugitive dust on the site to the satisfaction of the Engineer. These shall include, but not be limited to, the regular watering of unsealed pavement layers which are being rehabilitated as part of the Works and of unsealed parts of material haul routes, watering of stockpiles of construction aggregates and soil materials, and the adoption of procedures for site clearance and demolition which minimise dust generation. The maximum length of time during which road pavement shall remain unsealed following removal of existing surfacing as part of the Works shall be decided by the Engineer. The Engineer shall require such special precautions to be taken as he shall consider appropriate in the circumstances to prevent harmful fugitive dust emissions arising from activities such as cement- or lime- stabilisation of soils. Specific provision shall be made in the Contractor's Method Statements for dust minimisation measures, to the satisfaction of the Engineer.

The Contractor shall keep clean and free of mud, soil and other materials, sections of public roads used by him: and shall clear any material deposited on them as a result of his activities, to the satisfaction of the Engineer. All site vehicles and machinery deployed to site by the Contractor shall not emit undue noise or smoke, and shall be maintained in this state throughout the contract period. If, in the opinion of the Engineer, any of the Contractor's vehicles or machinery is emitting undue noise or smoke, such shall be removed from the site immediately or immediate rectification shall be carried out.

All works shall be executed in a manner which does not unduly impede pedestrian and/or vehicular access by owners and the general public to adjacent houses, other premises and lands. Specific provision shall be made in the Contractor's Method Statements for the maintenance of access, to the satisfaction of the Engineer.

### 134.8 Land and Water Pollution

The Contractor shall take all necessary precautions to prevent pollution of land and water resources arising directly or indirectly from his activities. He shall be responsible for taking immediate remedial action at his own cost to minimise the effects of any spills and leakages of polluting substances, to the satisfaction of the Engineer and in accordance with any instructions given by the Engineer in this respect. The Contractor shall be responsible for the payment of full and fair compensation to any persons or entities that have suffered damage to resources or property following spillages or leakages.

Sanitary facilities at the site offices and at worksites shall be maintained in a clean and hygienic condition at all times, and shall be provided in such numbers and of such types as set out in the Specification.

The washing of vehicles and construction equipment in or adjacent to watercourses is specifically prohibited. All such washing is to be carried out at designated washing areas, approved by the Engineer, which are equipped with efficient oil and grease traps.

Refuelling, routine servicing and non-emergency repair of vehicles and equipment shall only be carried out in designated refuelling/maintenance areas approved by the Engineer, with the exception of refuelling of small mobile equipment such as pumps, compressors, generators and concrete mixers, which may be carried out at deployment locations. Refuelling/maintenance areas shall be provided with an impermeable base and drainage systems which discharge through efficient oil and grease traps. They shall be protected from rain by means of suitable roofing. Facilities shall be provided to contain and clean up spillages and leakages of petroleum products to the satisfaction of the Engineer. Recovered petroleum products may be returned to store or shall be disposed of as special wastes, as provided for in the Contract. Materials used in clean up shall be disposed of as special waste.

Fuel stores shall have an impermeable base which shall be surrounded by an impermeable bund such that the volume of the area contained within the bund is not less than 110% of the maximum capacity of the storage. Storage facilities shall be subject to the approval of the Engineer. Spillages and leakages shall be dealt with without undue delay in the same manner as those which occur in maintenance/refuelling areas.

In the event of refuelling of minor equipment or emergency repairs to vehicles or plant being carried out at locations other than the designated refuelling/maintenance area, drip trays shall be employed to contain spillage of potentially polluting materials. These shall be of size and capacity appropriate to the activity being undertaken and shall be of a type approved by the Engineer. Any soil which becomes contaminated with petroleum products shall be carefully and immediately removed and disposed of as special waste.

Storage facilities for potentially polluting materials other than petroleum products shall be of a type approved by the Engineer.

Particular care shall be taken when activities are carried out in, or in the vicinity of, water courses or bodies of standing water, to ensure that pollution does not occur. Special precautions shall be taken as necessary, to the satisfaction of the Engineer, to ensure that materials such as, but not limited to, cement dust, fresh concrete, lime and petroleum products do not pollute the water body.

### **134.9 Wastes and Waste Disposal**

All wastes arising directly or indirectly in connection with construction activities shall be disposed of only at landfill sites operated by Municipal Council (MC), Urban Councils (UC) and Pradeshiya Sabha (PS) or by recycling at a facility which is duly authorized to conduct recycling activities. Disposal of any type of waste by burning or burial is specifically prohibited. In the event of the Contractor disposing of wastes other than as provided for in this Contract, he shall be required to remove any such wastes, dispose of them at MC, UC and PS site and clean up the disposal area at his own cost and to the satisfaction of the Engineer.

Prior to the commencement of any activities which may result in the generation of wastes, the Contractor shall consult with MC, UC and PS concerning any special arrangements which they may require in relation to waste disposal at sites under their control, and shall comply fully with any such requirements. The Contractor shall confirm to the Engineer that such consultation has taken place, and shall inform him of any requirements of MC, UC and PS regarding waste disposal.

Deliveries of wastes to MC, UC and PS sites shall be properly recorded by the Contractor. Drivers of waste haulage vehicles shall be provided with record books, available for inspection by the Engineer, which set out the registration number of the vehicle, the driver's name, the date and time of delivery of waste to a MC, UC and PS site, and the nature and volume of the waste. The record of each delivery shall be signed as correct by the driver, and shall be countersigned by the MC, UC and PS employee at the landfill site who is responsible for logging and inspecting waste deliveries. Disposal of wastes at the landfill site shall be carried out in accordance with the instructions of MC, UC and PS site staff. Waste concrete shall be broken into lumps which are no greater than 350mm in any dimension. Reinforcing steel shall be bent parallel and close to the concrete surface or cut off flush with the surface, so as to facilitate use in temporary roadways.

Waste oils shall be stored on site in leak proof containers until taken for disposal at a duly licensed recycling facility approved by the Engineer. Waste steel and other metals shall be disposed of at a duly licensed recycling facility approved by the Engineer. In the event that the material is considered unsuitable for recycling, it shall be disposed of in accordance with the instructions of the Engineer.

Arrangements for the disposal of special wastes including, but not limited to, soil and other materials contaminated by petroleum products, waste paint, resins and other potentially polluting materials and their containers, shall be discussed and agreed with MC, UC and PS, and shall be to the satisfaction of the Engineer.

Temporary storage of wastes shall not be done in such a manner as causes pollution or public nuisance in any form and shall be for the minimum practicable time. If, in the opinion of the Engineer, temporary storage arrangements are inappropriate in any way, the Contractor shall be required to remove such wastes for disposal forthwith.

#### **134.10 Siltation and Erosion Control**

In executing the Works, the Contractor shall take all reasonable steps to minimise siltation and erosion arising as a consequence of his activities. If, in the opinion of the Engineer, the Contractor's activities are causing undue erosion and/or siltation, or inappropriate or ineffective control measures are being adopted, the Contractor shall be required to implement, at his own cost, such additional siltation and erosion control measures and removal and disposal of deposited silt and repair of eroded locations as the Engineer may decide are appropriate in the circumstances.

In-bank or in-waterway excavation undertaken in connection with bridge replacement or bank protection works shall be carried out behind a cofferdam or silt curtain. Dewatering systems shall incorporate sedimentation basins whose outflow has suspended sediment content which is not, in the opinion of the Engineer, significantly higher than that in the watercourse immediately upstream of the structure. The Contractor's Method Statements for bridge replacement and bank protection works shall contain full details of the measures to be adopted to minimise siltation, and shall be to the satisfaction of the Engineer.

The excavation of river-mouth sand bars in order to facilitate execution of the works shall be expressly prohibited.

#### **134.11 Land Temporarily Required for Site Offices, Access, Storage, safe Working Areas etc.**

The Contractor shall obtain the permission in writing of landowners or those who have right-of-use of any land which is required temporarily in connection with execution of the Works. Such permission shall state the name and address of the owner concerned, the location and area of the land, the intended use for the land, the period over which it will be required and the extent to which the Contractor intends to clear the land in connection with the intended use. The location and type of any trees or structures which are not to be cleared/demolished shall be stated. Copies of such permissions shall be provided to the Engineer, whose agreement to use of such parcels of land for the specified purpose and period shall be obtained prior to commencement of any activity on that land by the Contractor. Such lands shall be deemed part of the Site. The Contractor shall be responsible for obtaining, at his own expense, any legal agreements and/or permits and authorisations required by law, in connection with the intended use of such lands.

The Engineer shall not agree to temporary use of lands by the Contractor which, in his opinion, are located in or adjacent to environmentally sensitive areas or have been designated as Environmentally Sensitive Areas by the relevant authority under the National Environmental Act (No 47) 1980. The Engineer shall not agree to the temporary use by the Contractor of beach or foreshore areas.

### **134.12 Abstraction of Water from Natural Sources**

The Contractor shall consult with the relevant authorities regarding suitable locations from which water may be abstracted for construction or other purposes from surface or groundwater resources. He shall obtain at his own expense any permits, authorisations and licences which are required by law in relation to the abstraction of water, prior to commencement of abstraction.

In the event that abstraction by the Contractor adversely affects the availability of supply to other users, he shall provide an adequate alternative supply at his cost and to the satisfaction of the Engineer.

### **134.13 Protection from Asphalt, Fuels, Lubricants etc.**

Materials that are hazardous to health and the environment, such as asphalt, fuels, lubricants, etc, shall be stored in protected areas. Bunds shall be provided to prevent leakage of fuels and lubricants to surrounding lands or watercourses and storage areas shall be lined with leak proof membranes in sensitive areas. No fuelling or servicing of vehicles will be permitted outside of these bundled areas. A spill containment plan (including provisions for removal and remediation of contaminated soil after the end of construction) shall be prepared and approved by the Engineer prior to the start of work on site. On-site remediation of soil will not be permitted without the approval of the Employer.

The contractor shall take all necessary steps, throughout the duration of the project, to minimize the emission of noxious gaseous contaminants to the atmosphere. Vehicles and equipment shall be routinely serviced and fitted with adequate exhaust systems. If any vehicle or equipment (in the Engineer's opinion) emits excessive smoke, it shall (on the Engineer's instruction) be removed from the site for repair or maintenance. In the event that abstraction by the Contractor adversely affects the availability of supply to other users, he shall provide an adequate alternative supply at his cost and to the satisfaction of the Engineer.

### **134.14 Environmental Management Plan(EMP)**

The Contractor shall implement the Environmental Management Plan attached with the bid documents. The remedial action shall comply and acceptable to The Central Environmental Authority (CEA) and other Environment Monitoring Agencies.

The Contractor is to prepare and present to the Engineer for approval an Environmental Method Statement (EMS) that clearly states methodology for implementing the EMP. The EMS shall also clearly outline the procedures for monitoring actual or alleged damage to buildings and property adjacent to the works. A minimum requirement of these procedures shall be the photographing of each property in advance of the works in the presence of the property owner. Original photographs shall be retained by the Contractor; copies are to be supplied to the property owner and the Engineer.

This EMS must be submitted within 28 days of the issue of the Letter of Acceptance.

The contractor is responsible to maintain and monitor the environment to ensure harmless environment. In order to maintain the activities in accordance with the EMP, the contractor is required to quote the rates in the Bills of quantity. On the other hand, the Engineer will impose a penalty in the following manner if the contractor fails to **131.13 Protection from Asphalt, Fuels, Lubricants etc.** keep the environment free of hazard. The major affects and their ratings are categorized as follows.

Generation of dust	20%
Disposal of Debris	20%
Soil erosion and damages to Topsoil	20%
Management of borrow pits	10%
Blockage of drain paths	5%
Stagnation of water	5%
Contamination of fuel and lubricants	5%
Material transportation on roads	5% (usage of by- roads, safety on Transportation)
Air noise and vibration	5%
Impact on flora and Fauna	5%

If any of the above defects are not remedied by the Contractor, the Engineer shall deduct the relevant component from quoted rate. The remedial actions shall be, acceptable to the Engineer and in accordance with EMP and Environmental Method Statement (EMS) proposed by the bidder. The assessment of mitigation measures shall be conducted weekly and the Engineer's satisfaction shall be ensured weekly. If the Contractor fails to take any action within a fortnight, the penalty shall be increased by 10% (ten percent) of the relevant component. Further if the Contractor fails to comply within one month, all remedial activities shall be arranged by a third party and the cost shall be recovered from the Contractor.

### **134.15 Measurement and Payment**

Payment will be made under:

<b>Pay Item</b>	<b>Description</b>	<b>Unit</b>
<b>No.</b>		
134a(1)	Compliance with the requirements of Section 131: General Environmental Requirements	Month

### **134 B SOCIAL REQUIREMENTS**

These items will be issued separately.

<b>Pay Item</b>	<b>Description</b>	<b>Unit</b>
<b>No.</b>		
134b(1)	Compliance with the requirements of Section 131: General Social Requirements	PS

## 135 GEOTECHNICAL INVESTIGATIONS

### 135.1 Scope of Work

The Contractor's task is to perform Geotechnical Investigations at the proposed bridge location to ascertain the characteristics of actual soil strata, and the engineering properties of each soil strata to allow design of the foundation and submit recommendations for types of foundations and safe bearing pressure for the foundation design.

The Geotechnical Investigations shall be carried out at actual locations of each abutment and pier position of the proposed bridge and in compliance with the following conditions. Except where otherwise permitted by the Engineer, the investigation shall be carried out in the manner approved by the Engineer and under the supervision of his authorised representative.

The methods in current internationally recognised standards such as ASTM, BS and those in practice in Sri Lanka shall be used in carrying out the investigation. The Contractor should forward the codes and standards that would be applied to the soil investigation work and obtain approval from the Engineer before the commencement of works.

The Contractor shall mobilise adequately qualified staff to carry out the geotechnical Investigations.

### 135.2 Services to be provided

The investigations shall be carried out at the bridge locations decided by the Engineer. The type of the test, number of the tests at the bridge, location of the tests shall be determined by the Engineer.

The services shall comprise but not limited to the following.

1. Mobilisation and Demobilisation.
2. Survey for location of boreholes and levels of the ground thereon,
3. Sub – soil investigation by rotary and/or wash boring work.
4. Undisturbed sampling of material.
5. Standard penetration tests
6. Dynamic cone penetration tests
7. Trial pits and visual observation of soil strata
8. Ground water level observations.
9. Laboratory tests as specified.
10. Reports.

All levels including the depth of borehole log taken shall be related to the appropriate Sri Lankan datum with the use of bench marks (TBM) installed adjacent to the site. The Contractor shall obtain TBM details from Engineer and establish at the site.

### **135.3 Qualification of Personnel**

The Contractor shall submit with his quotation, an organisation chart showing the structure of the working team and the number of personnel who will be employed for the works. All Contractors' staff involved in the works shall be recognised qualified personnel, and the Contractor shall submit qualifications of these personnel to the Engineer at the time of submissions of quotations. At least the key personnel and a foreman shall speak English.

The Engineer reserves the right to reject any of the nominated personnel if not satisfied without stating the reason.

### **135.4 Equipment**

The Contractor shall indicate in the quotation, the type and number of equipment and facilities he intends to use in the works, and shall use the same during the execution of the contract. He shall maintain the equipment in good working order during the period of the project. If the operations are producing unsatisfactory results, or are delayed due to any fault of the equipment, the Engineer has the right to instruct the Contractor to replace a part or all of the equipment and operators, at the Contractor's own costs.

### **135.5 Co-ordination**

The Contractor shall all times keep the Engineer informed of the progress and the state of the works related to the investigations. In particular, the Contractor shall give notification to the Engineer 72 hours in advance of commencing the investigations.

The Contractor shall provide the Engineer with access to the investigation sites in the field and laboratories at all times. The Contractor shall offer assistance to the Engineer's personnel in charge of the inspection of the works, and provide all necessary minor equipment.

### **135.6 Conditions**

Notwithstanding the involvement of the Engineer in inspecting the investigations, the Contractor carries full responsibility for carrying out the Works described in accordance with the relevant codes and common practices. The Contractor bears full responsibility for the correctness of the results obtained from the investigation.

### **135.7 Time Schedule**

The Contractor shall obtain the Engineer's approval for a working schedule showing at least the following activities on bar chart.

1. Mobilisation time.
2. Boring work for each borehole.
3. Laboratory tests.

4. Interim reports.
5. Submission of final report.

### **135.8 Existing Site Information**

The Contractor shall satisfy himself as to the character of the site and all its various materials, strata, obstacles, existing services, etc. and all items and things liable to affect or be encountered in the performance of his works by visiting and examining the sites. He shall obtain his own particulars, information and geological surveys, regarding the nature of the ground and subsoil conditions.

### **135.9 Drilling Works**

#### **(a) Borehole Locations**

The locations for the drillings shall be as indicated in a sketch and submitted to the Engineer for approval. The final number, locations and depth shall be subject to Engineer's approval.

#### **(b) Equipment and Tools**

The type of equipment used shall be shell and augur boring equipment, rotary drilling equipment or wash boring equipment depending on soil type and samples required for the investigation.

The drilling equipment for boring and rock coring shall consist of power driven machinery of an approved type complete with necessary special devices, accessories and supplies. The equipment shall include heavy duty drilling rigs provided with hydraulic feed mechanisms to facilitate obtaining undisturbed soil samples in overburden and cores in the rock. Drill rods should have a minimum outer diameter of 50mm supplied by the specialised manufacturer. Rods and joints shall be in good condition to avoid failures and deviation of boreholes.

The boreholes shall be cased throughout and shall be about 20 metres deep. The toe to the lining shall no time be more than 1.0 m above the level to which soil has been removed from the borehole. Before taking any undisturbed samples or making any insitu tests, the lining shall be extended down to the bottom of the bore holes at the test depth.

The Contractor shall use an adequate number of drilling rigs for core diameters of at least 54mm in rock and 75mm in overburden. Larger diameter cores may specifically requested by the Engineer for laboratory testing. The machines shall be mobile so that small crews can reasonably be expected to move them across difficult terrain.

No additional allowance or payment will be made for penetration of boulders, telescopic casing, cementing, and use of bentonite circulation and reaming of the hole. Cementing and bentonite circulation may only be applied after approval of the Engineer.

The Contractor shall provide all necessary water, water tanks and suitable means of pressurising for cleaning casing prior to sampling, coring rock etc.

The Contractor shall provide such platforms as may be necessary to maintain drill rigs level when making vertical borings on sloped land, soft ground and the like. The Contractor shall provide pontoons and such platforms as may be necessary to maintain drill rigs level when making vertical borings mid river for pier foundations.

### **(c) Sampling in Overburdened and Decomposed Rock**

If not expressly instructed to the contrary, the Contractor shall carry out the sampling in overburdened and decomposed rock. The Contractor shall adjust the procedures of drilling and sampling to the geological conditions in order to achieve the necessary quality of samples. It is suggested that the following procedures to be taken into consideration.

- Drilling with double or triple tube core barrels with bottom discharge or step bits.
- Drive drilling with split spoon and wash boring or rotary drilling techniques.

Saw tooth bits used in drilling with tungsten-carbide prisms or verdure plated, shall be adjusted in the geometry of the teeth to the type of the material drilled.

Coring of rock and undisturbed sampling shall be done with rigs mounted on a fixed platform. During execution, it is the Contractors' responsibility to ensure smooth and efficient continuity of work avoiding disturbances from wind, rainfall etc.

### **(d) Disturbed Sampling**

Disturbed samples shall be obtained from borehole cuttings and using split-spoon sampling for visual classification at site and stored in core boxes. The samples shall be taken at every half metre interval and at every identifiable change of strata to give a reliable record of the variations in the conditions of the sub-soil.

The core samples shall be well preserved and maintained on well constructed and approved core boxes. The core boxes shall be of wood and not more than 1.5 metres in length separated lengthwise with wooden partitions to accommodate 75mm core samples. The number of core boxes shall be according to requirement. The samples shall be placed in order and marked according to the bore hole identification and sampling depth.

The core boxes shall be labelled. The following information shall be indicated on core boxes.

- Road No. / Bridge No.
- Location of borehole
- Borehole identification number
- Sequence number of box.
- Depth
- Date / Time of commencement and completion of boring.

**(e) Undisturbed Sampling**

Undisturbed samples shall be obtained in soft cohesive soils. The samples shall be taken at every one metre interval and at every identifiable change of strata to cover the entire cohesive layer. If wash boring is employed the first disturbed part of the recovered core shall be discarded and only the balance used for testing.

The size of thin walled sampler should be such that a sample having a minimum size of 75 mm diameter and 350 to 400 mm length can be recovered. These samplers shall be forced into the soil layer by jacking and hammering shall not be permitted. At every extraction of undisturbed samples, the recovery ratio should be recorded.

Immediately after extraction the sample shall be trimmed at the edges and sealed with wax to prevent moisture loss, the top and bottom marked, stored in a wooden box lined with soft material to preclude sample damage. A label indicating the following details should be attached to each sample tube.

- Road No. / Bridge No.
- Location of borehole
- Borehole identification number
- Sequence number of Sampler Tube and stage box
- Depth
- Date / time of Commencement and Completion of Boring

**(f) Standard Penetration Test (SPT)**

The Contractor shall execute the SPT in compliance with the ASTM Standard or BS 1377 or equivalent. SPT testing shall be done on every borehole at 1.0 m intervals of soil depth up to 10 metre, and at 1.5m intervals of soil depth beyond 10 metre and at every identifiable change of soil strata.

The test shall be conducted after driving the casing to the bottom of the borehole and after cleaning with drill bits and other tools, to ensure the stability of tested soil at targeted depth. The driving of the split spoon shall be terminated when the number of blows is greater than 100 for 30 cm. of penetration.

The N-values as observed shall be reported in the bore logs without any correction for overburden or water table. The disturbed samples shall be taken from the SPT tube and air tight containers, labelled with the following details.

- Road No. / Bridge No.
- Dates of test
- Location of borehole
- Depth of SPT test
- Borehole identification number
- Depth of penetration
- Depth below surface

- Number of SPT blows

**(g) Dutch Cone Penetration Test (DCP)**

The Contractor shall carry out DCP tests at the structure foundations, as instructed by the Engineer. The DCP testing shall comply with Appendix C, TRL Overseas Road Note 31.

**(h) Trial Pits**

Trial pits shall be made at the depth of the foundation of the bridge. Generally trial pits shall be 1.5m x 1.5m x 1.5m. As the soil is removed from the pit, the natural layers of the soil profile shall be recorded. Samples of each layer shall be stored inside polythene covers. Adequate safety measures shall be provided at the trial pit. As soon as the records were approved by the Engineer, trial pits shall be back filled.

**(i) Water Table**

The depth of the water table shall be measured from the surface of the borehole. The level of the water table shall be measured daily and recorded before boring is continued the next morning. The position of the water table will also be recorded 24 hours after the completion of the borehole.

**(j) End of Borehole**

Termination of the boreholes shall be carried out only after it has been checked carefully by the method approved by the Engineer. Usually the depth of termination shall not be less than 1.0 m into the hard rock (RQD - Rock Quality Designation not less than 75) The back filling of the bore hole shall be carried out with an approved material as directed by the Engineer. After completion of the boring at any borehole, a borehole log shall be prepared in detail and submitted to the Engineer.

**135.10 Laboratory Tests**

Laboratory tests shall be carried out in accordance with ASTM or BS standards. Type and number of tests shall be decided by the Contractor and approved by the Engineer. The results of all tests shall be submitted in the format approved by the Engineer.

Samples shall be dispatched to the laboratory as soon as possible after being obtained and shall not be allowed to accumulate on site.

**(a) Preparation of Test Specimens**

The preparation of test specimens for the various tests shall be carried out in accordance with procedures laid down in relevant standards and codes.

In the case of soft cohesive undisturbed soils test samples for all types of shear tests and consolidation tests shall be prepared strictly by hand trimming and / or soil lathe.

Care shall be taken against bending of samples at the time of ejection of samples from the sampling tubes.

**(b) Unconfined Compression Tests**

Each unconfined compression test shall comprise tests on a minimum of three soil specimens not less than 38 mm diameter and height to diameter ratio of 2.

**(c) Triaxial Tests**

Triaxial test shall be conducted on the undisturbed samples. Each test shall be conducted on a minimum of three soil specimens tested at different confining pressures (0.5, 1.0 and 2.0 Pa N/mm<sup>2</sup>). The moisture content before and after the tests and the density shall also be determined.

**(d) Consolidation Tests**

Consolidation test shall be conducted on the undisturbed samples. The loading on each test specimen shall be applied in the following stages. 0.1, 0.25, 0.5, 2.0, 4.0, 8.0 Pa. And the unloading of the test specimens shall be done in three stages as follows. 0.0, 0.5, 1.0, 4.0 Pa.

**(e) Soluble Sulphate Content**

Tests shall be carried out in accordance with ASTM or BS standards.

**(f) Report**

On completion of each borehole, three copies of a borehole log shall be submitted to the Engineer, together with one copy of the list of disturbed samples taken from the boreholes. The report should include

- Road No. and Bridge No.
- Location of Boreholes on a plan
- Borehole level at start and finish
- A detail description of each stratum with start & finish level
- The position, type and identification of each sample and SPT value.
- Any other site test results available
- Laboratory investigation results
- The level at which each separate ground water level is first encountered and at which it comes to rest (standing water level)
- Recommendations for type of foundation for Abutments and Piers.
- Safe Bearing Capacity calculations for foundations.
- Soluble sulphate content present in the soil and recommendations for the type of cement to be employed for structures.
- Coloured digital photographs of each borehole site and of each set of samples in core boxes.

The Contractor shall submit his preliminary report within 7 days of the field work being completed. The Engineer shall notify the Contractor, if any amendments necessary together with any additional testing required. The Contractor shall carryout the amendments to the satisfaction of the Engineer within 7days of the notification.

### **135.11 Measurement and Payment**

#### **(a) Measurement**

The bridge geo technical Investigation work shall be measured as a Provisional Sum item.

#### **(b) Payment**

Payment for bridge geotechnical investigation work shall include for

1. Mobilisation and Demobilisation.
2. Survey for location of boreholes and levels of the ground thereon,
3. Sub – soil investigation by rotary and/or wash boring work.
4. Undisturbed sampling of material.
5. All Insitu testing work
6. Ground water level observations.
7. Laboratory tests as specified.
8. Reports.

Payment for the bridge geotechnical investigation shall be made upon the satisfactory completion of the geo technical investigation work and the receipt of the final report to the Engineer.

Pay item shall be

Item	Description	Unit
135(1)	Bridge geotechnical Investigation work	Prov Sum

**Insert a new section as follows**

### **136 Maintenance for one year**

#### **136.1 Description**

Upon the successful completion of the road improvements works required to be done and the Engineer has issued the Completion Certificate, the Contractor shall keep the road in a defects free condition for a period of 365 days, from the date of issue of the Completion Certificate, or such other extended period in accordance with the Conditions of Contract. This shall be done at the Contractors own responsibility and at his own cost.

**300 EARTHWORKS****301 ROADWAY EXCAVATION AND PREPARATION OF SUBGRADE IN CUT AREAS**

**Delete this section in full and insert as follows**

**Description**

This work shall consist of all excavation within the limits of the roadway, required for the purpose of roadway construction except excavation for structures (specified separately in section 302). It shall also consist of excavation directed by the Engineer falling outside the limits of the roadway, not specified elsewhere in these specifications. The work shall include hauling and stockpiling or hauling to sites of embankment construction of suitable materials, the disposal of unsuitable materials and the trimming and shaping of exposed faces of cut batters.

The roadway excavation shall also include all excavations required to be done within the right of way in accordance with the drawings, cross sections, excavations for approach roads, streets, intersections, pre loaded material when required and all other areas but not including excavations for drains, ditches, and channels.

**301.2 Classification of Materials****a) Excavated Materials**

Unless otherwise specified all materials excavated from the area designated for the roadway shall be classified as given below. The decision of the Engineer in this regard shall be binding on the contractor.

The total volume of roadway excavation shall either be included wholly under items (i), (ii), (iii), and (viii) or under items (ii), (iii), (iv), (v), (vi), (vii) and (viii) given below.

**(i) Unclassified soil**

Unclassified soil shall include all soils excavated in accordance with this specification.

**(ii) Soft rock**

Soft rock shall comprise weathered rock, sandstone, limestone, and such layers which can be excavated by picking, ripping and other similar means without resorting to blasting and/or sledging.

**(iii) Hard rock**

Hard rock shall comprise all igneous, metamorphic and sedimentary rock, including large boulders, which require blasting and/or sledging for removal. Boulders of volume less than 1m<sup>3</sup> each shall not be considered as hard rock

**(iv) Loose soils**

Loose soils shall comprise all loose sands and silts and other materials, deposited by earth slips or similar occurrences that can be excavated using the shovel or similar tools. For purposes of these specifications loose soils shall be further classified as dry or wet.

**(v) Ordinary soils**

Ordinary soils shall comprise all naturally occurring sands, clays, silts, organic, peat and varying combinations of these, the excavation of which requires tools such as the mamotty hoe in addition to the shovel.

**(vi) Medium Soils**

Medium soils shall comprise gravels, sands and clays and varying combinations of these, the excavation of which requires tools such as the mamotty and the shovel but in the opinion of the Engineer requires a greater effort per unit volume of excavation than for ordinary soils.

**(vii) Hard Soils**

Hard soils shall comprise gravels, cabooks, stiff clay, and other hardened layers of soil which require the pickaxe and similar tools to loosen before they could be excavated.

**(viii) Marshy Material**

Marshy material shall comprise materials from swamps and marshes containing watery peat and other vegetable matter, including logs, often found to exist in combination with sand, silt and clay which require special methods for excavation such as grabbing and pumping.

**(ix) Boulders**

Boulders shall comprise of solid pieces of rock that are weathered on all sides and of volume between 0 .25m<sup>3</sup> and 1.0m<sup>3</sup> .Any boulders of volume less than 0.25m<sup>3</sup> shall be removed under ordinary soil.

Measurements of boulders shall be taken as the maximum dimension along the longest axis of the boulder (length) multiplied by the area of a circle of circumference equal to the measured girth of the boulder at its widest point at right angles to the length axis.

**(b) Suitable and Unsuitable Materials**

For purposes of re-use and disposal, excavated materials shall be grouped as suitable and unsuitable, as given below:-

**(i) Unsuitable Materials**

Unsuitable materials shall include highly plastic clays, silts, peat and other organic soils and soils containing roots, grass and other vegetable matter and soils that do not meet the requirements of sub section 304.2. Materials that are soft or unstable merely because they are too wet or too dry shall not be considered as unsuitable unless otherwise so classified by the Engineer.

**(ii) Suitable Materials**

Suitable materials shall include all natural soils other than those defined as unsuitable materials above.

**301.3 Construction Requirement**

**General**

Excavated material shall be tested by the contractor in accordance with the relevant sections of these specifications in order to determine whether they are suitable for re-use or not. Material found suitable shall be stockpiled for re-use and the unsuitable material shall be taken to dump sites.

All excess material of whatever kind that will arise as a result of various forms of excavations done shall be removed by the Contractor to dumping areas to be selected by the Contractor and approved by the Engineer.

All excess excavated material taken to dump areas shall be spread and finished in a manner that will present a neat appearance and without causing any obstruction to any drainage or without causing any drainage to flow in to a road or other property.

**(a) Limits of excavation**

The contractor shall set out the limits of excavation and shall carry out excavation operations as specified herein in a manner approved by the Engineer. The excavation shall conform to the lines, levels, grades and side slopes shown on the drawings or as directed by the Engineer. However, if unsuitable material is encountered outside the specified limits of excavation such material shall be excavated over areas and to depths as directed by the Engineer. Where unsuitable material is removed below the sub grade level or embankment foundation or for benching under embankments, the excavation shall be backfilled in layers with appropriate suitable material and compacted to achieve the required densities as per section 304 or as directed by the Engineer. Any excess excavation of suitable materials shall be made good with suitable material at the cost of the contractor.

**(b) Removal of Top Soil**

Top soil removed during construction shall be classified as suitable for reuse in embankment slopes or unsuitable for any use. All top soil classified as suitable shall be removed to such depth as the Engineer may direct and neatly stockpiled. The top soil so stockpiled shall be made available for the works without any additional charge. Engineer's approval shall be obtained before the disposal of any top soil. This top soil shall be used for soiling the side slopes and verges.

**(c) Re-use of Suitable Material**

The contractor shall organize and carry out excavation work in a manner that the suitable materials are excavated separately for use in works without contamination by the unsuitable material. Any material that becomes unsuitable by contamination due to the negligence of the contractor shall be made good by him at his own expense.

All suitable material that is excavated shall be used in the construction of the roadway except where such material is in excess. Such excess material shall be disposed of or otherwise removed with the approval of the Engineer.

**d) Removal of Unsuitable Material**

Unsuitable material that is excavated shall be removed from the site to disposal areas approved by the Engineer. All dumped material shall be spread as directed by the Engineer in a manner not to interfere with the drainage pattern of the area.

**e) Excavation in Rock**

Rock encountered in roadway excavation shall be removed up to at least 0.20m below the finished level of the subgrade or as otherwise indicated in the drawings. A uniform surface that could be easily drained shall be obtained by controlled blasting, sledging and splitting along cleavage planes.

Any pockets formed in the rock due to uneven breakage shall be made good into an even surface to prevent the accumulation of ground water by filling with grade 15 concrete to the approval of the engineer.

The extra depth excavated shall be backfilled to the level of the top of the subgrade using suitable material in a manner specified for embankment construction in section 304.

Where blasting is required it shall be carried in accordance with to section 306 and all necessary precautions given therein carefully observed.

**(f) Excavation in marshy Material**

Unless otherwise specified or directed by the Engineer the method of excavation of marshy material shall be such that as the marshy material is excavated, the void is filled with an approved granular material with the least possible delay ensuring thereby, to the extent practicable, the exclusion of all unsuitable material from within the lateral limits of the roadway.

**(g) Excavation for Road Widening**

Excavation for widening of the existing road formation shall be done according to the cross sections given in drawings and/or as directed by the Engineer.

Care shall be exercised to ensure the stability of the road platform adjacent to the sections excavated and that the existing platform is not loosened beyond what is practically required. Any over break shall be made good at the expense of the contractor.

**(h) Earth Slips**

Removal of material in slips in areas beyond the lines and slopes of excavation shall not be paid for unless such occurrences are shown to have been beyond the control of the contractor and not preventable by the exercise of due care on his part.

**(i) De Watering**

If water is met within the cut area due to springs, seepage or rain, it shall be removed by suitable means as and when required by the Engineer.

Care shall be taken to discharge the drained water so as not to cause damage to the works, or any adjacent property.

#### **(j) Finishing Operations**

The surface resulting from the excavation shall be finished to the levels given in drawings or as directed by the Engineer. All cut slopes shall be finished neatly to the specified slopes care shall be taken to remove all unstable boulders away from these slopes.

### **301.4 Measurement and Payment**

#### **(a) Measurement**

Roadway excavation shall be measured in its original position and the volume determined in cubic metres by the average end-area method as computed on the original and final cross sections of required and completed work, unless otherwise specified. Separate measurements shall be made for each class of material encountered.

Measurements of rock excavated below subgrade level shall be computed on the basis of excavation to the specified minimum depth below subgrade level only and no over break shall be included.

Interim payments may be made on measured volume of required excavation actually excavated before final shaping, provided the contractor's intention to complete the work is clear.

#### **(b) Payment**

The quantities of roadway excavation measured, as specified above, will be paid for at the contract unit rate per cubic metre for each class of material encountered. Such rates shall include full compensation for excavation, removal, haulage for re-use or satisfactory disposal of all roadway excavation, for shaping, dressing and completion of surfaces and for furnishing all labour, material, tools, equipment and incidentals necessary to complete the work. Dewatering shall be paid for separately.

The rate for payment shall also include for all laboratory and field testing, Stockpiling and any multiple handling of materials

Where the loose soil is separately classified as wet and dry, payment shall be at two separate rates.

The Pay Items and Pay Units will be as follows :-

<b>Pay Item</b>		<b>Pay Unit</b>
301 (1)	Roadway excavation in unclassified soil	Cubic metres

301 (2)	Roadway excavation in classified soil (state class of soil)	Cubic metres
And the following		
301 (3)	Roadway excavation in classified rock (state whether soft or hard)	Cubic metres
301 (4)	Roadway excavation in marshy material	Cubic metres
301 (5)	Dewatering	Item

**Note :** Refer to subsection 106.6 regarding sub divisions of pay item.

## **302 EXCAVATION AND BACKFILL OF STRUCTURES**

**Delete this section in full and insert as follows**

## **302 EXCAVATION AND BACKFILL FOR BRIDGE FOUNDATIONS, DRAINS CHANNELS ETC.**

### **302.1 Description**

This work shall consist of the necessary excavation for the foundation of bridges, culverts, retaining walls, headwalls, wing walls, drains, channels, ditches and other structures.

The work shall include the necessary diverting of streams, construction and subsequent removal of necessary cofferdams and cribs, all necessary sheeting, shoring, bracing, dewatering and pumping, removal of logs, stumps and other deleterious matter and obstructions from placing the foundations; trimming of excavation; backfilling, clearing the site of debris and the disposal of excess excavated material.

This work shall also include the proper utilization and hauling or disposal of all excavated material, backfilling where required, constructing, shaping and finishing all earthwork involved in conformity with the required alignment, levels, grades and cross sections as shown in the drawings and as directed by the Engineer

### **302.2 Classification of Materials**

The classification of excavated materials and suitable and unsuitable materials for backfilling shall be as given in sub section 301.2.

### **302.3 Construction Requirements**

#### **(a) General**

Prior to commencement of excavation operations, the limits of excavation shall be set out as shown in the drawings or as directed by the Engineer.

The depth of excavation shall be as shown in the drawings, unless the foundation strata encountered is such as to require changes. In the latter case the depth of excavation shall be as directed by the Engineer. Where blasting is required it shall be carried out according to section 306 and all necessary precautions given therein carefully observed.

All suitable material removed from excavations shall be used in the formation of embankment as far as practicable. Only material in excess shall be disposed.

#### **(b) Excavation for Foundations above Water Table**

Unless otherwise directed excavation for foundations above water table shall be carried out to the width of the lowest step of the footings and the sides left vertical without shoring where the nature of the soil and the depth of excavation allows it. Where this is not possible the contractor shall erect all necessary shoring shuttering, and planking necessary for the safety of personnel and works.

#### **(c) Excavation for Foundations below Water Table**

Where water is met within the excavation due to stream flow, seepage, springs etc., the contractor shall take adequate measures such as bailing, pumping, construction of diversion channels and bunds, coffer damming and any other measures to keep the foundation trenches free from water as necessary.

Where cofferdamming is required, these shall be constructed to adequate depths and heights with due regard to safety and stability and made as watertight as necessary to permit work to be carried out inside them. The interior dimensions of the cofferdams should be such as to give sufficient clearance for the construction and inspection and to permit installation of pumping machinery etc., as may be required within the enclosed area.

#### **(d) Preparation of foundation**

The bottom of the foundation shall be to the lines and levels as given in the drawings or as required by the Engineer. Where this is in soil and above the water table it shall be watered where necessary and rammed, and where it is below the water table it shall be prepared as directed by the Engineer.

Where rock strata is encountered, soft and weathered material shall be removed as necessary and the surface trimmed and addressed as directed by the Engineer.

If the excavation has been carried out deeper than necessary, as given in the drawings or as otherwise directed by the Engineer, the extra depth shall be made good with concrete or missionary of the foundation grade or any other approved material at the cost of the contractor.

If in the opinion of the Engineer the material below the foundation is soft, contains organic matter or otherwise unsuitable, the Contractor shall remove the unsuitable material and backfill with suitable foundation fill material such as sand, rubble or concrete as specified or shown in the drawings or as instructed by the Engineer. If sand is used it should be properly consolidated by saturating with water and vibrating with compaction equipment or vibrators. Quality of sand shall conform to section 1701.2 and table 1701-2. Rubble used shall conform to section 1006.2.

**(e) Backfilling**

Backfilling of the foundation shall be carried out in accordance with sub section 304.3.j.(iv). As stated therein it shall be noted that the backfilling shall be done only after the foundation concrete or masonry has been in position for at least 7 days and in a manner not to cause thrust on any part of the foundation.

**(f) Use and Disposal of Surplus Material**

All suitable material from the surplus excavation material shall as far as possible be used in the construction of the roadway.

All excess soil and other material from excavation, including logs and boulders shall be removed from the site as directed by the Engineer.

**(g) Lined drains**

In the construction of lined drains, the casting of concrete against the earth faces of the excavation will be permitted subject to Engineer's approval. Any space between the lined drain and over excavation for drains shall be cleared of all debris prior to backfill. Such spaces shall be backfilled with suitable material in layers and properly compacted or by any other method of construction with the approval of the Engineer

### 302.4 Measurement and Payment

#### (a) Measurement

All excavation shall be measured according to the dimensions as given in the earthworks or as directed by the Engineer, in cubic metres for each class of material encountered. Any excavation in excess of the above, other than what had been allowed by the Engineer shall be considered as carried out for the convenience of the contractor in executing the work and shall not be measured for payment.

#### (b) Payment

The quantities of excavation for structures as measured above will be paid for at the contract unit rate per cubic metre for each class of material encountered. Such rates shall include full compensation for all labour, materials, tools, equipment, safety measures and incidentals necessary to carry out the work to this specification. This work shall include;

- (i) Setting out
- (ii) Removal of all logs, stumps and other deleterious matter and obstructions from the excavation and including the trimming of the bottom the of excavation.
- (iii) Backfilling, clearing the site and disposal of all surplus material.
- (iv) Construction of necessary cofferdams, cribs, sheeting, shoring and bracing and their subsequent removal and dewatering shall be paid for separately.

The Pay Items and Pay Units will be as follow.

Pay Item	Pay Unit
302 (1) Excavation in unclassified soil and backfill of structures	Cubic metres
302 (2) Eavation in classified soil (state class of soil) and backfill of structures	Cubic metres
302 (3) Excavation in classified rock (state whether soft or hard) and backfill of structures	Cubic metres
302 (4) Excavation in marshy material and backfill of structures	Cubic metres
302 (5) Preparation of base of foundation	Item
302 (6) Construction of necessary cofferdams, cribs, sheeting, shoring and	Item

	bracing and their subsequent removal	
302 (7)	Dewatering	Item
302 (8)	Excavation in boulders	Cubic metres

**NOTE :** Refer sub section 106.6 regarding sub-division of pay items.

## 501 PRIME COAT

### 501.2 Materials - Insert a new item ( c ) as follows

**501.2 (c)** If the contract specifies cut back bitumen to be prepared at the site the contractor could do so. He should ensure that full precautions and safety controls as required for such operations are arranged at the site and obtain the approval of the Engineer for these arrangements. Materials to be used shall be as follows.

Bitumen - Penetration grade 60 - 70 or 80 – 100  
 Kerosene - What is commercially available  
 Diesel - What is commercially available

## 505 SEAL COAT TREATMENTS (SURFACE DRESSINGS)

Insert general comments before sub section 505A.1& 505B.1 as follows.

### General

The contractor shall, with the approval of the Engineer, appoint a surface dressing technical officer who shall be fully competent to implement the surface dressing operations and having experience in operating all essential equipment

The contractor shall submit his detailed programme, arrangements and methodology for carrying out surface dressing work to the Engineer well in advance (minimum 14 days) of the intended date for commencing this work. Engineer shall review and inform the contractor of his approval or comments if any.

### 505B.3(d) Construction of SBST

#### 505B.3(d)) (i) Application of the binder

After the third para insert the following.

Spraying of binder shall not commence until the contractor has ensured that he has sufficient cover aggregate delivered to the site to enable the whole of the area programmed to be covered

The contractor should carry out a trial section of at least 200m at a location to be approved by the Engineer and in accordance with the approved methodology. If the trial section is satisfactorily done and approved by the Engineer, the contractor shall be entitled for payment. If it fails the contractor shall carry out further trials until a satisfactory result is achieved. No payment shall be made for failed trial sections.

If it is required to use an adhesion agent to improve the binding quality of the aggregate and the binder it shall be of approved quality and the amount to be used shall be determined after making appropriate testing as described in TRRL-ORN 3 (1985) or such other test that the contractor shall propose and approved by the Engineer.

#### **505.4(d) (II) Application of cover aggregate**

Insert a Para after the first Para as follows

The contractor may use the recommendations made in TRRL-ORN 3 (1985) for the design of the surface dressing cover aggregate requirements which shall be submitted to the Engineer for approval.

Insert the words “or under emergency conditions” after the words “small jobs” in line one of the second Para.

Insert the following Para at the end of the second Para keep the environment free of hazard. The major affects and their ratings are categorized as follows.

Generation of dust	20%
Disposal of Debris	20%
Soil erosion and damages to Topsoil	20%
Management of borrow pits	10%
Blockage of drain paths	5%
Stagnation of water	5%
Contamination of fuel and lubricants	5%
Material transportation on roads	5% (usage of by- roads, safety on Transportation)
Air noise and vibration	5%
Impact on flora and Fauna	5%

If any of the above defects are not remedied by the Contractor, the Engineer shall deduct the relevant component from quoted rate. The remedial actions shall be, acceptable to the Engineer and in accordance with EMP and Environmental Method Statement (EMS) proposed by the bidder. The assessment of mitigation measures shall be conducted weekly and the Engineer’s satisfaction shall be ensured weekly. If the Contractor fails to take any action within a fortnight, the penalty shall be increased by 10% (ten percent) of the relevant component. Further if the Contractor fails to comply within one month, all remedial activities shall be arranged by a third party and the cost shall be recovered from the Contractor.

**APPENDIX SP – 2 (Not Applicable)****FURNITURE AND EQUIPMENT FOR THE HOUSE OF  
ENGINEERS' REPRESENTATIVE**

For sitting, dining and kitchen

1. One drawing room suite (three seater, two single seater and coffee table)
2. One dining table 2m x 1.2m and six chairs.
3. One cabinet having two drawers at the top and shelves at the lower level with lockable doors.
4. One book case
5. Four Verandah chairs
6. One verandah table
7. One kitchen table
8. One kitchen cupboard
9. One kitchen shelf
10. One Refrigerator 0.22 m<sup>3</sup> capacity
11. One gas cooker with oven and grill and two gas bottles
12. One electric kettle of 1000 watt. capacity
13. Kitchen sink with draining board
14. Two dust bins.
15. One fire extinguisher.

For master bed room

16. Two double beds with mattresses, mattress covers and four pillows
17. One dressing table with stool
18. Two bed-side cabinet
19. One wardrobe
20. One table lamp
21. Two armed chairs
22. Three bed side mats
23. One waste paper basket
24. Two mosquito nets
25. One small table

For each of other two rooms

26. Two single beds with mattresses, mattress covers and two pillows

27. Two bed side cabinets
28. One Wardrobe
29. One chair
30. One small table
31. Two mosquito nets

For the verandah

32. Four verandah chairs
33. One verandah table

For each of the two bath rooms

34. One wall cabinet
35. One wall mirror
36. One bathroom stool
37. One tooth brush holder
38. One glass shelf
39. Two towel rail
40. One toilet roll holder
41. One commode
42. One bath tub
43. One wash basin
44. One shower
45. One lavatory brush
46. One flexible water hose

For the servants room, bath and toilet

47. One single bed with mattress, mattress cover and one pillow
48. One Mosquito net
49. One small table
50. One chair
51. One ceiling fan
52. One pedestal toilet
53. One wall mirror
54. One glass shelf
55. One shower
56. Two plastic buckets of capacity 2 lt. and 8 lt.
57. One towel rack

**APPENDIX SP – 3****FURNITURE AND EQUIPMENT FOR THE HOUSES OF THE  
ENGINEER'S STAFF (ARE)**

For the house

1. One drawing room suite (three seater, two single seater and small table)
2. One dining table 2m x 1.2m and six chairs.
3. One refrigerator 0.22m<sup>3</sup> capacity
4. Four single beds with mattress, mattress covers and pillows
5. Three bedside cupboards
6. Three steel cabinets
7. Two Verandah chairs
8. One verandah table
9. One kitchen table
10. One kitchen cupboard
11. One kitchen shelf
12. One gas cooker and two gas bottles
13. One electric kettle of 1000 watt. capacity
14. Kitchen sink with draining board
15. Two dust bins.
16. Two fire extinguishers.

For each of the two bath rooms

17. One wall cabinet
18. One wall mirror
19. One bathroom stool
20. One tooth brush holder
21. One glass shelf
22. Two towel rail
23. One toilet roll holder
24. One commode
25. One bath tub
26. One wash basin
27. One shower
28. One lavatory brush
29. One flexible water hose

For the servants room, bath and toilet

30. One single bed with mattress, mattress cover and one pillow
31. One Mosquito net
32. One small table
33. One chair
34. One ceiling fan
35. One pedestal toilet
36. One wall mirror
37. One glass shelf
38. One shower
39. Two plastic bucket of capacity 2 lt. and 8 lt.
40. One towel rack
41. One flexible water hose

**APPENDIX SP – 4****LIST OF FURNITURE AND EQUIPMENT FOR THE ENGINEERS'  
REPRESENTATIVE OFFICE (Team Leader)**

Following furniture shall be provided to the office and maintained.

1. Senior executive table with two drawers on each side and chair	1 No.
2. Junior executive table with two drawers on each side and chair	11 Nos.
3. Conference table with chairs for 12 persons	1 No.
4. Clerks table with two drawers on each side and chair	1 No.
5. Cushion chairs	5 Nos.
6. Ordinary chairs	2 Nos.
7. Steel filing cabinets four drawers each	6 No.
8. Steel Almirah approximately 2m high, 1m wide, 0.5m deep with shelves and two sashes door	2 Nos.

Following equipment shall be provided to the office and maintained.

1. Contractor shall provide a computer network of capacity 250GB and with provision for a minimum of 8 work stations each with 80GB hard disc capacity and access to the network. The work stations shall be located as required by the Engineer. Network shall be removed at the end of the contract.
2. One No. photo copy / printing machine (dry type) with A4 and A3 printing facilities and connected to the network and able to receive commands from any of the work stations. Photo copier shall become the property of the Employer at the end of the contract.
3. One No. photo copier (dry type) with A4 and A3 printing capability. The photocopier shall become the property of the Employer at the end of the contract.
4. One No. Document scanner. This shall become the property of the employer at the end of the contract.
5. One No. Fax machine
6. Software for the office use as required by the Engineer. The software shall become the property of the Employer at the end of the contract.
7. Five No. Calculators scientific (10 digit) (programmable)
8. Two No. Water dispensers for drinking water.
9. One No. Electric kettle 1500 watt.
10. One No. Refrigerator 0.14 M<sup>3</sup> capacity.
11. One No. Plan chest drawer with 5 drawers Minimum A0 size.
12. One No. Stapler No.56 type heavy duty.
13. Two No. Stapler (small)
14. One No. Puncher two hole with lever to set punch positions
15. Two No. Puncher (small)
16. One No. Pencil sharpener (table type)
17. Ten No. Filling trays.
18. Six No. Waste paper basket.
19. One No. Tea set.
20. One No. First aid box with the required medicine.
21. Stationary – As required and approved by the Engineer.
22. One No. Digital Camera, high resolution and optical Zoom

**APPENDIX SP – 5**

**LIST OF FURNITURE AND EQUIPMENT TO BE SUPPLIED  
TO THE SITE OFFICE (ARE's Office)**

Following furniture and equipment as approved by the Engineer shall be provided to the office and maintained.

1. Junior executive table with two drawers on each side and chair	5 Nos.
2 Clerks table with two drawers on each side and chair	1 No.
3. Ordinary chairs	2 Nos.
4. Steel filing cabinets four drawers each	2 Nos.
5. Desk top computer, Pentium four or better, 20 GB hard disk, 17" colour monitor, VGA card, 256MB Ram (This item shall be handed over to the Employer at the end of contract)	1 No.
6. Ink jet printer	1 No.
7. Photocopier	1 No.
8. Electric kettle 100 watt	1 No.
9. Tea set	1 No.
10. Water dispenser for drinking water	1 No
11. Fridge 0.14m <sup>3</sup> capacity	1 No.
12. Puncher two hole	1 No.
13. Stapler	1 No.
14. First aid box	1 No
15 Filing trays	4 No.
16. Stationary - as required and approved by the engineer.	
17. Waste paper basket	3 No
18. Bulletin board	1 No.

**APPENDIX SP – 6****LIST OF FURNITURE FOR THE ENGINEER'S REPRESENTATIVE  
LABORATORY**

Following furniture should be provided to the laboratory.

1. Junior executive table with two drawers on each side and chair	3 Nos.
2 Clerks table with two drawers on each side and chair	1 No.
3. Ordinary chairs	2 Nos.
4. Steel filing cabinets four drawers each	3 Nos.
5. Desk top computer, Pentium four or better, 20 GB hard disk, 17" colour monitor, VGA card, 256MB Ram (This item shall be handed over to the Employer at the end of contract)	1 No.
6. Ink jet printer	1 No.
7. Photocopier	1 No.
8. Electric kettle 100 watt	1 No.
9. Tea set	1 No.
10. Water dispenser for drinking water	1 No
11. Fridge 0.14m <sup>3</sup> capacity	1 No.
12. Puncher two hole	1 No.
13. Stapler	1 No.
14. First aid box	1 No
15 Filing trays	2 No.
16. Stationary - as required and approved by the engineer.	
17. Waste paper basket	2 Nos
18. Bulletin board	1 No.

**APPENDIX SP-7****TEST EQUIPMENT FOR ENGINEER'S LABORATORY****For Testing Soils**

Item No.	Description	Quantity
1	Set of sieves and sieve shaker for grain size analysis of soils and aggregates, conforming to BS 1377 standards, with sieves of sizes 75mm, 63m, 50mm, 37.5mm, 28mm, 20mm, 14mm, 10mm, 6.3mm, 5mm, 2mm, 1.8mm, 600 $\mu$ m, 300 $\mu$ m, 150 $\mu$ m, 75 $\mu$ m – 200m diameter frame – woven mesh – electrically operated shaker on 220-240 V, 50Hz, single phase power supply together with accessories, lid, receiver, 3separators and sieve brush	One set
2	Atterberg testing equipment, liquid limit test device, motorized conforming to BS 1377 standard, operated on 220-240 V, 50Hz, single phase power supply, together with revolution counter, grooving tool and gauge	One set
3	Atterberg testing equipment, plastic limit testing device, standard size 500mm x 500mm 8mm thick glass plate	One No.
4	Compaction test equipment, electrically operated on 220-240 V, 50Hz, single phase power supply with ability to compact soil samples for proctor density (standard and modified) and for CBR tests, conforming to BS 1377 standard, rammer diameter 50mm, drop height adjustable from 300mm to 450mm and weight of rammer adjustable from 2.5kg. to 4.5kg.	One No.
	Electric oven 120 lt. capacity, temperature up to 250°C, with three shelves, operated on 220-240 V, 50Hz, single phase power supply	
	Steel trays 460mmx460mmx50mm	Two No
	Steel trays 306mmx306mmx38mm	Two No
	Moisture content tins, diameter 65mm x dept 20mm in aluminum alloy, 60 gram capacity with lid	Eight No.
	Sample trays plastic 2.5 lt. capacity	Four No.
	Heat resistant gloves	Twelve pairs
	Moulds for proctor density test – BS standards, complete with collar and base plate	Two No.
	Moulds for CBR test – BS standards, complete with collar, base plate, and perforated base plate	Three No.
	CBR cutting collar for BS standard mould	One No.
	C spanner for BS standard CBR moulds	Two No.
	Tamping rod for CBR test	One No.
	Surcharge weights 2kg each, split type, to BS standard	Six No.
	CBR / Marshal test loading machine, electrically operated on 220-240 V, 50Hz, single phase power supply, with adjustable test speeds, conforming to BS standard and ASTM standard	One No.
	Load ring of range 0 to 10kN for Marshal/CBR test machine	One No.
	Load ring of range 0 to 50kN for Marshal/CBR test machine	One No.
	Microwave oven for moisture content determination, electrically operated on 220-240 V, 50Hz, single phase power supply, 700 watt rated power	One No.
	Microwave trays 1.2 lt. capacity	Four No.
	Field density test equipment, sand replacement method, BS	One set

Item No.	Description	Quantity
	standard, 150mm diameter pouring cylinder, complete with 300mm square tray with centre hole of diameter 150mm, and set of tools	
	Thermometer digital, range up to 250°C	Two No.

**For Testing Aggregate**

Item No.	Description	Quantity
	Sieve analysis – (use equipment provided under soils)	
	Aggregate impact value determination machine, manually operated, complete with cylinder and tamping rod, conforming to BS standard	One set
	Los angles abrasion test machine, electrically operated on 220-240 V, 50Hz, single phase power supply, complete with 12 charges, nut, spanner, cover and steel tray	One set
	Aggregate crushing value and aggregate ten percent fines value determining equipment, complete with cylinder, plunger, and base plate conforming to BS standard.	One set
	Compression test machine, motorized and hydraulically operated on, 220-240 V, 50Hz, single phase power supply, with option for manual operation, load up to 1500kN, with platens for testing 150mm cubes and attachment for flexural strength test on beams	One set
	Flakiness gauge to determine flakiness index	One No.
	Buoyancy balance complete with density basket and pan	One No.

**For Testing Cement and Concrete**

Item No.	Description	Quantity
	Moulds for casting concrete cubes 150mm	Twelve No.
	Moulds for casting 100mm x 100mm x 500mm long concrete beams for testing on flexure	Six No.
	Compression testing machine (use machine provided under aggregates)	
	Consistence and setting times for cement – testing equipment frame, plunger, initial setting time needle, final setting time needle and mould with ring and base plate	One set
	Apparatus for determining the fineness of cement according to BS standard 4550 complete with accessories	One set
	Concrete slump test equipment complete with slump cone, tamping rod, steel rule, baseplate, slump cone funnel and scoop	One set
	Equipment for checking the percentage of air entrained in Fresh concrete, complete with pressure pump, tamping rod, compacting bar and calibrating cylinder	One set
	Concrete test hammer to determine the strength of hardened concrete without destruction, light weight	One No.

**For Testing Bitumen and Asphalt Concrete**

Item No.	Description	Quantity
	Standard penetration test apparatus, complete with frame, dial gauge, hard steel penetration needle, penetration tin 70mm diameter x 45mm deep, water bath and transfer dish	One set
	Softening point test apparatus, complete with rings, guides, balls, water bath and thermometer	One set
	General purpose oven, operated on, 220-240 V, 50Hz, single phase power supply, 50 lt. capacity, temperature range up to 200°C	One No.
	Stainless steel test pan 140mm diameter and 9.5mm deep	Three No
	Metal containers 55mm diameter and 35mm deep with lid	Three No
	Ductility test equipment, operated on, 220-240 V, 50Hz, single phase power supply, including four briquette moulds and four base plates	One set
	Standard tar viscometer, operated on, 220-240 V, 50Hz, single phase power supply, complete with energy regulator, cup and ball valve	One set
	Marshal stability determination conforming to AASHTO/ASTM standard - supply 4" breaking head in two parts, 4" compaction moulds, compaction mould holder, sample ejector, stability compaction hammer (for manual compaction of sample), compaction pedestal, flow indicator, water bath and 4" filter paper disc (Note – Loading machine for stability measurement provided under soils)	One set
	Asphalt centrifuge extractor, to recover Bitumen from asphalt paving mix, 1500gm capacity, electrically operated on 220-240V, 50Hz, single phase power, conforming to AASHTO standard, complete with accessories, hot plate, two graduated cylinders, evaporating dish, pan, and desiccator cabinet	One set

**General Laboratory Equipment**

Item No.	Description	Quantity
	Trowel, 175mm long stainless steel blade, bullnosed	One No.
	Scoop, 125mm x 200mm x 75mm stainless steel	One No.
	Bench mounted mixer suitable for mixing soils, concrete, asphaltic material etc., five litre capacity, operated on, 220-240 V, 50Hz, single phase power supply, complete with mixing bowl, beater, and whisk	One set.
	Laboratory and field balance, for weighing up to 12.5 Kg. sliding weight on arm type, complete with loading pan	One set
	Hand held digital thermometer, with adjustable resolution, range up to 500°C, suitable for checking for checking asphalt temperature and other works	Two No.
	Crucible tongs 200mm long bow type	One No.
	Crucible tongs 400mm long bow type	One No.
	Crucible tongs, 200mm straight type	One No.
	Crucible tongs, 400mm straight type	One No.
	Heavy duty galvanized steel trays 600mm x 300mm x 50mm	Three No
	Heavy duty galvanized steel trays 300mm x 300mm x 40mm	Three No
	Sample containers, steel, capacity one litre with lid	6 No.
	Wire basket 200mm diameter, 190mm deep, 2mm mesh	One No.

<b>Item No.</b>	<b>Description</b>	<b>Quantity</b>
	Bowls stainless steel two litre capacity	One No
	Bowls stainless steel six litre capacity	One No
	Measuring cylinder 100ml capacity	One No.
	Measuring cylinder 50ml capacity	One No.
	Measuring cylinder 500ml capacity, tall and graduated	One No.
	Glass weighing bottles 50mm diameter and height 100mm	Two No.
	Glass weighing bottles 40mm diameter and height 80mm	Two No.
	Conical flasks 1000 ml, glass with mouth and graduated	Two No.
	Conical flasks 500 ml, glass with mouth and graduated	Two No.
	Glass funnels 110mm diameter	Two No.
	Graduated pipettes 25ml	Two No.
	Thermometer up to 100C	Two No.

**APPENDIX SP – 8****LIST OF FURNITURE AND TESTING EQUIPMENT FOR THE SITE LABORATORY**

The site laboratory shall be provided with the following furniture

- |                           |       |
|---------------------------|-------|
| 1. Junior executive table | 1 No. |
| 2. Ordinary chair         | 1 No. |

The list of test equipment required for the site laboratory is as follows

Item No.	Description	Quantity
	Moulds for casting concrete cubes 150mm	Nine No.
	Concrete slump test equipment complete with slump cone, tamping rod, steel rule, baseplate, slump cone funnel and scoop	One set
	Field density test equipment, sand replacement method, BS standard, 150mm diameter pouring cylinder, complete with 300mm square tray with centre hole of diameter 150mm, and set of tools	One set
	General purpose oven, operated on, 220-240 V, 50Hz, single phase power supply, 50 lt. capacity, temperature range up to 200°C	
	Scoop, 125mm x 200mm x 75mm stainless steel	One No.
	Trowel, 175mm long stainless steel blade, bullnosed	One No.
	Laboratory and field balance, for weighing up to 12.5 Kg. sliding weight on arm type, complete with loading pan	One set
	Crucible tongs, 200mm straight type	One No.
	Crucible tongs, 400mm straight type	One No.
	Heavy duty galvanized steel trays 600mm x 300mm x 50mm	One No
	Heavy duty galvanized steel trays 300mm x 300mm x 40mm	Two No
	Moisture content tins, diameter 65mm x dept 20mm in aluminum alloy, 60 gram capacity with lid	Four No.
	Heat resistant gloves	Four pairs
	Thermometer digital, range up to 250°C	One No. No.
	Thermometer up to 100C	Two No.

**APPENDIX SP – 9****LIST OF SURVEY EQUIPMENT FOR ENGINEER AND STAFF**

The list of survey equipment to be supplied is as follows

<b>Item No.</b>	<b>Description</b>	<b>Quantity</b>
	Total station capable of measuring distance up to 500m, angles to an accuracy of 10 arc seconds, complete with tripod, optical plummet and other accessories	One set
	Target prisms with mounting poles for working with the total station	Two No.
	Leveling bubble for mounting poles	Two No.
	Automatic level with provision for electronic distance measurement, complete with tripod, optical plummet and other accessories	One set
	Survey leveling staff, four metre long, telescopic type	Two No.
	Leveling bubble for leveling staff	Two No.
	Ranging rods, two metre long	Four No.
	Steel tape fifty metre long, white colour, 10mm wide, divided and numbered through out.	Two No.
	Fiber glass box tape, thirty metre long, divided and marked through out	Two No.
	Brass plumb	One No.
	Hammer, two kilogram weight	One No.
	Axe	One No.
	Shovel	One No.
	Surveyor umbrella, large	One No.
	Canvas field bag	No.
	Pegs and stakes as required	As required
	Aluminium straight edge, four metre long, fixed with two lifting handles on top side and two measuring wedges	One set
	Digital GPS Equipment	Two Nos.

**APPENDIX SP – 10****VEHICLES FOR THE ENGINEER AND STAFF**

<b>Vehicle Type</b>	<b>Basic Specification</b>	<b>No. Required</b>
Type 2	Provide initially new, and maintain, two wheel drive, double cabin pickup, 2000cc diesel engine, air conditioned, 4 doors, with driver, fuel etc. usage 3000 km per month. (2 Nos.)	72 vehicle months
Type 2	Provide initially new, and maintain, two wheel drive, double cabin pickup, 2000cc diesel engine, air conditioned, 4 doors, with driver, fuel etc. usage 3000km per month. (2 Nos.)	48 vehicle months
Type 3	Provide initially new, and maintain, 100cc (minimum) petrol engine motor cycle with fuel, service etc. Maximum usage 3000km per month. (3Nos.)	72 vehicle months

The number of vehicles and the vehicle months provided above is for the whole project up to its completion. This number is tentative and can be changed depending on the actual requirements and the availability of funds for purchase of vehicles.

The number of each type of vehicle required to be purchased or obtained on a monthly basis, under each of the Contracts shall be determined and inserted in the appropriate Bill of quantities.

The Contractor shall provide detailed specifications of the vehicles “type 2” and “type - 3” to be provided for the approval of the Engineer prior to procurement.

All “type 2” and “Type – 3” vehicles purchased for the project shall become the property of the Employer on completion of the project.

## **6.4 SUPPLIMENTAL SPECIFICATION**

## **101 ABBREVIATIONS**

Add the following at the end of the list

kg/cm<sup>2</sup> Kilogram per square centimeter  
lt Litres  
ml Mililitres

### **402.3 (l) Degree of Compaction of Stabilized Sub Bases and Bases**

Strength shall be determined by casting 150mm cubes in the field, of the material used for construction, curing them for 14 days (7 days moist curing and 7 days of soaked curing) and testing their strength under an unconfined compression testing machine. Strength to be achieved shall be as stipulated in sub clause 402.3 (d).

## **700 DRAINAGE CONSTRUCTION**

### **701 ROADSIDE AND LEAD AWAY SURFACE DRAINS**

#### **Construction Requirements**

**701.3 (a) Cutting and forming of earth drains** – The excavations shall be carried out as per 302 of Special Provisions.

### **703.6 Measurement and Payment**

**703.6 (b) Payment** - Insert the words “including shoring, dewatering, and for all items as stipulated in sub clause 106.3.” After the words “where required” in line three.

## **800 INCIDENTAL CONSTRUCTION**

### **801 TOP SOILING**

**801.2 materials** - add a new Para at the end of Para one as follows.

Fertilizer to be used shall be from a standard commercial grade conforming to all relevant regulations and shall provide the minimum percentage of nutrients specified.

Where the type of fertilizer is not specified the contractor shall obtain the Engineers approval prior to use of a particular fertilizer.

### **801.3 Construction requirements -**

Insert a new Para after Para three as follows.

If it is required to apply fertilizer for grassing, it shall be done during top soil application. The top soil shall be spread to a loose thickness of 100mm and the fertilizer applied at a uniform rate as specified over the area to be grassed. The soil shall then be scarified to a depth of 150mm and thoroughly mixed by mechanical means or otherwise and suitably compacted.

### **801.4 Measurement and Payment**

Pay items - Insert additional pay items as follows

<b>Pay Item</b>	<b>Description</b>	<b>Pay Unit</b>
801 (3) Fertilizer (provide and apply)		Tonne

## **803 PLANTING TREES, SHRUBS, VINES ETC.**

### **803.2 Materials -**

**803.2 (c)** - Insert the words “and vines, herein after collectively referred to as plant” after the words “All plants” in line three

### **803.4 Measurement and Payment**

**803.4 (b) Payment** - Para one - insert the words “and all items as stipulated in sub clause 106.3” at the end of Para

## **804 RIP RAP PROTECTION FOR EMBANKMENT SLOPES**

### **804.4 Measurement and Payment**

**804.4 (b) Payment** - Para one - insert the words “furnishing of materials, labour, equipment, tools, incidentals and for” after the words “full compensation for” in line two

## **806 PRECAST CONCRETE KERBS AND CHANNELS**

### **807.3 Construction Requirement**

807.3 (a) Precast concrete units - Para one - Delete the words “combined kerb and channel” after the words “of precast” in line one

**807.4 Measurement and Payment** - Delete the title and insert “Quality control”

The quality of material and of work shall be in accordance with these specifications and as instructed by the Engineer.

Re-number sub Section 807.4 as 807.5- Measurement and payment - Clauses shall remain the same.

**808 “GUARD RAILS AND WALLS, GUARD STONES, GUIDE POSTS AND BOLLARDS.**

808.2 Materials – Para one – Insert the words “20/20 and of class” after the word “grade” in line two.

**811.5 Measurement and Payment**

**(a) Measurement**

**(b) Payment**

Add a Pay Item as follows;

Pay Item	Description	Pay unit.
811(4)	Project information sign Reflective Road sign	No.

**820 USE OF GEOSYNTHETICS IN ROAD CONSTRUCTION AND MAINTENANCE**

**820.1 General**

Geosynthetics is a common term used to describe a range of materials used in the construction industry, particularly to enhance the stability of soils and to improve their functional properties. They can also be used in road pavement construction as a crack reducing or to reduce the appearance of reflective cracking and also to add strength to the surfacing. Geosynthetics can be broadly classified into three main types as follows.

1. Geotextile
2. Geomembranes
3. Geonets and Geocomposites

In road construction geosynthetics can be used with advantage in several functions as follows.

1. As a membrane for separation between two soil layers.

2. To protect erosion of soil embankments.
3. As a reinforcement in soil or asphalt work.
4. As a filtration layer.
5. As a drainage layer.

The geosynthetic material to be used in each case has to be carefully selected based on the properties required of it. Table. 820 – 1 given below can be used as a guidance, taking care to ensure that the material with the required properties of strength and class or survivability is properly selected. Properties of the geosynthetic required to be satisfied for the various survivability conditions are produced in the Table 820 - 2

**Table 820 - 1. Applications and functions for performance of geosynthetics**

Number	Application Area	Geosynthetics Used	Functions for Performance
1.	Embankments on soft soils	GT,GG	R,S
2.	Retaining walls	GG,GT	R
3.	Drainage and Filtration	GT	F, S
4.	Drainage-prefab, composite	GC,GN	D,F,S, B
5.	Erosion Control rip rap	GT	F, S
6.	Asphalt overlay	GT,GG	B,R,S
Abbreviations: Geotextile = GT      B = Barrier Geogrid = GG      D = Drainage Geocomposite = F = Filtration GC                      R = Geonet = GN      Reinforcement S = Separation			

**Table 820 – 2 - Minimum fabric properties recommended for fabric survivability**

Minimum geosynthetic material properties recommended for different levels of survivability <sup>a</sup>				
Required degree of geosynthetic survivability	Grab strength N	Puncture strength N	Burst strength KPa	Trap tear N
Low	400	135	1000	135
Moderate	580	180	1450	180
High	800	335	2000	225
Very high	1200	490	2970	335

<sup>a</sup> All values given in the above table represent the minimum values ( which shall mean that any roll in a lot of the material shall satisfy the above values or exceed them)

Values given in the above chart, Table 820 – 2, are the minimum recommended. These values are not values that are tested and confirmed. The study of geosynthetics in this respect is still in its early stages. As such you should use these values in combination with the requirements of the class of geosynthetics requirement for any function which are given in Table 1710 – 1.

Geosynthetics shall be used on works after a proper design for its use is done, taking into consideration all the factors that are present at the particular site and the requirements to be met by the geosynthetic to be used. Caution must be exercised when adopting standard specifications to ensure that they are appropriate for the particular application. Uniqueness of a situation and the consequences of a failure should be given due consideration. In special situations, where a failure could be of substantial loss, it is best to have the system properly designed by a person competent in this field.

## **820.2 Materials.**

- 1 Geotextile has to conform with section 1710
- 2 Geomembranes shall conform to section 1711
- 3 Geonets and Geocomposites shall be to section 1712
- 4 Soil or asphalt material incorporating the geosynthetic shall be according to the relevant sections of the specification.

Geosynthetic material shall be handled very carefully during transport, at site and when in storage. The material in rolls shall be protected by suitably wrapping them with paper of approved quality. It shall be stored above ground on suitably constructed racks or platforms of wooden or other suitable material. It should be protected from sunlight, heat sources, rain, chemicals, flames or damage by construction machinery etc.

## **820.3 Construction Requirements**

### **(a) Embankment construction**

The geosynthetic to be used shall be properly selected taking into consideration all the factors present at the site and the use for which the geosynthetic is required. Manufacturers' quality assurance certificate shall be obtained and submitted to the Engineer in all cases when geosynthetic material is used.

The area of the ground on which the geosynthetic is to be laid shall be properly cleaned of all vegetation, grass, rock, boulders, tree stumps etc and reasonably well formed. The degree of preparation required shall be based on the class and survivability of the geosynthetic selected for use. If a geosynthetic of very high survivability is used, very much ground preparation may not be needed. It may be laid over boulders, rock, or protruding tree stumps up to 150mm above ground level.

The geo synthetic shall be laid over ground, stretched loosely with no wrinkles or voids between the ground and the geosynthetic. When it is required to lay the geosynthetic on bends or corners, the material can be folded, cut to shape or cut and overlapped. It shall be firmly held in position without causing any perforations until the overlay material is placed.

Construction equipment shall not be allowed directly over the geosynthetic. An initial layer of approved soil of thickness 150 to 300 mm shall be laid before allowing any construction equipment to go over. The depth of the initial layer of soil shall depend on the nature of the equipment to be used.

### **(b) Pavement construction**

A geosynthetic can be used in the pavement construction by inserting it as a layer in between two asphaltic layers. The function of the paving fabric is to act as a water proofing and stress relieving membrane with the Pavement structure

Before commencing on any paving works all the equipment required shall be available and they shall be checked by the contractor and subsequently approved by the Engineer. A bitumen sprayer for applying the tack coat, paving machine for laying the asphalt concrete material, rollers for compacting are the more important equipment required. Geosynthetic material shall be on a tractor mounted spool for easy handling. All equipment in contact with the road surface such as tyres etc. shall be kept cleaned of dirt ,dust etc.

The surface on which the geosynthetic material is to be placed shall be free of dirt, water vegetation or other debris, as determined by the Engineer. Cracks exceeding 3 mm in width shall be filled with suitable crack filler as per Section 1105. Potholes shall be properly repaired as per Section 1102 and as directed by the Engineer. Fillers shall be allowed to cure prior to placing the paving fabric.

The binder application or the tack coat shall be carried out using a bitumen distributor equipped with a spray bar, with hand spraying kept to a minimum. The rate of application shall be as required for the geofabric in use and approved by the Engineer. Temperature of the asphalt material shall be sufficiently high to permit uniform application. For penetration grade bitumen the minimum temperature shall be 145<sup>0</sup>C. However, the distributor tank temperatures shall not exceed 160<sup>0</sup>C in order to avoid damage to the paving fabric.

As spraying with bituminous emulsions are improved by heating, temperatures in the 55<sup>0</sup>C to 70<sup>0</sup>C range are desirable. Since higher temperatures may break the emulsion, temperature of 70<sup>0</sup>C shall not be exceeded.

Width of application of the bituminous binder shall be the paving fabric width plus 150 mm. The bituminous binder shall not be applied any farther in advance of paving fabric placement than the distance the Contractor can maintain traffic free.

When bituminous emulsions (without solvents) are used, the emulsion shall be cured with essentially no moisture remaining prior to placing the paving fabric and final wearing surface.

The fabric used for paving shall be placed onto the bituminous binder with minimum wrinkles prior to the time the tack coat has cooled and lost tackiness. .

Brooming and/or pneumatic rolling shall be required to maximize paving fabric contact with the Pavement surface on which it is laid.

Joints in the paving fabric shall be overlapped by around 150mm. The overlapped layer shall be properly tack coated on to the road surface.

Any damaged geosynthetic shall be removed, or made good to the approval of the Engineer by the Contractor.

Geosynthetic shall be laid wrinkle free. However if any wrinkles are formed it shall be removed by folding over firmly on to the surface or by slitting and overlapping. Additional sealant shall be applied if required.

No traffic other than the construction equipment shall be allowed over the geosynthetic layer.

The hot-mix overlay placement shall closely follow paving fabric laydown. The temperature of the mix shall not exceed 160°C. In the event asphalt bleeds through the paving fabric causing construction problems before the overlay is placed, the affected areas shall be blotted by spreading sand. To avoid movement of or damage to the tack coated paving fabric, turning of the paver and other vehicles shall be kept to a minimum and gradual.

## **Quality Control**

The quality of all materials used and the works carried out shall be in accordance with these specifications and as instructed by the Engineer

### **820.5 Measurement and Payment**

#### **(a) Measurement**

The quantity of Geosynthetic material measured to be paid shall be in square meters of work completed in accordance with requirement of this item and the limiting dimensions shall not exceed those shown on the Drawings or fixed by the Engineer. Measurement shall only be made of area covered without considering any overlap. Embankment construction,

Tack coat application and the asphalt overlay shall be measured and paid separately under their respective sections

**(b) Payment**

The accepted quantity measured as provided above shall be paid at the Contract unit price per square meter of Geosynthetic material laid for the pay item as listed below in the BOQ which price and payment shall constitute full compensation for furnishing all materials, labour, equipment and placing of Geosynthetic material and other works given in these Specifications.

The price of bitumen sealant for sealing paving fabrics or the sand used for blotting (blinding) shall be included in the quoted rates. Embankment construction, tack coat application and asphalt overlay shall be paid under their respective sections

The Pay Items and Pay Units will be as follows:-

<b>Pay Item</b>	<b>Description</b>	<b>Pay Unit</b>
820 (1)	Providing and Placing of Geosynthetic material, (state type) in embankment construction	Sq.m.
820 (2)	Providing and Placing of Geosynthetic material, (state type) in pavement construction	Sq.m.

**1000 BRIDGES AND OTHER STRUCTURES**

**1001 CONCRETE FOR STRUCTURE**

**1001.4 (a) Designed mixes** - Insert a new Para, after Para five, as follows

Design mix details shall be submitted to the Engineer for approval. No concreting shall be done until the mix is approved. The contractors mix design proposal shall include the following details.

- (i) The source, type and proportions of the constituent material
- (ii) Aggregate grading and the saturated surface dry density
- (iii) Chemical admixture details if any
- (iv) The nominal slump and where superplastisizer is used the final slump
- (v) Maximum water content and the maximum water / cement ratio.
- (vi) Documentary evidence of previous performance, relevant test results of 3, 7 and 28 day tests and their comparison with the specified values.
- (vii) Method of placing concrete and the locations

(viii) Full details of the method for curing of concrete.

**Table 1001 - 4 Minimum cement content**

Grade	Minimum cement content in concrete kg/m <sup>3</sup>	Minimum 28 days compressive strength N/mm <sup>2</sup>	
		Minimum target strength (Preliminary tests)	Characteristic strength
30	315	40	30
35	330	45	35
40	345	50	40
45	360	55	45
50	400	60	50
60	450	70	60

**1001.6 Workability of Concrete** - Insert the following words at the end of the last Para “Where the quantity and the arrangement of the reinforcement bars and their position in relation to the formwork are such that the space within is congested to such an extent that the effective placing and vibration of concrete is not possible, the workability of concrete may be increased temporarily by adding a superplasticiser or other suitable admixture approved by the Engineer.

#### **1001.7 Testing of Concrete for Acceptance**

1001.7 (c) Insert a new Para at the end as follows

The ratio of the 7day and 28 day concrete cube strengths as obtained by their average values shall be determined for each lot of concrete poured for the first four or more pours. The average strength of the 7 day cured specimens shall be divided by the average strength of the 28 day specimens for each batch, and the ratio 'R' shall be determined. The ratio 'R' shall be expressed to three decimal places.

If during the construction of normal work, the average value of any 4 consecutive 7 day test results falls below the required 7 day strength as derived from the value of 'R', then the cement content of the concrete shall, without extra payment, be increased by 5 percent by weight or by an amount agreed by the Engineer. The increased cement content shall be maintained at least until the four corresponding 28 day strengths have been assessed for its conformity with the strength requirements of the specified grade of concrete in use. Whenever the cement content is increased, the concrete mix shall be adjusted to maintain the required workability.

#### **1001.8 Mixing of Concrete**

Insert a new Para at the end of the last Para as follows - “The temperature of the concrete shall be maintained below 33° C at the time of placing. If the ambient temperature is over 35 ° C concreting shall not be done.”

Insert a new Para after Para four as follows.

When compaction is done using internal vibrators they shall have a frequency range between 5000 to 8000 revolutions per minute (rpm) and when external vibrators are used the frequency range can be between 4000 to 5000 rpm.

When internal or external vibrators are used, they shall be handled by persons experienced in using them. The vibration shall be of sufficient duration and intensity to fully compact the concrete properly, but shall not be continued up to a point of causing segregation. The internal vibrator shall not be held in one position for more than 30 seconds, and it shall be withdrawn slowly and vertically and reinserted in a new position around 40cm away. Vibrators shall not be used to push concrete or to make it flow.

A concrete pump may be used for placing of concrete provided the Engineer has approved such use. In such event the workability of concrete shall be properly adjusted for pumping consistency by a proper design change of the concrete mix. When using a concrete pump the initial discharge of concrete shall be pumped to waste until consistent workable mix is discharged.

Insert a new Para after the last Para as follows.

The surface of the concrete after completion shall be finished as specified or as directed by the Engineer. All exposed faces of concrete, unless otherwise specified, shall be finished smooth by grinding or other method.

## **1003 PRESTRESSING FOR STRUCTURES**

### **1003.3 Delivery, Handling & Storage of Prestressing Tendons**

Insert a new Para before Para one as follows.

The tendons and other associated items shall be protected from damage or any other harmful effects during transport and storage. These items shall be properly wrapped with approved wrapping material, which shall be chemically inert and harmless, until they are taken for use on the works. Special care should be taken to protect the threaded ends of prestressing bars. Any damaged, bent or kinked tendon shall not be used in the works.

Para four - Delete this Para.

### **1003.4 Construction Requirement**

**1003.4 (b) Para one - Add new sentences at the end of the Para as follows.**  
“Sheaths, tendons, duct formers (extractable cores) and all reinforcement shall be firmly fixed in position so that they shall not be disturbed from their position during concreting, vibration or other constructional operations. Sheaths and extractable cores should be of sufficiently strong material to maintain their shape and profile during

concreting operations. Extractable cores shall not be removed until the concrete has attained sufficient strength to prevent damage.”

Para two - Insert the words “and correct profile” after the words “in position” in line four.

Insert new sentences at the end of Para as follows. – “Joints in sheaths shall be minimized. Where joints are included they shall be staggered keeping a minimum distance of 500mm between joints of adjacent sheaths. All joints shall be made leak proof to prevent any ingress of grout or water from concreting. In post tensioning work where tendons are to be inserted later, the sheathing ducts may be checked for clearance by inserting and pulling a dolly through each duct during concreting or soon afterwards.”

Para five - Insert a new sentence at the end of the first sentence as follows “the vents for air release shall be at high points and for drainage shall be at low points.”

#### **1003.4 (c) Stressing Steel**

1003.4 (b) (iv) – Stressing equipment - Para two - Insert the words “whether power driven or otherwise the” after the words “stressing equipment” in line one, and insert a new sentence at the end of the Para as follows. “The contractor shall submit to the Engineer, the full manufacturer’s specifications for the machine and its operational details, well in advance of carrying out prestressing works.”

1003.4 (b) (v) - Stressing operations – Insert a new Para before Para one as follows.

Stressing operations shall be carried out by personnel experienced in handling the equipment. Engineer or his accredited staff shall be present during stressing operation.

Para one - Insert a sentence at the end of the Para as follows “Initially the slack in the tendons shall be removed by pulling each strand with a force not exceeding 20% of its final load and slowly releasing. Proper stressing operations can commence thereafter.”

#### **1003.4(d) Cutting of Tendons**

Insert a new Para before the first Para as follows

The tendons or tendon wires shall be cut only after the grouting of the tendon sheaths are completed and the grout has attained the required strength.

1003.4 (d) (ii) Para one - Add two sentences at the end of Para as follows – Flame cutting shall not be adopted after the tendons are stressed. The temperature of anchorages shall not exceed 200° C during the cutting operation.

Insert a new item (g) as follows

### **1003.5 Measurement and Payment**

**1003.5 (b) Payment** - Insert an additional pay items as follows

<b>Pay Item</b>	<b>Description</b>	<b>Pay Unit</b>
1003 (7)	Prestressing bars, supplied, positioned and stressed	Number
1003 (8)	Precast post-tensioned beams cast at site (state size and type)	Number
1003 (9)	Precast post tensioned beams transported/moved at site and launched (state size and type)	Number

## **1004 PILE FOUNDATION FOR STRUCTURES**

### **1004.2 Materials**

1004.2 (e) At the end add the following. The material, forming the shoes, after casting shall be free from any cavities, foreign material or any other imperfections. and conforming to BS 970”.

### **1004.3 Manufacturing and Protective Requirements for Piles**

#### **(b) Precast concrete piles**

(vi) Handling stacking and storing - Insert a new Para after Para one as follows.

During transport of piles they shall be laid flat or supported at their lifting points, or as approved by the Engineer. Timber spacers shall be placed between adjacent pile stacks to prevent their contact.

## **1005 WELL FOUNDATIONS FOR STRUCTURES**

### **1005.3 Construction Requirements**

#### **1005.3 (c) Sinking** -

Para eight - Insert the word “adjacent “after the words “between the” in line one

Insert a new item (f) as follows

#### **1005.3 (f) Quality Control**

The quality of all materials used and the works carried out shall be in accordance with these specifications and as instructed by the Engineer.

## **1008 FORMWORK FOR STRUCTURES**

### **1008.3 Construction Requirement**

1008.3 (a) False work - insert a new Para at the end of the last Para as follows.

Density of wet concrete together with reinforcement shall be taken 2700kg/m<sup>3</sup>. Appropriate allowances shall be made for superimposed loads, wind loads etc. in the design of the false work. These can be in accordance with the BS code of practice for false work BS 5979 or any other approved Specification.

1008.3 (b) Construction of formwork - Para one - Insert a new sentence at the end of Para as follows. “The design of formwork can be in accordance with BS 3809 or any other approved specification.”

Para three - Delete the word “mortar” in line three and insert “shrinkage compensating mortar after it is cleaned and coated with an approved bonding agent.” And insert a new sentence at the end of the Para as follows “All mortar/grout fins or other surface imperfections shall be tooled and removed to form a smooth even surface of dense sound concrete.”

1008.3 (g) Removal of formwork - Insert four new Para at the end of the last Para as follows.

After the removal of formwork the Engineer shall make thorough inspection of the surface finish and make a note of any defects that are present. Defects, if any, shall be repaired by the contractor at his own cost. He should first submit a proposal for Engineers approval indicating the methodology for attending to the repairs. The defective areas shall be kept moist continuously until the repairs are done. Defects can be categorized into two as minor and major.

Minor defects such as small holes, pinholes, recesses, porous spots, shallow honeycombing, rough areas etc. shall be repaired by removing any loose or defective material and filling the surface with stiff cement mortar having the same proportions of cement and fine aggregate as used in the concrete. The surface shall be cleaned, washed and coated with an approved bonding agent before the cement mortar is applied. The mortar can then be forced into the holes and brought to an even surface with a masonry trowel or a wooden float. Shrinkage compensation grout may be used in place of cement if approved by the Engineer.

All areas of honeycombing or non-compaction which become visible when the forms are removed shall be deemed major defects. These shall not be repaired until the Engineer has given clear instructions or approval to the contractor’s proposal for the repair. These repairs shall be done under Engineers supervision. The defective concrete shall be cut back to sound concrete up to a depth of at least 20mm beyond any exposed reinforcement. The area of exposure shall be cut to an even shape of a rectangle or square and its sides shall be kept horizontal and vertical so that the finished repair will appear neat. The surface of the existing concrete shall be cleaned, washed, surface dried and coated with a bonding agent prior to placing the concrete. The concrete to be used shall be of the same composition as the original. Formwork for the repair shall be so constructed that the concrete can be properly compacted. Any surplus concrete that may protrude from the surface of the structure shall be neatly cut and removed and the surface repaired to a smooth finish.

Structural repairs to prestressed concrete members shall be carried out prior to application of the prestress. Prestressed concrete structures shall not be drilled, chipped or cut or otherwise disturbed after the application of the prestress.

## **1205 MAINTENANCE OF KERBS AND CHANNELS**

### **1205.3 Work Requirements**

Para one - Insert a new sentence at the end of Para as follows “The kerb edge on the carriageway side shall be cleaned, either mechanically or manually, as often as necessary to remove all debris, silt etc., so that the full width of the carriageway is available for the use of vehicular traffic.”

## **1403 PRESTRESSED CONCRETE AND REINFORCED CONCRETE BRIDGES**

### **1403.4 Measurement and Payment -**

**1403.4 (a) Measurement** - At the end add the following. Repairs to hand rails, as required and as instructed by the Engineer shall be measured as the number of linear metres of hand rail.

### **1403.4 (b) Payment -**

Insert following pay items

<b>Pay Item</b>	<b>Description</b>	<b>Pay Unit</b>
1403 (8)	Repair to hand rails	m

## **1405 CABLE SUPPORTED FOOT BRIDGES (SUSPENSION BRIDGES)**

1405.3 (b) Painting of steel members - Para one - Delete the figures “1301.3 (c)” in line four and insert “1401.3 (c)

## **1405 MAINTENANCE OF CAUSEWAYS**

**1406.2 Materials** - Insert two items as follows

- (d) Rubble shall be to section 1006
- (e) Mortar shall be to section 1703.2



**Table 1602 – 1 Delete this table and insert as follows****Table 1602 – 1 Quality Control Tests and their Frequencies**

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Fill for embankment (section 304, 301, 302, and 305) or elsewhere as required	Particle size analysis Atteberg limits Maximum dry density using modified compaction test 4 day soaked CBR Layer thickness Degree of compaction and field moisture content Degree of compaction (backfilling of excavation)	AASHTO T-90, T-89, BS 1377 AASHTO T-180, BS 1377 Test 13 AASHTO T-193, BS 1377 AASHTO T-191 or BS 1377 AASHTO T-191 or BS 1377	Do - do - One per 100 Cu.m or part thereof One per 1000 Cu.m or part thereof Regularly as required by the Engineer One per 500 Sq.m or part thereof subject to minimum of 2 tests per layer One per 50 lm or part thereof subject to minimum of 2 tests per layer	Table 1708 -1 Table 1708 -1 Table 1708 -1	Boulders or broken rock larger than 100mm should be removed      At optimum moisture content  At optimum moisture content

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Lower sub-base layer(Sections 301,304 and 305) or elsewhere as required	Particle size analysis  Atteberg limits  Maximum dry density using Modified compaction test  4 day soaked CBR  Layer thickness  Degree of compaction and field moisture content	BS 1377, AASHTO T-88-00, BSEN 933 AASHTO T-90, T89, BS 1377 AASHTO T-180, BS 1377 Test 13  AASHTO T-193, BS 1377  AASHTO T-191 or BS 1377	One per 1000 Cu.m or part thereof Do - do -  One per 100 Cu.m or part thereof  One per 1000 Cu.m or part thereof  Regularly as required by the Engineer  One per 500 Sq.m or part thereof subject to minimum of 2 tests per layer	Section 1708.1  Table 1708 -4  Table 1708 -4  Not less than 15%  Loose thickness from 125mm to 225mm  95 % of MDD	At 95% MDD  At optimum moisture content

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Upper sub-base layer Sections 401 or elsewhere as required.	Particle size analysis  Atteberg limits  Maximum dry density using Modified compaction  4 day soaked CBR  Layer thickness  Degree of compaction  Field moisture content	BS 1377, AASHTO T-88-00, BSEN 933 AASHTO T-90, T-89, BS 1377 AASHTO T-180, BS 1377 Test 13  AASHTO T-193, BS 1377  AASHTO T-191 or BS 1377  AASHTO T-191 or BS 1377	One per 200 Cu.m or part thereof  One per 200 Cu.m or part thereof  One per 100 Cu.m or part thereof  One per 500 Cu.m or part thereof  Regularly as required by the Engineer  One per 500 Sq.m or part thereof subject to minimum of 2 tests per layer  One per 250 Sq.m or part thereof subject to minimum of 2 tests per layer	Table 1708 - 3  Table 1708 -2  Table 1708 -2  Not less than 30% Table 1708-2  Loose thickness from 125mm to 225mm  98 % of MDD	At 98% MDD  At optimum moisture content

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Stabilized soil sub base or base course (section 402) or elsewhere as required	Lime or cement for compliance	Lime – SLS 552 Cement – Section 1703, SLS 107, BSEN 196	As required by the Engineer	Section 1703	Manufactures certification should be submitted

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Single size aggregate base (section 403 and 408) and elsewhere as required	Particle size analysis  Aggregate impact value  Flakiness index  Rate of spread of aggregate	BS 812, AASHTO T-27, BSEN 933  BS-812, BSEN 1097  BS-812, BSEN 933	One per 400 Cu.m  One per 400 Cu.m  One test per day  One test per day	Sections 1701.3 (a), 1701.3 (c) Table-1701-4  Not more than 30%  Not more than 35%  Table 403-1	
Water or dry bound macadam base (sections 404 and 409) and elsewhere as required	Particle size analysis of coarse aggregate  Particle size analysis of fine aggregate  Aggregate impact value coarse aggregate  Layer thickness	BS 812 AASHTO T-27-00, BSEN 933  BS 812 AASHTO T-27-00, BSEN 933  BS-812, BSEN 1097	One per 200Cu.m  One per 50 Cu.m  One per 400Cu.m  One per day	Table 1701-6  Table 1701-6  Not more than 30%  75 to 200mm compacted	

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Aggregate base course (sections 405 and 408) and elsewhere as required	Particle size analysis of aggregate	BS 812, AASHTO T-27-00, BSEN 933	One per 300 Cu.m	Table 1701-5	

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Aggregate base course (sections 405 and 408) and elsewhere as required (contd.)	4 days soaked CBR Layer thickness	AASHTO T-193, BS1377	One per 500 Cu.m or part thereof As required	Sec. 1701.3 Minimum 80%	At 98% MDD
Penetration macadam base (section 406 and 408) and elsewhere as required	Particle size analysis of coarse aggregate	BS 812 AASHTO T-27-00, BSEN 933	One per 400 Cu.m or part thereof	Table 1701-7	
	Particle size analysis of key aggregate	BS1377, AASHTO T-27, BSEN 933	One per 200Cu.m or part thereof	Table 1701-7	
	Aggregate impact value	BS 812, BSEN 1097	One per 400 Cu.m or part thereof	Section 1701.3 Not more than 30%	
	Flakiness index	BS-812, BSEN 933	One per 400 Cu.m or part thereof	Section 1701.3 Not more than 35%	
	Acceptance test for binder	Section 1702 Section 1802	As required by the Engineer	Table 1702-1	Manufactures certificate should be submitted (As per BS 3690-1 or AASHTO M20)
	Rate of spread of course aggregate		One test per day	Table 406-1	
	Rate of spread of binder	Section 1802.5	One test per day	Table 406-1	

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Penetration macadam base (section 406 and 408) and elsewhere as required (continued)	Temperature of application of binder Rate of spread of key aggregate		As required by the Engineer  One test per day	Table 406-2  Table 406-1	
Bitumen bound base (BBB) (section 407)	Acceptance testing of binder  Los angles abrasion value  Particle size analysis of combined aggregate  Aggregate impact value  Coating and stripping test  Temperature of binder  Temperature of aggregate	Section 1702 Section 1802  AASHTO T-96, BSEN 1097, BS 812 BS812, AASHTO T-27-00, BSEN 933  BS 812, BSEN 1097  AASHTO T-59, T-182, ASTM D 244	As required by the Engineer  One per 400 Cu.m or part thereof  One per 400 Cu.m or part thereof  One per 400 Cu.m or part thereof  One per 400 Cu.m or part thereof  At close intervals as required by the Engineer Do - do -	Table 1702-2  Section 1701.3(a) Not more than 40%  Table 407-1  Not greater than 30%  130°C – 160°C  150°C – 175°C	Manufactures certificate should be submitted (As per BS 3690-1 or AASHTO M20)

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Bitumen bound base (BBB) (section407) (contd.)	Mixing temperature  Laying temperature  Hot bin grading  Compliance to job mix  Marshal mix design  Core sampling	BS812,,AASHTO T-27, BSEN 933  ASTM D1559, AASHTO T 245	Do - do -  Do - do -  One per 300 tonnes (subject to minimum of one per day) One per 300 tonnes (subject to minimum of one per day) One for each change of aggregate or mix One per 250 Sq.m or as directed by the Engineer	145°C – 170°C  Greater than 115°C  Table 407-1  Section 407.3 (b)  Section 407.5 (a)	
Earthen shoulders or gravel surfacing (section 409 and 601)	Particle size analysis  Atterberg limit tests  Standard compaction test	BS 1377, AASHTO T-88-00, BSEN 933  AASHTO T-90, T-88,BS 1377 AASHTO T-180, BS 1377 Test 13	One per 300 Cu.m (subject to at least one for each type of soil) Do – do –  At least one test for each soil type and as required thereafter	Table 1708 - 7  Table 1707 - 8  Not less than 95% of MDD	

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Earthen shoulders or gravel surfacing (section 409 and 601) contd.	4 day soaked CBR  Layer thickness while spreading  Field moisture content prior to compaction  Degree of compaction of compacted layer	AASHTO T-193, BS1377  AASHTO T-191 or BS 1377  AASHTO T-191or BS 1377	As required by the Engineer  Regularly as required by the Engineer  One per 100Sq.m  One per 200 Cu.m	Section 1708.5, 20% at 95% MDD  125 to 225 mm loose  Near to optimum  95% of MDD	
Blended aggregate bases and surfacings (section 410)	Aggregate impact value  Particle size analysis of 37.5, 20 and 14mm aggregate  Flakiness index  Acceptance test of binder	BS 812, Section 1701.3 (a), BSEN 1097  BS 812, AASHTO T-27, BSEN 933  BS 812, Section 1701.3 (a), BSEN 933  Section 1702.3, ASTM D 2397	One per 400 Cu.m  Do – do –  Do – do –  As required by the Engineer	Not more than 30%  Table 1701-4  Not more than 35%  ASTM D 2397	Manufactures certificate should be submitted (As per BS 3690-1 or AASHTO M20)

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Blended aggregate bases and surfacings (section 410) contd.	Rate of spread of binder for two coats  Rate of spread blended aggregate base material and choker stone, if applicable  Layer thickness		Two tests per each coat per day  Two tests per day  Regularly as required by the Engineer	Section 410.3 (e)  Section 410.3 (c)  Each 75mm compacted thickness	
Prime coat or priming cum surface dressing of gravel roads (sections 501 and 602)	Depot tray test  Acceptance test for binder  Rate of application of binder  Temperature of application	BS 1707,Section 1802.5  Section 1702.2, BS 3690-1, ASSHTO T-82, ASTM D2076  Section 501.2	At least once a month As required by the Engineer  Two tests per day  Regularly as required by the Engineer	Table 1702-1  Section 501.2 (d)  Table 501-1	Manufactures certificate should be submitted (As per BS 3690-1 or AASHTO M20)

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Tack coat (section 502)	Depot tray test  Acceptance test for binder  Rate of application  Temperature of application	BS 1707, Section 1802.5  Section 1702.3, ASTM D 2397-98  Section 502.3 (c))	At least once a month As required by the Engineer  Two tests per day  Regularly as required by the Engineer	Section 1702.3, ASTM D 2397  Section 502.3 (c)  Section 502.3 (c)	Manufactures certificate should be submitted (As per BS 3690-1 or AASHTO M20)
Hot bitumen application (section 503)	Depot tray test  Acceptance test of binder  Rate of application of binder  Temperature of application of binder  Rate of spread of blinding material	BS 1707, Section 1802.5  Section 1702.1  BS 1707	At least once a month As required by the Engineer  Two tests per day  Regularly as required by the Engineer  Two tests per day	Table 1702-1  Section 502.3 (c)  160°C to 175°C  Section 503.4	Manufactures certificate should be submitted (As per BS 3690-1 or AASHTO M20)

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Sand seal (section 504)	Depot tray test  Acceptance test of binder  Particle size analysis of cover aggregate  Rate of application of binder  Temperature of application of binder  Rate of spread of cover aggregate	BS 1707, Section 1802.5  Section 1702-1, 1702-2 and 1702-3 as required  Section 1701-5, BS 1377, AASHTO T-88-00, BSEN 933	At least once a month As required by the Engineer  One test per 25 Cu.m  One test per 500 Sq.m  Regularly as required by the Engineer  One test per 500 Sq.m	Section 1702-1, 1702-2, 1702-3  Table 1701-9  Section 504-3 (c)  Section 504-3 (c)  Section 504-3(d)	Manufactures certificate should be submitted (As per BS 3690-1 or AASHTO M20)

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Seal coat treatment (surface dressing) (section 505)	Depot tray test  Particle size analysis of cover aggregate  Water absorption  Aggregate impact value  Los angles abrasion value  Flakiness index  Clay, silt and dust fraction of aggregate  Bulk specific gravity  Soundness  Acceptance test of binder	BS 1707, Section 1802.5  BS 812 AASHTO T-27-00, BSEN 933  BSEN 1097  BS 812, BSEN 1097  AASHTO T-96, BSEN 1097  BS 812, BSEN 933  Passing sieve 0.075mm  BS 812, AASHTO T-85  AASHTO T-104, BS 812  Section 1702 and sectin1802	At least once a month  One per 200Cu.m  One per 400 Cu.m  One per 200 Cu.m  One per 200 Cu.m  One per 400 Cu.m  One per 400 Cu.m  As required by the Engineer  As required by the Engineer  As required by the Engineer	Table 1701-8  Not more than 2%  Section 1701.3 (a), Not greater than 30%  Section 1701-3 not more than 40% Not more than 25% for 20mm and 30% for 10mm Not more than 1%  Not more than 12%  Section 1702-1, 1702-2, 1702-3	Manufactures certificate should be submitted (As per BS 3690-1or AASHTO M2)

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Seal coat treatment (surface dressing) (section 505) contd.	Rate of application of binder  Temperature of application of binder  Rate of spread of cover aggregate  Particle size analysis of combined aggregate  Acceptance test for binder  Aggregate impact value	BS 812 AASHTO T-27-00, BSEN 933  Section 1702-1, 1702-2 and 1702-3 as required  BS 812, BSEN 1097	One per 500 Sq.m  As required by the Engineer  One per 500 Sq.m  One per 300 Cu.m for machine mix or one per 30 Cu.m for manual mix subject to min. of one test for each change of material or mix  As required  One per 300 Cu.m for machine mix or one per 30 Cu.m for manual mix. min. of one test for each change of material or mix	Table 505-1 and 505-3  Table 505-2  Table 505-1 and 505-3  Table 507-1  Table 507-1  Section 1701.3, less than 30%	

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Cold mix for surfacing (Section 507) Contd.	Flakiness index	BS – 812, BSEN 933	One per 300 Cu.m for machine mix of one per 30 Cu.m for manual mix and min. of one test for each change of material or mix	Section 1701.3, less than 35%	
	Temperature of binder at time of mixing		At time of mixing	115°C to 155°C	
	Temperature of aggregate at time of mixing		At time of mixing	115°C to 155°C	
Slurry seal surfacing (section508)	Particle size analysis aggregate	BS 812 AASHTO T-27-00, BSEN 933	One per 20Cu.m or two tests per day which ever is greater Do – do –	Table 508 -1	
	Aggregate impact value	BS – 812, BSEN 1097	One per 2Cu.m or two tests per day which ever is greater as required by the Engineer	Table 508 - 2	
	Particle size analysis mineral filler Acceptance test for cement	BS 812 AASHTO T-27-00, BSEN 933 SLS 107, BS 12, BSEN 196, BS4550			

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Slurry seal surfacing (section508) contd.	Asphalt emulsion	ASTM D-2397, D-244	As required by the Engineer	Section 1702.3	
	Water for mixing	SLS 522	Two tests per day		
	Rate of application of mix		One per 20 Cu.m or two tests per day	Section 508.4	
	Consistency set time		One per 20 Cu.m or two tests per day	Section 508.5 (a) Section 508.5 (b)	
	curing time		One per 20 Cu.m or two tests per day	Section 508.5 (c)	
	Wet track abrasion test		One per 20 Cu.m or two tests per day	Section 508.5 (d)	
	Particle size analysis aggregate	BS 812 AASHTO T-27-00, BSEN 933	One per 50 Cu.m or one test per day	Table 507 – 1	
	Flakiness index	BS 812, BSEN 933	Do – do -		
	Aggregate impact value	BS 812, BSEN 1097	Do – do -		
	Acceptance test for cement	SLS 107, BS 12, BSEN 196, BS4550	As required by the Engineer	Section 1703	Manufactures certificate should be submitted
Cement incorporated cold mix surfacing (section 509)	Asphalt emulsion	Section 1702	As required by the Engineer	Table 1702 - 1	Manufactures certificate should be submitted
	Water for mixing	SLS 522	Do – do -		

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Gravelling on earth roads and re-gravelling of gravel roads ( section 601)	CBR test for gravelly soil  Atterberg limits  Standard compaction test  Particle size analysis aggregate  Layer thickness while spreading  Field moisture content prior to compaction  Degree of compaction	AASHTO T 193, BS1377  AASHTO T – 90, T-89, BS 1377  Section 1804 BS 1377, AASHTO T-180  BS 1377, AASHTO T-88-00, BSEN 933  AASHTO T-191, BS 1377,AASHTO T191  Section 1804, BS1377	One per 300 Cu.m or minimum one per day Do – do – Do – do – Do – do – Regularly as required by the Engineer One per 125 Cu.m  One per 500 Cu.m	Not less than 20%  Table 1708 -8  Not less than 95% of MDD  Table 1708 – 7  !00 to 150 mm  Optimum  Not less than 95% of MDD	
Priming cum surface dressing of gravel roads (Section 602)	Depot tray test  Acceptance test for binder  Rate of application of binder	BS 1707, Section 1802.5  Section 1702-2 and 1702-3 as required	As required by the Engineer As required by the Engineer Two test per day	Section 602.3 (c)	Manufactures certificate should be submitted (As per BS 3690-1 or AASHTO M20)

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Priming cum surface dressing of gravel roads (Section 602) contd.	Temperature of application		Regularly as required by the Engineer	To suit application viscosity	
Cement concrete pavement (Section 901)	Acceptance test for cement	SLS 107, BS 12, BSEN 196, BS4550	Two tests per day	Section 1703	Manufactures certificate should be submitted
	Acceptance test for water	SLS 522	One test per source and as required by the Engineer		
	Particle size analysis (coarse aggregate)	BS 812 AASHTO T-27-00, BSEN 933	One per 200 Cu.m	Table 1701 – 1	
	Particle size analysis (fine aggregate)	BS 812 AASHTO T-27-00, BSEN 933	One per 100Cu.m	Table 1701 – 2	
	Loss angles abrasion value	AASHTO T-96 BSEN 1097	One per 200 Cu.m	Not more than 35% preferred, absolute maximum 40%	
	Water absorption of aggregate	AASHTO T-85, BSEN 1097	As required by the Engineer		
	Mix design	BS 1881	Every change material or mix	Section 901.3	

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Cement concrete pavement (Section 901) contd.	Soundness of aggregate	AASHTO T-104,BS 812	As required by the Engineer	Not more than 12%	
	Alkali aggregate reactivity	BS812	As required by the Engineer		
	Water for concreting	SLS522	As required by the Engineer		
	Concrete strength	BS 1881, BSEN 12390	One test per 15 Cu.m or part thereof	Section 1001.7 (c)	
	Core strength of concrete		As required by the Engineer		
	Workability of fresh concrete, slump test	Section 1803.2 (g), BS 1881, BSEN 12350	One per two delivery trucks		
	Joint sealant	BS 2499, AASHTO M 282 for hot application BS 5212 for cold application	As required by the Engineer		Manufactures certificate should be submitted
	Admixture	Section 1705	As required by the Engineer		Do – do -
	Mild steel bars and high yield steel	CS 26, SLS 375, BS 4449, BS 4486	One for every consignment or as required by Eng.	Mild steel 250N/mm <sup>2</sup> ,High yield 460N/mm <sup>2</sup>	Do– do -

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Cement Concrete for structures (Section 1000)	Acceptance test for cement Acceptance test for water Particle size analysis (coarse aggregate) Particle size analysis (fine aggregate) Loss angles abrasion value Water absorption of aggregate Mix design Soundness of aggregate Alkali aggregate reactivity	SLS 107, BS 12, BSEN 196, BS4550 SLS 522 Section 1701.2, BS 812, AASHTO T-27, BSEN 933 Section 1701.2, BS 812, AASHTO T-27, BSEN 933 AASHTO T-96 BSEN 1097 AASHTO T-85 BSEN 1097 BS 1881 AASHTO T-104, BS 812 BS 812	Two tests per day One test per source and as required by the Engineer One per 200 Cu.m One per 100Cu.m One per 200 Cu.m As required by the Engineer Every change material or m As required by the Engineer As required by the Engineer	Section 1703 Table 1701 – 1 Table 1701 – 2 Not more than 40% Section 1001.4 (d)	

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Cement Concrete for structures (Section 1000) contd.	Water for concreting  Concrete strength  Core strength of concrete  Workability of fresh concrete, slump test  Joint sealant  Admixture  Mild steel bars and high yield steel  Temperature	SLS 522  BS 1881, BSEN 12390  Section 1803.2 (g), BS 1881,  BS 2499 for hot application BS 5212 for cold application  Section 1704  CS 26, SLS 375, BS 4449, BS 4486	As required by the Engineer  One test per 15 Cu.m or part thereof  As required by the Engineer  One per two delivery trucks  As required by the Engineer  As required by the Engineer  One for every consignment or as required by the engineer  At time of placing	Table 1001 - 5  Table 1001 - 6  Mild steel 250N/mm <sup>2</sup> ,High yield 460N/mm <sup>2</sup> Section 1002.  Not more than 33°C at time of placing	

Type of material or work item	Test item	Test method	Frequency	Standard value	Notes
Reinforcement for structures(Section 1002, 1003 and others)	Hot rolled mild steel characteristic strength	CS 26, SLS 375, BS 4449	One test for each lot delivered	250 N/mm <sup>2</sup>	Manufactures certificate should be submitted
	Hot rolled high yield steel characteristic strength	BS 4449	Do – do –	460 N/mm <sup>2</sup>	Manufactures certificate should be submitted
	Cold twisted high yield steel characteristic strength	CS 375, BS 4461	Do – do –	460 N/mm <sup>2</sup>	Manufactures certificate should be submitted
	Steel bars for pre-stressing	BS 4486	Do – do –		
	Steel wires for pre-stressing	BS 5896, BS 2691	Do – do –		
	Grout				
	Anchorage	Section 1703.1		30N/mm <sup>2</sup>	Manufactures certificate should be submitted
	Tendon sheaths				Manufactures certificate should be submitted

**1703 CEMENT**

Para six - Insert a sentence after the first sentence as follows “It shall be kept on a platform built well above the ground level .”

**1707 PAINTS**

Insert a new Para after the last Para as follows.

Paints for use on works shall be as required for the particular work item and as specified in the appropriate section. Paints for road marking, bridge structures etc. shall meet the requirements specified in these sections.

Insert a new section 1711 as follows.

**1711 GEOMEMBRANES**

Geomembranes are a group of materials coming under the family of geosynthetics. They are of fairly recent origin and the study of them are still being done in the construction industry. These are practically impermeable plastic sheets manufactured from high density polyethylene (HDPE) and polyvinylchloride (PVC). Ethylene propylene diene monomer (EPDM) is a thermoset polymer frequently used for membrane roofing applications.

Different types of geomembranes have significantly different properties, including strength, longevity, resistance to ultraviolet light, thermal expansion and contraction, chemical resistance, and ease of installation. The most appropriate geomembrane to use for a given application is dependent on the application and the environment to which the geomembrane will be exposed.

While different membranes have different strength and elongation properties, membranes should generally be designed so as not to be subjected to tensile stresses and should be treated gently during installation and subsequent use.

An important criteria that has to be used in the selection of a geomembrane for a particular application is the degree of survivability of the material that is required based on the ground conditions on which it is to be used. The table 1711 – 1 given below provides a guidance for this purpose.

**Table 1711 – 1 Required degree of survivability as a function of sub grade condition and construction equipment**

Required Degree of Survivability as a Function of Sub grade Conditions and Construction Equipment*			
Construction equipment and 150 to 300 mm. of cover material: initial lift thickness			
Sub grade Conditions	Low Ground-Pressure Equipment(< 28KPa.)	Medium Ground-Pressure Equipment(>28KPa <56KPa)	High Ground-Pressure Equipment(>56 KPa)

Required Degree of Survivability as a Function of Sub grade Conditions and Construction Equipment*			
	Construction equipment and 150 to 300 mm. of cover material: initial lift thickness		
Sub grade Conditions	Low Ground-Pressure Equipment( < 28KPa.)	Medium Ground-Pressure Equipment( >28KPa <56KPa)	High Ground-Pressure Equipment(>56 KPa)
Sub grade has been cleared of all obstacles except grass, weeds, leaves, and fine wood debris. Surface is smooth and level such that any shallow depressions and humps do not exceed a depth or height of 150 mm All larger depressions are filled. Alternatively, a smooth working table may be placed.	Low	Moderate	High
Sub grade has been cleared of obstacles larger than small to moderate-sized tree limbs and rocks. Tree trunks and stumps should be removed or covered with a partial working table. Depressions and humps should not exceed a depth or height of 450 mm Larger depressions should be filled.	Moderate	High	Very High
Minimal site preparation is required. Trees may be felled, delimbed, and left in place. Stumps should be cut to project not more than 150 mm above sub grade. Fabric may be draped directly over the tree trunks, stumps, large depressions and humps, holes, stream channels, and large boulders. Items should be removed only if placing the fabric and cover material over them will distort the finished road surface.	High	Very High	Not Recommended

Required Degree of Survivability as a Function of Sub grade Conditions and Construction Equipment*			
	Construction equipment and 150 to 300 mm. of cover material: initial lift thickness		
Sub grade Conditions	Low Ground-Pressure Equipment( < 28KPa.)	Medium Ground-Pressure Equipment( >28KPa <56KPa)	High Ground-Pressure Equipment(>56 KPa)
*Recommendations are for 150 to 300 mm initial lift thickness. For other initial lift Thickness.			
<p>300 to 450 mm.: reduce survivability requirement one level</p> <p>450 to 600 mm.: reduce survivability requirement two levels</p> <p>&gt; 600 mm reduce survivability requirement three levels</p>			
Survivability levels are in increasing order: low, moderate, high, and very high. For special construction techniques such as prerutting, increase fabric survivability requirement one level. Placement of excessive initial cover material thickness may cause bearing failure of soft sub grade.			
Source: After Christopher and Holts			

Insert a new section as follows

## 1712 GEONETS, GEOGRIDS AND GEOCOMPOSITE

### Geonets

Geonets are made of polymeric material used for drainage of foundations, soils, rocks, earth or any other geotechnical engineering related material. They are usually formed by continuous extension of parallel sets of polymeric ribs at acute angles to one another.

They shall be made from a single extruded nonoriented process from polyethylene or polypropylene or similar polymer. It shall have square or rectangular net shape aperture when used for protective works like gabions and mattresses. While in polygonal aperture it shall be used as a separator. It shall not be used as soil reinforcement due to its high creep characteristics, neither as a slope reinforcement or soil retaining wall or asphaltic reinforcement. Geonets used in protective works for highway structures shall be at least 650 gml sq.m. in unit weight. It shall be available in roll form in suitable width and shall be black in colour.

### Geogrid

A deformed or non-deformed grid of polymeric plastic material used primarily for reinforcement purposes with foundations, soils, rocks, earth, or any other geotechnical engineering related materials. They are stretched in one or two directions for improved physical properties or made on weaving machinery by unique methods

They shall be made from integrally jointed, mono or bi-directionally orientated or stretched meshes made from polyethylene or polypropylene or polyester or similar polymer, with high secant modulus, in square, rectangular, hexagonal or oval mesh form. Their junction strength shall be high with high creep resistance, and dimensional stability. Their open structure shall permit effective interlocking with soil, aggregates, rock etc., they shall be used as a tensile member or reinforcement.

Characteristics strength of such Geogrids varies from 40 kN/m to 200 kN/m peak strength at a maximum elongation of 15 per cent in the direction of the length of the roll.

## **Geocomposite**

They are manufactured materials using a combination of geotextiles, geogrids, geonets and or geomembranes.

They shall be made from combination of geonets, geogrids or geomembranes, as described in this and other sections, using heat bonded, seamed stitched or wrap techniques. Their principal use shall be to regulate drainage in cross-plane or in-plane directions. Minimum unit weight of such material shall conform to the requirements given in the Contract Drawing or to the Special Provisions.

## **1805 GEOTEXTILES (GEOSYNTHETICS)**

Insert the following after the first paragraph

### **1805.1 Weight**

The test to determine the mass per unit area (weight) of fabric shall be carried out in accordance with ASTM D 3776-96 (2002).

### **1805.2 Thickness**

The test to determine the thickness at specified pressures for single layers shall be carried out in accordance with ISO 9863-1:2005 and to determine the thickness of Geotextiles and Geotextile related products at specified pressures for single layer or multilayer products shall be carried out in accordance with ISO 9863-2:1996.

#### *1805.3 CBR Puncture Resistance Test*

**42.1.a.i.1.1.1 The test to determine the CBR puncture resistance shall be carried out in accordance with BS EN ISO 12236 – 1996**

#### *1805.4 Strip Tensile Test*

**42.1.a.i.1.1.2 The test to determine the tensile properties of Geotextiles by the wide width strip method shall be carried out in accordance with ASTM D 4595-86(2001).**

### **1805.5 Grab Tensile Test**

The test to determine the Grab Tensile strength shall be carried out in accordance with ASTM D 1682.

### **1805.6 Tear Strength Test**

The test to determine tear strength of non woven fabrics shall be carried out in accordance with ASTM D 1117-01.

### **1805.7 Penetration Resistance Test (Drop Test)**

The test to determine the penetration resistance shall be carried out in accordance with NT build 243.

### **1805.8 Vertical Permeability**

The test to determine the vertical permeability shall be carried out in accordance with BS 6906 & Part 3 1989 (1995).

### **1805.9 Pore Size**

The test to determine the pore size shall be carried out in accordance with E DIN 60500/6.

## **1806 REINFORCEMENT**

### **1806.1 Tensile Strength hot rolled mild steel**

The test for determining the strength of hot rolled mild steel reinforcement bars in tension BS 4449 SLS CS26

### **1806.2 Tensile strength test for cold worked deformed reinforcement bars**

Tests for determining the tensile strength of cold worked mild steel deformed bars BS 4486, SLS CS 375

### **1806.3 Bending of steel and scheduling**

Methods of bending and scheduling of steel reinforcement BS 4466, BS8666 (2000)

### **1806.4 Structural steel**

Tests for structural steel for bridges.

### **1806.5 Surface preparation of steel**

Tests for checking the surface preparation of steel BS 7079

### **1806.6 Welding of steel**

Tests for welding of steel BS 5135

**Delete Appendix – 1 in full and insert as follows**

**Appendix SS – 1****LIST OF STANDARD SPECIFICATIONS RELAVENT TO THE WORKS OF THIS SPECIFICATION****(a) PUBLICATIONS OF SRI LANKA STANDARDS INSTITUTION**

SLS 26-93	-	Hot Rolled Mild Steel Round Bars for Concrete Reinforcement	
SLS 31 : 1972	-	Galvanized Mild Steel Barbed wire	
SLS 39 : 1978	-	Common Burnt Clay Building Bricks	
CS 68 : 1969	-	Wrought Aluminium Steel and Strip	
CS 73 : 1969	-	Steel Channels, Angles and Tee Bars	
SLS 107 : Part 1-2002	}	Ordinary Portland Cement	
SLS 107 : Part 2-2002			
CS 124 : 1971	-	Test Sieves	
CS 139 : 1972		Mild Steel Wire for General Engineering	
Purposes			
SLS 147 : 1983	-	Rigid PVC Pipes	
CS 159 : 1972	-	Code of Practice for Seasoning of Timber	
SLS 217 : 1973	-	Reinforced Concrete Fence Posts	
SLS 238 : 1973		Metal Washers for General Engineering	Purposes
SLS 262 : Part 1: 1974	-	Method of Sampling of Fresh Concrete	
SLS 262 : Part 2 - 1975	-	Analysis of hardened concrete	
SLS 375 : 1976	Cold Worked Deformed Steel Bars for the	Reinforcement of Concrete	
SLS 449 : 1978	-	Glazed Earthen Ware Pipes	
SLS 452: 1979	-	Concrete Non Pressure Pipes, Reinforced or unreinforced, for Culverts and Sewers	
SLS 481 : 1980	-	Hexagonal Bolts Screws and Nuts	
SLS 493 : 1980	-	Galvanized Wire Netting	
SLS 522 : 1981	-	Water for Making Concrete	
SLS 539 : 1981	-	Enamel Paints for Exterior Use	
SLS 552 : 1982	-	Building Lime	
SLS 557 : 1982	-	Emulsion Paints for Exterior Use	
SLS 713 : 1985	-	Bituminous Anticorrosive Paint	
SLS 855 Part 1 - 1989	-	Specification for cement blocks	
SLS 855 Part 2 - 1989	-	Cement Blocks – Test methods	

**(b) BRITISH STANDARDS****As published by the British Standard Institution, London U.K.**

BS 12	Portland cement (Ordinary and rapid hardening).	
BS 63	Single size road stone and chippings.	
BS 76	Tars for road purposes.	
BS 497	Specifications for manhole covers, road gully gratings and frames fro	drainage purposes.
BS 598	Samples and examination of bituminous mixtures for roads and other	paved areas.
BS 812	Parts 1, 2, 3 and 4. Methods for sampling and testing of mineral aggregates, sands and fillers.	
BS 882	Specifications for aggregates from natural sources for concrete.	

BS 1200	Specification for building sands from natural sources.
BS 1377	Methods of test for soils for Civil Engineering purposes.
BS 1676	Heaters for tar and bitumen (Mobile and transportable
BS 1707	Hot binder distributors for road surface dressings
BS 1881	Methods of testing concrete
BS 3049	Pedestrian guard rails (metal).
BS 3148	Method of tests for water for making concrete.
BS 3690	Bitumen for road purposes.
BS 5911	specifications for precast concrete pipes and fittings, unreinforced or reinforced for drainage and sewerage.
BS 4449	Specification for hot rolled steel bars for reinforcement of concrete
BS 4483	Steel fabric for the reinforcement of concrete
BS 4486	Cold worked high tensile alloy steel bars for prestressed concrete
BS 4559	Tests on cement
BS 2000	Tests on bitumen
BS 5135	Testing of steel welds
BS 5400	Structural steel for bridges
BS 4466	Bending and scheduling of steel reinforcement
BS 8666 (2000)	Bending and schedule of steel reinforcement
BS 7079	Surface preparation of steel.

**(c) BRITISH EUROPEAN STANDARDS PUBLICATIONS**

BSEN 933-1 - Tests for geometrical properties of aggregates (part 1) – Particle size distribution

BSEN 933-3 - Tests for geometrical properties of aggregates (part 3) – Aggregate flakiness index

BSEN 932 -1 - Methods for sampling aggregates

BSEN 932 -2 - Methods for reducing laboratory samples

BSEN 932 – 5 - Aggregate testing common equipment and calibration

BSEN 1097 -1 (1998) - Resistance to wear of aggregates

BSEN 1097 -2 (1998) - Resistance fragmentation of aggregates

BSEN 1097 -3 - Loose bulk density and voids of aggregates

BSEN 1097 -6 (2000) - Water absorption of aggregates and particle density.

BSEN 1367 – 2 - Soundness of aggregate using magnesium sulphate.

BSEN 1426 (2000) - Bitumen and bitumen binders – Needle penetration test

BS 2000 – 49

BSEN 1427 (2000) – Bitumen softening point – Ring and ball test – BS 2000 – 58

BSEN 1430 (2000) - Determination of particle polarity of bitumen emulsion

BS 2000 – 292

BSEN 1431 (2000) – Determination of recovered binder and oil distillate from bitumen emulsion by distillation  
BS 2000 – 458

BSEN 1871 (2000) - Road marking materials – physical properties

BSEN 12272 – 1 (2002) - Surface dressing – test methods part 1 – Rate of spread and accuracy of spread of binder and chippings

BSEN 12272 – 2 (2003) - Surface dressing – test methods part 2 – visual assessment of defects

BSEN 12350 -1 (2000) – Method of sampling fresh concrete.

BSEN 12350 – 2 (2000) – Method of determination of slump

BSEN 12390 – 3 (2002) – Compressive strength of concrete cubes.

BSEN 12390 – 5 (2000) – Flexural strength of concrete.

BSEN12697 – 1 - Bitumen mixtures – test methods for hotmix asphalt part 1 – soluble binder content

BSEN12697 – 2 - Bitumen mixtures – test methods for hotmix asphalt part 2 – determination of particle size distribution

BSEN12697 – 5 (2002) - Bitumen mixtures – test methods for hotmix asphalt part 5 – determination of maximum density

BSEN12697 – 13 (2000) - Bitumen mixtures – test methods for hotmix asphalt part 13 – temperature measurement

BSEN12697 – 16 (2004) - Bitumen mixtures – test methods for hotmix asphalt part 16 – abrasion by studded tires

BSEN12697 – 30 (2004) - Bitumen mixtures – test methods for hotmix asphalt part 30 – specimen preparation by impact compactor

BSEN12697 – 35 (2004) - Bitumen mixtures – test methods for hotmix asphalt part 35 – laboratory mixing

BSEN12697 – 38 (2004) - Bitumen mixtures – test methods for hotmix asphalt part 38 – common equipment and calibration

PD6692 - Asphalt Guide on the use of BSEN12697 – bituminous mixtures - test methods for hot mix asphalt -

BSEN 13036 – 4 (2003) - Road and airfield surface characteristic – test methods part 4 – method of measurement of slip/skid resistance of a surface – the pendulum test

BSEN 13036 – 7 (2003) - Road and airfield surface characteristic – test methods part 7 – irregularity measurement of pavement courses – straight edge test

BSEN 1043 (2002) – Aggregates for bituminous mixtures and surface treatments for roads, airfields and other trafficked areas

PD 6682 – 2(2003) – Aggregates part 2 – guidance on the use of BSEN 13043

BSEN 13252 (2001) – Geotextile and geotextile related products characteristics required for use in drainage systems.

BSEN 13139 (2002) – Aggregate for mortar

BSEN 13285 (2003) – Unbound mixtures specifications

BSEN 13286 – 2 (2004) – Unbound and hydraulically bound mixtures – part 2 Test methods for determination of the laboratory reference density and water content – Proctor compaction

BSEN 13286 – 2 (2004) – Unbound and hydraulically bound mixtures – part 47 – test method for determination of California bearing ratio, immediate bearing index and linear swelling.

BSEN 13286 – 2 (2004) – Unbound and hydraulically bound mixtures – part 50 – Method for the manufacture of specimens of hydraulically bound mixtures using proctor equipment of vibrating able compaction.

BSEN 13375 – Flexible sheets for waterproofing – water proofing of concrete bridge decks and other concrete surfaces trafficable by vehicles – specimen preparation

BSEN 1008 (2002) – Mixing water for concrete

BSEN ISO 6507 – Hardness of steel.

BSEN ISO 11124 – 2 – Blast cleaning

BSEN ISO 11124 - 3 - Grit for blast cleaning

BSEN ISO 1461 - Galvanizing of steel

#### **(d) AMERICAN STANDARDS - ASTM PUBLICATIONS**

ASTM	C33	Standard specifications for concrete aggregates.
ASTM	C94/C94M	Standard specifications for Ready mixed concrete.
ASTM	C150	Standard specifications for Portland cement.
ASTM	C31/C31M	Standard practice for making and curing concrete test specimens in the field.
ASTM	C136	Standard test method for sieve analysis of fine and coarse aggregate.
ASTM	C76	Standard specifications for reinforced concrete culvert, storm drain and sewer pipes.
ASTM	D422	Standard test method for particle size analysis of soils.
ASTM	C494/C494M	Standard specifications for chemical admixture for concrete
ASTM	C172	Standard practice for sampling freshly mixed concrete.
ASTM	D4318	Standard test method for liquid limit, plastic limit, and plasticity index of soils.

ASTM	C231	Standard test method for air content of freshly mixed concrete by the pressure method.
ASTM	C128	Standard test method for density, relative density (specific gravity), and absorption of fine aggregates.
ASTM	C127	Standard test method for density, relative density (specific gravity), and absorption of coarse aggregates.
ASTM	C138/C138M	Standard test method for density, relative density (specific gravity), and absorption of fine aggregates.
ASTM	C192/192M	Standard practice for making and curing concrete test specimens in the laboratory.
ASTM	D5	Standard test method for penetration of bituminous material.
ASTM	D2216	standard test method for laboratory determination of water (moisture) content of soil and rock by mass.
ASTM	D2651	standard guide for preparation of metal surface for adhesive bonding.
ASTM	D75	Standard practice for sampling of aggregate - AASHTO No.T2
ASTM	C131	Standard test method for resistance to degradation of small size coarse aggregate by abrasion and impact in the Los Angles Machine
ASTM	C1077	Standard practice for laboratory testing concrete and concrete aggregate for use in construction and criteria for laboratory evaluation
ASTM	C78	Standard test method for flexural strength of concrete (using simple beam with third point loading)
ASTM	D448	Standard classification for sizes of aggregate for road and bridge construction
ASTM	D4956	Standard specifications for retroreflective sheeting for traffic control
ASTM	C260	Standard specifications for air entraining admixtures for concrete.
ASTM	D1883	Standard test method for CBR (California Bearing Ratio) of laboratory compacted soil.
ASTM	D3933	Standard guide for preparation of aluminium surfaces for structural adhesive bonding (phosphoric acid anodizing)
ASTM	C88	Standard test method for soundness of aggregate by use of sodium sulphate or magnesium sulphate.
ASTM	D854	Standard test method for specific gravity of soil solids by water pycnometer
ASTM	C566	Standard test method for total evaporable moisture content of aggregate by drying
ASTM	D36	Standard test method for softening point of bitumen (ring and ball apparatus)
ASTM	D4791	Standard test method for flat particles, elongated particles, or flat and elongated particles in coarse aggregate.
ASTM	C144	Standard specifications for aggregate for masonry mortar – AASHTO M45-70(1974)
ASTM	C1433	Standard specifications for precast reinforced concrete box sections for culverts, storm drains, and sewers.
ASTM	C289	Standard test method for potential alkali-silica reactivity of aggregates (chemical method)
ASTM	D140	Standard practice for sampling bituminous material.
ASTM	C91	Standard specification for masonry cement.
ASTM	C1074	Standard practice for estimating concrete strength by the maturity method.

ASTM	D244	Standard test method for and practices for emulsified asphalts-AASHTO T59
ASTM	C642	Standard test method for density, absorption, and voids in hardened concrete
ASTM	D3282	Standard practice for classification of soils and soil aggregate mixtures for highway construction purposes.
ASTM	C655	Standard specification for reinforced D-load culvert, storm drain and sewer pipe
ASTM	D4402	Standard test method for viscosity determination of asphalt at elevated temperatures using rotational viscometer.
ASTM	D421	Standard practice for dry preparation of soil samples for particle-size analysis and determination of silt constants.
ASTM	D2167	Standard test method for density and unit weight of silt in place by the rubber balloon method
ASTM	D2041	Standard test method for theoretical maximum specific gravity and density of bituminous paving mixtures.
ASTM	D4491	Standard test method for water permeability of geotextiles by permittivity.
ASTM	D4220	Standard practice for preserving and transporting soil samples
ASTM	D2940	Standard specification for graded aggregate material for bases or sub bases for highway or airports.
ASTM	D6690	Standard specification for joint and crack sealants, hot applied, for concrete and asphalt pavements.
ASTM	D6913	Standard test method for particle size distribution (gradation) of soils using sieve analysis.
ASTM	C76M	Standard specification for reinforced concrete culvert, storm drain, and sewer pipe (metric).
ASTM	D4751	Standard test method for determining apparent opening size of a geotextile (AOS)
ASTM	C535	Standard test method for resistance to degradation of large size coarse aggregate by abrasion and impact in the Los Angles Machine.
ASTM	D946	Standard test method for penetration graded asphalt cement for use in pavement construction
ASTM	D3665	Standard practice for random sampling of construction material
ASTM	D4429	Standard test method for CBR (California Bearing Ratio) of soils in place (reinstated)
ASTM	D3441	Standard test method for mechanical cone penetration test for soil.
ASTM	D226	Standard specification for asphalt saturated organic felt used in roofing and waterproofing
ASTM	D5329	Standard test method for sealants and fillers, hot applied, for joints and cracks in asphalt and Portland cement concrete pavements.
ASTM	D3381	Standard specification for viscosity-graded asphalt cement for use in pavement construction.
ASTM	D1559	Resistance to plastic flow of bituminous mixtures using Marshal apparatus.
ASTM	A615	Method of testing reinforcement steel bars
ASTM	D2419	Sand equivalent test for aggregates
ASTM	D1143	Load test on piles

### (e) AMERICAN STANDARDS - AASHTO PUBLICATIONS

AASHTO	SS M81	Cut-back asphalt (rapid curing method)
AASHTO	SS M82	Cut-back asphalt (medium curing method)
AASHTO	SS M140	Emulsified asphalt
AASHTO	SS M155	Granular material to control drainage under concrete pavement.
AASHTO	SS M168	Wood products.
AASHTO	SS M171	Sheet material for curing concrete.
AASHTO	SS M175	Perforated concrete pipes
AASHTO	SS M 176	Porous concrete pipes
AASHTO	SS M189	Asbestos cement under drain pipes.
AASHTO	SS M208	Cationic emulsified asphalt.
AASHTO	SS M252	Corrugated polyethelene drainage tubing
AASHTO	SS M49	Penetration of bituminous material.
AASHTO	SS M51	Ductility of bituminous material
AASHTO	SS M96	Resistance to abrasion of small size aggregate by the use of Los Angles Abrasion Machine
AASHTO	SS M128	Fineness of hydraulic cement by 150 and 75 $\mu\text{m}$ sieves
AASHTO	SS M134	Moisture-density relation of soil-cement mixtures
AASHTO	SS M164	Quantitative extraction of bitumen
AASHTO	SS M170	Recovery of asphalt from solution by Abson method.
AASHTO	SS M176	Plastic fines in grated aggregates and soils
AASHTO	SS M182	Coating and stripping of bitumen-aggregate mixtures.
AASHTO	SS M245	Resistance to plastic flow of bituminous mixtures using Marshal apparatus.

### (f) OTHER PUBLICATIONS

ICTAD/ID/11 - Published by the Institute of Construction Training and Development – Sri Lanka - For testing certain materials in the Lab or at the site.

TTRL Research report RR 140 – Preparation of cutback bitumen

TTRL Road Note 3 – A guid to surface dressing in tropical and sub-tropical countries.

TRRL Road Note 31 – a guide to the structural design of roads

National road safety secretariat (2003) – Manual of traffic control devices, part 1 – Ministry of transport and highways.

## **6.5 SUPPLEMENTAL INFORMATION**

### **A. Reports**

Bidders' attention is drawn to the following reports and information which were prepared during the feasibility and detailed design stages of project preparation for the Ministry of Local Government and Provincial Councils (MLGPC). The information is available for viewing in the office of the Project Management Unit, MLGPC in Colombo and in the Colombo office of the design consultant, Cardno International Pty Ltd in association with SMEC International, Engineering Consultants Ltd and MG Consultants

1. Detailed Design: SubGroup II(N) Draft Final Report, Cardno International Pty Ltd in association with SMEC International, Engineering Consultants Ltd and MG Consultants
2. Hydrological Study of Five Bridge Sites, Engineering Consultants Ltd., 1 Sept. 2008
3. Report on the Soil Investigations at various bridge sites prepared by Soil Tech (Pvt) Ltd, different dates in 2008

### **B. Environmental Management Plan**

Bidders' attention is drawn to the Road Specific Environmental Management Plans (EMPs) relevant to the roads of this package which are attached to this bid document.

Bidders' attention is also drawn to Special Provision 131 General Environmental Requirements which outlines actions the Contractor shall carry out in complying with environmental legislation and regulations.

## **Road Specific Environmental Management Plan**

### **Road Sector Assistance Project (RSAP)**

#### **Eastern Province**

### **NATPADDIMUNAI PANDIRUPPU BOUNDARY ROAD (EPAMC006)**

<b>CE Division</b>	-	<b>Ampara</b>
<b>EE Division</b>	-	<b>Kalmunai</b>
<b>DS Division</b>	-	<b>Kalmunai Tamil</b>
<b>MC Division</b>	-	<b>Kalmunai</b>

#### **Ampara District**

Starting Point – 314267 E / 245842 N (Natpaddimunai Jumma Mosque Junction)

End Point - 316436 E / 247182 N (Beach End)

**Road Specific Environmental Management Plan (EMP) for Rehabilitating and Upgrading  
Natpaddimunai Pandiruppu Boundary Road (EPAMC006) near Kalmunai  
(within Kalmunai EE Division in Ampara District)**

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The government of Sri Lanka (GOSL) has received a financial assistance from the World Bank to rehabilitate, improve and maintain the selected roads in provincial road network of the country. The proposed project will only focus on rehabilitation, improvement and maintenance of provincial roads selected through a strategic study, in order to facilitate economic activity in the areas served and provides users with better road safety conditions.

For provincial road rehabilitation, improvement and maintenance projects in Sri Lanka, all roads that will be rehabilitated, improved and / or maintained with IDA funds will need to prepare road specific EMP's and EA's to ensure compliance with the World Bank's environmental safeguard policies and the relevant provisions under the National Environmental Act (NEA) and associated regulations.

The road specific EMP and EA should be ready prior to finalization of the bidding documents. Sufficient conditions should be specified in the bidding documents, as well as the contractual agreements clearly defining requirements of compliance to adhere to the EA, implement the EMP and any subsequent changes and penalties for non-compliance. The EMP will be cost estimated in order to allow the contractor to bid for the funds required to implement the EMP. It is recommended the experience gained from Road Sector Assistance Projects should be taken into consideration when preparing this cost estimate.

Road specific EMP is the summarized matrix of all possible impacts that may occur during rehabilitation and upgrading the selected roads. The road specific EMP prepared for rehabilitation and upgrading Natpaddimunai Pandiruppu Boundary road in Kalmunai within Kalmunai EE Division in Ampara District is given below.

### **Road Specific Environmental Management Plan**

<b>Road</b>	-	Natpaddimunai Pandiruppu Boundary Road (EPAMC040)	<b>Road Length</b> -	2.575 km
<b>DS Division</b>	-	Kalmunai Tamil	<b>CE Division</b>	- Ampara
<b>MC Division</b>	-	Kalmunai	<b>EE Division</b>	- Kalmunai

#### **1. Pre Construction Stage**

##### **(A). Land Acquisition**

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
1	Land Acquisition - identification of sections of already built structures to be removed from the existing road reservation	i). Loss of sections of already built structures (boundary walls, front sections of boutiques and houses,etc,) after removal of such structures	<ul style="list-style-type: none"> <li>Providing necessary provisions to shift and restore the structures outside the new road reservation.</li> <li>Required livelihood restoration measures for affected persons will be given in line with Environmental and Social Safeguard Policies of World Bank, National Involuntary Resettlement Policy (NIRP) and concession arrangements made by Provincial RDA for compensating project affected persons.</li> </ul>	Applicable throughout the road	As & when required	PRDD / DS / MC / PIU
	- acquisition of private / state lands for adjustments to road alignment	(i). Loss of sections of roadside lands (ii). Loss of roadside landscape	<ul style="list-style-type: none"> <li>Compensation based on the Land Acquisition Act (LAA), National Involuntary Resettlement Policy (NIRP) and concession arrangements made by Provincial RDA for compensating project affected persons.</li> <li>Consent of MC / DS for releasing sections of lands belongs to MC / DS that may need to be acquired due to minor adjustment to alignment within such areas.</li> </ul>	Applicable throughout the road	As & when required	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Consent of Agrarian Development Department should be obtained if filling of roadside strip of abandoned paddy land between 1+445 – 1+495 chainage in RHS is required</li> </ul>	Applicable to 1+445 – 1+495 chainage of roadway in RHS	During filling	PRDD / PIU / ADD

**(B). Identification of Utility Supply Line Posts needs to be Shifted**

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
1.2	Shifting of utility supply lines  - Identification of telephone posts to be shifted & straighten - Identification of electricity posts & electricity transformers to be shifted.	(i). deviating sections of already built paths of utility supply lines from their present positions.  (ii). New locations to be identified for utility line posts, earmarked for shifting.	<ul style="list-style-type: none"> <li>Prior consultation and consent should be obtained from relevant service providers for shifting of utility lines due to design requirements or shift in alignment.</li> <li>Providing necessary provisions to shift and restore the utility structures outside the new road reservation for respective utility service suppliers.</li> <li>Prior consultation and consent should be obtained from relevant land owners for shifting utility line posts inside their lands</li> </ul>	Applicable throughout the road  Locations of utility supply line posts to be shifted and straighten are given in Annex – II (electricity posts & electricity transformers) and Annex – III (telephone posts).	As & when required	PRDD / PIU / SLT / CEB

**(C). Design for New Culverts, Cross Culverts, Built-up Drains, Built-up Leaderways at Required Locations**

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
1.2	Design of new culverts, cross culverts, etc.,  - Based on the elevation difference of roadway and flow pattern of drains across and along the road, it is necessary to design culverts, cross culverts, etc	(i).Identification of locations where new culverts to be erected  (ii). Identification of locations where new cross culverts to be erected  (iii). Identification of locations where new built-up drains & new leaderways to be erected	<ul style="list-style-type: none"> <li>For new culverts appropriate designs should be considered to allow sheath flow or cross drainage without any blocking.</li> <li>Locations for new cross culverts, built-up drains, built-up leaderways should be identified to enable smooth drain of rain water through side drains and leaderways</li> </ul>	Applicable throughout the road  Locations of proposed new culverts, cross culverts, built-up drains & built-up leaderways are given in Annex - IV	As & when required	PRDD / PIU

## 2 **Construction Stage**

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
1	<p>Site clearance and land development</p> <ul style="list-style-type: none"> <li>- setting out of area to be cleared</li> <li>- clearing</li> <li>- removal of trees</li> <li>- disposal of waste created from vegetation &amp; other debris material</li> </ul>	<ul style="list-style-type: none"> <li>(i). Loss of vegetation cover (trees, plants, etc.)</li> <li>(ii). Soil erosion on cleared roadway after removing unsuitable soil cover at stretches &amp; uprooting of trees at places, etc.</li> <li>(iii). Loss of roadside landscape</li> </ul>	<ul style="list-style-type: none"> <li>• Prevention of removal of trees as far as possible by slight adjusting the centerline, whenever possible.</li> <li>• However, to maintain the required width of the road &amp; its side drains, total of 10 trees have to be removed during the site clearance. During removing, attention should be paid to maintain minimum disturbances to soil cover and also care should be taken not to damage adjoining trees.</li> <li>• It is recommended to plant trees along the possible stretches of roadside in order to enhance the environment</li> <li>• It is also recommended to maintain the cleared roadway after removing unsuitable soil cover, filled sections of roadway, sections with uprooted trees, etc, without allowing for soil erosion, roadside slope collapsing and to enhance the environment.</li> <li>• Water spraying should be done at a regular interval.</li> </ul>	<p>Applicable throughout the road</p> <p>Location, variety &amp; size of trees to be removed are given in Annex – V.</p> <p>Stretches of removal of unsuitable soil cover are given in Annex – VI.</p>	<p>As and when required</p>	<p>PRDD / DS / PIU</p>
				Applicable throughout the road	Frequently	PRDD / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		(v). Generation of vegetation waste (eg:- leaves, braches, stems, grasses, shrubs.	<ul style="list-style-type: none"> <li>Waste shall be disposed as directed by the EE in a suitable site, subject to the approval of the MC. All the dispose material shall be disposed in such a manner that,           <ul style="list-style-type: none"> <li>- water ways &amp; drainage paths are not blocked</li> <li>- should not be nuisance to the public</li> <li>- should not be washed away during rains &amp; floods</li> </ul> </li> </ul>	Applicable throughout the road	Frequently	PRDD / MC / PIU
2	Earth works & construction  Earthworks & excavation of roadway, LHS / RHS side drains, roadside leaderways, removal of unsuitable soil, stockpiling of suitable soil, road widening, filling, lifting & leveling, eroded sections in roadway & shoulders to be strengthen, erection of concrete built up side drains, clean / repairs / development of	(i). Dust, soil & other debris materials are generated during earthworks & roadway excavations, LHS / RHS side drains, roadside leader ways development, removal of unsuitable soil, stockpiling of suitable soil, road widening, filling, lifting & leveling, strengthening of eroded sections of roadway & shoulders, & construction development of concrete built-up side drains, clean / repairs /	<ul style="list-style-type: none"> <li>Earth material excavation to develop (erect, deepen &amp; reshape) LHS / RHS side drains, removal of unsuitable soil, road widening, filling, lifting &amp; leveling, eroded sections in road way and shoulders to be strengthen, formation of shoulders, gravel surfacing, construction / development of culverts, cross culverts, built-up, covered built-up drains &amp; covered built up leaderways, retaining &amp; toe walls &amp; side walls of culverts to be extended, should be done as per designs.</li> <li>During excavation attention should be paid to maintain filled roadside LHS / RHS downward slopes in 1 : 4 ratio to avoid possible soil erosion &amp; collapsings</li> <li>Contractor should find suitable soil material for shoulder formation and / or road filling from a borrow pit, subject to approval of the EE.</li> </ul>	Applicable throughout the road.  Locations of built-up & covered built-up drains, covered built up leaderways, culverts, cross culverts, retaining & toe walls to be developed / erected & culvert side walls to be extended are given in Annex- IV.	If any public complaint received during earth work and/or construction work	PRDD / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
	existing concrete built-up drains, apply concrete to erect concrete covered built up leaderways, clean and minor repairs to existing concrete covered built up leaderways, silttraps, culverts, box & cross culverts, retaining & toe walls, side walls of culverts to be extended, & formation of shoulders, gravel surfacing, road concreting & tar laying, grass turfing on edges of the gravel layer, side slopes of filled & lifted road stretches and downward roadside slopes to be grass turfed	development & construction of concrete covered built-up drains & leaderways, culverts, cross & box culverts,, retaining & toe walls, side walls of culverts to be extended, shoulder formation, road concreting, asphalt laying	<ul style="list-style-type: none"> <li>Excavated earth materials and all debris materials shall be disposed immediately without allowing to stockpile at locations recommended by EE.</li> <li>During transportation, dispose materials should be covered with tarpaulin.</li> </ul>	Applicable throughout the road	During earthwork operation	PRDD / MC / PIU
			<ul style="list-style-type: none"> <li>With the consent of EE, contractor can use dispose materials to fill lands in an environmentally friendly manner for legally acceptable purposes</li> </ul>	Applicable throughout the road / working area	Routing	PRDD / PIU
		(ii). Surface soil erosion, siltation into water bodies & abandoned paddy fields, impacts to aquatic flora & fauna, blockage of water ways & drainage paths, wash away of disposed soil materials during floods are created while handling dispose soil & other construction waste material	<ul style="list-style-type: none"> <li>Debris material shall be disposed in such a manner that waterways, drainage paths would not get blocked.</li> <li>Drainage paths in LHS / RHS of the road should be improved / erected to drain rain water properly.</li> <li>Concrete built up side drains in LHS / RHS of the road should be developed (erected, deepen &amp; reshaped) to drain rain water properly.</li> <li>Cross culverts, culverts, side built-up drains,built-up leaderways should be erected to drain rain water properly</li> <li>Silt traps will be constructed to avoid siltation into water ways (e.g. Thona Lagoon) where necessary</li> <li>To avoid siltation, drainage paths should not be directed to water bodies and abandoned paddy fields and they should be separated from streams / ab. paddy fields when road meets streams / ab. paddy fields</li> </ul>	Applicable to working area throughout the road  List of covered built up side drains, built up leaderways, culverts & cross culverts, locations of silttraps are given in Annex – IV. Locations of roadside abandoned paddy fields, removal of unsuitable soil, road widening, filling, lifting & leveling, etc, are given in Annex – VI.	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			<ul style="list-style-type: none"> <li>To maintain aquatic flora &amp; fauna along waterways, excavation work at the vicinity of waterways will be conducted during dry period.</li> <li>Disposed materials should not be allowed to wash away during floods.</li> </ul>	Roadside water bodies are given in Annex – VIII.		
			<ul style="list-style-type: none"> <li>To avoid erosion of unloaded soil, level the disposal once a week in dry period or regularly in rainy season.</li> </ul>		During earth work operation, if any public complain received	PRDD / MC / PIU
			<ul style="list-style-type: none"> <li>Water spraying should be done regularly.</li> </ul>	Applicable to working area throughout the road	Once a week	PRDD / MC / PIU
			<ul style="list-style-type: none"> <li>It is recommended to grass turf on filled sections of roadside downward slopes to control soil erosion and avoid collapsing.</li> <li>Shrubs &amp; grasses to be planted on top surface of soil after completion of disposal</li> </ul>	Applicable to working area	On completion of the excavation	PRDD / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		(iii). Loss of stripped top soil removed during excavation for edge widening	<ul style="list-style-type: none"> <li>Stripped top soil during edge widening for a specified depth of 150 mm should be stored in stockpile for a height not exceeding 2m, under the direction of EE. If the contractor is in doubt whether to conserve top soil in a given area, EE should be consulted for advice. Stockpiles should be placed outside flood affected areas.</li> </ul>	Applicable throughout the road / working area	During earth work operation	PRDD / MC / PIU
			<ul style="list-style-type: none"> <li>Such stockpiled topsoil should be used to re-fill the areas where topsoil has been removed. Residual topsoil must be distributed on adjoining / proximate barren areas as identified by the EE in a layer of thickness of 75 mm – 150 mm. Stockpiles should be placed outside flood affected areas.</li> </ul>	Applicable throughout the road / working area	During earth work operation	PRDD / MC / PIU
			<ul style="list-style-type: none"> <li>Stockpiled topsoil for reuse shall not be surcharged or overburdened. As far as possible, multiple handling of top soil should be kept to a minimum. Advice &amp; instructions should be given to operators, supervisors and other workers about the importance of top soil and thereby to minimize removal of it. Stockpiled materials (top soil and others) should be stored separately.</li> </ul>	Applicable throughout the road / working area	Routine	PRDD / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		(iv). Risk of soil erosion in excavated areas for road filling, lifting & leveling, erecting retaining walls, headwall extensions, roadside slope embankment cutting removal of unsuitable soil, gravel laying, shoulder formation, construction of culverts, cross culverts, earth, shoe, built-up & covered built-up drains, retaining , toe & side walls of culverts, etc.	<ul style="list-style-type: none"> <li>Barricades such as humps will be erected at excavated areas for earth, shoe, built-up, covered built-up drains, culverts &amp; cross culverts, silttraps, bridges, retaining &amp; toe walls, side wall extensions, stretches of road widening, filling &amp; lifting and roadside slope embankment cutting, with proper sign boards, as some work in these sections will have to be stopped during heavy rains due to heavy erosion. To prevent soil erosion in these excavated areas, proper earth drain system should be introduced.</li> <li>The work, permanent or temporary, shall consist of measures as per design or as directed by the EE to control soil erosion, sedimentation &amp; waterway pollution to the satisfaction of EE. Typical measures include the use of berms, dikes, sediment basins, fiber mats, mulches, grasses, slope drains &amp; other devices. All sedimentation &amp; pollution control works &amp; maintenance thereof are deemed, as incidental to the earthworks. As quickly as possible remove all the excavated soil from drains, culverts, walls &amp; shoulders to stockpiling lands. Please adhere to the CEA guidelines on the mitigatory measures for soil erosion. Ensure that the mitigatory measures are carried out consistently during the period of the project work</li> </ul>	List & locations of built-up drains, culverts, cross culverts& retaining walls, toe walls, covered built up leaderways, silttraps to be repaired / erected are given in Annex – IV.  Applicable throughout the road / working area	Routine  Routine	PRDD / MC / PIU  PRDD / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		(v). Risk of soil erosion on edges of laid gravel layer & lifted roadside slopes and road side slope embankment	<ul style="list-style-type: none"> <li>To avoid soil erosion on edges of laid gravel layer, grass turfing should be done.</li> <li>To control soil erosion on filled sections of road side downward slope, it is recommended to grass turf on downward slopes.</li> </ul>	Applicable throughout the road	Routine	PRDD / MC / PIU
3.	Impact on Flora	(i). Loss, Damage or Disruption to flora	<ul style="list-style-type: none"> <li>All works shall be carried out in a manner that the destruction to the flora and their habitats is minimised. Trees and vegetation shall be felled / removed only if that impinges directly on the permanent works or necessary temporary works. In all such cases contractor shall take prior approval from the Engineer.</li> <li>Contractor shall make every effort to avoid removal and/or destruction of trees of religious, cultural and aesthetic significance. If such action is unavoidable the Engineer shall be informed in advance and carry out public consultation and report on the same should be submitted to the Engineer.</li> <li>Contractor shall adhere to the guidelines and recommendations made by the Central Environmental Authority, if any with regard to felling of trees and removal of vegetation.</li> </ul>	Throughout the road section where trees near / within the existing road reservation have to be removed and at locations where minor adjustments to the alignment is made as per design requirements.  Location, variety & size of trees to be removed are given in Annex – V.	During removal of trees	PRDD / DS / CEA / MC / PIU

**(A). Applicable throughout the road**

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			<ul style="list-style-type: none"> <li>• Removed trees must be handed over to the State Timber Corporation.</li> <li>• A compensatory tree planting program should be developed in consultation with DS / DEO, local authorities and communities in order to replenish the loss of trees. At least 3 good specimens of same tree species (having &gt; 4 cm DBH) should be planted for each tree removed. Compensatory tree planting should be attended for about two years to promote survival of the replanted specimens</li> <li>• Replanting should be as near as possible to the removal location Planting of selected fast growing trees which are of native species</li> <li>• Replanting in the private lands could be encouraged to compensate impact due to loss of vegetation in private lands</li> </ul>	Throughout the road section		PRDD / DS / PIU / RM - STC

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
4.	Impact on Fauna	(i). Loss, Damage or Disruption to fauna	<ul style="list-style-type: none"> <li>• All works shall be carried out in such a manner that the destruction or disruption to the fauna and their habitats is minimum.</li> <li>• Construction workers shall be instructed to protect fauna including wild animals and aquatic life as well as their habitats. Hunting, poaching and unauthorized fishing by project workers is not allowed.</li> <li>• Siting of all hot mix plants, crushing plants, workshops, depots and temporary worker camps and storing of toxic and hazardous materials at approved locations, and recycling and dumping of solid waste matter at locations approved by local authorities, maintenance of vehicles and equipment in good operable condition, ensuring no leakage of oil or fuel and the fitting of proper exhaust baffles. Any solid waste should not be dumped into water bodies.</li> </ul>	<p>Applicable throughout the road section</p> <p>Locations selected for erecting the asphalt, crusher and concrete batching plants and workshops</p>	Routine	PRDD / DS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
5.	Protection of water sources & quality due to road & related works	(i). Loss of minor water sources & effects to water quality of streams	<ul style="list-style-type: none"> <li>Minimize wastage of water in the construction process / operations. Educate &amp; make employees aware on water conservation, waste minimization &amp; safe disposal of waste.</li> </ul>	Applicable throughout the road	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Arrange adequate supply of water for the project purpose throughout the construction period. Not obtain water for project purposes, including for labour camps, from public or community water supply schemes without a prior approval from the relevant authority.</li> </ul>	Applicable throughout the road	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Not extract water from ground water or surface water bodies without the permission from EE &amp; relevant authority. Obtain the permission for extracting water prior to the commencing of the project, from the relevant authority.</li> </ul>	Applicable throughout the road	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Construction over the seasonal streams / roadside water bodies shall be undertaken in dry period.</li> <li>Apply best management practices to control contamination of run-off water during maintenance &amp; operation of equipment.</li> <li>Maintain adequate distance between stockpiles &amp; water bodies to control effects to natural drainage paths.</li> </ul>	Roadside water bodies are given in Annex - VIII	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
6.	Traffic management	(i). Disruption to road users during construction due to loss of access, The road may have to be closed for traffic during some Construction	<ul style="list-style-type: none"> <li>Temporary access will be provided when permanent access is blocked for construction. When construction work is in progress in one side, the other side will be opened for traffic &amp; properly trained flagmen will be made available with proper sign boards for control vehicles. At the end of each day, debris that blocked access path will be cleared away under the supervision of a supervisor.</li> </ul>	Applicable throughout the road	Routine	PRDD / Police / PIU
			<ul style="list-style-type: none"> <li>Use of road signs, barricades, cones &amp; trained flagmen. All sign barricades, pavement markings used for traffic management shall be cleared to the standards approved by Police. Provision for traffic safety measures shall be considered incidental to work &amp; follow ICTAD guidelines &amp; any instructions given by the Police.</li> </ul>	Applicable throughout the road	Routine	PRDD / Police / PIU
			<ul style="list-style-type: none"> <li>The contractor shall ensure that the running surface is always properly maintained, particularly during monsoon rainy period. So that disruption to traffic will not be occurred.</li> </ul>	Applicable throughout the road	Routine	PRDD / PIU / Police

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			<ul style="list-style-type: none"> <li>Temporary traffic detours shall be kept free of dust by frequent application of water. Personnel used for traffic control by the contractor shall be properly trained &amp; provided with proper gear including communication equipment, luminous jackets for night use. Instructions &amp; advice to be given to workers to implement safety at site.</li> </ul>	Applicable throughout the road	Routine	PRDD / PIU
		(ii). Traffic control & safety	<ul style="list-style-type: none"> <li>Contractor shall comply with requirements for safety of the workers as per the ILO Convention No. 62 and Safety &amp; Health Regulations of the Factory Ordinance of Sri Lanka to the extent that those are applicable to this contract. The contractor shall supply all necessary safety measures at site.</li> </ul>	Applicable throughout the road	Routine	PRDD / PIU / Police
7.	Operation of heavy vehicles & equipment	Noise Pollution due to operation of heavy vehicles & equipment	<ul style="list-style-type: none"> <li>Repairing vehicles, machinery &amp; equipment shall be done &amp; stationed only in the areas of work &amp; in any other designated areas by the EE. Instruction &amp; advice should be given to drivers &amp; operators (both company owned &amp; hired) to park vehicles &amp; equipment in the areas of work or designated areas by EE.</li> <li>Working duration will be limited to 7 am -6 pm. Noise limit for construction equipment, such as compactors, rollers, front end loaders, concrete mixtures, cranes, vibrators &amp; saws shall not exceed 75 dB (A).</li> </ul>	Environmentally sensitive sites for noise along the roadway are given in Annex – VII.	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		Air Pollution due to dust generation	<ul style="list-style-type: none"> <li>The contractor shall effectively manage the dust generating activities such as top soil removal, handling and transporting sand, rubble, bitumen, and cement during periods of high winds or during more stable conditions with winds directed towards adjacent residences and other facilities.</li> <li>All stockpiles shall be located sufficiently away from sensitive receptors.</li> <li>All vehicles delivering materials shall be covered to avoid spillage and dust emission.</li> <li>The contractor should avoid, where possible and take suitable action to prevent dirt and mud being carried to the roads (particularly following wet weather).</li> <li>The contractor should enforce vehicle speed limits to minimize dust generation.</li> <li>The Contractor shall employ a water truck to sprinkle water for dust suppression on all exposed areas as required (note: the use of waste water / waste oil for dust suppression is prohibited)</li> <li>All cleared areas shall be rehabilitated progressively.</li> <li>All earthwork shall be protected in a manner acceptable to the minimize generation of dust.</li> <li>All existing highways and roads used by vehicles of the contractor, or any of his subcontractor or supplies of materials or plant and similarly roads which are part of the works shall be kept clean and clear of all dust/mud or other extraneous materials dropped by such vehicles or their tyres.</li> </ul>	Applicable throughout the road where earth work will take place, storage locations of sand, rubble, bitumen, cement and all sub roads used for material transportation.  Pay special attention to environmentally sensitive sites for air pollution mentioned in Annex – VII.	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			<ul style="list-style-type: none"> <li>Clearance shall be affected immediately by manual sweeping and removal of debris, or, if so directed by the Engineer, by mechanical sweeping and clearing equipment. Additionally, if so directed by the Engineer, the road surface will be hosed or sprinkled water using appropriate equipments.</li> <li>Plants, machinery and equipment shall be handled (including dismantling) so as to minimize generation of dust.</li> <li>The contractor shall take every precaution to reduce the level of dust emission from the hot mix plants and the batching plants up to the satisfaction of the Engineer in accordance with the relevant emission norms.</li> <li>The hot mix plant be sited in accordance with CEA guidelines and operated with an EPL. The hot mix plants shall be fitted with</li> </ul>			
		Air Pollution due to Emission from Hot-Mix Plants and Batching Plants	<ul style="list-style-type: none"> <li>The hot mix plants and batching plants shall be sited in accordance with CEA guidelines. It is recommended that hot mix plants and batching plants to be located sufficiently away from noise sensitive sites (Annex – VII).</li> <li>The exhaust gases shall comply with the requirements of the relevant current emission control legislation. All operations at plants shall be undertaken in accordance with all current rules and regulations protecting the environment as well as the conditions given in the EPL.</li> </ul>	Locations where hot mix plants and batching plants are fixed.	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		Air Pollution due to Odour & Offensive Smells	<ul style="list-style-type: none"> <li>Contractor shall take all precautions such as storing all chemicals used for construction works in properly closed containers with good ventilations to prevent odour and offensive smell emanating from chemicals and processes applied in construction works or from labour camps. In a situation when/where odour or offensive smell does occur contractor shall take immediate action to rectify the situation. Contractor is responsible for any compensation involved with any health issue arisen out of bad odour and offensive smells.</li> </ul>	Throughout the roadway including all sites used for store all chemicals and places where chemical reactions taken place.	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>The waste disposal and sewerage treatment system for the labour camps shall be properly designed, built and operated so that no odour is generated. Compliance with the regulations on health and safety as well as CEA and LA guidelines shall be strictly adhered to.</li> </ul>	At labour camps	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		Air Pollution due to Emissions from Construction Vehicles , Equipment & Machinery	<ul style="list-style-type: none"> <li>• The emission standards promulgated under the National Environment Act shall be strictly adhered to.</li> <li>• All vehicles, equipment and machinery used for construction shall be regularly serviced and well maintained to ensure that emission levels comply with the relevant standards.</li> <li>• Contractor should obtain the certificate issued by the Vehicular Emission Test (VET) for all construction vehicles, plants and other machineries and it should be renewed annually</li> </ul>	All plants, machinery and vehicles used for construction	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
8.	Protection of Cultural & Religious Places & Properties	Prevention of Damages to Cultural & Religious Places & Properties	<ul style="list-style-type: none"> <li>During construction activities the contractor should take all necessary and adequate care to minimize impacts on cultural properties which includes cultural sites and remains, places of worship including kovils &amp; mosques (Cultural &amp; religious sites are given in Annex – VII).</li> <li>Workers should not be allowed to trespass in to such areas.</li> </ul>	Locations of Cultural and religious sites are given in Annex – VII	Routine	PRDD / DS / MC / Local Religious Leaders / PIU

### (B). Camp Sites / Site Office

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1	Installation of site office, labor camps	(i). Camp Sites / Site Office construction/ waste/ debris and vegetation waste like roots, leaves, stems, grasses, shrubs etc. From site clearance and fixing of temporary residential structures.	<ul style="list-style-type: none"> <li>Sites needing minimum vegetation clearance should be selected. It should also be away from tanks, canals and streams. Trees shall not be cut for clearing of the site.</li> </ul>	At the beginning	PRDD / DS / MC / PIU
		(ii). Generation of domestic solid waste from labor camps	<ul style="list-style-type: none"> <li>Garbage bins shall be provided by contractor at site offices and labor camps to collect solid waste. The disposal of the waste should be done at the disposal site of the LA.</li> </ul>	Once a month	PRDD / DS / MC / PHI through PRDA / PIU
		(iii). Generation of sewage waste from labor camps.	<ul style="list-style-type: none"> <li>The sewage to be generated from labor camp or site office should be disposed properly designed septic tanks or by other suitable sanitary disposal method complying with standards and guidelines of LA on sewage disposal.</li> </ul>	Once a month	PRDD / DS / MC / PHI through PRDA / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		(iv). Health problem may occur due to poor sanitation facilities and breeding of mosquitoes. Poor solid waste management shall be a major concern.	<ul style="list-style-type: none"> <li>Contractor shall take all precautions to prevent odor and offensive smell emanating from chemicals and processes applied in construction works or from labor camps. In a situation when/ where odor or offensive smell does occur, contractor shall take immediate action to rectify the situation. Contractor is responsible for any compensation involved with any health issue arisen out of bad odor and offensive smells. To prevent the breeding of vectors, the labor camps should be kept clean and hygienic. If there is any outbreak of disease, then the MOH or PHI of the area should be informed immediately. PHI and his staff to be requested for fumigation anti-mosquitoes chemicals (DDT) at regular period to avoid spreading of Dengue, Malaria etc.</li> </ul>	Once a month	PRDD / MOH/ PHI through PRDA / PIU
2	Extraction of water		<ul style="list-style-type: none"> <li>The contractor is responsible for arranging adequate supply of water for the project purpose through out the construction period. Contractor shall not obtain water for labor camps including other project works from public or community water supplies without approval from the relevant authority.</li> </ul>	Once a month	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
3	Rehabilitation of site		<ul style="list-style-type: none"> <li>Contractor shall remove the labor camps fully after its need is over, empty the septic tanks and close them, if instructed by the EE. Remove all garbage, debris and clean and landscape the area with grasses or suitable plants species.</li> </ul>	At the closure of the project	PRDD / DS / MC / PIU

**(C). Burrow Areas****Refer Annex IX for procedure to obtain Mining License for burrow pit operation**

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Establishment of burrow areas	(i). General issues due to establishment of burrow pit	<ul style="list-style-type: none"> <li>Burrowing within the RoW is prohibited under this contract. However, earth available from excavation for roadside drains as per design, may be used as embankment material subject to approval of the EE.</li> </ul>	At the beginning	PRDD / DS / MC / CEA /GSMB / PIU
			<ul style="list-style-type: none"> <li>Contractor shall comply with the environmental requirements/ guidelines issued by the CEA / GSMB and LA in respect of locating burrow areas and with regard to all operations related to excavation and transportation of earth from such sites.</li> </ul>	At the beginning	PRDD / DS / MC / CEA /GSMB / PIU
			<ul style="list-style-type: none"> <li>Burrow areas shall not be opened without the permission of the EE. The location, depth of excavation and extend of the pit or open cut area shall be as approved by the EE.</li> </ul>	At the beginning	PRDD / DS / MC / CEA /GSMB / PIU
			<ul style="list-style-type: none"> <li>Establishment of burrow pits/ areas and its operational activities shall not endanger the properties. Also shall not be danger or health hazard to the people.</li> </ul>	At the beginning	PRDD / DS / MC / CEA /GSMB / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
2.	Top soil removal	(i). Loss of top soil removed from burrow pits	<ul style="list-style-type: none"> <li>If agricultural / other productive areas to be used as burrow area, for the purpose of this project where it has to be removed topsoil, shall be stripped to a specified depth of 150 mm and stored in stockpiles of height not exceeding 2 m, if directed by the EE. If the contractor is in any doubt on whether to conserve the topsoil or not for any given area shall obtain the direction from the EE in writing. Such stockpiled topsoil must be returned to cover the areas including cut slopes where the topsoil has been removed due to project activities. Residual topsoil must be distributed on adjoining/ proximate barren areas as identified by the Engineer in a layer of thickness of 75 mm - 150 mm. Stockpiles should be placed outside flood affected areas.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Topsoil thus stockpiled for reuse shall not be surcharged or overburdened. As far as possible multiple handling of topsoil stockpiles should be kept to a minimum.</li> <li>Advices and instructions should be given to operators, supervisors and other workers regarding how important is topsoil stockpiles and thereby minimize removal of topsoil.</li> </ul>	Once a month	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
3.	Excavation of earth	(i). Generation of dust due to excavation	<ul style="list-style-type: none"> <li>• All excavated material should be immediately taken to the site. If earth to be stockpiled, it should be covered. All workers are instructed to carry out activities in order to minimize dust generation. Water spraying should be done at regular intervals. Operation should not be carried out during period of high wind speeds.</li> </ul>	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>• All stockpiles shall be located sufficiently away from sensitive receptors viz. religious sites, cultural and heritage sites, schools, institutions etc.</li> </ul>	Routine	PRDD / DS / MC / PIU
4.	Transportation of earth	(i). Generation of dust during transportation	<ul style="list-style-type: none"> <li>• Loading and excavation of earth during high wind speeds should be avoided. All vehicles delivering earth shall be covered to avoid spillage of materials. The contractor shall enforce speed limits to minimize dust generation. Remove or sweep debris, dust and mud on roads using water bowsers (every two hours) to control dust generation on roads.</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		(ii). Emission from construction vehicles, equipment and machinery	<ul style="list-style-type: none"> <li>Maximum speed of vehicle traveling within the construction areas should be limited to 20 km/hr for heavy vehicles and 40 km/hr for light vehicles.</li> </ul>	Routine	PRDD / DS / MC / PIU
5.	Rehabilitation / restoration of burrow areas		<ul style="list-style-type: none"> <li>As directed by the EE, the debris and residual spoil material and earth shall be used to fill the borrow areas. Required quantities of top soil shall be laid and proper drainage shall be provided in the burrow areas.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Once the burrow areas have been filled with suitable soil, appropriate plants and grasses shall be planted on top of it.</li> </ul>	Once a week during planting and once in three months during maintenance	PRDD / DS / MC / PIU

**(D). Quarry Operations****Refer Annex - X for procedure to obtain Mining License for quarry operation**

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Quarry Operations	(i). Contamination or disturbance to the existing drainage system by the proposed quarry operations.	<ul style="list-style-type: none"> <li>Measures for preserving natural drainage system and soil erosion are as follows: Silt traps to be installed to avoid any contamination of streams/ rivers and other water bodies. Therefore, to prevent erosion, turfing works to be done on slope faces at quarry site and also earth drains to be maintained properly.</li> </ul>	Once a month	PRDD / DS / MC / PIU
		(ii). Loss of rare / endangered species of vegetation	<ul style="list-style-type: none"> <li>Contractor shall provide necessary instructions to workers, drivers, and operators not to destroy vegetation unnecessarily.</li> </ul>	Once a month	PRDD / DS / MC / PIU
		(iii). Adverse effects of air and noise pollution on nearby Settlements (Schools, Hospitals, Public buildings, Temples, Monuments), Forests, National parks, Biodiversity reserves etc. The settlements	<ul style="list-style-type: none"> <li>Measures to control the air pollution/ dust from quarry operations are as follows:</li> <li>Water spraying at regular interval on site area and access roads. Planting trees and developing green belt around dust creating areas.</li> <li>Reduce expose area to wind.</li> <li>Proper maintenance of access road.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Compensation Measures</li> </ul> <p>(a) The properties and life of the people of surrounding area to be covered with</p>	As and when required	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		to be located within 1 km distance are most likely to be affected.	<p>Public Liability Insurance Policy paid by the Contractor for the possible damages, which might accidentally occur even after taking all mitigatory measures.</p> <p>(b). Contractor will quickly repair the damages which might be caused by accidental fly rocks or any other reasons connected to quarry operations, even after taking all mitigatory measures.</p>		

**Pl. refer item no. G) 7 (i) - Risks and Safety issues and mitigations when handling explosives**

**(E). Crusher Plant**

No.	Activity	Environmental Issues	Mitigation Measures	Monitoring	
				Frequency	Responsibility
1.	Crusher plant operation	(i). Air pollution due to dust emission from crusher plant	<ul style="list-style-type: none"> <li>The crusher plant shall be sited in accordance with the CEA guidelines.</li> </ul>	At the beginning	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>A tall fence to be made around the crusher plants to minimize the dust and emission spread to surrounding area.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Water sprinkler system to be installed to crusher to control dust.</li> </ul>	Once a week	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Plant, machinery and equipment shall be handled carefully (including dismantling) so as to minimize generation of dust.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>All crushers used for construction shall conform to relevant dust emission levels as stated in the EPL</li> </ul>	Once a month	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		(ii). Noise and vibration generation from crusher plant	<ul style="list-style-type: none"> <li>• Contractor shall take appropriate action to ensure that activities do not result in damage to adjacent properties due to vibration as stated in the EPL.</li> <li>• Maintaining noise level at the boundary of the crusher plant below 55 dB (A) as stated in the EPL. Operation period of the crusher plant to be limited to day- time between 8 hrs to 18 hrs.</li> </ul>	Once a month	PRDD / DS / MC / PIU

**(F). Access roads to/ from establishments to the site areas**

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Movement of heavy vehicles	(i). Damages to access/ local roads due to the movement of vehicles loaded with heavy construction related materials.	<ul style="list-style-type: none"> <li>• The maintenance and rehabilitation of the access roads in the event of damage by the contractor's operations shall be the responsibility of the contractor and to be attended as directed by EE.</li> <li>• Contractor to strictly limit loads to authorized values</li> </ul>	Routine	PRDD / DS / MC / PIU

**(G). Other Issues**

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Health and safety	(i). Protection of workers	<ul style="list-style-type: none"> <li>The contractor shall comply with requirements for the safety of the workmen as per the ILO convention No. 62 and Safety and Health Regulations of the Factory Ordinance of Sri Lanka to the extent that those are applicable to this contract. The contractor shall supply all necessary safety appliances such as safety goggles, helmets, masks, boots etc. to the workers and staff. The contractor has to comply with all regulations, regarding safe scaffolding, ladders, working platforms, gangway, stairways, excavators, trenches and safe means of entry.</li> <li>Recording day to day safety arrangements and incidents.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Measuring safety level- using checklist.</li> <li>Employing trained and experienced personnel when handling explosives.</li> <li>Informing public and workers about blasting by using siren at the places where blasting.</li> </ul>	Once a month	PRDD / DS / MC / PIU
2.	First Aid		<ul style="list-style-type: none"> <li>Provision of an ambulance with required medicine and also trained person.</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
3.	Portable Water		<ul style="list-style-type: none"> <li>In every workplace and labor camps, potable water shall be available throughout the day in sufficient quantities. Water should be easily accessible. In general cold potable water is acceptable.</li> <li><u>Removing all used and empty cans, containers, tires etc. from accommodation and project area.</u></li> </ul>	Routine	PRDD / DS / MC / PHI / PIU
4.	Hygiene		<ul style="list-style-type: none"> <li>Approved chemicals to be regularly applied to destroy mosquitoes.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Office building and accommodation to be cleaned everyday.</li> <li>Giving education about vector based diseases to the workers.</li> <li>Quality mosquito nets to be provided to workers.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Contractor shall keep all places of work, labor camps, and office and store buildings clean, devoid of garbage to prevent breeding of rats and other vectors such as files.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Measuring health level of workers - using checklists. Measuring health level of workers by keeping interpersonal relationship with workers</li> </ul>	Once a month	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
5.	Extraction of natural resources such as sand, metal, earth	(i). Depletion of natural Resources	<ul style="list-style-type: none"> <li>Keeping interpersonal relationship with local public (project area) and get information about vector based diseases at village level.</li> <li>Clean and maintain drain lines properly to prevent stagnation of water.</li> <li>Arranging awareness programs about vector based diseases to the workers.</li> <li>Provide proper solid waste management facility at the camp and office premises and educate all workers on properly handle the facility in consultation with PS.</li> </ul> <ul style="list-style-type: none"> <li>Any extractive natural resources for project</li> </ul>	Twice a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Forest Reserves and Protected areas shall not be encroached upon temporarily or permanently either for road expansion, parking of vehicles disposal of debris, stockpiling of earth, garbage disposal etc. or any activity under this project.</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
				Routine	PRDD / DS / MC / PIU
6.	Use of fuel	i) Risk of contamination and accidents by fuel	<ul style="list-style-type: none"> <li>• All applicable approvals/ licenses of Government of Sri Lanka to operate facilities and road construction work shall be obtained prior to commencing the relevant work. The conditions contained in these approvals/ licenses shall not be violated under any circumstances.</li> </ul>	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>• Vehicle/ machinery and equipment serving and maintenance work shall be carried- out only in designated locations/ service stations approved by the EE. Avoid sensitive location such as close to streams/ rivers, upstream of wells and springs used by community and areas of flooding.</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>Waste oil, other petroleum products and untreated waste water shall not be discharged on ground so that it causes soil pollution. Adequate measures shall be taken against pollution of soil by spillage of petroleum/ oil products from storage tanks and containers. All waste petroleum products shall be disposed of in accordance with the guidelines issued by the CEA or the EE.</li> <li>Sites used for vehicle and plant service and maintenance shall be cleaned thoroughly and free of waste, oil product etc. and all debris shall be disposed in designated sites of the LA. Sites restoration will be considered as incidental to work.</li> <li>All vehicles and plant maintenance and servicing stations shall be located and operated as per the conditions and/ or guidelines issued by the CEA. In general, these should be located away from water-bodies. Wastewater shall not be disposed without meeting the disposal standards of the CEA. Waste water from vehicle and plant maintenance and servicing stations shall be removed of oil and grease and other contaminants to meet the relevant standards before discharging to the environment.</li> </ul>	Once a month Once a month Once a month	PRDD / DS / MC / CEA / PIU PRDD / DS / MC / CEA / PIU PRDD / DS / MC / CEA / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>Vehicle, machinery and equipment maintenance and refueling shall be done as required by the Manual to prevent water pollution as well.</li> </ul>	Once a month	PRDD / DS / MC / PIU
7.	Handling of explosives	(i). Risk and Safety issues due to blasting at mining and Quarry site	<ul style="list-style-type: none"> <li>Safety measures at mining/ quarry site are as follows:</li> <li>The warning sign boards have to be permanently erected around the proposed site to inform/ warn general public that this is a blasting site and entry is dangerous. The method of signaling the firing of blast round to be in the same sign board. The flagmen with red flags will be stationed in close vicinity around the blasting area, in order to prevent unauthorized persons including other workers of the site except members of blasting gang, when charging proceeds.</li> <li>Smoking or other sources of fire will not be allowed while charging proceeds. Standard guidelines to be strictly followed during storing, transporting, handling, charging and blasting of explosives in order to prevent accident misfire etc.</li> </ul>	During blasting	PRDD / DS / MC / Police / Explosive Controller / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>When the charging is completed and it is ready to fire, red flagmen will inform the houses in close proximity. An air siren, which can be heard more than 500 m from the site, will be operated three times before firing a shot. Soon after the firing of shot, Mine Engineer or blasting Headman will inspect the blasted area for detecting undetonated explosive devices, if any. If he is satisfied that every thing is in order to the work and machinery will be allowed to proceed on, after a short intermittent, siren spell to inform people that blasting is completed.</li> </ul>		
8.	All activities	(i). Loss of green cover vegetations and fauna by clearing of green surface cover for development, cutting of trees and important vegetations during project activities.	<ul style="list-style-type: none"> <li>During any project related activity (borrow pit, quarry etc.) if a rare/ threatened/ endangered fauna or flora species, is found, it shall be immediately informed to the EE. All activities that could destroy such species and or its habitat shall be stopped with immediate effect. Such activities shall be started only after obtaining the EE's approval.</li> <li>Contractor shall carry - out all activities and plans that the EE instructed him to undertake to conserve such flora and fauna and / or its habitat.</li> </ul>	Once a month	PRDD / DS / MC / PIU

		<p>(ii). Parking and servicing of construction vehicle and equipment other than working areas or other than designated areas.</p> <p>(iii). Carelessness of workers</p> <p>(iv). Accidents with wild animals by vehicles or equipment, hunting of wild animals by workers.</p>	<ul style="list-style-type: none"> <li>• All works shall be carried-out in such a manner that the destruction or disruption to the ground vegetations, fauna and their habitats are minimal.</li> </ul>	At the beginning	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>• Construction workers, drivers, workers shall be instructed protect fauna including wild animals and aquatic life as well as their habitats. Hunting, poaching, unauthorized fishing by project workers is not allowed. Construction workers shall not be allowed to trespass into Sanctuaries, National Parks and protected areas if the road is traversing through such areas.</li> </ul>	Once a month	PRDD / DS / MC / PIU
9.	Operation of heavy vehicles and equipments	<p>(i). Noise and vibration</p>	<ul style="list-style-type: none"> <li>• All vehicles, equipment and machinery used for construction work should be regularly serviced and well maintained to ensure that emission levels comply with the relevant standards. For this purpose, experienced officer and supporting staff may be engaged.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>• Working time shall be limited to 7.00 am to 6.00 pm.</li> <li>• Workers working at strong noisy areas provided with ear plugs, helmets, masks, other protective gears.</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
10.	Disposal of Harmful Construction Wastes	(i) Risk of contamination and accidents by fuel  i	<ul style="list-style-type: none"> <li>• Noise limits for construction equipment used in this project (measured at one meter from the edge of the equipment in free field) such as compactors, rollers, front-end loaders, concrete mixers, cranes (movable), vibrators and saws shall not exceed 75 dB (A)</li> </ul>	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>• All machinery and equipment should be well maintained and fitted with noise reduction device in accordance with manufacturer's instructions.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>• Contractor prior to the commencement of work shall provide list of harmful, hazardous and risky chemicals/ material that will be used in the project work to the Engineer. Contractor shall also provide the list of places where such chemicals/materials or their containers or other harmful materials have been dumped as waste at the end of the project.</li> <li>• All disposal sites should be approved by the engineer and approved by CEA and relevant local authority.</li> <li>• The contractor shall clean up any area including water-bodies affected/ contaminated (if any) as directed by the engineer at his own cost</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
11.	Storage & Handling of Construction Materials	Emmision of Dust	<ul style="list-style-type: none"> <li>Storage locations of sand, metal, soil should be located away from settlements and other sensitive receptors and covered (with artificial barriers or natural vegetation).</li> <li>All access roads within the storage site should be sprinkled with water for dust suspension.</li> </ul>	Routine	PRDD / DS / MC / PIU
		Storage of fuel, oil and chemicals (avoid fumes and offensive odour)	<ul style="list-style-type: none"> <li>All cement, bitumen (barrels), oil and other chemicals should be stored and handled on an impervious surface (concrete slab) above ground level.</li> <li>Storage facility of cement, bitumen (barrels), oil and other chemicals should be an enclosed structure ensuring that no storm water flows in to the structure.</li> <li>A ridge should be placed around the storage facility to avoid runoff getting in to the structure.</li> <li>Adequate ventilation should be kept to avoid accumulation of fumes and offensive odour that could be harmful to material handlers.</li> </ul>	Routine	PRDD / DS / MC PIU
12.	Flood Prevention	Blockage of drainage paths & drains	<ul style="list-style-type: none"> <li>Contractor's activities shall not lead to flooding conditions as a result of blocked drainage paths and drains. The contractor shall take all measures necessary or as directed by the Engineer to keep all drainage paths and drains clear of blockage at all times.</li> <li>If flooding or stagnation of water is caused by contractor's activities, contractors shall provide suitable means to (a) prevent loss</li> </ul>	Routine	PRDD / DS / MC / ID / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			of access to any land or property and (b) prevent damage to land and property. Contractor shall compensate for any loss of income or damage as a result		
		Work in flood prone areas	<ul style="list-style-type: none"> <li>• Contractor's activities shall not lead to aggravate floods in flood prone areas when working in flood prone areas.</li> <li>• When working in flood prone areas during rainy season the contractor shall avoid storing materials, chemicals and other items of work in areas where those can be washed away by the floods.</li> </ul>	Routine	PRDD / DS / MC / ID / PIU
13..	Environmental enhancement	Utilities & roadside amenities	<ul style="list-style-type: none"> <li>• Contractor shall replace all amenities such as bus shelters that were removed/ relocated during the construction unless the Engineer directed the contractor not to do so.</li> <li>• Contractor shall take care not to damage/destroy or affect the functional purposes of utilities such as water, electricity, telephone posts. The arrangements the contractor made with those service providers shall be informed to the Engineer in writing (advance work). Contractor shall assist the service providers in whatever possible manner to minimize disruption to such services.</li> <li>• In case of an inadvertent damage cause to a utility, the contractor shall immediately inform the service provider and help to restore the service without delay.</li> </ul>	During replacement	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
14..	Handling environmental issues	Road Furniture	<ul style="list-style-type: none"> <li>• Road furniture including footpaths, railings, storm water drains, crash barrier, traffic signs, speed zone signs, pavement markers and any other such items will be provided as per design given in the Bid Documents.</li> <li>• Intersections, rotaries, traffic islands, roadside protection and other structures or furniture shall be constructed, complete with the landscape elements as per design in the above manner.</li> <li>• The Contractor will appoint a suitably qualified Environmental Officer following the award of the contract. The Environmental Officer will be the primary point of contact for assistance with all environmental issues during the pre-construction and construction phases. He/ She shall be responsible for ensuring the implementation of EMAP.</li> <li>• The Contractor shall appoint a person responsible for community liaison and to handle public complaints regarding environmental/ social related matters. All public complaints will be entered into the Complaints Register. The Environmental Officer will promptly investigate and review environmental complaints and implement the appropriate corrective actions to arrest or mitigate the cause of the complaints. A register of all complaints is to be passed to the Engineer within 24 hrs they are received, with the action taken by the Environmental Officer on complaints thereof.</li> </ul>	When providing such items  Routine	PRDD / DS / MC / PIU  PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>● Contractor shall develop suitable method to receive complaints. The complain register shall be placed at a convenient place, easily accessible by the public.</li> <li>● Contractor shall prepare detailed Environmental Method Statement (EMS) clearly stating the approach, actions and manner in which the EMAP is implemented. It is required from the contractor to prepare the EMS for each work site, if work will be carried out at more than one site at once and time plan for implementation. The EMS shall be updated regularly and submit for Engineers review.</li> </ul>		

### 3. Operational Stage

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Stagnation of water at culverts during heavy rains due to siltation and blocking of openings with debris.		<ul style="list-style-type: none"> <li>Regular clearing/ cleaning and maintenance of all culverts to reduce the chances of failures and blocking due to debris. Maintenance manual of PRDA should be followed to maintain the road drainage system</li> </ul>	Routine	PRDD / DS / MC / PIU
	Road safety		<ul style="list-style-type: none"> <li>All road furniture described under item 15 of construction stage should be maintained by PRDA</li> <li>A management plan should be formulated with the local police to avoid any vehicle to carry loads that exceed the carrying capacity (load) of the rehabilitated road.</li> <li>Weigh stations could be introduced at selected locations to measure the load of vehicle.</li> </ul>	Routine	PRDD / DS / MC / Police / PIU
	Encochement of new ROW		<ul style="list-style-type: none"> <li>Continuous monitoring and strict regulations should be followed to avoid the encroachment. Executive Engineers under direct supervision of Chief Engineer and Provincial Director should conduct regular checking along the road and remove any unauthorized activities within the ROW.</li> </ul>	Routine and when an complaint is received	PRDD / DS / MC / Police / PIU

## **ANNEXES**

**ANNEX – I:** Built Structures / Part of Built Structures / Abandoned Structures to be Removed

**ANNEX – II:** Roadside Electricity Posts to be Shifted / Roadside Electricity Transformers to be shifted

**ANNEX – III:** Roadside Telephone Posts to be Shifted / Tilted Telephone Posts to be Straighten

**ANNEX - IV:** List & Chainage of Culverts, Cross Culverts, Box Culverts, Built-up Drains, Covered Built-up drains, Concrete Shoe Drains, Retaining Walls, Toe Walls to be Repaired / Erected, Demolish Abandoned Culverts, Demolish Damaged Culverts & Erect New Culverts, Side walls of Culverts to be Extended, Roadside Covered Built Up Leaderways to be Erected, Repaired & Cleaned, Silttraps to be Erected

**ANNEX – V:** List of Trees to be Removed or Affected due to Development of RHS / LHS Roadway

**ANNEX – VI:** List & Chainage of Removal of Unsuitable Soil, Road to be Filled & Lifted, Roadside Abandoned Paddy Fields, Stretches of Road Sections to be Widen, Raise the Road to Enable Rain Water Drain Properly, Concrete Road Sections, Road Sections to be Concreted, Existing Concrete Road Sections to be Widen by Removing Unsuitable Soil in Both Sides and Applying Concrete

**ANNEX – VII:** List & Chainages of Environmentally Sensitive Sites along the Roadway (Noise Pollution and Air Pollution Sensitive Sites)

**ANNEX – VIII:** List & Chainages of Environmentally (Ecologically) Sensitive Water Bodies in Close Proximity to the Roadway

**ANNEX – IX:** Summary of Procedure to Obtain Mining License for Borrow Pit Operation

**ANNEX – X:** Summary of Procedure to Obtain Mining License for Quarry Operation

**ANNEX – I****Built Structures / Part of Built Structures / Abandoned Structures to be Removed**

<b>Chainage</b>	<b>Activity</b>
0+100 – 0+200	0+150 Concrete slab in LHS to be removed
0+400 – 0+500	0+400 – 0+500 Boundary walls of houses in LHS to be demolished & erect new walls in further LHS 0+400 – 0+475 Roadward directed sections of some houses in LHS to be demolished
0+500 – 0+600	0+520 Remove bottom section of broken post box 0+535 – 0+555 Remove front roadward sections of boutiques in LHS
1+200 – 1+300	1+255 – 1+260 Remove concrete slabs in RHS
1+700 – 1+800	1+795 – 1+800 Demolish boundary wall of a house in LHS. 1+795 – 1+800 Front section of a boutique in LHS is also has to demolish.
1+800 – 1+900	1+800 -1+815 Demolish boundary wall of a house in LHS. 1+800 –1+815 Front section of a boutique in LHS is also has to demolish. 1+855 – 1+875 Demolish boundary wall in RHS and erect new wall towards further RHS.

**ANNEX – II****Roadside Electricity Posts to be Shifted / Roadside Electricity Transformers to be shifted**

<b>Chainage</b>	<b>Activity</b>
0+000 – 0+100	0+000 Electricity post in LHS to be shifted towards further LHS 0+024 Electricity post in LHS to be shifted towards further LHS 0+046 Electricity post in LHS to be shifted towards further LHS
0+200 – 0+300	0+204 Electricity post in LHS to be shifted towards further LHS 0+228 Electricity post in RHS to be shifted towards further RHS
0+400 – 0+500	0+418 Electricity post in LHS to be shifted towards further LHS 0+435 Electricity post in LHS to be shifted towards further LHS 0+463 Electricity post in LHS to be shifted towards further LHS 0+475 Electricity post in LHS to be shifted towards further LHS
0+500 – 0+600	0+520 Electricity post in LHS to be shifted towards further LHS 0+535 Electricity post in LHS to be shifted towards further LHS 0+535 Electricity post in RHS to be shifted towards further RHS 0+558 Electricity post in RHS to be shifted towards further RHS
0+600 – 0+700	0+600 Electricity post in RHS to be shifted towards further RHS 0+647 Electricity post in RHS to be shifted towards further RHS
0+700 – 0+800	0+733 Electricity post in RHS to be shifted towards further RHS 0+780 Electricity post in RHS to be shifted towards further RHS
0+900 – 1+000	0+993 Electricity post in RHS to be shifted towards further RHS
1+100 – 1+200	1+155 Electricity post in LHS to be shifted towards further LHS 1+189 Electricity post in LHS to be shifted towards further LHS
1+200 – 1+300	1+223 Electricity post in LHS to be shifted towards further LHS 1+290 Electricity post in LHS to be shifted towards further LHS
1+500 – 1+600	1+505 Electricity post in RHS to be shifted towards further RHS
1+600 – 1+700	1+627 Electricity post in RHS to be shifted towards further RHS
1+700 – 1+800	1+707 Electricity post in RHS to be shifted towards further RHS. 1+740 Transformer in RHS to be shifted towards further RHS.
1+800 – 1+900	1+870 Electricity post in RHS to be shifted towards further RHS
1+900 – 2+000	1+907 Electricity post in RHS to be shifted towards further RHS 1+915 Electricity post in RHS to be shifted towards further RHS 1+940 Electricity post in RHS to be shifted towards further RHS 1+950 Electricity post in RHS to be shifted towards further RHS
2+100 – 2+200	2+105 Electricity post in RHS to be shifted towards further RHS 2+183 Electricity post in RHS to be shifted towards further RHS

<b>Chainage</b>	<b>Activity</b>
	2+197 Electricity post in RHS to be shifted towards further RHS
2+200 – 2+300	2+200 Electricity post in RHS to be shifted towards further RHS 2+240 Electricity post in RHS to be shifted towards further RHS
2+300 – 2+400	2+302 Electricity post in RHS to be shifted towards further RHS 2+363 Electricity post in RHS to be shifted towards further RHS
2+400 – 2+500	2+420 Electricity transformer in RHS to be shifted towards further RHS

**ANNEX – III****Roadside Telephone Posts to be Shifted / Tilted Telephone Posts to be Straighten**

<b>Chainage</b>	<b>Activity</b>
0+000 – 0+100	0+038 Telephone post in RHS to be shifted towards further RHS 0+071 Telephone post in RHS to be shifted towards further RHS
0+200 – 0+300	0+214 Telephone post in RHS to be shifted towards further RHS
0+400 – 0+500	0+485 Telephone post in LHS to be shifted towards further LHS
0+500 – 0+600	0+554 Telephone post in RHS to be shifted towards further RHS
0+700 – 0+800	0+745 Telephone post in LHS to be shifted towards further LHS 0+785 Telephone post in LHS to be shifted towards further LHS
0+800 – 0+900	0+810 Straighten the tilted telephone post in RHS
1+200 – 1+300	1+205 Telephone post in RHS to be shifted towards further RHS 1+230 Telephone post in RHS to be shifted towards further RHS
1+300 – 1+400	1+305 Telephone post in RHS to be shifted towards further RHS
1+400 – 1+500	1+445 Telephone post in RHS to be shifted towards further RHS
1+800 – 1+900	1+830 Telephone post in RHS to be shifted towards further RHS
2+000 – 2+100	2+070 Telephone post in LHS to be shifted towards further LHS 2+100 Telephone post in LHS to be shifted towards further LHS
2+100 – 2+200	2+113 Telephone post in LHS to be shifted towards further LHS 2+120 Telephone post in LHS to be shifted towards further LHS 2+185 Telephone post in LHS to be shifted towards further LHS
2+200 – 2+300	2+212 Telephone post in LHS to be shifted towards further LHS 2+243 Telephone post in LHS to be shifted towards further LHS
2+300 – 2+400	2+300 Telephone post in LHS to be shifted towards further LHS 2+353 Telephone post in LHS to be shifted towards further LHS
2+400 – 2+500	2+405 Telephone post in LHS to be shifted towards further LHS 2+440 Telephone post in LHS to be shifted towards further LHS 2+490 Telephone post in LHS to be shifted towards further LHS

**ANNEX – IV**

**List & Chainage of Culverts, Cross Culverts, Box Culverts, Built-up Drains, Covered Built-up drains, Concrete Shoe Drains, Retaining Walls, Toe Walls to be Repaired / Erected, Demolish Abandoned Culverts, Demolish Damaged Culverts & Erect New Culverts, Side walls of Culverts to be Extended, Roadside Covered Built Up Leaderways to be Erected, Repaired & Cleaned, Silttraps to be Erected**

<b>Chainage</b>	<b>Activity</b>
0+000 – 0+100	<p>0+000 – 0+100 Erect concrete shoe drain in RHS</p> <p>0+000 – 0+100 Minor repairs to existing concrete built up drain in LHS and clean it, as the drain is partly filled with debris.</p> <p>0+000 Existing culvert to be widen 1m in LHS and clean it.</p> <p>0+000 Existing 100m long concrete built up leaderway directed to a canal at the edge of paddy fields in RHS. Minor repairs to leaderway. Leaderway is partly filled with debris. Clean it. Erect a silttrap at starting point of leaderway ( in RHS end of culvert)</p> <p>0+73 Side road to RHS. Erect concrete shoe drain across the road to continue RHS side drain.</p>
0+100 – 0+200	<p>0+100 – 0+200 Erect concrete shoe drain in RHS</p> <p>0+100 – 0+120 Minor repairs to existing concrete built up drain in LHS and clean it</p> <p>0+120 – 0+200 Erect concrete built up drain in LHS</p> <p>0+120 Side road to LHS. Erect a cross culvert</p> <p>0+130 Minor repairs to existing leaderway in RHS and clean it.</p> <p>0+130 Connect RHS concrete shoe drain to leaderway</p>
0+200 – 0+300	<p>0+200 – 0+300 Erect concrete shoe drain in RHS</p> <p>0+200 – 0+300 Erect concrete built up drain in LHS</p> <p>0+228 Existing damaged culvert to be demolished &amp; erect a new one by widening</p> <p>0+228 Erect a concrete built up leaderway in RHS for 50m distance. Erect a silttrap at starting point of leaderway ( in RHS end of culvert)</p> <p>0+230 Existing road to RHS. Erect cross culvert</p>
0+300 – 0+400	<p>0+300 – 0+400 Erect concrete shoe drain in RHS</p> <p>0+300 – 0+335 Erect concrete built up drain in LHS</p> <p>0+335 – 0+357 Minor repairs to existing concrete built up drain in LHS and clean it.</p>

<b>Chainage</b>	<b>Activity</b>
	<p>0+357 – 0+400 Erect concrete built up drain in LHS</p> <p>0+350 Demolish existing abandoned culvert near school entrance.</p> <p>0+358 Demolish existing partly damaged culvert and erect a new culvert by widening</p> <p>0+358 Existing concrete built up leaderway in RHS. Clean it. Erect a silttrap at the starting point of leaderway (RHS end of culvert).</p>
0+400 – 0+500	<p>0+400 – 0+500 Erect concrete shoe drain in RHS</p> <p>0+400 – 0+475 Erect concrete built up drain in LHS</p> <p>0+475 – 0+500 Erect concrete shoe drain in RHS</p>
0+500 – 0+600	<p>0+500 – 0+520 Erect concrete shoe drain in both RHS &amp; LHS</p> <p>0+535 – 0+600 Erect concrete built up drain in LHS</p> <p>0+535 – 0+600 Erect concrete shoe drain in RHS</p> <p>0+520 Erect culvert (at the western boundary of Kalmunai – Chavalakade main road)</p> <p>0+552 Existing concrete built up leaderway connected to water logged area in LHS. Erect a silttrap at the starting point of leaderway.</p>
0+600 – 0+700	<p>0+600 – 0+700 Erect concrete built up drain in LHS</p> <p>0+600 – 0+670 Erect concrete shoe drain in RHS</p> <p>0+670 – 0+700 Erect concrete built up drain in RHS</p> <p>0+643 Existing leaderway connected to water logged area in LHS. Erect a silttrap at the starting point of leaderway.</p> <p>0+643 Side road to LHS. Erect cross drain.</p>
0+700 – 0+800	<p>0+700 – 0+800 Erect concrete built up drains in both RHS &amp; LHS</p> <p>0+700 Side roads to both RHS &amp; LHS. Erect cross culvert</p> <p>0+730 Side road to LHS. Erect cross culvert</p> <p>0+740 side road to RHS. Erect cross culvert</p> <p>0+755 Erect angle box culvert to enable RHS drain water to drain along the leaderway at 0+761.</p> <p>0+761 Erect covered concrete built up leaderway in LHS for 100m distance. Leaderway is to be connected to Water logged area. Erect silttrap at the starting point of leaderway.</p>
0+800 – 0+900	<p>0+800 – 0+900 Erect concrete built up drains in both RHS &amp; LHS</p> <p>0+840 Erect covered concrete built up leaderway in LHS for 100m distance. Leaderway is to be connected to Water logged paddy land.</p> <p>0+840 Erect new culvert to enable RHS drain water to flow along the leaderway. Erect silttrap at the starting point of leaderway (at the RHS corner of the culvert).</p>

<b>Chainage</b>	<b>Activity</b>
	0+885 Side road to RHS. Erect cross culvert
0+900 – 1+000	0+900 – 1+000 Erect concrete built up drains in both LHS & RHS 0+940 Side road to RHS. Erect cross culvert.
1+000 – 1+100	1+000 – 1+100 Erect concrete built up drains in both RHS & LHS 1+015 Side road to RHS. Erect a cross culvert. 1+095 Side road to RHS. Erect a cross culvert.
1+100 – 1+200	1+100 – 1+200 Erect concrete built up drains in both RHS & LHS
1+200 – 1+300	1+200 – 1+285 Erect concrete built up drains in both RHS and LHS 1+285 – 1+300 Minor repairs to existing concrete built up drain in RHS 1+285 – 1+300 Erect concrete built up drain in LHS 1+275 Side road to RHS. Erect cross culvert.
1+300 – 1+400	1+300 – 1+400 Minor repairs to existing concrete built up drain in RHS 1+300 – 1+400 Erect concrete built up drain in LHS 1+340 Demolish existing culvert and erect a new culvert by widening both sides 1+340 Existing leaderway in LHS connected to Periyakulam Tank. Clean it.
1+400 – 1+500	1+400 – 1+500 Minor repairs to existing concrete built up drain in RHS 1+400 – 1+500 Erect concrete built up drain in LHS 1+495 Cross culvert exists at western edge of A4 road. Drain water of both sides of the road under discussion could be connected to the cross culvert.
1+500 – 1+600	1+505 – 1+590 Existing built up drain in LHS to be demolished and erect a new drain in further LHS. 1+590 – 1+600 Minor repairs to existing concrete built up drains in both RHS & LHS and clean both drains. 1+505 – 1+590 Repairs to existing built up drain in RHS 1+505 Cross culvert exists at eastern edge of A4 road. Drain water of both sides of the road under discussion could be connected to the cross culvert. 1+540 Side road to LHS. Erect cross culvert. 1+595 Existing roads to both RHS & LHS. Minor repairs to existing cross culverts.
1+600 – 1+700	1+600 – 1+700 Minor repairs to existing concrete built up drains in both RHS & LHS and clean both drains. 1+663 Side road to LHS. Minor repairs to existing cross culvert.

<b>Chainage</b>	<b>Activity</b>
1+700 – 1+800	<p>1+700 – 1+752 Minor repairs to existing concrete built up drains in both RHS &amp; LHS and clean both drains.</p> <p>1+752 – 1+800 Erect concrete built up drain in LHS</p> <p>1+752 - 1+800 Repair, lift and clean existing concrete built up drain in RHS.</p> <p>1+712 Side road to LHS. Minor repairs to existing cross culvert.</p>
1+800 – 1+900	<p>1+800 – 1+855 Erect concrete built up drain in LHS</p> <p>1+800 - 1+855 Repair, lift and clean existing concrete built up drain in RHS.</p> <p>1+855 – 1+900 Erect both sides concrete built up drains.</p> <p>1+805 Side road to RHS. Repairs to existing cross culvert.</p>
1+900 – 2+000	<p>1+900 – 1+925 Erect both sides concrete built up drains.</p> <p>1+925 – 1+980 Erect concrete built up drain in RHS and erect concrete shoe drain in LHS</p> <p>1+980 – 2+000 Minor repairs to existing concrete built up drain in RHS and erect concrete shoe drain in LHS</p> <p>1+950 Side road to LHS. Erect cross culvert.</p> <p>1+970 Side road to RHS. Erect cross culvert.</p>
2+000 – 2+100	<p>2+000 – 2+100 Minor repairs to existing concrete built up drain in RHS and erect concrete shoe drain in LHS</p>
2+100 – 2+200	<p>2+100 – 2+150 Minor repairs to existing concrete built up drain in RHS and erect concrete shoe drain in LHS</p> <p>2+150 – 2+200 Repairs to existing concrete built up drain in RHS and erect concrete built up drain in LHS</p> <p>2+135 Side road to RHS. Repairs to existing cross culvert.</p> <p>2+147 Side road to LHS. Erect concrete shoe drain over the side road to enable to continue side drain.</p> <p>2+180 Side road to LHS. Erect cross culvert.</p>
2+200 – 2+300	<p>2+200 – 2+300 Repairs to existing concrete built up drain in RHS and erect concrete built up drain in LHS</p> <p>2+241 Side road to RHS. Repairs to existing cross culvert.</p> <p>2+250 Entrance to Church &amp; Community Centre in LHS. Erect a cross culvert.</p>
2+300 – 2+400	<p>2+300 – 2+400 Repairs to existing concrete built up drain in RHS and erect concrete built up drain in LHS</p> <p>2+350 Entrance to play ground. Erect cross culvert.</p> <p>2+365 Side road to RHS. Minor Repairs to existing cross culvert</p> <p>2+395 Side road to RHS. Minor Repairs to existing cross culvert</p>

<b>Chainage</b>	<b>Activity</b>
2+400 – 2+500	<p>2+400 – 2+425 Repairs to existing concrete built up drain in RHS and erect concrete built up drain in LHS</p> <p>2+425 – 2+436 Erect concrete built up drains in both LHS &amp; RHS</p> <p>2+436 – 2+500 Erect concrete built up drain in LHS and no drain required in RHS.</p> <p>2+436 Existing box culvert. Existing leaderway extending from LHS runs through this culvert. Drain water flow through the culvert enter to Thona lagoon. Erect a silttrap at the right end of the culvert. Repairs to box culvert. Erect concrete built up leaderway for 75m distance in LHS.</p> <p>2+346 – 2+500 Erect toe wall in RHS</p> <p>2+491 Side road to LHS. Erect cross culvert.</p>
2+500 – 2+575	<p>2+500 – 2+575 Erect concrete built up drain in LHS and no drain required in RHS.</p> <p>2+500 – 2+575 Erect toe wall in RHS</p>

**ANNEX – V****List of Trees to be Removed or Affected due to Development of RHS / LHS Roadway**

Total number of 10 individual trees belonging to 3 species over 10 cm DBH will have to be removed from roadside due to proposed project and one individual tree over 10 cm DBH will have to be removed from home garden due to proposed project. Details are given in the following table.

**Abbreviations:**

**RHS** – Right Hand Side, **LHS** – Left Hand Side, **HG** – Home Gardens and other Anthropogenic Sites, **RS** – Roadsides, **N** – Native, **I** – Introduced, **DBH** – Diameter at Breast Height, **cm** – Centimeter

Chainage	Side	Habitat	Tree Species	Local Name	Status	DBH/cm	Note
0+438	RHS	HG	<i>Cocos nucifera</i>	Coconut	N	30	Cut
1+260	RHS	RS	<i>Borassus flabellifer</i>	Palmyrah	I	15	Cut
1+445	RHS	RS	<i>Peltophorum pterocarpum</i>		N	35	Cut
1+450	RHS	RS	<i>Peltophorum pterocarpum</i>		N	20	Cut
1+454	RHS	RS	<i>Peltophorum pterocarpum</i>		N	20	Cut
1+456	RHS	RS	<i>Peltophorum pterocarpum</i>		N	15	Cut
1+460	RHS	RS	<i>Peltophorum pterocarpum</i>		N	15	Cut
1+461	RHS	RS	<i>Peltophorum pterocarpum</i>		N	10	Cut
1+463	RHS	RS	<i>Peltophorum pterocarpum</i>		N	25	Cut
1+465	RHS	RS	<i>Peltophorum pterocarpum</i>		N	20	Cut
1+470	RHS	RS	<i>Thespesia populnea</i>	Suriya	N	25	Cut

## ANNEX – VI

**List & Chainage of Removal of Unsuitable Soil, Road to be Filled & Lifted, Roadside Abandoned Paddy Fields, Stretches of Road Sections to be Widen, Raise the Road to Enable Rain Water Drain Properly, Concrete Road Sections, Road Sections to be Concreted, Existing Concrete Road Sections to be Widen by Removing Unsuitable Soil in Both Sides and Applying Concrete**

<b>Chainage</b>	<b>Activity</b>
0+400 – 0+500	0+400 – 0+500 Remove unsuitable soil and fill with suitable soil
0+500 – 0+600	0+500 – 0+520 Remove unsuitable soil and fill with suitable soil 0+535 – 0+600 Remove unsuitable soil and fill with suitable soil
0+600 – 0+700	0+600 – 0+670 Remove unsuitable soil and fill with suitable soil 0+670 – 0+700 Lift the road by 0.5m to avoid water stagnation
0+700 – 0+800	0+700 – 0+800 Lift the road by 0.5m to avoid water stagnation
0+800 – 0+900	0+800 – 0+900 Lift the road by 0.5m to avoid water stagnation
0+900 – 1+000	0+980 – 1+000 Lift the road to avoid water stagnation during rainy periods.
1+000 – 1+100	1+000 – 1+100 Lift the road to avoid water stagnation during rainy periods.
1+200 – 1+300	1+290 – 1+300 Remove unsuitable soil, fill with suitable soil and lift the road.
1+300 – 1+400	1+300 – 1+400 Remove unsuitable soil, fill with suitable soil and lift the road.
1+400 – 1+500	1+400 -1+495 Remove unsuitable soil, fill with suitable soil and lift the road. 1+445 – 1+495 Abandoned paddy fields in RHS
1+500 – 1+600	1+505 – 1+600 Remove unsuitable soil, fill with suitable soil and lift the road.
1+600 – 1+700	1+600 – 1+700 Remove unsuitable soil, fill with suitable soil and lift the road
1+700 – 1+800	1+700 – 1+800 Remove unsuitable soil, fill with suitable soil and lift the road
1+800 – 1+900	1+800 – 1+900 Remove unsuitable soil, fill with suitable soil and lift the road
1+900 – 2+000	1+900 – 1+925 Remove unsuitable soil, fill with suitable soil and lift the road 1+925 – 2+000 Existing concrete road. Widen the road by removing

<b>Chainage</b>	<b>Activity</b>
	unsuitable soil in both sides of the road and applying concrete upto 1m width. Then apply premix asphalt on top.
2+000 – 2+100	2+000 – 2+100 Existing concrete road. Widen the road by removing unsuitable soil in both sides of the road and applying concrete upto 1m width. Then apply premix asphalt on top.
2+100 – 2+200	2+100 – 2+200 Existing concrete road. Widen the road by removing unsuitable soil in both sides of the road and applying concrete upto 1m width. Then apply premix asphalt on top.
2+200 – 2+300	2+200 – 2+300 Existing concrete road. Widen the road by removing unsuitable soil in both sides of the road and applying concrete upto 1m width. Then apply premix asphalt on top.
2+300 – 2+400	2+300 – 2+400 Existing concrete road. Widen the road by removing unsuitable soil in both sides of the road and applying concrete upto 1m width. Then apply premix asphalt on top.
2+400 – 2+500	<p>2+436 – 2+500 Road to be concreted</p> <p>2+436 – 2+500 Lift the road to enable to flow drain water of proposed LHS concrete built up drain to the culvert at 2+436</p> <p>2+400 – 2+436 Existing concrete road. Widen the road by removing unsuitable soil in both sides of the road and applying concrete upto 1m width. Then apply premix asphalt on top.</p>
2+500 – 2+575	<p>2+500 – 2+575 Road to be concreted</p> <p>2+500 – 2+575 Lift the road to enable to flow drain water of proposed LHS concrete built up drain to the culvert at 2+436</p>

## **ANNEX – VII**

### **List & Chainages of Environmentally Sensitive Sites along the Roadway (Noise Pollution and Air Pollution Sensitive Sites)**

<b>Chainage</b>	<b>Activity</b>
0+000 – 0+100	0+000 – 0+100 Jumma Mosque in LHS
0+200 – 0+300	0+230 – 0+300 Sivashakthi Vidyalaya in RHS.
0+300 – 0+400	0+300 – 0+360 Sivashakthi Vidyalaya in RHS.
0+500 – 0+600	0+535 – 0+555 Natpaddimunai Junction 0+520 – 0+535 Crossing of Kalmunai – Chavalakade main road
0+800 – 0+900	0+890 – 0+900 Pulleyan Tamil Kovil in RHS
0+900 – 1+000	0+900 – 0+940 Pulleyan Tamil Kovil in RHS 0+980 CEB office in LHS
1+000 – 1+100	1+095 – 1+100 Helpage Sri Lanka (NGO) office in LHS 1+095 – 1+100 Red Cross office in LHS
1+100 – 1+200	1+100 – 1+115 Helpage Sri Lanka (NGO) office in LHS 1+100 – 1+130 Red Cross office in LHS
1+300 – 1+400	1+330 Tamil Information Technology Association in LHS 1+330 Tuition class in RHS
1+400 – 1+500	1+495 – 1+500 Thala Wattarankulam Junction. Crossing of A4 (CRWB) main road.
1+500 – 1+600	1+500 – 1+505 Thala Vattarankulam Junction. Crossing of A4 (CRWB) main road.
1+600 – 1+700	1+665 – 1+700 Child & Community Development Network in RHS.
2+100 – 2+200	2+100 – 2+120 Kovil in RHS
2+200 – 2+300	2+200 – 2+240 Community Centre in LHS 2+260 – 2+285 Church in LHS
2+300 – 2+400	2+320 – 2+400 Play ground in LHS

**ANNEX – VIII****List & Chainages of Environmentally (Ecologically) Sensitive Water Bodies in Close Proximity to the Roadway**

<b>Chainage</b>	<b>Activity</b>
1+300 – 1+400	1+370 – 1+400 Periyakulam Tank reservation spread upto the LHS road edge.
1+400 – 1+500	1+400 – 1+420 Periyakulam Tank reservation spread upto the LHS road edge.
2+000 – 2+100	2+080 – 2+100 Water Logged Area in RHS about 15m away from the road edge.
2+400 – 2+500	2+425 – 2+500 Thona lagoon in RHS
2+500 – 2+575	2+500 – 2+575 Thona lagoon in RHS

## **ANNEX - IX**

### **Summary of Procedure to Obtain Mining License for Borrow Pit Operation**

1. Identify the site and verify ownership (land clearing)
2. Obtain letters of consent from the owners (Private / Government)
3. Contractor applies for site clearance from CEA
4. CEA may request an IEE or EIA to be carried out by the contractor
5. CEA gives clearance.
6. Contractor applies for Mining License (IML/A, IML/B or IML/C) from GSMB.
7. GMSB conducts joint inspection with a committee comprising with CEA, DS, and PS.
8. Contractor has to make bank guarantee specified by the GSMB based on the situation of the land, prior to issuing Mining License.
9. Contractor applies for Trade license from PS.

**ANNEX – X****Summary of Procedure to Obtain Mining License for Quarry Operation**

1. Identify the site and verify ownership (land clearing)
2. Obtain letters of consent from the owners (Private/ Government)
3. Contractor applies for site clearance from CEA
4. CEA may request an IEE or EIA to be carried out by the contractor
5. CEA gives clearance
6. Contractor applies for Mining License (IML/A, IML/B or IML/C) from GSMB.
7. GMSB conducts joint inspection with a committee comprising with CEA, DS, and PS who would decide whether the test blast is needed for IML-A and IML-B which depends on the sensitivity of the site. Test blast will be carried out prior to issuing Mining License
8. Contractor applies for EPL from CEA
9. EPL is issued by CEA
10. GSMB monitors noise and vibrations annually and renews license
11. Contractor applies for explosive license from the Ministry of Defense
12. Contractor applies for Trade license/ Approval from PS

### **Abbreviations**

CEA	-	Central Environment Authority
DS	-	Divisional Secretariat
PIU	-	Project Implement Unit
GSMB	-	Geological Survey and Mines Bureau
NWS&DB	-	National Water Supply and Drainage Board
ADD	-	Agrarian Development Department
PRDD	-	Provincial Road Development Department
SLT	-	Sri Lanka Telecom
STC	-	State Timber Corporation
CEB	-	Ceylon Electricity Board
ICTAD	-	Institute for Construction Training and Development
ID	-	Irrigation Department
LA	-	Local Authority
ILO	-	International Labor Organization
IAD	-	International Development Agency
WB	-	World Bank
MC	-	Municipal Council
PS	-	Pradeshiya Sabha
CRWB	-	Colombo – Ratnapura – Wellawaya – Batticaloa
IE	-	Irrigation Engineer
ME	-	Mining Engineer
EE	-	Executive Engineer
MOH	-	Medical Officer of Health
PHI	-	Public Health Inspector
RoW	-	Right of Way
EIA	-	Environmental Impact Assessment
IEE	-	Initial Environmental Examination
RHS	-	Right Hand Side
LHS	-	Left Hand Side
Co-op	-	Co-operative
DBH	-	Diameter at Breast Height
IML	-	Industrial Mining License
EPL	-	Environmental Protection License
VET	-	Vehicular Emission Test
EMP	-	Environmental Management Plan
EA	-	Environmental Assessment

## **Road Specific Environmental Management Plan**

### **Road Sector Assistance Project (RSAP)**

#### **Eastern Province**

#### **THIRUPATHI AMMAN KOVIL ROAD (EPAMD007)**

CE Division	-	Ampara
EE Division	-	Kalmunai
DS Division	-	Kalmunai Tamil
MC Division	-	Kalmunai

#### **Ampara District**

Starting Point – 315339 E / 246993 N (Thirupathi Amman Kovil Junction)

End Point - 316260 E / 247420 N (Beach End)

**Road Specific Environmental Management Plan (EMP) for Rehabilitating and Upgrading  
Thirupathi Amman Kovil Road (EPAMD007) near Kalmunai  
(within Kalmunai EE Division in Ampara District)**

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The government of Sri Lanka (GOSL) has received a financial assistance from the World Bank to rehabilitate, improve and maintain the selected roads in provincial road network of the country. The proposed project will only focus on rehabilitation, improvement and maintenance of provincial roads selected through a strategic study, in order to facilitate economic activity in the areas served and provides users with better road safety conditions.

For provincial road rehabilitation, improvement and maintenance projects in Sri Lanka, all roads that will be rehabilitated, improved and / or maintained with IDA funds will need to prepare road specific EMP's and EA's to ensure compliance with the World Bank's environmental safeguard policies and the relevant provisions under the National Environmental Act (NEA) and associated regulations.

The road specific EMP and EA should be ready prior to finalization of the bidding documents. Sufficient conditions should be specified in the bidding documents, as well as the contractual agreements clearly defining requirements of compliance to adhere to the EA, implement the EMP and any subsequent changes and penalties for non-compliance. The EMP will be cost estimated in order to allow the contractor to bid for the funds required to implement the EMP. It is recommended the experience gained from Road Sector Assistance Projects should be taken into consideration when preparing this cost estimate.

Road specific EMP is the summarized matrix of all possible impacts that may occur during rehabilitation and upgrading the selected roads. The road specific EMP prepared for rehabilitation and upgrading Thirupathi Amman Kovil road in Kalmunai within Kalmunai EE Division in Ampara District is given below.

### **Road Specific Environmental Management Plan**

<b>Road</b>	-	Thirupathi Amman Kovil Road (EPAMD007)	<b>Road Length -</b>	1.200 km
<b>DS Division</b>	-	Kalmunai Tamil	<b>CE Division</b>	- Ampara
<b>MC Division</b>	-	Kalmunai	<b>EE Division</b>	- Kalmunai

#### **1. Pre Construction Stage**

##### **(A). Land Acquisition**

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
1	<p>Land Acquisition</p> <p>- identification of sections of already built structures to be removed from the existing road reservation</p> <p>- acquisition of private / state lands for adjustments to road alignment</p>	<p>i). Loss of sections of already built structures (boundary walls, front sections of boutiques and houses, abandoned roadside tube wells, etc,) after removal of such structures</p> <p>(i). Loss of sections of roadside lands</p> <p>(ii). Loss of roadside landscape</p>	<ul style="list-style-type: none"> <li>Providing necessary provisions to shift and restore the structures outside the new road reservation.</li> <li>Required livelihood restoration measures for affected persons will be given in line with Environmental and Social Safeguard Policies of World Bank, National Involuntary Resettlement Policy (NIRP) and concession arrangements made by Provincial RDA for compensating project affected persons.</li> <li>Compensation based on the Land Acquisition Act (LAA), National Involuntary Resettlement Policy (NIRP) and concession arrangements made by Provincial RDA for compensating project affected persons.</li> <li>Consent of MC / DS for releasing sections of lands belongs to MC / DS that may need to be acquired due to minor adjustment to alignment within such areas.</li> </ul>	<p>Applicable throughout the road</p> <p>Locations &amp; type of structures need to be removed are given in Annex - I</p> <p>Applicable throughout the road</p>	<p>As &amp; when required</p> <p>As &amp; when required</p>	<p>PRDD / DS / MC / PIU</p> <p>PRDD / DS / MC / PIU</p>

### (B). Identification of Utility Supply Line Posts needs to be Shifted

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
1.2	Shifting of utility supply lines - Identification of telephone posts to be shifted & abandoned posts to be removed - Identification of electricity posts to be shifted & abandoned posts to be removed	(i). deviating sections of already built paths of utility supply lines from their present positions.  (ii). New locations to be identified for utility line posts, earmarked for shifting.	<ul style="list-style-type: none"> <li>Prior consultation and consent should be obtained from relevant service providers for shifting of utility lines due to design requirements or shift in alignment.</li> <li>Providing necessary provisions to shift and restore the utility structures outside the new road reservation for respective utility service suppliers.</li> <li>Prior consultation and consent should be obtained from relevant land owners for shifting utility line posts inside their lands</li> </ul>	Applicable throughout the road  Locations of utility supply line posts to be shifted and abandoned posts to be removed are given in Annex – II (electricity posts) and Annex – III (telephone posts).	As & when required	PRDD / PIU / SLT / CEB

### (C). Design for New Culverts, Cross Culverts, Built-up Drains, Built-up Leaderways at Required Locations

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
1.2	Design of new culverts, cross culverts, etc.,  - Based on the elevation difference of roadway and flow pattern of drains across and along the road, it is necessary to design culverts, cross culverts, etc	(i).Identification of locations where new culverts to be erected  (ii). Identification of locations where new cross culverts to be erected  (iii). Identification of locations where new built-up drains & new leaderways to be erected	<ul style="list-style-type: none"> <li>For new culverts appropriate designs should be considered to allow sheath flow or cross drainage without any blocking.</li> <li>Locations for new cross culverts, built-up drains, built-up leaderways should be identified to enable smooth drain of rain water through side drains and leaderways</li> </ul>	Applicable throughout the road  Locations of proposed new culverts, cross culverts, built-up drains & built-up leaderways are given in Annex - IV	As & when required	PRDD / PIU

## 2 **Construction Stage**

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
1	<p>Site clearance and land development</p> <ul style="list-style-type: none"> <li>- setting out of area to be cleared</li> <li>- clearing</li> <li>- removal of trees</li> <li>- disposal of waste created from vegetation &amp; other debris material</li> </ul>	<ul style="list-style-type: none"> <li>(i). Loss of vegetation cover (trees, plants, etc.)</li> <li>(ii). Soil erosion on cleared roadside downward slope sections, cleared roadway due to removal of unsuitable soil cover at stretches) &amp; uprooting of tree, etc.</li> <li>(iii). Loss of roadside landscape</li> </ul>	<ul style="list-style-type: none"> <li>• Prevention of removal of trees as far as possible by slight adjusting the centerline, whenever possible.</li> <li>• However, to maintain the required width of the road &amp; its side drains, only 01 coconut tree has to be removed during the site clearance. During removing, attention should be paid to maintain minimum disturbances to soil cover and also care should be taken not to damage adjoining trees.</li> <li>• It is recommended to plant trees along the possible stretches of roadside in order to enhance the environment</li> <li>• It is also recommended to maintain the cleared roadway after removing unsuitable soil cover, cleared roadside downward slopes, filled sections of roadway, section with uprooted tree, etc, without allowing for soil erosion, roadside slope collapsing and to enhance the environment.</li> <li>• Water spraying should be done at a regular interval.</li> </ul>	<p>Applicable throughout the road</p> <p>Location, variety &amp; size of single tree to be removed are given in Annex – V.</p> <p>Stretches of removal of unsuitable soil cover &amp; roadside downward slopes are given in Annex – VI.</p> <p>Applicable throughout the road</p>	<p>As and when required</p> <p>Frequently</p>	<p>PRDD / DS / PIU</p> <p>PRDD / MC / PIU</p>

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		(v). Generation of vegetation waste (eg:- leaves, braches, stems, grasses, shrubs.	<ul style="list-style-type: none"> <li>Waste shall be disposed as directed by the EE in a suitable site, subject to the approval of the MC. All the dispose material shall be disposed in such a manner that,           <ul style="list-style-type: none"> <li>- water ways &amp; drainage paths are not blocked</li> <li>- should not be nuisance to the public</li> <li>- should not be washed away during rains &amp; floods</li> </ul> </li> </ul>	Applicable throughout the road	Frequently	PRDD / MC / PIU
2	Earth works & construction  Earthworks & excavation of roadway, LHS / RHS side drains, roadside leaderways, removal of unsuitable soil, stockpiling of suitable soil, road widening, filling, lifting & leveling, eroded sections in roadway & shoulders to be strengthen, erection of concrete built up side drains, clean / repairs / development of	(i). Dust, soil & other debris materials are generated during earthworks & roadway excavations, LHS / RHS side drains, roadside leader ways development, removal of unsuitable soil, stockpiling of suitable soil, road widening, filling, lifting & leveling, strengthening of eroded sections of roadway & shoulders, & construction development of concrete built-up side drains, clean / repairs /	<ul style="list-style-type: none"> <li>Earth material excavation to develop (erect, deepen &amp; reshape) LHS / RHS side drains, removal of unsuitable soil, road widening, filling, lifting &amp; leveling, eroded sections in road way and shoulders to be strengthen, formation of shoulders, gravel surfacing, construction / development of culverts, cross culverts, built-up, covered built-up drains &amp; covered built up leaderways, retaining &amp; toe walls &amp; side walls of culverts to be extended, should be done as per designs.</li> <li>During excavation attention should be paid to maintain cleared roadside LHS / RHS downward slopes in 1 : 4 ratio to avoid possible soil erosion &amp; collapsings</li> <li>Contractor should find suitable soil material for shoulder formation and / or road filling from a borrow pit, subject to approval of the EE.</li> </ul>	Applicable throughout the road.  Locations of built-up & covered built-up drains, covered built up leaderways, culverts, cross culverts, retaining & toe walls to be developed / erected & culvert side walls to be extended are given in Annex- IV.	If any public complaint received during earth work and/or construction work	PRDD / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
	existing concrete built-up drains, apply concrete to erect concrete covered built up leaderways, clean and minor repairs to existing concrete covered built up leaderways, silttraps, culverts, box & cross culverts, retaining & toe walls, side walls of culverts to be extended, & formation of shoulders, gravel surfacing, road concreting & tar laying, grass turfing on edges of the gravel layer, side slopes of filled & lifted road stretches and downward roadside slopes to be grass turfed	development & construction of concrete covered built-up drains & leaderways, culverts, cross & box culverts,, retaining & toe walls, side walls of culverts to be extended, shoulder formation, road concreting, asphalt laying	<ul style="list-style-type: none"> <li>Excavated earth materials and all debris materials shall be disposed immediately without allowing to stockpile at locations recommended by EE.</li> <li>During transportation, dispose materials should be covered with tarpaulin.</li> </ul>	Applicable throughout the road	During earthwork operation	PRDD / MC / PIU
		(ii). Surface soil erosion, siltation into water bodies & abandoned paddy fields, impacts to aquatic flora & fauna, blockage of water ways & drainage paths, wash away of disposed soil materials during floods are created while handling dispose soil & other construction waste material	<ul style="list-style-type: none"> <li>Debris material shall be disposed in such a manner that waterways, drainage paths would not get blocked.</li> <li>Drainage paths in LHS / RHS of the road should be improved / erected to drain rain water properly.</li> <li>Concrete built up side drains in LHS / RHS of the road should be developed (erected, deepen &amp; reshaped) to drain rain water properly.</li> <li>Cross culverts, culverts, side built-up drains,built-up leaderways should be erected to drain rain water properly</li> <li>Silt traps will be constructed to avoid siltation into water ways where necessary</li> <li>To avoid siltation, drainage paths should not be directed to water bodies and they should be separated from water bodies when road meets water body</li> </ul>	Applicable to working area throughout the road  List of covered built up side drains, built up leaderways, culverts & cross culverts, locations of silttraps are given in Annex – IV.  Locations of removal of unsuitable soil, road widening, filling, lifting & leveling, mainitaing roadside downward slope in 1:4 ratio & grass turf, etc, are given in Annex – VI.	Routing	PRDD / PIU
					Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			<ul style="list-style-type: none"> <li>To maintain aquatic flora &amp; fauna along waterways, excavation work at the vicinity of waterways will be conducted during dry period.</li> <li>Disposed materials should not be allowed to wash away during floods.</li> </ul>	Applicable to areas close to water bodies throughout the road		
			<ul style="list-style-type: none"> <li>To avoid erosion of unloaded soil, level the disposal once a week in dry period or regularly in rainy season.</li> </ul>		During earth work operation, if any public complain received	PRDD / MC / PIU
			<ul style="list-style-type: none"> <li>Water spraying should be done regularly.</li> </ul>	Applicable to working area throughout the road	Once a week	PRDD / MC / PIU
			<ul style="list-style-type: none"> <li>It is recommended to grass turf on roadside downward slopes and filled sections of roadside to control soil erosion and avoid collapsing.</li> <li>Shrubs &amp; grasses to be planted on top surface of soil after completion of disposal</li> </ul>	Applicable to working area	On completion of the excavation	PRDD / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		(iii). Loss of stripped top soil removed during excavation for edge widening	<ul style="list-style-type: none"> <li>Stripped top soil during edge widening for a specified depth of 150 mm should be stored in stockpile for a height not exceeding 2m, under the direction of EE. If the contractor is in doubt whether to conserve top soil in a given area, EE should be consulted for advice. Stockpiles should be placed outside flood affected areas.</li> </ul>	Applicable throughout the road / working area	During earth work operation	PRDD / MC / PIU
			<ul style="list-style-type: none"> <li>Such stockpiled topsoil should be used to re-fill the areas where topsoil has been removed. Residual topsoil must be distributed on adjoining / proximate barren areas as identified by the EE in a layer of thickness of 75 mm – 150 mm. Stockpiles should be placed outside flood affected areas.</li> </ul>	Applicable throughout the road / working area	During earth work operation	PRDD / MC / PIU
			<ul style="list-style-type: none"> <li>Stockpiled topsoil for reuse shall not be surcharged or overburdened. As far as possible, multiple handling of top soil should be kept to a minimum. Advice &amp; instructions should be given to operators, supervisors and other workers about the importance of top soil and thereby to minimize removal of it. Stockpiled materials (top soil and others) should be stored separately.</li> </ul>	Applicable throughout the road / working area	Routine	PRDD / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		(iv). Risk of soil erosion in excavated areas for road filling, lifting & leveling, erecting retaining walls, headwall extensions, roadside slope embankment cutting removal of unsuitable soil, gravel laying, shoulder formation, construction of culverts, cross culverts, earth, shoe, built-up & covered built-up drains, retaining , toe & side walls of culverts, etc.	<ul style="list-style-type: none"> <li>Barricades such as humps will be erected at excavated areas for earth, shoe, built-up, covered built-up drains, culverts &amp; cross culverts, silttraps, bridges, retaining &amp; toe walls, side wall extensions, stretches of road widening, filling &amp; lifting and roadside slope embankment cutting, with proper sign boards, as some work in these sections will have to be stopped during heavy rains due to heavy erosion. To prevent soil erosion in these excavated areas, proper earth drain system should be introduced.</li> <li>The work, permanent or temporary, shall consist of measures as per design or as directed by the EE to control soil erosion, sedimentation &amp; waterway pollution to the satisfaction of EE. Typical measures include the use of berms, dikes, sediment basins, fiber mats, mulches, grasses, slope drains &amp; other devices. All sedimentation &amp; pollution control works &amp; maintenance thereof are deemed, as incidental to the earthworks. As quickly as possible remove all the excavated soil from drains, culverts, walls &amp; shoulders to stockpiling lands. Please adhere to the CEA guidelines on the mitigatory measures for soil erosion. Ensure that the mitigatory measures are carried out consistently during the period of the project work</li> </ul>	List & locations of built-up drains, culverts, cross culverts& retaining walls, toe walls, covered built up leaderways, silttraps to be repaired / erected are given in Annex – IV.	Routine	PRDD / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		(v). Risk of soil erosion on edges of laid gravel layer & lifted roadside slopes and road side slope embankment	<ul style="list-style-type: none"> <li>To avoid soil erosion on edges of laid gravel layer, grass turfing should be done.</li> <li>To control soil erosion on filled sections of road side and roadside downward slopes, it is recommended to grass turf on such sections / slopes</li> </ul>	Applicable throughout the road	Routine	PRDD / MC / PIU
3.	Impact on Flora	(i). Loss, Damage or Disruption to flora	<ul style="list-style-type: none"> <li>All works shall be carried out in a manner that the destruction to the flora and their habitats is minimised. Trees and vegetation shall be felled / removed only if that impinges directly on the permanent works or necessary temporary works. In all such cases contractor shall take prior approval from the Engineer.</li> <li>Contractor shall make every effort to avoid removal and/or destruction of trees of religious, cultural and aesthetic significance. If such action is unavoidable the Engineer shall be informed in advance and carry out public consultation and report on the same should be submitted to the Engineer.</li> <li>Contractor shall adhere to the guidelines and recommendations made by the Central Environmental Authority, if any with regard to felling of trees and removal of vegetation.</li> </ul>	Throughout the road section where trees near / within the existing road reservation have to be removed and at locations where minor adjustments to the alignment is made as per design requirements.  Location, variety & size of single tree to be removed are given in Annex – V.	During removal of trees	PRDD / DS / CEA / MC / PIU

**(A). Applicable throughout the road**

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			<ul style="list-style-type: none"> <li>• Removed tree must be handed over to the State Timber Corporation.</li> <li>• A compensatory tree planting program should be developed in consultation with DS / DEO, local authorities and communities in order to replenish the loss of trees. At least 3 good specimens of same tree species (having &gt; 4 cm DBH) should be planted for each tree removed. Compensatory tree planting should be attended for about two years to promote survival of the replanted specimens</li> <li>• Replanting should be as near as possible to the removal location Planting of selected fast growing trees which are of native species</li> <li>• Replanting in the private lands could be encouraged to compensate impact due to loss of vegetation in private lands</li> </ul>	Throughout the road section		PRDD / DS / PIU / RM - STC

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
4.	Impact on Fauna	(i). Loss, Damage or Disruption to fauna	<ul style="list-style-type: none"> <li>• All works shall be carried out in such a manner that the destruction or disruption to the fauna and their habitats is minimum.</li> <li>• Construction workers shall be instructed to protect fauna including wild animals and aquatic life as well as their habitats. Hunting, poaching and unauthorized fishing by project workers is not allowed.</li> <li>• Siting of all hot mix plants, crushing plants, workshops, depots and temporary worker camps and storing of toxic and hazardous materials at approved locations, and recycling and dumping of solid waste matter at locations approved by local authorities, maintenance of vehicles and equipment in good operable condition, ensuring no leakage of oil or fuel and the fitting of proper exhaust baffles. Any solid waste should not be dumped into water bodies.</li> </ul>	Applicable throughout the road section	Routine	PRDD / DS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
5.	Protection of water sources & quality due to road & related works	(i). Loss of minor water sources & effects to water quality of streams	<ul style="list-style-type: none"> <li>Minimize wastage of water in the construction process / operations. Educate &amp; make employees aware on water conservation, waste minimization &amp; safe disposal of waste.</li> </ul>	Applicable throughout the road	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Arrange adequate supply of water for the project purpose throughout the construction period. Not obtain water for project purposes, including for labour camps, from public or community water supply schemes without a prior approval from the relevant authority.</li> </ul>	Applicable throughout the road	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Not extract water from ground water or surface water bodies without the permission from EE &amp; relevant authority. Obtain the permission for extracting water prior to the commencing of the project, from the relevant authority.</li> </ul>	Applicable throughout the road	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Construction over the seasonal streams / roadside water bodies shall be undertaken in dry period.</li> <li>Apply best management practices to control contamination of run-off water during maintenance &amp; operation of equipment.</li> <li>Maintain adequate distance between stockpiles &amp; water bodies to control effects to natural drainage paths.</li> </ul>	When a waterway is encountered	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
6.	Traffic management	(i). Disruption to road users during construction due to loss of access, The road may have to be closed for traffic during some Construction	<ul style="list-style-type: none"> <li>Temporary access will be provided when permanent access is blocked for construction. When construction work is in progress in one side, the other side will be opened for traffic &amp; properly trained flagmen will be made available with proper sign boards for control vehicles. At the end of each day, debris that blocked access path will be cleared away under the supervision of a supervisor.</li> </ul>	Applicable throughout the road	Routine	PRDD / Police / PIU
			<ul style="list-style-type: none"> <li>Use of road signs, barricades, cones &amp; trained flagmen. All sign barricades, pavement markings used for traffic management shall be cleared to the standards approved by Police. Provision for traffic safety measures shall be considered incidental to work &amp; follow ICTAD guidelines &amp; any instructions given by the Police.</li> </ul>	Applicable throughout the road	Routine	PRDD / Police / PIU
			<ul style="list-style-type: none"> <li>The contractor shall ensure that the running surface is always properly maintained, particularly during monsoon rainy period. So that disruption to traffic will not be occurred.</li> </ul>	Applicable throughout the road	Routine	PRDD / PIU / Police

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			<ul style="list-style-type: none"> <li>Temporary traffic detours shall be kept free of dust by frequent application of water. Personnel used for traffic control by the contractor shall be properly trained &amp; provided with proper gear including communication equipment, luminous jackets for night use. Instructions &amp; advice to be given to workers to implement safety at site.</li> </ul>	Applicable throughout the road	Routine	PRDD / PIU
			<ul style="list-style-type: none"> <li>Contractor shall comply with requirements for safety of the workers as per the ILO Convention No. 62 and Safety &amp; Health Regulations of the Factory Ordinance of Sri Lanka to the extent that those are applicable to this contract. The contractor shall supply all necessary safety measures at site.</li> </ul>	Applicable throughout the road	Routine	PRDD / PIU / Police
7.	Operation of heavy vehicles & equipment	Noise Pollution due to operation of heavy vehicles & equipment	<ul style="list-style-type: none"> <li>Repairing vehicles, machinery &amp; equipment shall be done &amp; stationed only in the areas of work &amp; in any other designated areas by the EE. Instruction &amp; advice should be given to drivers &amp; operators (both company owned &amp; hired) to park vehicles &amp; equipment in the areas of work or designated areas by EE.</li> <li>Working duration will be limited to 7 am -6 pm. Noise limit for construction equipment, such as compactors, rollers, front end loaders, concrete mixtures, cranes, vibrators &amp; saws shall not exceed 75 dB (A).</li> </ul>	Environmentally sensitive sites for noise along the roadway are given in Annex – VII.	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
		Air Pollution due to dust generation	<ul style="list-style-type: none"> <li>• The contractor shall effectively manage the dust generating activities such as top soil removal, handling and transporting sand, rubble, bitumen, and cement during periods of high winds or during more stable conditions with winds directed towards adjacent residences and other facilities.</li> <li>• All stockpiles shall be located sufficiently away from sensitive receptors.</li> <li>• All vehicles delivering materials shall be covered to avoid spillage and dust emission.</li> <li>• The contractor should avoid, where possible and take suitable action to prevent dirt and mud being carried to the roads (particularly following wet weather).</li> <li>• The contractor should enforce vehicle speed limits to minimize dust generation.</li> <li>• The Contractor shall employ a water truck to sprinkle water for dust suppression on all</li> </ul>	<p>Applicable throughout the road where earth work will take place, storage locations of sand, rubble, bitumen, cement and all sub roads used for material transportation.</p> <p>Pay special attention to environmentally sensitive sites for air pollution mentioned in Annex – VII.</p>	<p>Routine</p>	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			<p>exposed areas as required (note: the use of waste water / waste oil for dust suppression is prohibited)</p> <ul style="list-style-type: none"> <li>● All cleared areas shall be rehabilitated progressively.</li> <li>● All earthwork shall be protected in a manner acceptable to the minimize generation of dust.</li> <li>● All existing highways and roads used by vehicles of the contractor, or any of his subcontractor or supplies of materials or plant and similarly roads which are part of the works shall be kept clean and clear of all dust/mud or other extraneous materials dropped by such vehicles or their tyres.</li> </ul>			

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			<ul style="list-style-type: none"> <li>Clearance shall be affected immediately by manual sweeping and removal of debris, or, if so directed by the Engineer, by mechanical sweeping and clearing equipment. Additionally, if so directed by the Engineer, the road surface will be hosed or sprinkled water using appropriate equipments.</li> <li>Plants, machinery and equipment shall be handled (including dismantling) so as to minimize generation of dust.</li> <li>The contractor shall take every precaution to reduce the level of dust emission from the hot mix plants and the batching plants up to the satisfaction of the Engineer in accordance with the relevant emission norms.</li> <li>The hot mix plant be sited in accordance with CEA guidelines and operated with an EPL. The hot mix plants shall be fitted with</li> </ul>			
		Air Pollution due to Emission from Hot-Mix Plants and Batching Plants	<ul style="list-style-type: none"> <li>The hot mix plants and batching plants shall be sited in accordance with CEA guidelines. It is recommended that hot mix plants and batching plants to be located sufficiently away from noise sensitive sites (Annex – VII).</li> <li>The exhaust gases shall comply with the requirements of the relevant current emission control legislation. All operations at plants shall be undertaken in accordance with all current rules and regulations protecting the environment as well as the conditions given in the EPL.</li> </ul>	Locations where hot mix plants and batching plants are fixed.	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		Air Pollution due to Odour & Offensive Smells	<ul style="list-style-type: none"> <li>Contractor shall take all precautions such as storing all chemicals used for construction works in properly closed containers with good ventilations to prevent odour and offensive smell emanating from chemicals and processes applied in construction works or from labour camps. In a situation when/where odour or offensive smell does occur contractor shall take immediate action to rectify the situation. Contractor is responsible for any compensation involved with any health issue arisen out of bad odour and offensive smells.</li> </ul>	Throughout the roadway including all sites used for store all chemicals and places where chemical reactions taken place.	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>The waste disposal and sewerage treatment system for the labour camps shall be properly designed, built and operated so that no odour is generated. Compliance with the regulations on health and safety as well as CEA and LA guidelines shall be strictly adhered to.</li> </ul>	At labour camps	Routine	PRDD / DS / MC / PIU
	Air Pollution due to Emissions from Construction Vehicles , Equipment & Machinery		<ul style="list-style-type: none"> <li>The emission standards promulgated under the National Environment Act shall be strictly adhered to.</li> <li>All vehicles, equipment and machinery used for construction shall be regularly serviced and well maintained to ensure that emission levels comply with the relevant standards.</li> <li>Contractor should obtain the certificate issued by the Vehicular Emission Test (VET) for all construction vehicles, plants and other machineries and it should be renewed annually</li> </ul>	All plants, machinery and vehicles used for construction	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
8.	Protection of Cultural & Religious Places & Properties	Prevention of Damages to Cultural & Religious Places & Properties	<ul style="list-style-type: none"> <li>During construction activities the contractor should take all necessary and adequate care to minimize impacts on cultural properties which includes cultural sites and remains, places of worship including kovils (Cultural &amp; religious sites are given in Annex – VII).</li> <li>Workers should not be allowed to trespass in to such areas.</li> </ul>	Locations of Cultural and religious sites are given in Annex – VII	Routine	PRDD / DS / MC / Local Religious Leaders / PIU

## (B). Camp Sites / Site Office

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1	Installation of site office, labor camps	(i). Camp Sites / Site Office construction/ waste/ debris and vegetation waste like roots, leaves, stems, grasses, shrubs etc. From site clearance and fixing of temporary residential structures.	<ul style="list-style-type: none"> <li>Sites needing minimum vegetation clearance should be selected. It should also be away from tanks, canals and streams. Trees shall not be cut for clearing of the site.</li> </ul>	At the beginning	PRDD / DS / MC / PIU
		(ii). Generation of domestic solid waste from labor camps	<ul style="list-style-type: none"> <li>Garbage bins shall be provided by contractor at site offices and labor camps to collect solid waste. The disposal of the waste should be done at the disposal site of the LA.</li> </ul>	Once a month	PRDD / DS / MC / PHI through PRDA / PIU
		(iii). Generation of sewage waste from labor camps.	<ul style="list-style-type: none"> <li>The sewage to be generated from labor camp or site office should be disposed properly designed septic tanks or by other suitable sanitary disposal method complying with standards and guidelines of LA on sewage disposal.</li> </ul>	Once a month	PRDD / DS / MC / PHI through PRDA / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		(iv). Health problem may occur due to poor sanitation facilities and breeding of mosquitoes. Poor solid waste management shall be a major concern.	<ul style="list-style-type: none"> <li>Contractor shall take all precautions to prevent odor and offensive smell emanating from chemicals and processes applied in construction works or from labor camps. In a situation when/ where odor or offensive smell does occur, contractor shall take immediate action to rectify the situation. Contractor is responsible for any compensation involved with any health issue arisen out of bad odor and offensive smells. To prevent the breeding of vectors, the labor camps should be kept clean and hygienic. If there is any outbreak of disease, then the MOH or PHI of the area should be informed immediately. PHI and his staff to be requested for fumigation anti-mosquitoes chemicals (DDT) at regular period to avoid spreading of Dengue, Malaria etc.</li> </ul>	Once a month	PRDD / MOH/ PHI through PRDA / PIU
2	Extraction of water		<ul style="list-style-type: none"> <li>The contractor is responsible for arranging adequate supply of water for the project purpose through out the construction period. Contractor shall not obtain water for labor camps including other project works from public or community water supplies without approval from the relevant authority.</li> </ul>	Once a month	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
3	Rehabilitation of site		<ul style="list-style-type: none"> <li>Contractor shall remove the labor camps fully after its need is over, empty the septic tanks and close them, if instructed by the EE. Remove all garbage, debris and clean and landscape the area with grasses or suitable plants species.</li> </ul>	At the closure of the project	PRDD / DS / MC / PIU

**(C). Burrow Areas****Refer Annex VIII for procedure to obtain Mining License for burrow pit operation**

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Establishment of burrow areas	(i). General issues due to establishment of burrow pit	<ul style="list-style-type: none"> <li>Burrowing within the RoW is prohibited under this contract. However, earth available from excavation for roadside drains as per design, may be used as embankment material subject to approval of the EE.</li> </ul>	At the beginning	PRDD / DS / MC / CEA / GSMB / PIU
			<ul style="list-style-type: none"> <li>Contractor shall comply with the environmental requirements/ guidelines issued by the CEA / GSMB and LA in respect of locating burrow areas and with regard to all operations related to excavation and transportation of earth from such sites.</li> </ul>	At the beginning	PRDD / DS / MC / CEA / GSMB / PIU
			<ul style="list-style-type: none"> <li>Burrow areas shall not be opened without the permission of the EE. The location, depth of excavation and extend of the pit or open cut area shall be as approved by the EE.</li> </ul>	At the beginning	PRDD / DS / MC / CEA / GSMB / PIU
			<ul style="list-style-type: none"> <li>Establishment of burrow pits/ areas and its operational activities shall not endanger the properties. Also shall not be danger or health hazard to the people.</li> </ul>	At the beginning	PRDD / DS / MC / CEA / GSMB / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
2.	Top soil removal	(i). Loss of top soil removed from burrow pits	<ul style="list-style-type: none"> <li>If agricultural / other productive areas to be used as burrow area, for the purpose of this project where it has to be removed topsoil, shall be stripped to a specified depth of 150 mm and stored in stockpiles of height not exceeding 2 m, if directed by the EE. If the contractor is in any doubt on whether to conserve the topsoil or not for any given area shall obtain the direction from the EE in writing. Such stockpiled topsoil must be returned to cover the areas including cut slopes where the topsoil has been removed due to project activities. Residual topsoil must be distributed on adjoining/ proximate barren areas as identified by the Engineer in a layer of thickness of 75 mm - 150 mm. Stockpiles should be placed outside flood affected areas.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Topsoil thus stockpiled for reuse shall not be surcharged or overburdened. As far as possible multiple handling of topsoil stockpiles should be kept to a minimum.</li> <li>Advices and instructions should be given to operators, supervisors and other workers regarding how important is topsoil stockpiles and thereby minimize removal of topsoil.</li> </ul>	Once a month	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
3.	Excavation of earth	(i). Generation of dust due to excavation	<ul style="list-style-type: none"> <li>• All excavated material should be immediately taken to the site. If earth to be stockpiled, it should be covered. All workers are instructed to carry out activities in order to minimize dust generation. Water spraying should be done at regular intervals. Operation should not be carried out during period of high wind speeds.</li> </ul>	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>• All stockpiles shall be located sufficiently away from sensitive receptors viz. religious sites, cultural and heritage sites, schools, institutions etc.</li> </ul>	Routine	PRDD / DS / MC / PIU
4.	Transportation of earth	(i). Generation of dust during transportation	<ul style="list-style-type: none"> <li>• Loading and excavation of earth during high wind speeds should be avoided. All vehicles delivering earth shall be covered to avoid spillage of materials. The contractor shall enforce speed limits to minimize dust generation. Remove or sweep debris, dust and mud on roads using water bowsers (every two hours) to control dust generation on roads.</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
5.	Rehabilitation / restoration of burrow areas	(ii). Emission from construction vehicles, equipment and machinery	<ul style="list-style-type: none"> <li>Maximum speed of vehicle traveling within the construction areas should be limited to 20 km/hr for heavy vehicles and 40 km/hr for light vehicles.</li> </ul>	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>As directed by the EE, the debris and residual spoil material and earth shall be used to fill the borrow areas. Required quantities of top soil shall be laid and proper drainage shall be provided in the burrow areas.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Once the burrow areas have been filled with suitable soil, appropriate plants and grasses shall be planted on top of it.</li> </ul>	Once a week during planting and once in three months during maintenance	PRDD / DS / MC / PIU

**(D). Quarry Operations****Refer Annex - IX for procedure to obtain Mining License for quarry operation**

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Quarry Operations	(i). Contamination or disturbance to the existing drainage system by the proposed quarry operations.	<ul style="list-style-type: none"> <li>Measures for preserving natural drainage system and soil erosion are as follows: Silt traps to be installed to avoid any contamination of streams/ rivers and other water bodies. Therefore, to prevent erosion, turfing works to be done on slope faces at quarry site and also earth drains to be maintained properly.</li> </ul>	Once a month	PRDD / DS / MC / PIU
		(ii). Loss of rare / endangered species of vegetation	<ul style="list-style-type: none"> <li>Contractor shall provide necessary instructions to workers, drivers, and operators not to destroy vegetation unnecessarily.</li> </ul>	Once a month	PRDD / DS / MC / PIU
		(iii). Adverse effects of air and noise pollution on nearby Settlements (Schools, Hospitals, Public buildings, Temples, Monuments), Forests, National parks, Biodiversity reserves etc. The settlements	<ul style="list-style-type: none"> <li>Measures to control the air pollution/ dust from quarry operations are as follows:</li> <li>Water spraying at regular interval on site area and access roads. Planting trees and developing green belt around dust creating areas.</li> <li>Reduce expose area to wind.</li> <li>Proper maintenance of access road.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Compensation Measures</li> </ul> <p>(a) The properties and life of the people of surrounding area to be covered with</p>	As and when required	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		to be located within 1 km distance are most likely to be affected.	<p>Public Liability Insurance Policy paid by the Contractor for the possible damages, which might accidentally occur even after taking all mitigatory measures.</p> <p>(b). Contractor will quickly repair the damages which might be caused by accidental fly rocks or any other reasons connected to quarry operations, even after taking all mitigatory measures.</p>		

**Pl. refer item no. G) 7 (i) - Risks and Safety issues and mitigations when handling explosives**

### (E). Crusher Plant

No.	Activity	Environmental Issues	Mitigation Measures	Monitoring	
				Frequency	Responsibility
1.	Crusher plant operation	(i). Air pollution due to dust emission from crusher plant	<ul style="list-style-type: none"> <li>The crusher plant shall be sited in accordance with the CEA guidelines.</li> </ul>	At the beginning	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>A tall fence to be made around the crusher plants to minimize the dust and emission spread to surrounding area.</li> </ul>	Once a month	PRDD / DS / MC PIU
			<ul style="list-style-type: none"> <li>Water sprinkler system to be installed to crusher to control dust.</li> </ul>	Once a week	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Plant, machinery and equipment shall be handled carefully (including dismantling) so as to minimize generation of dust.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>All crushers used for construction shall conform to relevant dust emission levels as stated in the EPL</li> </ul>	Once a month	PRDD / DS / MC PIU
		(ii). Noise and vibration generation from crusher plant	<ul style="list-style-type: none"> <li>Contractor shall take appropriate action to ensure that activities do not result in damage to adjacent properties due to vibration as stated in the EPL.</li> <li>Maintaining noise level at the boundary of the crusher plant below 55 dB (A) as stated in the EPL. Operation period of the crusher plant to be limited to day- time between 8 hrs to 18 hrs.</li> </ul>	Once a month	PRDD / DS / MC / PIU

**(F). Access roads to/ from establishments to the site areas**

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Movement of heavy vehicles	(i). Damages to access/ local roads due to the movement of vehicles loaded with heavy construction related materials.	<ul style="list-style-type: none"> <li>• The maintenance and rehabilitation of the access roads in the event of damage by the contractor's operations shall be the responsibility of the contractor and to be attended as directed by EE.</li> <li>• Contractor to strictly limit loads to authorized values</li> </ul>	Routine	PRDD / DS / MC / PIU

**(G). Other Issues**

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Health and safety	(i). Protection of workers	<ul style="list-style-type: none"> <li>The contractor shall comply with requirements for the safety of the workmen as per the ILO convention No. 62 and Safety and Health Regulations of the Factory Ordinance of Sri Lanka to the extent that those are applicable to this contract. The contractor shall supply all necessary safety appliances such as safety goggles, helmets, masks, boots etc. to the workers and staff. The contractor has to comply with all regulations, regarding safe scaffolding, ladders, working platforms, gangway, stairways, excavators, trenches and safe means of entry.</li> <li>Recording day to day safety arrangements and incidents.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Measuring safety level- using checklist.</li> <li>Employing trained and experienced personnel when handling explosives.</li> <li>Informing public and workers about blasting by using siren at the places where blasting.</li> </ul>	Once a month	PRDD / DS / MC / PIU
2.	First Aid		<ul style="list-style-type: none"> <li>Provision of an ambulance with required medicine and also trained person.</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
3.	Portable Water		<ul style="list-style-type: none"> <li>In every workplace and labor camps, potable water shall be available throughout the day in sufficient quantities. Water should be easily accessible. In general cold potable water is acceptable.</li> </ul>	Routine	PRDD / DS / MC / PHI / PIU
4.	Hygiene		<ul style="list-style-type: none"> <li>Removing all used and empty cans, containers, tires etc. from accommodation and project area.</li> <li>Approved chemicals to be regularly applied to destroy mosquitoes.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Office building and accommodation to be cleaned everyday.</li> <li>Giving education about vector based diseases to the workers.</li> <li>Quality mosquito nets to be provided to workers.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Contractor shall keep all places of work, labor camps, and office and store buildings clean, devoid of garbage to prevent breeding of rats and other vectors such as files.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Measuring health level of workers - using checklists. Measuring health level of workers by keeping interpersonal relationship with workers</li> </ul>	Once a month	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>• Keeping interpersonal relationship with local public (project area) and get information about vector based diseases at village level.</li> <li>• Clean and maintain drain lines properly to prevent stagnation of water.</li> <li>• Arranging awareness programs about vector based diseases to the workers.</li> <li>• Provide proper solid waste management facility at the camp and office premises and educate all workers on properly handle the facility in consultation with PS.</li> </ul>	Twice a month	PRDD / DS / MC / PIU
5.	Extraction of natural resources such as sand, metal, earth	(i). Depletion of natural Resources	<ul style="list-style-type: none"> <li>• Any extractive natural resources for project activities shall not be extracted from designated Forest Reserves under the Forest Ordinance and designated protected areas under the Fauna and Flora Protection Ordinance.</li> </ul>	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>• Forest Reserves and Protected areas shall not be encroached upon temporarily or permanently either for road expansion, parking of vehicles disposal of debris, stockpiling of earth, garbage disposal etc. or any activity under this project.</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
6.	Use of fuel	i) Risk of contamination and accidents by fuel	<ul style="list-style-type: none"> <li>All applicable approvals/ licenses of Government of Sri Lanka to operate facilities and road construction work shall be obtained prior to commencing the relevant work. The conditions contained in these approvals/ licenses shall not be violated under any circumstances.</li> </ul>	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>If construction related resources are to be obtained from commercial sources, the contractor shall ensure that the commercial suppliers have the requisite approvals/ licenses to extract/ supply such resources and will be responsible for having copies of such approvals/ licenses at the site office.</li> </ul>	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Vehicle/ machinery and equipment serving and maintenance work shall be carried- out only in designated locations/ service stations approved by the EE. Avoid sensitive location such as close to streams/ rivers, upstream of wells and springs used by community and areas of flooding.</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>Waste oil, other petroleum products and untreated waste water shall not be discharged on ground so that it causes soil pollution. Adequate measures shall be taken against pollution of soil by spillage of petroleum/ oil products from storage tanks and containers. All waste petroleum products shall be disposed of in accordance with the guidelines issued by the CEA or the EE.</li> </ul>	Once a month	PRDD / DS / MC / CEA / PIU
			<ul style="list-style-type: none"> <li>Sites used for vehicle and plant service and maintenance shall be cleaned thoroughly and free of waste, oil product etc. and all debris shall be disposed in designated sites of the LA. Sites restoration will be considered as incidental to work.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>All vehicles and plant maintenance and servicing stations shall be located and operated as per the conditions and/ or guidelines issued by the CEA. In general, these should be located away from water-bodies. Wastewater shall not be disposed without meeting the disposal standards of the CEA. Waste water from vehicle and plant maintenance and servicing stations shall be removed of oil and grease and other contaminants to meet the relevant standards before discharging to the environment.</li> </ul>	Once a month	PRDD / DS / MC / CEA / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>Vehicle, machinery and equipment maintenance and refueling shall be done as required by the Manual to prevent water pollution as well.</li> </ul>	Once a month	PRDD / DS / MC / PIU
7.	Handling of explosives	(i). Risk and Safety issues due to blasting at mining and Quarry site	<ul style="list-style-type: none"> <li>Safety measures at mining/ quarry site are as follows:</li> <li>The warning sign boards have to be permanently erected around the proposed site to inform/ warn general public that this is a blasting site and entry is dangerous. The method of signaling the firing of blast round to be in the same sign board. The flagmen with red flags will be stationed in close vicinity around the blasting area, in order to prevent unauthorized persons including other workers of the site except members of blasting gang, when charging proceeds.</li> <li>Smoking or other sources of fire will not be allowed while charging proceeds. Standard guidelines to be strictly followed during storing, transporting, handling, charging and blasting of explosives in order to prevent accident misfire etc.</li> </ul>	During blasting	PRDD / DS / MC / Police / Explosive Controller / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
8.	All activities	(i). Loss of green cover vegetations and fauna by clearing of green surface cover for development, cutting of trees and important vegetations during project activities.	<ul style="list-style-type: none"> <li>When the charging is completed and it is ready to fire, red flagmen will inform the houses in close proximity. An air siren, which can be heard more than 500 m from the site, will be operated three times before firing a shot. Soon after the firing of shot, Mine Engineer or blasting Headman will inspect the blasted area for detecting undetonated explosive devices, if any. If he is satisfied that every thing is in order to the work and machinery will be allowed to proceed on, after a short intermittent, siren spell to inform people that blasting is completed.</li> <li>During any project related activity (borrow pit, quarry etc.) if a rare/ threatened/ endangered fauna or flora species, is found, it shall be immediately informed to the EE. All activities that could destroy such species and or its habitat shall be stopped with immediate effect. Such activities shall be started only after obtaining the EE's approval.</li> <li>Contractor shall carry - out all activities and plans that the EE instructed him to undertake to conserve such flora and fauna and / or its habitat.</li> </ul>	Once a month	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		(ii). Parking and servicing of construction vehicle and equipment other than working areas or other than designated areas.  (iii). Carelessness of workers  (iv). Accidents with wild animals by vehicles or equipment, hunting of wild animals by workers.	<ul style="list-style-type: none"> <li>• All works shall be carried-out in such a manner that the destruction or disruption to the ground vegetations, fauna and their habitats are minimal.</li> </ul>	At the beginning	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>• Construction workers, drivers, workers shall be instructed protect fauna including wild animals and aquatic life as well as their habitats. Hunting, poaching, unauthorized fishing by project workers is not allowed. Construction workers shall not be allowed to trespass into Sanctuaries, National Parks and protected areas if the road is traversing through such areas.</li> </ul>	Once a month	PRDD / DS / MC / PIU
9.	Operation of heavy vehicles and equipments	(i). Noise and vibration	<ul style="list-style-type: none"> <li>• All vehicles, equipment and machinery used for construction work should be regularly serviced and well maintained to ensure that emission levels comply with the relevant standards. For this purpose, experienced officer and supporting staff may be engaged.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>• Working time shall be limited to 7.00 am to 6.00 pm.</li> <li>• Workers working at strong noisy areas provided with ear plugs, helmets, masks, other protective gears.</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
10.			<ul style="list-style-type: none"> <li>• Noise limits for construction equipment used in this project (measured at one meter from the edge of the equipment in free field) such as compactors, rollers, front-end loaders, concrete mixers, cranes (movable), vibrators and saws shall not exceed 75 dB (A)</li> </ul>	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>• All machinery and equipment should be well maintained and fitted with noise reduction device in accordance with manufacturer's instructions.</li> </ul>	Once a month	PRDD / DS / MC / PIU
10.	Disposal of Harmful Construction Wastes	(i) Risk of contamination and accidents by fuel  i	<ul style="list-style-type: none"> <li>• Contractor prior to the commencement of work shall provide list of harmful, hazardous and risky chemicals/ material that will be used in the project work to the Engineer. Contractor shall also provide the list of places where such chemicals/materials or their containers or other harmful materials have been dumped as waste at the end of the project.</li> <li>• All disposal sites should be approved by the engineer and approved by CEA and relevant local authority.</li> <li>• The contractor shall clean up any area including water-bodies affected/ contaminated (if any) as directed by the engineer at his own cost</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
	Storage & Handling of Construction Materials	Emmision of Dust	<ul style="list-style-type: none"> <li>Storage locations of sand, metal, soil should be located away from settlements and other sensitive receptors and covered (with artificial barriers or natural vegetation).</li> <li>All access roads within the storage site should be sprinkled with water for dust suspension.</li> </ul>	Routine	PRDD / DS / MC / PIU
		Storage of fuel, oil and chemicals (avoid fumes and offensive odour)	<ul style="list-style-type: none"> <li>All cement, bitumen (barrels), oil and other chemicals should be stored and handled on an impervious surface (concrete slab) above ground level.</li> <li>Storage facility of cement, bitumen (barrels), oil and other chemicals should be an enclosed structure ensuring that no storm water flows in to the structure.</li> <li>A ridge should be placed around the storage facility to avoid runoff getting in to the structure.</li> <li>Adequate ventilation should be kept to avoid accumulation of fumes and offensive odour that could be harmful to material handlers.</li> </ul>	Routine	PRDD / DS / MC PIU
	Flood Prevention	Blockage of drainage paths & drains	<ul style="list-style-type: none"> <li>Contractor's activities shall not lead to flooding conditions as a result of blocked drainage paths and drains. The contractor shall take all measures necessary or as directed by the Engineer to keep all drainage paths and drains clear of blockage at all times.</li> <li>If flooding or stagnation of water is caused by contractor's activities, contractors shall provide suitable means to (a) prevent loss</li> </ul>	Routine	PRDD / DS / MC / ID / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			of access to any land or property and (b) prevent damage to land and property. Contractor shall compensate for any loss of income or damage as a result		
		Work in flood prone areas	<ul style="list-style-type: none"> <li>• Contractor's activities shall not lead to aggravate floods in flood prone areas when working in flood prone areas.</li> <li>• When working in flood prone areas during rainy season the contractor shall avoid storing materials, chemicals and other items of work in areas where those can be washed away by the floods.</li> </ul>	Routine	PRDD / DS / MC / ID / PIU
13..	Environmental enhancement	Utilities & roadside amenities	<ul style="list-style-type: none"> <li>• Contractor shall replace all amenities such as bus shelters that were removed/ relocated during the construction unless the Engineer directed the contractor not to do so.</li> <li>• Contractor shall take care not to damage/destroy or affect the functional purposes of utilities such as water, electricity, telephone posts. The arrangements the contractor made with those service providers shall be informed to the Engineer in writing (advance work). Contractor shall assist the service providers in whatever possible manner to minimize disruption to such services.</li> <li>• In case of an inadvertent damage cause to a utility, the contractor shall immediately inform the service provider and help to restore the service without delay.</li> </ul>	During replacement	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		Road Furniture	<ul style="list-style-type: none"> <li>• Road furniture including footpaths, railings, storm water drains, crash barrier, traffic signs, speed zone signs, pavement markers and any other such items will be provided as per design given in the Bid Documents.</li> <li>• Intersections, rotaries, traffic islands, roadside protection and other structures or furniture shall be constructed, complete with the landscape elements as per design in the above manner.</li> </ul>	When providing such items	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
14..	Handling environmental issues		<ul style="list-style-type: none"> <li>● The Contractor will appoint a suitably qualified Environmental Officer following the award of the contract. The Environmental Officer will be the primary point of contact for assistance with all environmental issues during the pre-construction and construction phases. He/ She shall be responsible for ensuring the implementation of EMAP.</li> <li>● The Contractor shall appoint a person responsible for community liaison and to handle public complaints regarding environmental/ social related matters. All public complaints will be entered into the Complaints Register. The Environmental Officer will promptly investigate and review environmental complaints and implement the appropriate corrective actions to arrest or mitigate the cause of the complaints. A register of all complaints is to be passed to the Engineer within 24 hrs they are received, with the action taken by the Environmental Officer on complains thereof.</li> </ul>		
			<ul style="list-style-type: none"> <li>● Contractor shall develop suitable method to receive complaints. The complain register shall be placed at a convenient place, easily accessible by the public.</li> <li>● Contractor shall prepare detailed Environmental Method Statement (EMS) clearly stating the approach, actions and manner in which the EMAP is implemented. It is required from the contractor to prepare the EMS for each work site, if work will be carried out at more than one site at once and time plan for implementation. The EMS shall be updated regularly and submit for Engineers review.</li> </ul>		

### 3. Operational Stage

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Stagnation of water at culverts during heavy rains due to siltation and blocking of openings with debris.		<ul style="list-style-type: none"> <li>Regular clearing/ cleaning and maintenance of all culverts to reduce the chances of failures and blocking due to debris. Maintenance manual of PRDA should be followed to maintain the road drainage system</li> <li></li> </ul>	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>All road furniture described under item 15 of construction stage should be maintained by PRDA</li> <li>A management plan should be formulated with the local police to avoid any vehicle to carry loads that exceed the carrying capacity (load) of the rehabilitated road.</li> <li>Weigh stations could be introduced at selected locations to measure the load of vehicle.</li> </ul>	Routine	PRDD / DS / MC / Police / PIU
	Encochement of new ROW		<ul style="list-style-type: none"> <li>Continuous monitoring and strict regulations should be followed to avoid the encroachment. Executive Engineers under direct supervision of Chief Engineer and Provincial Director should conduct regular checking along the road and remove any unauthorized activities within the ROW.</li> </ul>	Routine and when an complaint is received	PRDD / DS / MC / Police / PIU

## **ANNEXES**

**ANNEX – I:** Roadside Built Structures / Part of Built Structures / Fixed Name Boards / Damaged & Abandoned Tube Wells, Gates, Concrete Columns to be Removed

**ANNEX – II:** Roadside Electricity Posts to be Shifted / Roadside Abandoned Electricity Posts to be Removed

**ANNEX – III:** Roadside Telephone Posts to be Shifted / Roadside Abandoned Telephone Posts to be Removed

**ANNEX - IV:** List & Chainage of Culverts, Cross Culverts, Box Culverts, Built-up Drains, Covered Built-up drains, Concrete Shoe Drains, Toe Walls to be Repaired / Erected, Sections with Side Drains are not Required & Erect New Culverts, Side walls of Culverts to be Extended, Roadside Covered Built Up Leaderways to be Erected, Repaired & Cleaned, Silttraps to be Erected

**ANNEX – V:** List of Trees to be Removed or Affected due to Development of RHS / LHS Roadway

**ANNEX – VI:** List & Chainage of Removal of Unsuitable Soil, Road to be Filled & Lifted, Stretches of Road Sections to be Widen, Raise the Road to Enable Rain Water Drain Properly, Gravel Road Sections to be Concreted, Existing Concrete Road Sections to be Widen by Removing Unsuitable Soil in Both Sides and Applying Concrete, Maintain 1-1.5m Deep Both Roadside Downward Slopes in 1:4 ratio and Grass Turf

**ANNEX – VII:** List & Chainages of Environmentally Sensitive Sites along the Roadway (Noise Pollution and Air Pollution Sensitive Sites)

**ANNEX – VIII:** Summary of Procedure to Obtain Mining License for Borrow Pit Operation

**ANNEX – IX:** Summary of Procedure to Obtain Mining License for Quarry Operation

**ANNEX – I****Roadside Built Structures / Part of Built Structures / Fixed Name Boards / Damaged & Abandoned Tube Wells, Gates, Concrete Columns to be Removed**

<b>Chainage</b>	<b>Activity</b>
0+000 – 0+100	0+017 – 0+020 Demolish section of RHS boundary wall and roadward directed section of a house.
0+200 – 0+300	0+205 – 0+225 Demolish LHS boundary walls of boutique and Samurdhi Maha Sangamaya building 0+230 – 0+300 Demolish both sides boundary walls
0+500 – 0+600	0+530 – 0+555 Demolish boundary wall in RHS 0+560 – 0+600 Demolish boundary wall in LHS
0+600 – 0+700	0+600 – 0+610 Demolish boundary wall in LHS 0+641 Damaged and abandoned tube well in RHS to be demolished. 0+670 Remove Tsunami name board in LHS and re-fix in further LHS 0+698 Demolish two concrete columns of a gate in a house in LHS and re-build in further LHS.
0+800 – 0+900	0+847 Remove damaged tube well in LHS

**ANNEX – II****Roadside Electricity Posts to be Shifted / Roadside Abandoned Electricity Posts to be Removed**

<b>Chainage</b>	<b>Activity</b>
0+000 – 0+100	0+022 Electricity post in LHS to be shifted towards further LHS 0+050 Electricity post in RHS to be shifted towards further RHS 0+075 Electricity post in LHS to be shifted towards further LHS 0+095 Electricity post in LHS to be shifted towards further LHS
0+100 – 0+200	0+192 Electricity post in RHS to be shifted towards further RHS
0+200 – 0+300	0+229 Abandoned electricity post in RHS to be removed 0+230 Electricity post in RHS to be shifted towards further RHS 0+260 Electricity post in LHS to be shifted towards further LHS
0+300 – 0+400	0+300 Electricity post in LHS to be shifted towards further LHS 0+329 Electricity post in RHS to be shifted towards further RHS 0+340 Electricity post in LHS to be shifted towards further LHS 0+355 Electricity post in LHS to be shifted towards further LHS 0+385 Electricity post in RHS to be shifted towards further RHS 0+395 Electricity post in RHS to be shifted towards further RHS
0+400 – 0+500	0+422 Electricity post in RHS to be shifted towards further RHS 0+425 Electricity post in RHS to be shifted towards further RHS 0+455 Electricity post in RHS to be shifted towards further RHS 0+465 Electricity post in LHS to be shifted towards further LHS 0+485 Electricity post in LHS to be shifted towards further LHS
0+500 – 0+600	0+509 Electricity post in LHS to be shifted towards further LHS 0+525 Electricity post in LHS to be shifted towards further LHS 0+560 Electricity post in LHS to be shifted towards further LHS
0+600 – 0+700	0+640 Electricity post in RHS to be shifted towards further RHS
0+700 – 0+800	0+723 Electricity post in RHS to be shifted towards further RHS 0+735 Electricity post in RHS to be shifted towards further RHS 0+780 Electricity post in RHS to be shifted towards further RHS
0+800 – 0+900	0+848 Electricity post in LHS to be shifted towards further LHS
1+000 – 1+100	1+065 Electricity post in LHS to be shifted towards further LHS
1+100 – 1+200	1+145 Electricity post in LHS to be shifted towards further LHS

**ANNEX – III****Roadside Telephone Posts to be Shifted / Roadside Abandoned Telephone Posts to be Removed**

<b>Chainage</b>	<b>Activity</b>
0+000 – 0+100	0+090 Telephone post in RHS to be shifted towards further RHS
0+100 – 0+200	0+175 Two telephone posts in RHS to be shifted towards further RHS 0+190 Telephone post in LHS to be shifted towards further LHS
0+200 – 0+300	0+231 Two telephone posts in RHS to be shifted towards further RHS 0+253 Telephone post in RHS to be shifted towards further RHS 0+275 Telephone post in RHS to be shifted towards further RHS 0+296 Telephone post in RHS to be shifted towards further RHS
0+300 – 0+400	0+325 Telephone post in RHS to be shifted towards further RHS 0+328 Remove abandoned telephone post in RHS
0+400 – 0+500	0+423 Telephone post in RHS to be shifted towards further RHS 0+455 Telephone post in RHS to be shifted towards further RHS
0+500 – 0+600	0+510 Telephone post in RHS to be shifted towards further RHS 0+525 Telephone post in RHS to be shifted towards further RHS 0+547 Telephone post in RHS to be shifted towards further RHS 0+580 Telephone post in LHS to be shifted towards further LHS
0+600 – 0+700	0+603 Telephone post in LHS to be shifted towards further LHS 0+618 Telephone post in LHS to be shifted towards further LHS 0+680 Telephone post in LHS to be shifted towards further LHS
0+700 – 0+800	0+710 Telephone post in LHS to be shifted towards further LHS 0+738 Telephone post in LHS to be shifted towards further LHS 0+765 Telephone post in LHS to be shifted towards further LHS 0+778 Telephone post in LHS to be shifted towards further LHS
0+800 – 0+900	0+845 Telephone post in RHS to be shifted towards further RHS

**ANNEX – IV**

**List & Chainage of Culverts, Cross Culverts, Box Culverts, Built-up Drains, Covered Built-up drains, Concrete Shoe Drains, Toe Walls to be Repaired / Erected, Sections with Side Drains are not Required & Erect New Culverts, Side walls of Culverts to be Extended, Roadside Covered Built Up Leaderways to be Erected, Repaired & Cleaned, Silttraps to be Erected**

<b>Chainage</b>	<b>Activity</b>
0+000 – 0+100	0+000 – 0+100 Erect concrete shoe drains in both RHS & LHS 0+000 Minor repairs and clean existing culvert at the starting point of the road (at the eastern end of A4 (CRWB) main road) 0+055 Side road to RHS. Extend concrete shoe drain over the side road.
0+100 – 0+200	0+100 – 0+200 Erect concrete shoe drains in both RHS & LHS 0+120 Side roads to both RHS and LHS. Extend concrete shoe drains over the side roads.
0+200 – 0+300	0+200 – 0+300 Erect concrete shoe drain in LHS 0+200 - 0+230 Erect concrete shoe drain in RHS 0+230 – 0+300 Erect covered concrete built up drain in RHS 0+230 Minor side road to RHS. Erect covered concrete built up leaderway in the middle of the minor road 0+233 Side road to RHS. Erect cross culvert 0+297 Side road to RHS. Extend concrete shoe drain over the side road.
0+300 – 0+400	0+300 – 0+355 Erect concrete shoe drain in RHS & concrete built up drain LHS 0+300 – 0+355 Erect concrete shoe drain in LHS 0+355 – 0+400 No side drain in LHS 0+325 Side road to RHS. Erect cross culvert.
0+400 – 0+500	0+400 – 0+500 Erect concrete shoe drains in both RHS & LHS 0+486 Side roads to both RHS and LHS. Extend concrete shoe drains on top of both side roads.
0+500 – 0+600	0+500 – 0+560 Erect concrete shoe drains in both RHS & LHS 0+560 – 0+600 Repairs to existing concrete built up drain in RHS. Cover it with concrete slabs. 0+560 – 0+600 Erect concrete shoe drain in LHS 0+555 Side roads to both RHS and LHS. Extend concrete shoe drains over the side roads.
0+600 – 0+700	0+600 – 0+700 Repairs to existing concrete built up drain in RHS. Cover it with concrete slabs.

<b>Chainage</b>	<b>Activity</b>
	0+600 – 0+700 Erect concrete shoe drain in LHS 0+635 Side road to RHS. Erect cross culvert. 0+668 Side road to RHS. Erect cross culvert.
0+700 – 0+800	0+700 – 0+800 Repairs to existing concrete built up drain in RHS. Cover it with concrete slabs. 0+700 – 0+800 Erect concrete shoe drain in LHS 0+720 Side road to LHS. Extend concrete shoe drain on top of side road.
0+800 – 0+900	0+800 – 0+900 Repairs to existing concrete built up drain in RHS. Cover it with concrete slabs. 0+800 – 0+900 Erect concrete shoe drain in LHS
0+900 – 1+000	0+900 – 0+940 Repairs to existing concrete built up drain in RHS. Cover it with concrete slabs. 0+900 – 0+940 Erect concrete shoe drain in LHS 0+940 – 1+000 Side drains are not required in both RHS & LHS 0+940 – 0+945 Existing one pipe culvert to be replaced by box culvert. Erect concrete built up leaderway in LHS for 75m distance & in RHS for 350m distance (upto the meeting point of Natpaddimunai road). Erect a silttrap at the RHS side of the culvert. 0+940 – 1+000 Erect toe wall in LHS.
1+000 – 1+100	1+000 – 1+100 Side drains are not required in both RHS & LHS 1+000 – 1+100 Erect toe wall in LHS.
1+100 – 1+200	1+100 – 1+200 Side drains are not required in both RHS & LHS 1+100 – 1+200 Erect toe wall in LHS

**ANNEX – V****List of Trees to be Removed or Affected due to Development of RHS / LHS Roadway**

One individual Coconut tree having about 25 cm DBH will have to be removed due to road widening. Details are given in the following table.

**Abbreviations:**

**LHS** – Left Hand Side

**HG** – Home Gardens

**N** – Native

**DBH** – Diameter at Breast Height

**cm** – Centimeter

**ST** - Status

<b>Chainage</b>	<b>Side</b>	<b>Habitat</b>	<b>Tree Species</b>	<b>Local Name</b>	<b>ST</b>	<b>DBH/cm</b>	<b>Note</b>
0+635	LHS	HG	<i>Cocos nucifera</i>	Pol / Coconut	N	25	Cut

**ANNEX – VI**

**List & Chainage of Removal of Unsuitable Soil, Road to be Filled & Lifted, Stretches of Road Sections to be Widen, Raise the Road to Enable Rain Water Drain Properly, Gravel Road Sections to be Concreted, Existing Concrete Road Sections to be Widen by Removing Unsuitable Soil in Both Sides and Applying Concrete, Maintain 1-1.5m Deep Both Roadside Downward Slopes in 1:4 ratio and Grass Turf**

<b>Chainage</b>	<b>Activity</b>
0+100 – 0+200	0+170 – 0+180 Lift the road to enable to drain water towards culvert at 0+000
0+200 – 0+300	0+230 – 0+300 Remove unsuitable soil, fill with suitable soil and lift the road.
0+400 – 0+500	0+400 – 0+500 Remove unsuitable soil, fill with suitable soil and lift the road
0+500 – 0+600	0+500 – 0+600 Remove unsuitable soil, fill with suitable soil and lift the road 0+555 – 0+600 Lift the road by 0.5m to enable to drain water towards sea side
0+600 – 0+700	0+600 – 0+670 Lift the road by 0.5m to enable to drain water towards sea side 0+670 – 0+700 Existing concrete road. Widen the road by removing unsuitable soil in both sides of the road and applying concrete upto 1m width. Then apply premix asphalt on top.
0+700 – 0+800	0+700 – 0+800 Existing concrete road. Widen the road by removing unsuitable soil in both sides of the road and applying concrete upto 1m width. Then apply premix asphalt on top.
0+800 – 0+900	0+800 – 0+900 Existing concrete road. Widen the road by removing unsuitable soil in both sides of the road and applying concrete upto 1m width. Then apply premix asphalt on top.
0+900 – 1+000	0+940 – 1+000 LHS side slope is 1.5m deep. After erection of toe wall, maintain the LHS side slope in 1:4 ratio and grass turf on it. RHS side slope is 1m deep. Maintain the RHS side slope in 1:4 ratio and grass turf on it. 0+900 – 1+000 Existing concrete road. Widen the road by removing unsuitable soil in both sides of the road and applying concrete upto 1m width. Then apply premix asphalt on top.
1+000 – 1+100	1+000 – 1+100 Existing concrete road. Widen the road by removing

Chainage	Activity
	<p>unsuitable soil in both sides of the road and applying concrete upto 1m width. Then apply premix asphalt on top.</p> <p>1+000 – 1+100 LHS side slope is 1.5m deep. After erection of toe wall, maintain the LHS side slope in 1:4 ratio and grass turf on it. RHS side slope is 1m deep. Maintain the RHS side slope in 1:4 ratio and grass turf on it.</p>
1+100 – 1+200	<p>1+100 – 1+200 LHS side slope is 1.5m deep. After erection of toe wall, maintain the LHS side slope in 1:4 ratio and grass turf on it. RHS side slope is 1m deep. Maintain the RHS side slope in 1:4 ratio and grass turf on it.</p> <p>1+100 – 1+165 Existing concrete road. Widen the road by removing unsuitable soil in both sides of the road and applying concrete upto 1m width. Then apply premix asphalt on top.</p> <p>1+165 – 1200 Existing gravel road. Concrete it.</p>

**ANNEX – VII****List & Chainages of Environmentally Sensitive Sites along the Roadway**  
**(Noise Pollution and Air Pollution Sensitive Sites)**

<b>Chainage</b>	<b>Activity</b>
0+100 – 0+200	0+175 – 0+ 200 Thirupathi Amman Kovil in LHS
0+200 – 0+300	0+220 – 0+230 Samurdhi Maha Sangamaya building in LHS
0+500 – 0+600	0+500 Rural and Elders Committee Building in Pandiruppu
0+800 – 0+900	0+825 – 0+870 Vishnu Kovil in RHS
1+000 – 1+100	1+065 – 1+100 Cemetery in 50m away in LHS
1+100 – 1+200	1+100 – 1+145 Cemetery in 50m away in LHS 1+200 Vishnu Kovil in 50m away from the road in RHS..

**ANNEX - VIII****Summary of Procedure to Obtain Mining License for Borrow Pit Operation**

1. Identify the site and verify ownership (land clearing)
10. Obtain letters of consent from the owners (Private / Government)
11. Contractor applies for site clearance from CEA
12. CEA may request an IEE or EIA to be carried out by the contractor
13. CEA gives clearance.
14. Contractor applies for Mining License (IML/A, IML/B or IML/C) from GSMB.
15. GMSB conducts joint inspection with a committee comprising with CEA, DS, and PS.
16. Contractor has to make bank guarantee specified by the GSMB based on the situation of the land, prior to issuing Mining License.
17. Contractor applies for Trade license from PS.

## **ANNEX – IX**

### **Summary of Procedure to Obtain Mining License for Quarry Operation**

1. Identify the site and verify ownership (land clearing)
13. Obtain letters of consent from the owners (Private/ Government)
14. Contractor applies for site clearance from CEA
15. CEA may request an IEE or EIA to be carried out by the contractor
16. CEA gives clearance
17. Contractor applies for Mining License (IML/A, IML/B or IML/C) from GSMB.
18. GMSB conducts joint inspection with a committee comprising with CEA, DS, and PS who would decide whether the test blast is needed for IML-A and IML-B which depends on the sensitivity of the site. Test blast will be carried out prior to issuing Mining License
19. Contractor applies for EPL from CEA
20. EPL is issued by CEA
21. GSMB monitors noise and vibrations annually and renews license
22. Contractor applies for explosive license from the Ministry of Defense
23. Contractor applies for Trade license/ Approval from PS

### **Abbreviations**

CEA	-	Central Environment Authority
DS	-	Divisional Secretariat
PIU	-	Project Implement Unit
GSMB	-	Geological Survey and Mines Bureau
NWS&DB	-	National Water Supply and Drainage Board
ADD	-	Agrarian Development Department
PRDD	-	Provincial Road Development Department
SLT	-	Sri Lanka Telecom
STC	-	State Timber Corporation
CEB	-	Ceylon Electricity Board
ICTAD	-	Institute for Construction Training and Development
ID	-	Irrigation Department
LA	-	Local Authority
ILO	-	International Labor Organization
IAD	-	International Development Agency
WB	-	World Bank
MC	-	Municipal Council
PS	-	Pradeshiya Sabha
CRWB	-	Colombo – Ratnapura – Wellawaya – Batticaloa
IE	-	Irrigation Engineer
ME	-	Mining Engineer
EE	-	Executive Engineer
MOH	-	Medical Officer of Health
PHI	-	Public Health Inspector
RoW	-	Right of Way
EIA	-	Environmental Impact Assessment
IEE	-	Initial Environmental Examination
RHS	-	Right Hand Side
LHS	-	Left Hand Side
Co-op	-	Co-operative
DBH	-	Diameter at Breast Height
IML	-	Industrial Mining License
EPL	-	Environmental Protection License
VET	-	Vehicular Emission Test
EMP	-	Environmental Management Plan
EA	-	Environmental Assessment

## **Road Specific Environmental Management Plan**

### **Road Sector Assistance Project (RSAP)**

#### **Eastern Province**

### **SAINTHAMARUTHU KALMUNAIKUDY BOUNDARY ROAD (EPAMC016)**

<b>CE Division</b>	- Ampara
<b>EE Division</b>	- Kalmunai
<b>DS Division</b>	- Kalmunai Muslim & Sainthamaruthu
<b>MC Division</b>	- Kalmunai

#### **Ampara District**

Starting Point – 316924 E / 244132 N (Zahira College Junction)

End Point - 317942 E / 244356 N (Beach End)

**Road Specific Environmental Management Plan (EMP) for Rehabilitating and Upgrading  
Sainthamaruthu Kalmunaikudy Boundary Road (EPAMC016) near Kalmunai (within  
Kalmunai EE Division in Ampara District)**

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The government of Sri Lanka (GOSL) has received a financial assistance from the World Bank to rehabilitate, improve and maintain the selected roads in provincial road network of the country. The proposed project will only focus on rehabilitation, improvement and maintenance of provincial roads selected through a strategic study, in order to facilitate economic activity in the areas served and provides users with better road safety conditions.

For provincial road rehabilitation, improvement and maintenance projects in Sri Lanka, all roads that will be rehabilitated, improved and / or maintained with IDA funds will need to prepare road specific EMP's and EA's to ensure compliance with the World Bank's environmental safeguard policies and the relevant provisions under the National Environmental Act (NEA) and associated regulations.

The road specific EMP and EA should be ready prior to finalization of the bidding documents. Sufficient conditions should be specified in the bidding documents, as well as the contractual agreements clearly defining requirements of compliance to adhere to the EA, implement the EMP and any subsequent changes and penalties for non-compliance. The EMP will be cost estimated in order to allow the contractor to bid for the funds required to implement the EMP. It is recommended the experience gained from Road Sector Assistance Projects should be taken into consideration when preparing this cost estimate.

Road specific EMP is the summarized matrix of all possible impacts that may occur during rehabilitation and upgrading the selected roads. The road specific EMP prepared for rehabilitation and upgrading Sainthamaruthu Kalmunaikudy road in Kalmunai within Kalmunai EE Division in Ampara District is given below.



### **Road Specific Environmental Management Plan**

<b>Road</b>	-	Sainthamaruthu Kalmunaikudy Road (EPAMC016)	<b>Road Length -</b>	1.050 km
<b>DS Division</b>	-	Kalmunai Muslim & Sainthamaruthu	<b>CE Division</b>	- Ampara
<b>MC Division</b>	-	Kalmunai	<b>EE Division</b>	- Kalmunai

#### **1. Pre Construction Stage**

##### **(A). Land Acquisition**

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
1	<p>Land Acquisition</p> <p>- identification of sections of already built structures to be removed from the existing road reservation</p>	<p>i). Loss of sections of already built structures (boundary walls, front built up steps of a boutique and gate) after removal of such structures</p>	<ul style="list-style-type: none"> <li>Providing necessary provisions to shift and restore the structures outside the new road reservation.</li> <li>Required livelihood restoration measures for affected persons will be given in line with Environmental and Social Safeguard Policies of World Bank, National Involuntary Resettlement Policy (NIRP) and concession arrangements made by Provincial RDA for compensating project affected persons.</li> </ul>	<p>Applicable throughout the road</p> <p>Locations &amp; type of structures need to be removed are given in Annex - I</p>	<p>As &amp; when required</p>	<p>PRDD / DS / MC / PIU</p>
	<p>- acquisition of private / state lands for adjustments to road alignment</p>	<p>(i). Loss of sections of roadside lands</p> <p>(ii). Loss of roadside landscape</p>	<ul style="list-style-type: none"> <li>Compensation based on the Land Acquisition Act (LAA), National Involuntary Resettlement Policy (NIRP) and concession arrangements made by Provincial RDA for compensating project affected persons.</li> <li>Consent of MC / DS for releasing sections of lands belongs to MC / DS that may need to be acquired due to minor adjustment to alignment within such areas.</li> </ul>	<p>Applicable throughout the road</p>	<p>As &amp; when required</p>	<p>PRDD / DS / MC / PIU</p>

**(B). Identification of Utility Supply Line Posts needs to be Shifted**

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
1.2	<p>Shifting of utility supply lines</p> <ul style="list-style-type: none"> <li>- Identification of telephone posts to be shifted</li> <li>- Identification of electricity posts to be shifted &amp; removal of abandoned electricity posts</li> </ul>	<ul style="list-style-type: none"> <li>(i). deviating sections of already built paths of utility supply lines from their present positions.</li> <li>(ii). New locations to be identified for utility line posts, earmarked for shifting.</li> </ul>	<ul style="list-style-type: none"> <li>• Prior consultation and consent should be obtained from relevant service providers for shifting of utility lines due to design requirements or shift in alignment.</li> <li>• Providing necessary provisions to shift and restore the utility structures outside the new road reservation for respective utility service suppliers.</li> <li>• Prior consultation and consent should be obtained from relevant land owners for shifting utility line posts inside their lands</li> </ul>	<p>Applicable throughout the road</p> <p>Locations of electricity posts to be shifted and abandoned electricity posts to be removed are given in Annex – II</p> <p>Locations of telephone posts to be shifted are given in Annex – III.</p>	As & when required	PRDD / PIU / SLT / CEB

**(C). Design for New Culverts, Cross Culverts, Built-up Drains, Built-up Leaderways, etc, at Required Locations**

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
1.2	Design of new culverts, cross culverts, etc.,  - Based on the elevation difference of roadway and flow pattern of drains across and along the road, it is necessary to design culverts, cross culverts, etc	(i).Identification of locations where new culverts to be erected  (ii). Identification of locations where new cross culverts to be erected  (iii). Identification of locations where new built-up drains shoe drains & new leaderways to be erected	<ul style="list-style-type: none"> <li>For new culverts appropriate designs should be considered to allow sheath flow or cross drainage without any blocking.</li> <li>Locations for new cross culverts, built-up drains, built-up leaderways should be identified to enable smooth drain of rain water through side drains and leaderways</li> </ul>	Applicable throughout the road  Locations of proposed new culverts, cross culverts, built-up drains, built-up leaderways, etc, are given in Annex - IV	As & when required	PRDD / PIU

## 2 Construction Stage

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
1	<p>Site clearance and land development</p> <ul style="list-style-type: none"> <li>- setting out of area to be cleared</li> <li>- clearing</li> <li>- removal of trees</li> <li>- disposal of waste created from vegetation &amp; other debris material</li> </ul>	<ul style="list-style-type: none"> <li>(i). Loss of vegetation cover (trees, plants, etc.)</li> <li>((ii). Soil erosion on lifted road sections, cleared roadway due to removal of unsuitable soil cover at stretches) &amp; uprooting of trees, etc.</li> <li>(iii). Loss of roadside landscape</li> </ul>	<ul style="list-style-type: none"> <li>• Prevention of removal of trees as far as possible by slight adjusting the centerline, whenever possible.</li> <li>• However, to maintain the required width of the road &amp; its side drains, total of 3 trees have to be removed during the site clearance. During removing, attention should be paid to maintain minimum disturbances to soil cover and also care should be taken not to damage adjoining trees.</li> <li>• It is recommended to plant trees along the possible stretches of roadside in order to enhance the environment</li> <li>• It is also recommended to maintain the cleared roadway after removing unsuitable soil cover, filled sections of roadway, section with uprooted trees, etc, without allowing for soil erosion, roadside slope collapsing and to enhance the environment.</li> </ul>	<p>Applicable throughout the road</p> <p>Location, variety &amp; size of trees to be removed are given in Annex – V.</p> <p>Stretches of removal of unsuitable soil cover &amp; lifted road sections are given in Annex – VI.</p>	As and when required	PRDD / DS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			Water spraying should be done at a regular interval.	Applicable throughout the road	Frequently	PRDD / MC / PIU
		(v). Generation of vegetation waste (eg:- leaves, braches, stems, grasses, shrubs.	<ul style="list-style-type: none"> <li>Waste shall be disposed as directed by the EE in a suitable site, subject to the approval of the MC. All the dispose material shall be disposed in such a manner that, <ul style="list-style-type: none"> <li>- water ways &amp; drainage paths are not blocked</li> <li>- should not be nuisance to the public</li> <li>- should not be washed away during rains &amp; floods</li> </ul> </li> </ul>	Applicable throughout the road	Frequently	PRDD / MC / PIU
2	Earth works & construction Earthworks & excavation of roadway, LHS / RHS side drains, roadside leaderways, removal of unsuitable soil, stockpiling of suitable soil, road widening, filling, lifting & leveling, eroded sections in roadway & shoulders to be strengthen, erection of concrete built up side drains, clean / repairs / development of	(i). Dust, soil & other debris materials are generated during earthworks & roadway excavations, LHS / RHS side drains, roadside leader ways development, removal of unsuitable soil, stockpiling of suitable soil, road widening, filling, lifting & leveling, strengthening of eroded sections of roadway & shoulders, & construction development of concrete built-up side drains, clean / repairs /	<ul style="list-style-type: none"> <li>Earth material excavation to develop (erect, deepen &amp; reshape) LHS / RHS side drains, removal of unsuitable soil, road widening, filling, lifting &amp; leveling, eroded sections in road way and shoulders to be strengthen, formation of shoulders, gravel surfacing, construction / development of culverts, cross culverts, built-up, covered built-up drains &amp; covered built up leaderways, retaining &amp; toe walls &amp; side walls of culverts to be extended, should be done as per designs.</li> <li>During excavation attention should be paid to maintain filled roadside LHS / RHS downward slopes in 1 : 4 ratio to avoid possible soil erosion &amp; collapsings</li> <li>Contractor should find suitable soil material for shoulder formation and / or road filling from a borrow pit, subject to approval of the EE.</li> </ul>	Applicable throughout the road. Locations of built-up & covered built-up drains, covered built up leaderways, culverts, cross culverts, retaining & toe walls to be developed / erected & culvert side walls to be extended are given in Annex-IV.	If any public complaint received during earth work and/or construction work	PRDD / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
	existing concrete built-up drains, apply concrete to erect concrete covered built up leaderways, clean and minor repairs to existing concrete covered built up leaderways, silttraps, culverts, box & cross culverts, retaining & toe walls, side walls of culverts to be extended, & formation of shoulders, gravel surfacing, road concreting & tar laying, grass turfing on edges of the gravel layer, side slopes of filled & lifted road stretches and downward roadside slopes to be grass turfed	development & construction of concrete covered built-up drains & leaderways, culverts, cross & box culverts,, retaining & toe walls, side walls of culverts to be extended, shoulder formation, road concreting, asphalt laying	<ul style="list-style-type: none"> <li>Excavated earth materials and all debris materials shall be disposed immediately without allowing to stockpile at locations recommended by EE.</li> <li>During transportation, dispose materials should be covered with tarpaulin.</li> </ul>	Applicable throughout the road	During earthwork operation	PRDD / MC / PIU
		(ii). Surface soil erosion, siltation into water bodies & abandoned paddy fields, impacts to aquatic flora & fauna, blockage of water ways & drainage paths, wash away of disposed soil materials during floods are created while handling dispose soil & other construction waste material	<ul style="list-style-type: none"> <li>Debris material shall be disposed in such a manner that waterways, drainage paths would not get blocked.</li> <li>Drainage paths in LHS / RHS of the road should be improved / erected to drain rain water properly.</li> <li>Concrete built up side drains in LHS / RHS of the road should be developed (erected, deepen &amp; reshaped) to drain rain water properly.</li> <li>Cross culverts, culverts, side built-up drains,built-up leaderways should be erected to drain rain water properly</li> <li>Silt traps will be constructed to avoid siltation into water ways where necessary</li> <li>To avoid siltation, drainage paths should not be directed to water bodies and they should be separated from water bodies when road meets water bodies.</li> </ul>	Applicable to working area throughout the road  List of covered built up side drains, built up leaderways, culverts & cross culverts, locations of silttraps are given in Annex – IV.  Locations of removal of unsuitable soil, road widening, filling, lifting & leveling, etc, are given in Annex – VI.	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
			<ul style="list-style-type: none"> <li>To maintain aquatic flora &amp; fauna along waterways, excavation work at the vicinity of waterways will be conducted during dry period.</li> <li>Disposed materials should not be allowed to wash away during floods.</li> </ul>	Applicable to areas close to water bodies throughout the road		

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			<ul style="list-style-type: none"> <li>To avoid erosion of unloaded soil, level the disposal once a week in dry period or regularly in rainy season.</li> </ul>		During earth work operation, if any public complain received	PRDD / MC / PIU
			<ul style="list-style-type: none"> <li>Water spraying should be done regularly.</li> </ul>	Applicable to working area throughout the road	Once a week	PRDD / MC / PIU
			<ul style="list-style-type: none"> <li>It is recommended to grass turf on filled sections of roadside downward slopes to control soil erosion and avoid collapsing.</li> <li>Shrubs &amp; grasses to be planted on top surface of soil after completion of disposal</li> </ul>	Applicable to working area	On completion of the excavation	PRDD / MC / PIU
No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		(iii). Loss of stripped top soil removed during excavation for edge widening	<ul style="list-style-type: none"> <li>Stripped top soil during edge widening for a specified depth of 150 mm should be stored in stockpile for a height not exceeding 2m, under the direction of EE. If the contractor is in doubt whether to conserve top soil in a given area, EE should be consulted for advice. Stockpiles should be placed outside flood affected areas.</li> </ul>	Applicable throughout the road / working area	During earth work operation	PRDD / MC / PIU
			<ul style="list-style-type: none"> <li>Such stockpiled topsoil should be used to re-fill the areas where topsoil has been removed. Residual topsoil must be distributed on adjoining / proximate barren areas as identified by the EE in a layer of thickness of 75 mm – 150 mm. Stockpiles should be placed outside flood affected areas.</li> </ul>	Applicable throughout the road / working area	During earth work operation	PRDD / MC / PIU
			<ul style="list-style-type: none"> <li>Stockpiled topsoil for reuse shall not be surcharged or overburdened. As far as possible, multiple handling of top soil should be kept to a minimum. Advice &amp; instructions should be given to operators, supervisors and other workers about the importance of top soil and thereby to minimize removal of it. Stockpiled materials (top soil and others) should be</li> </ul>	Applicable throughout the road / working area	Routine	PRDD / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			stored separately.			
No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		(iv). Risk of soil erosion in excavated areas for road filling, lifting & leveling, erecting retaining walls, headwall extensions, filling of roadway, removal of unsuitable soil, gravel laying, shoulder formation, construction of culverts, cross culverts, earth, shoe, built-up & covered built-up drains, retaining , toe & side walls of culverts, etc.	<ul style="list-style-type: none"> <li>Barricades such as humps will be erected at excavated areas for earth, shoe, built-up, covered built-up drains, culverts &amp; cross culverts, silttraps, bridges, retaining &amp; toe walls, side wall extensions, stretches of road widening, filling &amp; lifting and roadside slope embankment cutting, with proper sign boards, as some work in these sections will have to be stopped during heavy rains due to heavy erosion. To prevent soil erosion in these excavated areas, proper earth drain system should be introduced.</li> <li>The work, permanent or temporary, shall consist of measures as per design or as directed by the EE to control soil erosion, sedimentation &amp; waterway pollution to the satisfaction of EE. Typical measures include the use of berms, dikes, sediment basins, fiber mats, mulches, grasses, slope drains &amp; other devices. All sedimentation &amp; pollution</li> </ul>	List & locations of built-up drains, culverts, cross culverts& retaining walls, toe walls, covered built up leaderways, silttraps to be repaired / erected are given in Annex – IV.  Applicable throughout the road / working area	Routine  Routine	PRDD / MC / PIU  PRDD / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			control works & maintenance thereof are deemed, as incidental to the earthworks. As quickly as possible remove all the excavated soil from drains, culverts, walls & shoulders to stockpiling lands. Please adhere to the CEA guidelines on the mitigatory measures for soil erosion. Ensure that the mitigatory measures are carried out consistently during the period of the project work			
No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
3.	Impact on Flora	(i). Loss, Damage or Disruption to flora	<ul style="list-style-type: none"> <li>• To avoid soil erosion on edges of laid gravel layer, grass turfing should be done.</li> <li>• To control soil erosion on filled sections of road side downward slope, it is recommended to grass turf on downward slopes.</li> </ul>	Applicable throughout the road	Routine	PRDD / MC / PIU
					During removal of trees	PRDD / DS / CEA / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			<ul style="list-style-type: none"> <li>Contractor shall make every effort to avoid removal and/or destruction of trees of religious, cultural and aesthetic significance. If such action is unavoidable the Engineer shall be informed in advance and carry out public consultation and report on the same should be submitted to the Engineer.</li> <li>Contractor shall adhere to the guidelines and recommendations made by the Central Environmental Authority, if any with regard to felling of trees and removal of vegetation.</li> </ul>	<p>the alignment is made as per design requirements.</p> <p>Location, variety &amp; size of trees to be removed are given in Annex – V.</p>		

#### (A). Applicable throughout the road

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			<ul style="list-style-type: none"> <li>Removed trees must be handed over to the State Timber Corporation.</li> <li>A compensatory tree planting program should be developed in consultation with DS / DEO, local authorities and communities in order to replenish the loss of trees. At least 3 good specimens of same tree species (having &gt; 4 cm DBH) should be planted for each tree removed.</li> </ul>	Throughout the road section		PRDD / DS / PIU / RM - STC

		<p>Compensatory tree planting should be attended for about two years to promote survival of the replanted specimens</p> <ul style="list-style-type: none"> <li>• Replanting should be as near as possible to the removal location Planting of selected fast growing trees which are of native species</li> <li>• Replanting in the private lands could be encouraged to compensate impact due to loss of vegetation in private lands</li> </ul>		
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No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
4.	Impact on Fauna	(i). Loss, Damage or Disruption to fauna	<ul style="list-style-type: none"> <li>• All works shall be carried out in such a manner that the destruction or disruption to the fauna and their habitats is minimum.</li> <li>• Construction workers shall be instructed to protect fauna including wild animals and aquatic life as well as their habitats. Hunting, poaching and unauthorized fishing by project workers is not allowed.</li> </ul>	Applicable throughout the road section	Routine	PRDD / DS / PIU

			<ul style="list-style-type: none"> <li>Siting of all hot mix plants, crushing plants, workshops, depots and temporary worker camps and storing of toxic and hazardous materials at approved locations, and recycling and dumping of solid waste matter at locations approved by local authorities, maintenance of vehicles and equipment in good operable condition, ensuring no leakage of oil or fuel and the fitting of proper exhaust baffles. Any solid waste should not be dumped into water bodies.</li> </ul>	Locations selected for erecting the asphalt, crusher and concrete batching plants and workshops		
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No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
5.	Protection of water sources & quality due to road & related works	(i). Loss of minor water sources & effects to water quality of streams	<ul style="list-style-type: none"> <li>Minimize wastage of water in the construction process / operations. Educate &amp; make employees aware on water conservation, waste minimization &amp; safe disposal of waste.</li> </ul>	Applicable throughout the road	Routine	PRDD / DS / MC / PIU

		<ul style="list-style-type: none"> <li>Arrange adequate supply of water for the project purpose throughout the construction period. Not obtain water for project purposes, including for labour camps, from public or community water supply schemes without a prior approval from the relevant authority.</li> <li>Not extract water from ground water or surface water bodies without the permission from EE &amp; relevant authority. Obtain the permission for extracting water prior to the commencing of the project, from the relevant authority.</li> </ul>	Applicable throughout the road	Routine	PRDD / DS / MC / PIU
		<ul style="list-style-type: none"> <li>Construction over the seasonal streams / roadside water bodies shall be undertaken in dry period.</li> <li>Apply best management practices to control contamination of run-off water during maintenance &amp; operation of equipment.</li> <li>Maintain adequate distance between stockpiles &amp; water bodies to control effects to natural drainage paths.</li> </ul>	Roadside water bodies are given in Annex - VIII	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility

6.	Traffic management	(i). Disruption to road users during construction due to loss of access, The road may have to be closed for traffic during some Construction	<ul style="list-style-type: none"> <li>Temporary access will be provided when permanent access is blocked for construction. When construction work is in progress in one side, the other side will be opened for traffic &amp; properly trained flagmen will be made available with proper sign boards for control vehicles. At the end of each day, debris that blocked access path will be cleared away under the supervision of a supervisor.</li> </ul>	Applicable throughout the road	Routine	PRDD / Police / PIU
			<ul style="list-style-type: none"> <li>Use of road signs, barricades, cones &amp; trained flagmen. All sign barricades, pavement markings used for traffic management shall be cleared to the standards approved by Police. Provision for traffic safety measures shall be considered incidental to work &amp; follow ICTAD guidelines &amp; any instructions given by the Police.</li> </ul>	Applicable throughout the road	Routine	PRDD / Police / PIU
			<ul style="list-style-type: none"> <li>The contractor shall ensure that the running surface is always properly maintained, particularly during monsoon rainy period. So that disruption to traffic will not be occurred.</li> </ul>	Applicable throughout the road	Routine	PRDD / PIU / Police

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
7.	Operation of heavy vehicles & equipment	Noise Pollution due to operation of heavy vehicles & equipment	<ul style="list-style-type: none"> <li>Temporary traffic detours shall be kept free of dust by frequent application of water. Personnel used for traffic control by the contractor shall be properly trained &amp; provided with proper gear including communication equipment, luminous jackets for night use. Instructions &amp; advice to be given to workers to implement safety at site.</li> </ul>	Applicable throughout the road	Routine	PRDD / PIU
			<ul style="list-style-type: none"> <li>Contractor shall comply with requirements for safety of the workers as per the ILO Convention No. 62 and Safety &amp; Health Regulations of the Factory Ordinance of Sri Lanka to the extent that those are applicable to this contract. The contractor shall supply all necessary safety measures at site.</li> </ul>	Applicable throughout the road	Routine	PRDD / PIU / Police
			<ul style="list-style-type: none"> <li>Repairing vehicles, machinery &amp; equipment shall be done &amp; stationed only in the areas of work &amp; in any other designated areas by the EE. Instruction &amp; advice should be given to drivers &amp; operators (both company owned &amp; hired) to park vehicles &amp; equipment in the areas of work or designated areas by EE.</li> <li>Working duration will be limited to 7 am -6 pm. Noise limit for construction equipment, such as compactors, rollers, front end loaders, concrete mixtures, cranes, vibrators &amp; saws shall not exceed 75 dB (A).</li> </ul>	Environmentally sensitive sites for noise along the roadway are given in Annex – VII.	Routine	PRDD / DS / MC / PIU

	Air Pollution due to dust generation	<ul style="list-style-type: none"> <li>The contractor shall effectively manage the dust generating activities such as top soil removal, handling and transporting sand, rubble, bitumen, and cement during periods of high winds or during more stable conditions with winds directed towards adjacent residences and other facilities.</li> <li>All stockpiles shall be located sufficiently away from sensitive receptors.</li> <li>All vehicles delivering materials shall be covered to avoid spillage and dust emission.</li> <li>The contractor should avoid, where possible and take suitable action to prevent dirt and mud being carried to the roads (particularly following wet weather).</li> <li>The contractor should enforce vehicle speed limits to minimize dust generation.</li> <li>The Contractor shall employ a water truck to sprinkle water for dust suppression on all exposed areas as required (note: the use of waste water / waste oil for dust suppression is prohibited)</li> <li>All cleared areas shall be rehabilitated progressively.</li> <li>All earthwork shall be protected in a manner acceptable to the minimize generation of dust.</li> <li>All existing highways and roads used by vehicles of the contractor, or any of his subcontractor or supplies of materials or plant and similarly roads which are part of the works shall be kept clean and clear of all dust/mud or other extraneous materials dropped by such vehicles or their tyres.</li> </ul>	<p>Applicable throughout the road where earth work will take place, storage locations of sand, rubble, bitumen, cement and all sub roads used for material transportation.</p> <p>Pay special attention to environmentally sensitive sites for air pollution mentioned in Annex – VII.</p>	Routine	PRDD / DS / MC / PIU
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No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility

		<ul style="list-style-type: none"><li>Clearance shall be affected immediately by manual sweeping and removal of debris, or, if so directed by the Engineer, by mechanical sweeping and clearing equipment. Additionally, if so directed by the Engineer, the road surface will be hosed or sprinkled water using appropriate equipments.</li><li>Plants, machinery and equipment shall be handled (including dismantling) so as to minimize generation of dust.</li><li>The contractor shall take every precaution to reduce the level of dust emission from the hot mix plants and the batching plants up to the satisfaction of the Engineer in accordance with the relevant emission norms.</li><li>The hot mix plant be sited in accordance with CEA guidelines and operated with an EPL. The hot mix plants shall be fitted with</li></ul>			
	Air Pollution due to Emission from Hot-Mix Plants and Batching Plants	<ul style="list-style-type: none"><li>The hot mix plants and batching plants shall be sited in accordance with CEA guidelines. It is recommended that hot mix plants and batching plants to be located sufficiently away from noise sensitive sites (Annex – VII).</li><li>The exhaust gases shall comply with the requirements of the relevant current emission control legislation. All operations at plants shall be undertaken in accordance with all current rules and regulations protecting the environment as well as the conditions given in the EPL.</li></ul>	Locations where hot mix plants and batching plants are fixed.	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		Air Pollution due to Odour & Offensive Smells	<ul style="list-style-type: none"> <li>Contractor shall take all precautions such as storing all chemicals used for construction works in properly closed containers with good ventilations to prevent odour and offensive smell emanating from chemicals and processes applied in construction works or from labour camps. In a situation when/where odour or offensive smell does occur contractor shall take immediate action to rectify the situation. Contractor is responsible for any compensation involved with any health issue arisen out of bad odour and offensive smells.</li> </ul>	Throughout the roadway including all sites used for store all chemicals and places where chemical reactions taken place.	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>The waste disposal and sewerage treatment system for the labour camps shall be properly designed, built and operated so that no odour is generated. Compliance with the regulations on health and safety as well as CEA and LA guidelines shall be strictly adhered to.</li> <li></li> </ul>	At labour camps	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		Air Pollution due to Emissions from Construction Vehicles , Equipment & Machinery	<ul style="list-style-type: none"> <li>• The emission standards promulgated under the National Environment Act shall be strictly adhered to.</li> <li>• All vehicles, equipment and machinery used for construction shall be regularly serviced and well maintained to ensure that emission levels comply with the relevant standards.</li> <li>• Contractor should obtain the certificate issued by the Vehicular Emission Test (VET) for all construction vehicles, plants and other machineries and it should be renewed annually</li> </ul>	All plants, machinery and vehicles used for construction	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
8.	Protection of Cultural & Religious Places & Properties	Prevention of Damages to Cultural & Religious Places & Properties	<ul style="list-style-type: none"> <li>During construction activities the contractor should take all necessary and adequate care to minimize impacts on cultural properties which includes cultural sites and remains, places of worship including kovils &amp; mosques (Cultural &amp; religious sites are given in Annex – VII).</li> <li>Workers should not be allowed to trespass in to such areas.</li> </ul>	Locations of Cultural and religious sites are given in Annex – VII	Routine	PRDD / DS / MC / Local Religious Leaders / PIU

## (B). Camp Sites / Site Office

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1	Installation of site office, labor camps	(i). Camp Sites / Site Office construction/ waste/ debris and vegetation waste like roots, leaves, stems, grasses, shrubs etc. From site clearance and fixing of temporary residential structures.	<ul style="list-style-type: none"> <li>Sites needing minimum vegetation clearance should be selected. It should also be away from tanks, canals and streams. Trees shall not be cut for clearing of the site.</li> </ul>	At the beginning	PRDD / DS / MC / PIU
		(ii). Generation of domestic solid waste from labor camps	<ul style="list-style-type: none"> <li>Garbage bins shall be provided by contractor at site offices and labor camps to collect solid waste. The disposal of the waste should be done at the disposal site of the LA.</li> </ul>	Once a month	PRDD / DS / MC / PHI through PRDA / PIU
		(iii). Generation of sewage waste from labor camps.	<ul style="list-style-type: none"> <li>The sewage to be generated from labor camp or site office should be disposed properly designed septic tanks or by other suitable sanitary disposal method complying with standards and guidelines of LA on sewage disposal.</li> </ul>	Once a month	PRDD / DS / MC / PHI through PRDA / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		(iv). Health problem may occur due to poor sanitation facilities and breeding of mosquitoes. Poor solid waste management shall be a major concern.	<ul style="list-style-type: none"> <li>Contractor shall take all precautions to prevent odor and offensive smell emanating from chemicals and processes applied in construction works or from labor camps. In a situation when/ where odor or offensive smell does occur, contractor shall take immediate action to rectify the situation. Contractor is responsible for any compensation involved with any health issue arisen out of bad odor and offensive smells. To prevent the breeding of vectors, the labor camps should be kept clean and hygienic. If there is any outbreak of disease, then the MOH or PHI of the area should be informed immediately. PHI and his staff to be requested for fumigation anti-mosquitoes chemicals (DDT) at regular period to avoid spreading of Dengue, Malaria etc.</li> </ul>	Once a month	PRDD / MOH/ PHI through PRDA / PIU
2	Extraction of water		<ul style="list-style-type: none"> <li>The contractor is responsible for arranging adequate supply of water for the project purpose through out the construction period. Contractor shall not obtain water for labor camps including other project works from public or community water supplies without approval from the relevant authority.</li> </ul>	Once a month	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
3	Rehabilitation of site		<ul style="list-style-type: none"> <li>Contractor shall remove the labor camps fully after its need is over, empty the septic tanks and close them, if instructed by the EE. Remove all garbage, debris and clean and landscape the area with grasses or suitable plants species.</li> </ul>	At the closure of the project	PRDD / DS / MC / PIU

**(C). Burrow Areas****Refer Annex VIII for procedure to obtain Mining License for burrow pit operation**

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Establishment of burrow areas	(i). General issues due to establishment of burrow pit	<ul style="list-style-type: none"> <li>Burrowing within the RoW is prohibited under this contract. However, earth available from excavation for roadside drains as per design, may be used as embankment material subject to approval of the EE.</li> </ul>	At the beginning	PRDD / DS / MC / CEA /GSMB / PIU
			<ul style="list-style-type: none"> <li>Contractor shall comply with the environmental requirements/ guidelines issued by the CEA / GSMB and LA in respect of locating burrow areas and with regard to all operations related to excavation and transportation of earth from such sites.</li> </ul>	At the beginning	PRDD / DS / MC / CEA /GSMB / PIU
			<ul style="list-style-type: none"> <li>Burrow areas shall not be opened without the permission of the EE. The location, depth of excavation and extend of the pit or open cut area shall be as approved by the EE.</li> </ul>	At the beginning	PRDD / DS / MC / CEA /GSMB / PIU
			<ul style="list-style-type: none"> <li>Establishment of burrow pits/ areas and its operational activities shall not endanger the properties. Also shall not be danger or health hazard to the people.</li> </ul>	At the beginning	PRDD / DS / MC / CEA /GSMB / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
2.	Top soil removal	(i). Loss of top soil removed from burrow pits	<ul style="list-style-type: none"> <li>If agricultural / other productive areas to be used as burrow area, for the purpose of this project where it has to be removed topsoil, shall be stripped to a specified depth of 150 mm and stored in stockpiles of height not exceeding 2 m, if directed by the EE. If the contractor is in any doubt on whether to conserve the topsoil or not for any given area shall obtain the direction from the EE in writing. Such stockpiled topsoil must be returned to cover the areas including cut slopes where the topsoil has been removed due to project activities. Residual topsoil must be distributed on adjoining/ proximate barren areas as identified by the Engineer in a layer of thickness of 75 mm - 150 mm. Stockpiles should be placed outside flood affected areas.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Topsoil thus stockpiled for reuse shall not be surcharged or overburdened. As far as possible multiple handling of topsoil stockpiles should be kept to a minimum.</li> <li>Advices and instructions should be given to operators, supervisors and other workers regarding how important is topsoil stockpiles and thereby minimize removal of topsoil.</li> </ul>	Once a month	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
3.	Excavation of earth	(i). Generation of dust due to excavation	<ul style="list-style-type: none"> <li>• All excavated material should be immediately taken to the site. If earth to be stockpiled, it should be covered. All workers are instructed to carry out activities in order to minimize dust generation. Water spraying should be done at regular intervals. Operation should not be carried out during period of high wind speeds.</li> </ul>	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>• All stockpiles shall be located sufficiently away from sensitive receptors viz. religious sites, cultural and heritage sites, schools, institutions etc.</li> </ul>	Routine	PRDD / DS / MC / PIU
4.	Transportation of earth	(i). Generation of dust during transportation	<ul style="list-style-type: none"> <li>• Loading and excavation of earth during high wind speeds should be avoided. All vehicles delivering earth shall be covered to avoid spillage of materials. The contractor shall enforce speed limits to minimize dust generation. Remove or sweep debris, dust and mud on roads using water bowers (every two hours) to control dust generation on roads.</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		(ii). Emission from construction vehicles, equipment and machinery	<ul style="list-style-type: none"> <li>Maximum speed of vehicle traveling within the construction areas should be limited to 20 km/hr for heavy vehicles and 40 km/hr for light vehicles.</li> </ul>	Routine	PRDD / DS / MC / PIU
5.	Rehabilitation / restoration of burrow areas		<ul style="list-style-type: none"> <li>As directed by the EE, the debris and residual spoil material and earth shall be used to fill the borrow areas. Required quantities of top soil shall be laid and proper drainage shall be provided in the burrow areas.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Once the burrow areas have been filled with suitable soil, appropriate plants and grasses shall be planted on top of it.</li> </ul>	Once a week during planting and once in three months during maintenance	PRDD / DS / MC / PIU

**(D). Quarry Operations****Refer Annex - IX for procedure to obtain Mining License for quarry operation**

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Quarry Operations	(i). Contamination or disturbance to the existing drainage system by the proposed quarry operations.	<ul style="list-style-type: none"> <li>Measures for preserving natural drainage system and soil erosion are as follows: Silt traps to be installed to avoid any contamination of streams/ rivers and other water bodies. Therefore, to prevent erosion, turfing works to be done on slope faces at quarry site and also earth drains to be maintained properly.</li> </ul>	Once a month	PRDD / DS / MC / PIU
		(ii). Loss of rare / endangered species of vegetation	<ul style="list-style-type: none"> <li>Contractor shall provide necessary instructions to workers, drivers, and operators not to destroy vegetation unnecessarily.</li> </ul>	Once a month	PRDD / DS / MC / PIU
		(iii). Adverse effects of air and noise pollution on nearby Settlements (Schools, Hospitals, Public buildings, Temples, Monuments), Forests, National parks, Biodiversity reserves etc. The settlements	<ul style="list-style-type: none"> <li>Measures to control the air pollution/ dust from quarry operations are as follows:</li> <li>Water spraying at regular interval on site area and access roads. Planting trees and developing green belt around dust creating areas.</li> <li>Reduce expose area to wind.</li> <li>Proper maintenance of access road.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Compensation Measures</li> </ul> <p>(a) The properties and life of the people of surrounding area to be covered with</p>	As and when required	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		to be located within 1 km distance are most likely to be affected.	<p>Public Liability Insurance Policy paid by the Contractor for the possible damages, which might accidentally occur even after taking all mitigatory measures.</p> <p>(b). Contractor will quickly repair the damages which might be caused by accidental fly rocks or any other reasons connected to quarry operations, even after taking all mitigatory measures.</p>		

**Pl. refer item no. G) 7 (i) - Risks and Safety issues and mitigations when handling explosives**

**(E). Crusher Plant**

No.	Activity	Environmental Issues	Mitigation Measures	Monitoring	
				Frequency	Responsibility
1.	Crusher plant operation	(i). Air pollution due to dust emission from crusher plant	<ul style="list-style-type: none"> <li>The crusher plant shall be sited in accordance with the CEA guidelines.</li> </ul>	At the beginning	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>A tall fence to be made around the crusher plants to minimize the dust and emission spread to surrounding area.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Water sprinkler system to be installed to crusher to control dust.</li> </ul>	Once a week	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Plant, machinery and equipment shall be handled carefully (including dismantling) so as to minimize generation of dust.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>All crushers used for construction shall conform to relevant dust emission levels as stated in the EPL</li> </ul>	Once a month	PRDD / DS / MC / PIU
		(ii). Noise and vibration generation from crusher plant	<ul style="list-style-type: none"> <li>Contractor shall take appropriate action to ensure that activities do not result in damage to adjacent properties due to vibration as stated in the EPL.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Maintaining noise level at the boundary of the crusher plant below 55 dB (A) as stated in the EPL. Operation period of the crusher plant to be limited to day- time between 8 hrs to 18 hrs.</li> </ul>		

**(F). Access roads to/ from establishments to the site areas**

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Movement of heavy vehicles	(i). Damages to access/ local roads due to the movement of vehicles loaded with heavy construction related materials.	<ul style="list-style-type: none"> <li>• The maintenance and rehabilitation of the access roads in the event of damage by the contractor's operations shall be the responsibility of the contractor and to be attended as directed by EE.</li> <li>• Contractor to strictly limit loads to authorized values</li> </ul>	Routine	PRDD / DS / MC / PIU

**(G). Other Issues**

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Health and safety	(i). Protection of workers	<ul style="list-style-type: none"> <li>The contractor shall comply with requirements for the safety of the workmen as per the ILO convention No. 62 and Safety and Health Regulations of the Factory Ordinance of Sri Lanka to the extent that those are applicable to this contract. The contractor shall supply all necessary safety appliances such as safety goggles, helmets, masks, boots etc. to the workers and staff. The contractor has to comply with all regulations, regarding safe scaffolding, ladders, working platforms, gangway, stairways, excavators, trenches and safe means of entry.</li> <li>Recording day to day safety arrangements and incidents.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Measuring safety level- using checklist.</li> <li>Employing trained and experienced personnel when handling explosives.</li> <li>Informing public and workers about blasting by using siren at the places where blasting.</li> </ul>	Once a month	PRDD / DS / MC / PIU
2.	First Aid		<ul style="list-style-type: none"> <li>Provision of an ambulance with required medicine and also trained person.</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
3.	Portable Water		<ul style="list-style-type: none"> <li>In every workplace and labor camps, potable water shall be available throughout the day in sufficient quantities. Water should be easily accessible. In general cold potable water is acceptable.</li> </ul>	Routine	PRDD / DS / MC / PHI / PIU
4.	Hygiene		<ul style="list-style-type: none"> <li>Removing all used and empty cans, containers, tires etc. from accommodation and project area.</li> <li>Approved chemicals to be regularly applied to destroy mosquitoes.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Office building and accommodation to be cleaned everyday.</li> <li>Giving education about vector based diseases to the workers.</li> <li>Quality mosquito nets to be provided to workers.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Contractor shall keep all places of work, labor camps, and office and store buildings clean, devoid of garbage to prevent breeding of rats and other vectors such as files.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Measuring health level of workers - using checklists. Measuring health level of workers by keeping interpersonal relationship with workers</li> </ul>	Once a month	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
5.	Extraction of natural resources such as sand, metal, earth	(i). Depletion of natural Resources	<ul style="list-style-type: none"> <li>Keeping interpersonal relationship with local public (project area) and get information about vector based diseases at village level.</li> <li>Clean and maintain drain lines properly to prevent stagnation of water.</li> <li>Arranging awareness programs about vector based diseases to the workers.</li> <li>Provide proper solid waste management facility at the camp and office premises and educate all workers on properly handle the facility in consultation with PS.</li> </ul> <ul style="list-style-type: none"> <li>Any extractive natural resources for project</li> </ul>	Twice a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>Forest Reserves and Protected areas shall not be encroached upon temporarily or permanently either for road expansion, parking of vehicles disposal of debris, stockpiling of earth, garbage disposal etc. or any activity under this project.</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>• All applicable approvals/ licenses of Government of Sri Lanka to operate facilities and road construction work shall be obtained prior to commencing the relevant work. The conditions contained in these approvals/ licenses shall not be violated under any circumstances.</li> </ul>	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>• If construction related resources are to be obtained from commercial sources, the contractor shall ensure that the commercial suppliers have the requisite approvals/ licenses to extract/ supply such resources and will be responsible for having copies of such approvals/ licenses at the site office.</li> </ul>	Routine	PRDD / DS / MC / PIU
6.	Use of fuel	i) Risk of contamination and accidents by fuel	Vehicle/ machinery and equipment serving and maintenance work shall be carried- out only in designated locations/ service stations approved by the EE. Avoid sensitive location such as close to streams/ rivers, upstream of wells and springs used by community and areas of flooding.	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>Waste oil, other petroleum products and untreated waste water shall not be discharged on ground so that it causes soil pollution. Adequate measures shall be taken against pollution of soil by spillage of petroleum/ oil products from storage tanks and containers. All waste petroleum products shall be disposed of in accordance with the guidelines issued by the CEA or the EE.</li> </ul>	Once a month	PRDD / DS / MC / CEA / PIU
			<ul style="list-style-type: none"> <li>Sites used for vehicle and plant service and maintenance shall be cleaned thoroughly and free of waste, oil product etc. and all debris shall be disposed in designated sites of the LA. Sites restoration will be considered as incidental to work.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>All vehicles and plant maintenance and servicing stations shall be located and operated as per the conditions and/ or guidelines issued by the CEA. In general, these should be located away from water-bodies. Wastewater shall not be disposed without meeting the disposal standards of the CEA. Waste water from vehicle and plant maintenance and servicing stations shall be removed of oil and grease and other contaminants to meet the relevant standards before discharging to the environment.</li> </ul>	Once a month	PRDD / DS / MC / CEA / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
7.	Handling of explosives	(i). Risk and Safety issues due to blasting at mining and Quarry site	<ul style="list-style-type: none"> <li>Vehicle, machinery and equipment maintenance and refueling shall be done as required by the Manual to prevent water pollution as well.</li> <li>Safety measures at mining/ quarry site are as follows:</li> <li>The warning sign boards have to be permanently erected around the proposed site to inform/ warn general public that this is a blasting site and entry is dangerous. The method of signaling the firing of blast round to be in the same sign board. The flagmen with red flags will be stationed in close vicinity around the blasting area, in order to prevent unauthorized persons including other workers of the site except members of blasting gang, when charging proceeds.</li> <li>Smoking or other sources of fire will not be allowed while charging proceeds. Standard guidelines to be strictly followed during storing, transporting, handling, charging and blasting of explosives in order to prevent accident misfire etc.</li> </ul>	Once a month  During blasting	PRDD / DS / MC / PIU  PRDD / DS / MC / Police / Explosive Controller / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>When the charging is completed and it is ready to fire, red flagmen will inform the houses in close proximity. An air siren, which can be heard more than 500 m from the site, will be operated three times before firing a shot. Soon after the firing of shot, Mine Engineer or blasting Headman will inspect the blasted area for detecting undetonated explosive devices, if any. If he is satisfied that every thing is in order to the work and machinery will be allowed to proceed on, after a short intermittent, siren spell to inform people that blasting is completed.</li> </ul>		
8.	All activities	(i). Loss of green cover vegetations and fauna by clearing of green surface cover for development, cutting of trees and important vegetations during project activities.	<ul style="list-style-type: none"> <li>During any project related activity (borrow pit, quarry etc.) if a rare/ threatened/ endangered fauna or flora species, is found, it shall be immediately informed to the EE. All activities that could destroy such species and or its habitat shall be stopped with immediate effect. Such activities shall be started only after obtaining the EE's approval.</li> <li>Contractor shall carry - out all activities and plans that the EE instructed him to undertake to conserve such flora and fauna and / or its habitat.</li> </ul>	Once a month	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		(ii). Parking and servicing of construction vehicle and equipment other than working areas or other than designated areas.  (iii). Carelessness of workers  (iv). Accidents with wild animals by vehicles or equipment, hunting of wild animals by workers.	<ul style="list-style-type: none"> <li>• All works shall be carried-out in such a manner that the destruction or disruption to the ground vegetations, fauna and their habitats are minimal.</li> </ul>	At the beginning	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>• Construction workers, drivers, workers shall be instructed protect fauna including wild animals and aquatic life as well as their habitats. Hunting, poaching, unauthorized fishing by project workers is not allowed. Construction workers shall not be allowed to trespass into Sanctuaries, National Parks and protected areas if the road is traversing through such areas.</li> </ul>	Once a month	PRDD / DS / MC / PIU
9.	Operation of heavy vehicles and equipments	(i). Noise and vibration	<ul style="list-style-type: none"> <li>• All vehicles, equipment and machinery used for construction work should be regularly serviced and well maintained to ensure that emission levels comply with the relevant standards. For this purpose, experienced officer and supporting staff may be engaged.</li> </ul>	Once a month	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>• Working time shall be limited to 7.00 am to 6.00 pm.</li> <li>• Workers working at strong noisy areas provided with ear plugs, helmets, masks, other protective gears.</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
10.			<ul style="list-style-type: none"> <li>• Noise limits for construction equipment used in this project (measured at one meter from the edge of the equipment in free field) such as compactors, rollers, front-end loaders, concrete mixers, cranes (movable), vibrators and saws shall not exceed 75 dB (A)</li> </ul>	Routine	PRDD / DS / MC / PIU
			<ul style="list-style-type: none"> <li>• All machinery and equipment should be well maintained and fitted with noise reduction device in accordance with manufacturer's instructions.</li> </ul>	Once a month	PRDD / DS / MC / PIU
10.	Disposal of Harmful Construction Wastes	(i) Risk of contamination and accidents by fuel  i	<ul style="list-style-type: none"> <li>• Contractor prior to the commencement of work shall provide list of harmful, hazardous and risky chemicals/ material that will be used in the project work to the Engineer. Contractor shall also provide the list of places where such chemicals/materials or their containers or other harmful materials have been dumped as waste at the end of the project.</li> <li>• All disposal sites should be approved by the engineer and approved by CEA and relevant local authority.</li> <li>• The contractor shall clean up any area including water-bodies affected/ contaminated (if any) as directed by the engineer at his own cost</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
11.	Storage & Handling of Construction Materials	Emmision of Dust	<ul style="list-style-type: none"> <li>Storage locations of sand, metal, soil should be located away from settlements and other sensitive receptors and covered (with artificial barriers or natural vegetation).</li> <li>All access roads within the storage site should be sprinkled with water for dust suspension.</li> </ul>	Routine	PRDD / DS / MC / PIU
		Storage of fuel, oil and chemicals (avoid fumes and offensive odour)	<ul style="list-style-type: none"> <li>All cement, bitumen (barrels), oil and other chemicals should be stored and handled on an impervious surface (concrete slab) above ground level.</li> <li>Storage facility of cement, bitumen (barrels), oil and other chemicals should be an enclosed structure ensuring that no storm water flows in to the structure.</li> <li>A ridge should be placed around the storage facility to avoid runoff getting in to the structure.</li> <li>Adequate ventilation should be kept to avoid accumulation of fumes and offensive odour that could be harmful to material handlers.</li> </ul>	Routine	PRDD / DS / MC / PIU
12.	Flood Prevention	Blockage of drainage paths & drains	<ul style="list-style-type: none"> <li>Contractor's activities shall not lead to flooding conditions as a result of blocked drainage paths and drains. The contractor shall take all measures necessary or as directed by the Engineer to keep all drainage paths and drains clear of blockage at all times.</li> <li>If flooding or stagnation of water is caused by contractor's activities, contractors shall provide suitable means to (a) prevent loss</li> </ul>	Routine	PRDD / DS / MC / ID / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
13..	Environmental enhancement	Utilities & roadside amenities	of access to any land or property and (b) prevent damage to land and property. Contractor shall compensate for any loss of income or damage as a result		
			<ul style="list-style-type: none"> <li>• Contractor's activities shall not lead to aggravate floods in flood prone areas when working in flood prone areas.</li> <li>• When working in flood prone areas during rainy season the contractor shall avoid storing materials, chemicals and other items of work in areas where those can be washed away by the floods.</li> <li>• Contractor shall replace all amenities such as bus shelters that were removed/ relocated during the construction unless the Engineer directed the contractor not to do so.</li> </ul>	Routine	PRDD / DS / MC / ID / PIU
13..	Environmental enhancement	Utilities & roadside amenities	<ul style="list-style-type: none"> <li>• Contractor shall take care not to damage/destroy or affect the functional purposes of utilities such as water, electricity, telephone posts. The arrangements the contractor made with those service providers shall be informed to the Engineer in writing (advance work). Contractor shall assist the service providers in whatever possible manner to minimize disruption to such services.</li> <li>• In case of an inadvertent damage cause to a utility, the contractor shall immediately inform the service provider and help to restore the service without delay.</li> </ul>	During replacement	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		Road Furniture	<ul style="list-style-type: none"> <li>Road furniture including footpaths, railings, storm water drains, crash barrier, traffic signs, speed zone signs, pavement markers and any other such items will be provided as per design given in the Bid Documents.</li> <li>Intersections, rotaries, traffic islands, roadside protection and other structures or furniture shall be constructed, complete with the landscape elements as per design in the above manner.</li> </ul>	When providing such items	PRDD / DS / MC / PIU
14..	Handling environmental issues		<ul style="list-style-type: none"> <li>The Contractor will appoint a suitably qualified Environmental Officer following the award of the contract. The Environmental Officer will be the primary point of contact for assistance with all environmental issues during the pre-construction and construction phases. He/ She shall be responsible for ensuring the implementation of EMAP.</li> <li>The Contractor shall appoint a person responsible for community liaison and to handle public complaints regarding environmental/ social related matters. All public complaints will be entered into the Complaints Register. The Environmental Officer will promptly investigate and review environmental complaints and implement the appropriate corrective actions to arrest or mitigate the cause of the complaints. A register of all complaints is to be passed to the Engineer within 24 hrs they are received, with the action taken by the Environmental Officer on complaints thereof</li> </ul>	Routine	PRDD / DS / MC / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>● Contractor shall develop suitable method to receive complaints. The complain register shall be placed at a convenient place, easily accessible by the public.</li> <li>● Contractor shall prepare detailed Environmental Method Statement (EMS) clearly stating the approach, actions and manner in which the EMAP is implemented. It is required from the contractor to prepare the EMS for each work site, if work will be carried out at more than one site at once and time plan for implementation. The EMS shall be updated regularly and submit for Engineers review.</li> </ul>		

### 3. Operational Stage

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Stagnation of water at culverts during heavy rains due to siltation and blocking of openings with debris.		<ul style="list-style-type: none"> <li>Regular clearing/ cleaning and maintenance of all culverts to reduce the chances of failures and blocking due to debris. Maintenance manual of PRDA should be followed to maintain the road drainage system</li> </ul>	Routine	PRDD / DS / MC / PIU
	Road safety		<ul style="list-style-type: none"> <li>All road furniture described under item 15 of construction stage should be maintained by PRDA</li> <li>A management plan should be formulated with the local police to avoid any vehicle to carry loads that exceed the carrying capacity (load) of the rehabilitated road.</li> <li>Weigh stations could be introduced at selected locations to measure the load of vehicle.</li> </ul>	Routine	PRDD / DS / MC / Police / PIU
	Encochement of new ROW		<ul style="list-style-type: none"> <li>Continuous monitoring and strict regulations should be followed to avoid the encroachment. Executive Engineers under direct supervision of Chief Engineer and Provincial Director should conduct regular checking along the road and remove any unauthorized activities within the ROW.</li> </ul>	Routine and when an complaint is received	PRDD / DS / MC / Police / PIU

## **ANNEXES**

**ANNEX – I:** Roadside Built Structures / Part of Built Structures to be Removed

**ANNEX – II:** Roadside Electricity Posts to be Shifted / Roadside Abandoned Electricity Posts to be Removed

**ANNEX – III:** Roadside Telephone Posts to be Shifted

**ANNEX - IV:** List & Chainage of Culverts, Cross Culverts, Built-up Drains, Covered Built-up drains, Concrete Shoe Drains to be Repaired / Erected / Re-build, Erect New Culverts, Side walls of Culverts to be Extended, Roadside Covered Built Up Leaderways to be Erected, Repaired & Cleaned, Silttraps to be Erected

**ANNEX – V:** List of Trees to be Removed or Affected due to Development of RHS / LHS Roadway

**ANNEX – VI:** List & Chainage of Removal of Unsuitable Soil, Road to be Filled & Lifted, Raise the Road to Enable Rain Water Drain Properly,

**ANNEX – VII:** List & Chainages of Environmentally Sensitive Sites along the Roadway (Noise Pollution and Air Pollution Sensitive Sites)

**ANNEX – VIII:** Summary of Procedure to Obtain Mining License for Borrow Pit Operation

**ANNEX – IX:** Summary of Procedure to Obtain Mining License for Quarry Operation

**ANNEX – I****Roadside Built Structures / Part of Built Structures to be Removed**

<b>Chainage</b>	<b>Activity</b>
0+000 – 0+100	0+020 Roadward built up steps of a boutique in LHS to be demolished
0+500 – 0+600	0+540 – 0+550 Demolish section of boundary wall & gate in LHS and re-build in towards further LHS 0+595 – 0+600 Demolish section of boundary wall in LHS
0+700 – 0+800	0+700 – 0+710 Demolish section of boundary wall in LHS 0+720 – 0+730 Demolish section of boundary wall in LHS

**ANNEX – II****Roadside Electricity Posts to be Shifted / Roadside Abandoned Electricity Posts to be Removed**

<b>Chainage</b>	<b>Activity</b>
0+000 – 0+100	0+005 Electricity post in LHS to be shifted towards further LHS 0+007 Electricity post in LHS to be shifted towards further LHS
0+100 – 0+200	0+175 Electricity post in RHS to be shifted towards further RHS
0+500 – 0+600	0+520 Electricity post in LHS to be shifted towards further LHS 0+527 Remove abandoned electricity post in LHS 0+595 Electricity post in LHS to be shifted towards further LHS 0+596 Remove abandoned electricity post in LHS.
0+700 – 0+800	0+715 Electricity post in LHS to be shifted towards further LHS 0+735 Electricity post in LHS to be shifted towards further LHS
0+800 – 0+900	0+800 Electricity post in LHS to be shifted towards further LHS 0+840 Electricity post in LHS to be shifted towards further LHS
0+900 – 1+000	0+920 Electricity post in LHS to be shifted towards further LHS 0+990 Electricity post in LHS to be shifted towards further LHS
1+000 – 1+050	1+025 Electricity post in LHS to be shifted towards further LHS

**ANNEX – III****Roadside Telephone Posts to be Shifted**

<b>Chainage</b>	<b>Activity</b>
0+000 – 0+100	0+043 Telephone post in RHS to be shifted towards further RHS
0+100 – 0+200	0+150 Telephone post in RHS to be shifted towards further RHS 0+180 Telephone post in RHS to be shifted towards further RHS
0+200 – 0+300	0+225 Telephone post in RHS to be shifted towards further RHS 0+250 Telephone post in RHS to be shifted towards further RHS 0+285 Telephone post in RHS to be shifted towards further RHS
0+300 – 0+400	0+380 Telephone post in RHS to be shifted towards further RHS
0+400 – 0+500	0+425 Telephone post in RHS to be shifted towards further RHS 0+470 Telephone post in RHS to be shifted towards further RHS 0+480 Telephone post in RHS to be shifted towards further RHS

**ANNEX – IV**

**List & Chainage of Culverts, Cross Culverts, Box Culverts, Built-up Drains, Covered Built-up drains, Concrete Shoe Drains, Toe Walls to be Repaired / Erected / Re-build, Sections with Side Drains are not Required & Erect New Culverts, Side walls of Culverts to be Extended, Roadside Covered Built Up Leaderways to be Erected, Repaired & Cleaned, Silttraps to be Erected**

<b>Chainage</b>	<b>Activity</b>
0+000 – 0+100	0+000 – 0+100 Demolish both sides existing partly damaged concrete built up drains and erect new concrete covered built up drains in both RHS & LHS. 0+000 Minor repairs and clean existing culvert at the starting point of the road (at the eastern end of A4 (CRWB) main road) 0+085 Side road to LHS. Re-build existing cross culvert
0+100 – 0+200	0+100 – 0+200 Demolish both sides existing partly damaged concrete built up drains and erect new concrete covered built up drains in both RHS & LHS.
0+200 – 0+300	0+200 – 0+300 Demolish both sides existing partly damaged concrete built up drains and erect new concrete covered built up drains in both RHS & LHS.
0+300 – 0+400	0+300 – 0+400 Demolish existing partly damaged concrete built up drain and erect new concrete covered built up drain in LHS 0+300 – 0+350 Erect concrete covered built up drain in RHS 0+350 – 0+400 Erect concrete shoe drain in RHS 0+315 Side road to LHS. Re-build existing cross culvert. 0+351 Side road to RHS. Extend concrete shoe drain on top of side road.
0+400 – 0+500	0+400 – 0+500 Demolish existing partly damaged concrete built up drain and erect new concrete covered built up drains in LHS 0+400 – 0+500 Erect concrete shoe drain in RHS 0+400 Side road to LHS. Erect cross culvert. 0+450 Side road to LHS. Erect cross culvert.
0+500 – 0+600	0+500 – 0+510 Demolish existing partly damaged concrete built up drain and erect new concrete covered built up drain in LHS 0+510 – 0+600 Erect concrete shoe drain in LHS 0+500 – 0+510 Erect concrete shoe drain in RHS 0+510 – 0+600 Minor repairs to existing concrete built up drains 0+510 Repairs to existing culvert.

<b>Chainage</b>	<b>Activity</b>
0+600 – 0+700	0+600 – 0+700 Erect concrete shoe drain in LHS 0+600 – 0+640 Minor repairs to existing concrete built up drains and put concrete covers on top. 0+640 – 0+700 Erect concrete built up covered drain in RHS 0+640 Side road to RHS. Minor repairs to existing cross culvert. 0+640 Leaderway (in RHS) is starting from RHS edge of cross culvert. Erect silttrap at the RHS edge of cross culvert.
0+700 – 0+800	0+700 – 0+800 Erect concrete shoe drain in LHS 0+700 – 0+800 Erect concrete built up covered drain in RHS
0+800 – 0+900	0+800 – 0+900 Erect concrete shoe drain in LHS 0+800 – 0+900 Erect concrete built up covered drain in RHS 0+855 Side road to RHS. Erect cross culvert 0+880 Side road to RHS. Erect cross culvert
0+900 – 1+000	0+900 – 1+000 Erect concrete shoe drain in LHS 0+900 – 1+000 Erect concrete built up covered drain in RHS 0+920 Side road to RHS. Erect cross culvert
1+000 – 1+050	1+000 – 1+050 Erect concrete shoe drain in LHS 1+000 – 1+050 Erect concrete built up covered drain in RHS 1+000 Side road to RHS. Erect cross culvert 1+050 Erect culvert at the end point of road (along the westward edge of existing road parallel to beach and erect concrete built up leaderway along the westward edge of this road until it meets Sainamaruthu Lagoon). Erect silttrap at the RHS end of the proposed culvert at end point of the road.

**ANNEX – V****List of Trees to be Removed or Affected due to Development of RHS / LHS Roadway**

Three individual trees belonging to two species having about 15 cm DBH will be removed from roadsides due to road widening. Details are given In following table.

**Abbreviations:**

**RHS** – Right Hand Side

**RS** – Roadside

**N** – Native

**I** – Introduced

**DBH** – Diameter at Breast Height

**cm** – Centimeter

Chainage	Side	Habitat	Tree Species	Local Name	Status	DBH (cm)	Note
0+430	RHS	RS	<i>Thespesia populnea</i>	Suriya	N	15	Cut
0+432	RHS	RS	<i>Thespesia populnea</i>	Suriya	N	15	Cut
0+965	RHS	RS	<i>Ceiba pentandra</i>	Pulun	I	15	Cut

**ANNEX – VI****List & Chainage of Removal of Unsuitable Soil, Road to be Filled & Lifted, Raise the Road to Enable Rain Water Drain Properly,**

<b>Chainage</b>	<b>Activity</b>
0+100 – 0+200	0+175 – 0+200 Remove unsuitable soil, fill with suitable soil and lift the road
0+200 – 0+300	0+200 – 0+300 Remove unsuitable soil, fill with suitable soil and lift the road
0+300 – 0+400	0+300 – 0+350 Remove unsuitable soil, fill with suitable soil and lift the road
0+400 – 0+500	0+400 – 0+500 Remove unsuitable soil, fill with suitable soil and lift the road
0+700 – 0+800	0+750 – 0+790 Remove unsuitable soil, fill with suitable soil and lift the road

**ANNEX – VII**

**List & Chainages of Environmentally Sensitive Sites along the Roadway (Noise Pollution and Air Pollution Sensitive Sites)**

<b>Chainage</b>	<b>Activity</b>
0+000 – 0+100	0+035 – 0+050 Multi Trade Vocational Training Centre in RHS 0+090 – 0+100 Mahamud Ladies College in LHS 0+090 – 0+100 Happy Kids Pre School in RHS
0+100 – 0+200	0+100 – 0+200 Mahamud Ladies College in LHS 0+100 – 0+110 Happy Kids Pre School in RHS
0+200 – 0+300	0+200 – 0+300 Mahamud Ladies College in LHS
0+300 – 0+400	00+300 – 0+315 Mahamud Ladies College in LHS
0+600 – 0+700	0+650 – 0+700 Zahira College in Sainthamaruthu in RHS
0+700 – 0+800	0+700 – 0+800 Zahira College in Sainthamaruthu in RHS
0+800 – 0+900	0+800 – 0+855 Zahira College in Sainthamaruthu in RHS

**ANNEX - VIII****Summary of Procedure to Obtain Mining License for Borrow Pit Operation**

1. Identify the site and verify ownership (land clearing)
18. Obtain letters of consent from the owners (Private / Government)
19. Contractor applies for site clearance from CEA
20. CEA may request an IEE or EIA to be carried out by the contractor
21. CEA gives clearance.
22. Contractor applies for Mining License (IML/A, IML/B or IML/C) from GSMB.
23. GMSB conducts joint inspection with a committee comprising with CEA, DS, and PS.
24. Contractor has to make bank guarantee specified by the GSMB based on the situation of the land, prior to issuing Mining License.
25. Contractor applies for Trade license from PS.

## **ANNEX – IX**

### **Summary of Procedure to Obtain Mining License for Quarry Operation**

1. Identify the site and verify ownership (land clearing)
24. Obtain letters of consent from the owners (Private/ Government)
25. Contractor applies for site clearance from CEA
26. CEA may request an IEE or EIA to be carried out by the contractor
27. CEA gives clearance
28. Contractor applies for Mining License (IML/A, IML/B or IML/C) from GSMB.
29. GMSB conducts joint inspection with a committee comprising with CEA, DS, and PS who would decide whether the test blast is needed for IML-A and IML-B which depends on the sensitivity of the site. Test blast will be carried out prior to issuing Mining License
30. Contractor applies for EPL from CEA
31. EPL is issued by CEA
32. GSMB monitors noise and vibrations annually and renews license
33. Contractor applies for explosive license from the Ministry of Defense
34. Contractor applies for Trade license/ Approval from PS

### **Abbreviations**

CEA	-	Central Environment Authority
DS	-	Divisional Secretariat
PIU	-	Project Implement Unit
GSMB	-	Geological Survey and Mines Bureau
NWS&DB	-	National Water Supply and Drainage Board
ADD	-	Agrarian Development Department
PRDD	-	Provincial Road Development Department
SLT	-	Sri Lanka Telecom
STC	-	State Timber Corporation
CEB	-	Ceylon Electricity Board
ICTAD	-	Institute for Construction Training and Development
ID	-	Irrigation Department
LA	-	Local Authority
ILO	-	International Labor Organization
IAD	-	International Development Agency
WB	-	World Bank
MC	-	Municipal Council
PS	-	Pradeshiya Sabha
CRWB	-	Colombo – Ratnapura – Wellawaya – Batticaloa
IE	-	Irrigation Engineer
ME	-	Mining Engineer
EE	-	Executive Engineer
MOH	-	Medical Officer of Health
PHI	-	Public Health Inspector
RoW	-	Right of Way
EIA	-	Environmental Impact Assessment
IEE	-	Initial Environmental Examination
RHS	-	Right Hand Side
LHS	-	Left Hand Side
Co-op	-	Co-operative
DBH	-	Diameter at Breast Height
IML	-	Industrial Mining License
EPL	-	Environmental Protection License
VET	-	Vehicular Emission Test
EMP	-	Environmental Management Plan
EA	-	Environmental Assessment

## **Road Specific Environmental Management Plan**

### **Road Sector Assistance Project (RSAP)**

#### **Eastern Province**

#### **MALWATTA SURUIPODAI ROAD (EPAMC039)**

CE Division	-	Ampara
EE Division	-	Kalmunai
DS Division	-	Samanthurai
PS Division	-	Samanthurai

#### **Ampara District**

Starting Point – 306942 E / 236637 N (Malwatta Junction)

End Point - 308571 E / 232475 N (Meeting Point of Gal Oya Stream)

**Road Specific Environmental Management Plan (EMP) for Rehabilitating and Upgrading  
Malwatta – Suruipodai Road (EPAMC039) near Samanthurai  
(within Kalmunai EE Division in Ampara District)**

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The government of Sri Lanka (GOSL) has received a financial assistance from the World Bank to rehabilitate, improve and maintain the selected roads in provincial road network of the country. The proposed project will only focus on rehabilitation, improvement and maintenance of provincial roads selected through a strategic study, in order to facilitate economic activity in the areas served and provides users with better road safety conditions.

For provincial road rehabilitation, improvement and maintenance projects in Sri Lanka, all roads that will be rehabilitated, improved and / or maintained with IDA funds will need to prepare road specific EMP's and EA's to ensure compliance with the World Bank's environmental safeguard policies and the relevant provisions under the National Environmental Act (NEA) and associated regulations.

The road specific EMP and EA should be ready prior to finalization of the bidding documents. Sufficient conditions should be specified in the bidding documents, as well as the contractual agreements clearly defining requirements of compliance to adhere to the EA, implement the EMP and any subsequent changes and penalties for non-compliance. The EMP will be cost estimated in order to allow the contractor to bid for the funds required to implement the EMP. It is recommended the experience gained from Road Sector Assistance Projects should be taken into consideration when preparing this cost estimate.

Road specific EMP is the summarized matrix of all possible impacts that may occur during rehabilitation and upgrading the selected roads. The road specific EMP prepared for rehabilitation and upgrading Malwatta Suruipodai road near Samanthurai within Kalmunai EE Division in Ampara District is given below.

### **Road Specific Environmental Management Plan**

<b>Road</b>	-	Malwatta Suruipodai Road (EPAMC039)	<b>Road Length</b>	-	4.950 km
<b>DS Division</b>	-	Samanthurai	<b>CE Division</b>	-	Ampara
<b>PS Division</b>	-	Samanthurai	<b>EE Division</b>	-	Kalmunai

#### **1. Pre Construction Stage**

##### **(A). Land Acquisition**

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
1	Land Acquisition - identification of sections of already built structures to be removed from the existing road reservation	i). Loss of sections of already built structure (only 100m long barb wire fence) after removal of such structure	<ul style="list-style-type: none"> <li>Providing necessary provisions to shift and restore the structures outside the new road reservation.</li> <li>Required livelihood restoration measures for affected persons will be given in line with Environmental and Social Safeguard Policies of World Bank, National Involuntary Resettlement Policy (NIRP) and concession arrangements made by Provincial RDA for compensating project affected persons.</li> </ul>	Applicable throughout the road	As & when required	PRDD / DS / PS / PIU
		(i). Loss of sections of roadside lands (ii). Loss of roadside landscape	<ul style="list-style-type: none"> <li>Compensation based on the Land Acquisition Act (LAA), National Involuntary Resettlement Policy (NIRP) and concession arrangements made by Provincial RDA for compensating project affected persons.</li> <li>Consent of PS / DS for releasing sections of lands belongs to PS / DS that may need to be acquired due to minor adjustment to alignment within such areas.</li> </ul>	Applicable throughout the road	As & when required	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>Consent of Agrarian Development Department for filling of paddy lands along the road stretch</li> </ul>	Applicable throughout the road	During filling	PRDD / PIU / ADD

**(B). Identification of Utility Supply Line Posts needs to be Shifted**

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
Not a Single Utility supply Line Post (i.e. Electricity Posts or Telephone Posts) is Required to Shift during the Proposed Road Development Work						

**(C). Design for New Culverts, Box Culverts, Cross Culverts, Leaderways, etc, for Required Locations**

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
1.2	Design of new culverts, box culverts, cross culverts, , etc,  - Based on the elevation difference of roadway and flow pattern of drains across and along the road, it is necessary to design culverts, box culverts, cross culverts, leaderways, etc.,	(i).Identification of locations where new culverts, box culverts to be erected  (ii). Identification of locations where new cross culverts to be erected  (iii). Identification of locations where leaderways to be erected	<ul style="list-style-type: none"> <li>For new culverts, box culverts, appropriate designs should be considered to allow sheath flow or cross drainage without any blocking.</li> <li>Locations for new cross culverts should be identified to enable smooth drain of rain water through side drains</li> </ul>	Applicable throughout the road  Locations of proposed new culverts, box culverts, cross culverts & leaderways are given in Annex – II.	As & when required	PRDD / PIU

## 2 **Construction Stage**

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
1	<p>Site clearance and land development</p> <ul style="list-style-type: none"> <li>- setting out of area to be cleared</li> <li>- clearing</li> <li>- removal of trees</li> <li>- disposal of waste created from vegetation &amp; other debris material</li> </ul>	<p>(i). Loss of vegetation cover (trees, plants, etc.).</p> <p>(ii). Collapsing &amp; soil erosion on cleared &amp; filled road side downward slope sections of roadway.</p> <p>(iii). Loss of roadside landscape.</p>	<ul style="list-style-type: none"> <li>• Prevention of removal of trees as far as possible by slight adjusting the centerline, whenever possible.</li> <li>• However, to maintain the required width of the road &amp; its side drains, total of 19 trees have to be removed during the site clearance. During removing, attention should be paid to maintain minimum disturbances to soil cover and also care should be taken not to damage adjoining trees.</li> <li>• It is recommended to plant trees along the possible stretches of roadside in order to enhance the environment</li> <li>• It is also recommended to maintain the cleared &amp; filled LHS / RHS downward slope sections of roadway in 1:4 ratio and grass turf on them to control soil erosion, slope collapsing and to enhance the environment.</li> </ul>	<p>Applicable throughout the road</p> <p>Location, variety &amp; size of trees to be removed are given in Annex – III.</p>	As and when required	PRDD / DS / PIU
					Frequently	PRDD / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		(v). Generation of vegetation waste (eg:- leaves, braches, stems, grasses, shrubs.	<ul style="list-style-type: none"> <li>Waste shall be disposed as directed by the EE in a suitable site, subject to the approval of the LA. All the dispose material shall be disposed in such a manner that, <ul style="list-style-type: none"> <li>- water ways &amp; drainage paths are not blocked</li> <li>- should not be nuisance to the public</li> <li>- should not be washed away during rains &amp; floods</li> </ul> </li> </ul>	Applicable throughout the road	Frequently	PRDD / PS / PIU
2	Earth works & construction  Earthworks & excavation of roadway, LHS / RHS side drains, roadside leaderways, removal of unsuitable soil, stockpiling of suitable soil, road widening, filling, lifting & leveling, eroded sections in roadway, roadside downward slopes & shoulders to be strengthen, erection of roadside earth drains at required stretches,	(i). Dust, soil & other debris materials are generated during earthworks & roadway excavations, LHS / RHS side drains, roadside leader ways development, removal of unsuitable soil, stockpiling of suitable soil, road widening, filling, lifting & leveling, strengthening of eroded sections of roadway, roadside downward slopes & shoulders strengthening & erection of roadside earth drains at stretches, clean /	<ul style="list-style-type: none"> <li>Earth material excavation to develop (erect, deepen &amp; reshape) LHS / RHS side drains, removal of unsuitable soil, road widening, filling, lifting &amp; leveling, eroded sections in road way and shoulders to be strengthen, formation of shoulders, gravel surfacing, construction / development of culverts, cross &amp; box culverts, retaining &amp; toe walls &amp; side walls of culverts &amp; bridges to be extended, etc, should be done as per designs.</li> <li>During excavation attention should be paid to maintain 0.75 – 2.5m deep roadside LHS / RHS downward slopes in 1 : 4 ratio to avoid possible slope failures</li> <li>Contractor should find suitable soil material for shoulder formation and / or road filling from a borrow pit, subject to approval of the EE.</li> </ul>	Applicable throughout the road.  Locations of built-up & covered built-up drains, covered built up leaderways, culverts, cross culverts, retaining & toe walls to be developed / erected & culvert side walls to be extended are given in Annex-II.  List of stretches of roadside paddy fields to be filled for road widening is given in Annex – IV.	If any public complaint received during earth work and/or construction work	PRDD / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
	clean /	repairs /				
No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
	repairs / development of existing culverts, cross culverts, box culverts, existing leaderways, apply concrete to erect & repair silttraps, culverts, box & cross culverts, retaining & toe walls, side walls of culverts & bridges to be extended / repaired / rebuilt,	development of existing culverts, cross culverts, box culverts, existing leaderways, applying concrete to erect & repair silttraps, culverts, box & cross culverts, retaining & toe walls, side walls of culverts & bridges to be extended, shoulder formation, road concreting, asphalt laying	<ul style="list-style-type: none"> <li>Excavated earth materials and all debris materials shall be disposed immediately without allowing to stockpile at locations recommended by EE.</li> <li>During transportation, dispose materials should be covered with tarpaulin.</li> </ul>	Applicable throughout the road	During earthwork operation	PRDD / PS / PIU
			<ul style="list-style-type: none"> <li>With the consent of EE, contractor can use dispose materials to fill lands in an environmentally friendly manner for legally acceptable purposes</li> </ul>	Applicable throughout the road / working area	Routing	PRDD / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
	bridges & irrigation turn outs to be repaired / rebuilt & formation of shoulders, gravel surfacing & tar laying, grass turfing on edges of the gravel layer, side slopes of filled & lifted road stretches and downward roadside slopes to be grass turfed	(ii). Surface soil erosion, siltation into water bodies & paddy fields, impacts to aquatic flora & fauna, blockage of water ways & drainage paths, wash away of disposed soil materials during floods are created while handling dispose soil & other construction waste materia	<ul style="list-style-type: none"> <li>Debris material shall be disposed in such a manner that waterways, drainage paths would not get blocked.</li> <li>Drainage paths in LHS / RHS of the road should be improved / erected to drain rain water properly.</li> <li>Cross culverts, culverts &amp; side built-up drains should be erected to drain rain water properly</li> <li>Silt traps will be constructed to avoid siltation into water ways where necessary</li> <li>To avoid siltation, drainage paths should not be directed to streams and paddy fields and they should be separated from streams / paddy fields when road meets streams / paddy fields</li> </ul>	Applicable to working area throughout the road List of culverts, box & cross culverts, bridges, irrigation turn outs, leaderways, locations of silttraps are given in Annex – II. Locations of roadside paddy fields, removal of unsuitable soil, road widening, filling, lifting & leveling, etc, are given in Annex – IV.	Routine	PRDD / DS / PS / PIU
No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			<ul style="list-style-type: none"> <li>To maintain aquatic flora &amp; fauna along waterways, excavation work at the vicinity of waterways will be conducted during dry period.</li> <li>Disposed materials should not be allowed to wash away during floods.</li> <li>To avoid erosion of unloaded soil, level the disposal once a week in dry period or regularly in rainy season.</li> </ul>	Applicable to working area throughout the road	During earth work operation, if any public	PRDD / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
					complain received	
			<ul style="list-style-type: none"> <li>Water spraying should be done regularly.</li> </ul>	Applicable to working area throughout the road	Once a week	PRDD / PS / PIU
			<ul style="list-style-type: none"> <li>It is recommended to grass turf in 0.75 – 2.5m deep roadside downward slope to control soil erosion and avoid slope collapsing.</li> <li>Shrubs &amp; grasses to be planted on top surface of soil after completion of disposal</li> </ul>	Applicable to working area	On completion of the excavation	PRDD / PS / PIU
No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		(iii). Loss of stripped top soil removed during excavation for edge widening	<ul style="list-style-type: none"> <li>Stripped top soil during edge widening for a specified depth of 150 mm should be stored in stockpile for a height not exceeding 2m, under the direction of EE. If the contractor is in doubt whether to conserve top soil in a given area, EE should be consulted for advice. Stockpiles should be placed outside flood affected areas.</li> </ul>	Applicable throughout the road / working area	During earth work operation	PRDD / PS / PIU
			<ul style="list-style-type: none"> <li>Such stockpiled topsoil should be used to re-fill the areas where topsoil has been removed. Residual topsoil must be distributed on adjoining / proximate barren areas as identified by the EE in a layer of thickness of 75 mm – 150 mm. Stockpiles should be placed outside flood affected areas.</li> </ul>	Applicable throughout the road / working area	During earth work operation	PRDD / PS / PIU
			<ul style="list-style-type: none"> <li>Stockpiled topsoil for reuse shall not be surcharged or overburdened. As far as possible, multiple handling of top soil should be kept to a minimum. Advice &amp; instructions should be given to operators, supervisors and other workers about the importance of top soil and thereby to minimize removal of it. Stockpiled materials (top soil and others) should be stored separately.</li> </ul>	Applicable throughout the road / working area	Routine	PRDD / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		(iv). Risk of soil erosion in excavated areas for road filling, lifting & leveling, erecting retaining walls, headwall extensions, roadside slope embankment cutting removal of unsuitable soil, gravel laying, shoulder formation, construction of culverts, cross culverts, earth drains,bridges,	<ul style="list-style-type: none"> <li>• Barricades such as humps will be erected at excavated areas for earth, shoe, culverts &amp; cross culverts, silttraps, bridges, irrigation turn outs, retaining &amp; toe walls, side wall extensions, stretches of road widening, filling &amp; lifting and roadside slope embankment cutting, with proper sign boards, as some work in these sections will have to be stopped during heavy rains due to heavy erosion. To prevent soil erosion in these excavated areas, proper earth drain system should be introduced.</li> </ul>	List & locations of built-up drains, culverts, cross culverts& retaining walls, toe walls, covered built up leaderways, silttraps to be repaired / erected are given in Annex – II.	Routine	PRDD / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		irrigation turn outs, retaining , toe & side walls of culverts, etc.	<ul style="list-style-type: none"> <li>The work, permanent or temporary, shall consist of measures as per design or as directed by the EE to control soil erosion, sedimentation &amp; waterway pollution to the satisfaction of EE. Typical measures include the use of berms, dikes, sediment basins, fiber mats, mulches, grasses, slope drains &amp; other devices. All sedimentation &amp; pollution control works &amp; maintenance thereof are deemed, as incidental to the earthworks. As quickly as possible remove all the excavated soil from drains, culverts, walls &amp; shoulders to stockpiling lands. Please adhere to the CEA guidelines on the mitigatory measures for soil erosion. Ensure that the mitigatory measures are carried out consistently during the period of the project work</li> </ul>	Applicable throughout the road / working area	Routine	PRDD / PS / PIU
No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
		(v). Risk of soil erosion on edges of laid gravel layer, grass turfing should be done.	<ul style="list-style-type: none"> <li>To avoid soil erosion on edges of laid gravel layer, grass turfing should be done.</li> <li>To control soil erosion on excavated &amp; filled road side downward slopes along the roadway, it is recommended to grass turf on downward slopes.</li> </ul>	Applicable throughout the road	Routine	PRDD / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
3.	Impact on Flora	(i). Loss, Damage or Disruption to flora	<ul style="list-style-type: none"> <li>All works shall be carried out in a manner that the destruction to the flora and their habitats is minimised. Trees and vegetation shall be felled / removed only if that impinges directly on the permanent works or necessary temporary works. In all such cases contractor shall take prior approval from the Engineer.</li> <li>Contractor shall make every effort to avoid removal and/or destruction of trees of religious, cultural and aesthetic significance. If such action is unavoidable the Engineer shall be informed in advance and carry out public consultation and report on the same should be submitted to the Engineer.</li> <li>Contractor shall adhere to the guidelines and recommendations made by the Central Environmental Authority, if any with regard to felling of trees and removal of vegetation.</li> </ul>	<p>Throughout the road section where trees near / within the existing road reservation have to be removed and at locations where minor adjustments to the alignment is made as per design requirements.</p> <p>Location, variety &amp; size of trees to be removed are given in Annex – III.</p>	During removal of trees	PRDD / DS / CEA / PS / PIU

**(A). Applicable throughout the road**

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility

		<ul style="list-style-type: none"><li>• Removed trees must be handed over to the State Timber Corporation.</li><li>• A compensatory tree planting program should be developed in consultation with DS / DEO, local authorities and communities in order to replenish the loss of trees. At least 3 good specimens of same tree species (having &gt; 4 cm DBH) should be planted for each tree removed. Compensatory tree planting should be attended for about two years to promote survival of the replanted specimens</li><li>• Replanting should be as near as possible to the removal location Planting of selected fast growing trees which are of native species</li><li>• Replanting in the private lands could be encouraged to compensate impact due to loss of vegetation in private lands</li></ul>	Throughout the road section		PRDD / DS / PIU / RM - STC
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No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
4.	Impact on Fauna	(i). Loss, Damage or Disruption to fauna	<ul style="list-style-type: none"> <li>• All works shall be carried out in such a manner that the destruction or disruption to the fauna and their habitats is minimum.</li> <li>• Construction workers shall be instructed to protect fauna including wild animals and aquatic life as well as their habitats. Hunting, poaching and unauthorized fishing by project workers is not allowed.</li> <li>• Siting of all hot mix plants, crushing plants, workshops, depots and temporary worker camps and storing of toxic and hazardous materials at approved locations, and recycling and dumping of solid waste matter at locations approved by local authorities, maintenance of vehicles and equipment in good operable condition, ensuring no leakage of oil or fuel and the fitting of proper exhaust baffles. Any solid waste should not be dumped into water bodies.</li> </ul>	Applicable throughout the road section	Routine	PRDD / DS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
5.	Protection of water sources & quality due to road & related works	(i). Loss of minor water sources & effects to water quality of streams	<ul style="list-style-type: none"> <li>Minimize wastage of water in the construction process / operations. Educate &amp; make employees aware on water conservation, waste minimization &amp; safe disposal of waste.</li> </ul>	Applicable throughout the road	Routine	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>Arrange adequate supply of water for the project purpose throughout the construction period. Not obtain water for project purposes, including for labour camps, from public or community water supply schemes without a prior approval from the relevant authority.</li> </ul>	Applicable throughout the road	Routine	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>Not extract water from ground water or surface water bodies without the permission from EE &amp; relevant authority. Obtain the permission for extracting water prior to the commencing of the project, from the relevant authority.</li> </ul>	Applicable throughout the road	Routine	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>Construction over the seasonal streams shall be undertaken in dry period.</li> <li>Apply best management practices to control contamination of run-off water during maintenance &amp; operation of equipment.</li> <li>Maintain adequate distance between stockpiles &amp; water bodies to control effects to natural drainage paths.</li> </ul>	When a waterway is encountered	Routine	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
6.	Traffic management	(i). Disruption to road users during construction due to loss of access, The road may have to be closed for traffic during some Construction	<ul style="list-style-type: none"> <li>Temporary access will be provided when permanent access is blocked for construction. When construction work is in progress in one side, the other side will be opened for traffic &amp; properly trained flagmen will be made available with proper sign boards for control vehicles. At the end of each day, debris that blocked access path will be cleared away under the supervision of a supervisor.</li> </ul>	Applicable throughout the road	Routine	PRDD / Police / PIU
			<ul style="list-style-type: none"> <li>Use of road signs, barricades, cones &amp; trained flagmen. All sign barricades, pavement markings used for traffic management shall be cleared to the standards approved by Police. Provision for traffic safety measures shall be considered incidental to work &amp; follow ICTAD guidelines &amp; any instructions given by the Police.</li> </ul>	Applicable throughout the road	Routine	PRDD / Police / PIU
			<ul style="list-style-type: none"> <li>The contractor shall ensure that the running surface is always properly maintained, particularly during monsoon rainy period. So that disruption to traffic will not be occurred.</li> </ul>	Applicable throughout the road	Routine	PRDD / PIU / Police

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		(ii). Traffic control & safety	<ul style="list-style-type: none"> <li>Temporary traffic detours shall be kept free of dust by frequent application of water. Personnel used for traffic control by the contractor shall be properly trained &amp; provided with proper gear including communication equipment, luminous jackets for night use. Instructions &amp; advice to be given to workers to implement safety at site.</li> <li>Contractor shall comply with requirements for safety of the workers as per the ILO Convention No. 62 and Safety &amp; Health Regulations of the Factory Ordinance of Sri Lanka to the extent that those are applicable to this contract. The contractor shall supply all necessary safety measures at site.</li> </ul>	Applicable throughout the road  Applicable throughout the road	Routine  Routine	PRDD / PIU  PRDD / PIU / Police
7.	Operation of heavy vehicles & equipment	Noise Pollution due to operation of heavy vehicles & equipment	<ul style="list-style-type: none"> <li>Repairing vehicles, machinery &amp; equipment shall be done &amp; stationed only in the areas of work &amp; in any other designated areas by the EE. Instruction &amp; advice should be given to drivers &amp; operators (both company owned &amp; hired) to park vehicles &amp; equipment in the areas of work or designated areas by EE.</li> <li>Working duration will be limited to 7 am -6 pm. Noise limit for construction equipment, such as compactors, rollers, front end loaders, concrete mixtures, cranes, vibrators &amp; saws shall not exceed 75 dB (A).</li> </ul>	Environmentally sensitive sites for noise along the roadway are given in Annex – VII.	Routine	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		Air Pollution due to dust generation	<ul style="list-style-type: none"> <li>The contractor shall effectively manage the dust generating activities such as top soil removal, handling and transporting sand, rubble, bitumen, and cement during periods of high winds or during more stable conditions with winds directed towards adjacent residences and other facilities.</li> <li>All stockpiles shall be located sufficiently away from sensitive receptors.</li> <li>All vehicles delivering materials shall be covered to avoid spillage and dust emission.</li> <li>The contractor should avoid, where possible and take suitable action to prevent dirt and mud being carried to the roads (particularly following wet weather).</li> <li>The contractor should enforce vehicle speed limits to minimize dust generation.</li> <li>The Contractor shall employ a water truck to sprinkle water for dust suppression on all exposed areas as required (note: the use of waste water / waste oil for dust suppression is prohibited)</li> <li>All cleared areas shall be rehabilitated progressively.</li> <li>All earthwork shall be protected in a manner acceptable to the minimize generation of dust.</li> <li>All existing highways and roads used by vehicles of the contractor, or any of his subcontractor or supplies of materials or plant and similarly roads which are part of the works shall be kept clean and clear of all dust/mud or other extraneous materials dropped by such vehicles or their tyres.</li> </ul>	<p>Applicable throughout the road where earth work will take place, storage locations of sand, rubble, bitumen, cement and all sub roads used for material transportation.</p> <p>Pay special attention to environmentally sensitive sites for air pollution mentioned in Annex – VII.</p>	Routine	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
			<ul style="list-style-type: none"> <li>Clearance shall be affected immediately by manual sweeping and removal of debris, or, if so directed by the Engineer, by mechanical sweeping and clearing equipment. Additionally, if so directed by the Engineer, the road surface will be hosed or sprinkled water using appropriate equipments.</li> <li>Plants, machinery and equipment shall be handled (including dismantling) so as to minimize generation of dust.</li> <li>The contractor shall take every precaution to reduce the level of dust emission from the hot mix plants and the batching plants up to the satisfaction of the Engineer in accordance with the relevant emission norms.</li> <li>The hot mix plant be sited in accordance with CEA guidelines and operated with an EPL. The hot mix plants shall be fitted with</li> </ul>			
		Air Pollution due to Emission from Hot-Mix Plants and Batching Plants	<ul style="list-style-type: none"> <li>The hot mix plants and batching plants shall be sited in accordance with CEA guidelines. It is recommended that hot mix plants and batching plants to be located sufficiently away from noise sensitive sites (Annex – VII).</li> <li>The exhaust gases shall comply with the requirements of the relevant current emission control legislation. All operations at plants shall be undertaken in accordance with all current rules and regulations protecting the environment as well as the conditions given in the EPL.</li> </ul>	Locations where hot mix plants and batching plants are fixed.	Routine	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
		Air Pollution due to Odour & Offensive Smells	<ul style="list-style-type: none"> <li>Contractor shall take all precautions such as storing all chemicals used for construction works in properly closed containers with good ventilations to prevent odour and offensive smell emanating from chemicals and processes applied in construction works or from labour camps. In a situation when/where odour or offensive smell does occur contractor shall take immediate action to rectify the situation. Contractor is responsible for any compensation involved with any health issue arisen out of bad odour and offensive smells.</li> </ul>	Throughout the roadway including all sites used for store all chemicals and places where chemical reactions taken place.	Routine	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>The waste disposal and sewerage treatment system for the labour camps shall be properly designed, built and operated so that no odour is generated. Compliance with the regulations on health and safety as well as CEA and LA guidelines shall be strictly adhered to.</li> </ul>	At labour camps	Routine	PRDD / DS / PS / PIU
	Air Pollution due to Emissions from Construction Vehicles , Equipment & Machinery		<ul style="list-style-type: none"> <li>The emission standards promulgated under the National Environment Act shall be strictly adhered to.</li> <li>All vehicles, equipment and machinery used for construction shall be regularly serviced and well maintained to ensure that emission levels comply with the relevant standards.</li> <li>Contractor should obtain the certificate issued by the Vehicular Emission Test (VET) for all construction vehicles, plants and other machineries and it should be renewed annually</li> </ul>	All plants, machinery and vehicles used for construction	Routine	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Location	Monitoring	
					Frequency	Responsibility
8.	Protection of Cultural & Religious Places & Properties	Prevention of Damages to Cultural & Religious Places & Properties	<ul style="list-style-type: none"> <li>During construction activities the contractor should take all necessary and adequate care to minimize impacts on cultural properties which includes cultural sites and remains, places of worship including kovils (Cultural &amp; religious sites are given in Annex – V).</li> <li>Workers should not be allowed to trespass in to such areas.</li> </ul>	Locations of Cultural and religious sites are given in Annex – V	Routine	PRDD / DS / PS / Local Religious Leaders / PIU

## (B). Camp Sites / Site Office

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1	Installation of site office, labor camps	(i). Camp Sites / Site Office construction/ waste/ debris and vegetation waste like roots, leaves, stems, grasses, shrubs etc. From site clearance and fixing of temporary residential structures.	<ul style="list-style-type: none"> <li>Sites needing minimum vegetation clearance should be selected. It should also be away from tanks, canals and streams. Trees shall not be cut for clearing of the site.</li> </ul>	At the beginning	PRDD / DS / PS / PIU
		(ii). Generation of domestic solid waste from labor camps	<ul style="list-style-type: none"> <li>Garbage bins shall be provided by contractor at site offices and labor camps to collect solid waste. The disposal of the waste should be done at the disposal site of the LA.</li> </ul>	Once a month	PRDD / DS / PS / PHI through PRDA / PIU
		(iii). Generation of sewage waste from labor camps.	<ul style="list-style-type: none"> <li>The sewage to be generated from labor camp or site office should be disposed properly designed septic tanks or by other suitable sanitary disposal method complying with standards and guidelines of LA on sewage disposal.</li> </ul>	Once a month	PRDD / DS / PS / PHI through PRDA / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		(iv). Health problem may occur due to poor sanitation facilities and breeding of mosquitoes. Poor solid waste management shall be a major concern.	<ul style="list-style-type: none"> <li>Contractor shall take all precautions to prevent odor and offensive smell emanating from chemicals and processes applied in construction works or from labor camps. In a situation when/ where odor or offensive smell does occur, contractor shall take immediate action to rectify the situation. Contractor is responsible for any compensation involved with any health issue arisen out of bad odor and offensive smells. To prevent the breeding of vectors, the labor camps should be kept clean and hygienic. If there is any outbreak of disease, then the MOH or PHI of the area should be informed immediately. PHI and his staff to be requested for fumigation anti-mosquitoes chemicals (DDT) at regular period to avoid spreading of Dengue, Malaria etc.</li> </ul>	Once a month	PRDD / MOH/ PHI through PRDA / PIU
2	Extraction of water		<ul style="list-style-type: none"> <li>The contractor is responsible for arranging adequate supply of water for the project purpose through out the construction period. Contractor shall not obtain water for labor camps including other project works from public or community water supplies without approval from the relevant authority.</li> </ul>	Once a month	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
3	Rehabilitation of site		<ul style="list-style-type: none"> <li>Contractor shall remove the labor camps fully after its need is over, empty the septic tanks and close them, if instructed by the EE. Remove all garbage, debris and clean and landscape the area with grasses or suitable plants species.</li> </ul>	At the closure of the project	PRDD / DS / PS / PIU

**(C). Burrow Areas****Refer Annex VI for procedure to obtain Mining License for burrow pit operation**

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Establishment of burrow areas	(i). General issues due to establishment of burrow pit	<ul style="list-style-type: none"> <li>Burrowing within the RoW is prohibited under this contract. However, earth available from excavation for roadside drains as per design, may be used as embankment material subject to approval of the EE.</li> </ul>	At the beginning	PRDD / DS / PS / CEA /GSMB / PIU
			<ul style="list-style-type: none"> <li>Contractor shall comply with the environmental requirements/ guidelines issued by the CEA / GSMB and LA in respect of locating burrow areas and with regard to all operations related to excavation and transportation of earth from such sites.</li> </ul>	At the beginning	PRDD / DS / PS / CEA /GSMB / PIU
			<ul style="list-style-type: none"> <li>Burrow areas shall not be opened without the permission of the EE. The location, depth of excavation and extend of the pit or open cut area shall be as approved by the EE.</li> </ul>	At the beginning	PRDD / DS / PS / CEA /GSMB / PIU
			<ul style="list-style-type: none"> <li>Establishment of burrow pits/ areas and its operational activities shall not endanger the properties. Also shall not be danger or health hazard to the people.</li> </ul>	At the beginning	PRDD / DS / PS / CEA /GSMB / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
2.	Top soil removal	(i). Loss of top soil removed from burrow pits	<ul style="list-style-type: none"> <li>If agricultural / other productive areas to be used as burrow area, for the purpose of this project where it has to be removed topsoil, shall be stripped to a specified depth of 150 mm and stored in stockpiles of height not exceeding 2 m, if directed by the EE. If the contractor is in any doubt on whether to conserve the topsoil or not for any given area shall obtain the direction from the EE in writing. Such stockpiled topsoil must be returned to cover the areas including cut slopes where the topsoil has been removed due to project activities. Residual topsoil must be distributed on adjoining/ proximate barren areas as identified by the Engineer in a layer of thickness of 75 mm - 150 mm. Stockpiles should be placed outside flood affected areas.</li> </ul>	Once a month	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>Topsoil thus stockpiled for reuse shall not be surcharged or overburdened. As far as possible multiple handling of topsoil stockpiles should be kept to a minimum.</li> <li>Advices and instructions should be given to operators, supervisors and other workers regarding how important is topsoil stockpiles and thereby minimize removal of topsoil.</li> </ul>	Once a month	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
3.	Excavation of earth	(i). Generation of dust due to excavation	<ul style="list-style-type: none"> <li>All excavated material should be immediately taken to the site. If earth to be stockpiled, it should be covered. All workers are instructed to carry out activities in order to minimize dust generation. Water spraying should be done at regular intervals. Operation should not be carried out during period of high wind speeds.</li> </ul>	Routine	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>All stockpiles shall be located sufficiently away from sensitive receptors viz. religious sites, cultural and heritage sites, schools, institutions etc.</li> </ul>	Routine	PRDD / DS / PS / PIU
4.	Transportation of earth	(i). Generation of dust during transportation	<ul style="list-style-type: none"> <li>Loading and excavation of earth during high wind speeds should be avoided. All vehicles delivering earth shall be covered to avoid spillage of materials. The contractor shall enforce speed limits to minimize dust generation. Remove or sweep debris, dust and mud on roads using water bowsers (every two hours) to control dust generation on roads.</li> </ul>	Routine	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		(ii). Emission from construction vehicles, equipment and machinery	<ul style="list-style-type: none"> <li>Maximum speed of vehicle traveling within the construction areas should be limited to 20 km/hr for heavy vehicles and 40 km/hr for light vehicles.</li> </ul>	Routine	PRDD / DS / PS / PIU
5.	Rehabilitation / restoration of burrow areas		<ul style="list-style-type: none"> <li>As directed by the EE, the debris and residual spoil material and earth shall be used to fill the borrow areas. Required quantities of top soil shall be laid and proper drainage shall be provided in the burrow areas.</li> </ul>	Once a month	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>Once the burrow areas have been filled with suitable soil, appropriate plants and grasses shall be planted on top of it.</li> </ul>	Once a week during planting and once in three months during maintenance	PRDD / DS / PS / PIU

**(D). Quarry Operations****Refer Annex - VII for procedure to obtain Mining License for quarry operation**

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Quarry Operations	(i). Contamination or disturbance to the existing drainage system by the proposed quarry operations.	<ul style="list-style-type: none"> <li>Measures for preserving natural drainage system and soil erosion are as follows: Silt traps to be installed to avoid any contamination of streams/ rivers and other water bodies. Therefore, to prevent erosion, turfing works to be done on slope faces at quarry site and also earth drains to be maintained properly.</li> </ul>	Once a month	PRDD / DS / PS / PIU
		(ii). Loss of rare / endangered species of vegetation	<ul style="list-style-type: none"> <li>Contractor shall provide necessary instructions to workers, drivers, and operators not to destroy vegetation unnecessarily.</li> </ul>	Once a month	PRDD / DS / PS / PIU
		(iii). Adverse effects of air and noise pollution on nearby Settlements (Schools, Hospitals, Public buildings, Temples, Monuments), Forests, National	<ul style="list-style-type: none"> <li>Measures to control the air pollution/ dust from quarry operations are as follows:</li> <li>Water spraying at regular interval on site area and access roads. Planting trees and developing green belt around dust creating areas.</li> <li>Reduce expose area to wind.</li> <li>Proper maintenance of access road.</li> </ul>	Once a month	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues parks, Biodiversity reserves etc. The settlements	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>● Compensation Measures</li> </ul> <p>(a) The properties and life of the people of surrounding area to be covered with</p>	As and when required	PRDD / DS / PS / PIU
		to be located within 1 km distance are most likely to be affected.	<p>Public Liability Insurance Policy paid by the Contractor for the possible damages, which might accidentally occur even after taking all mitigatory measures.</p> <p>(b). Contractor will quickly repair the damages which might be caused by accidental fly rocks or any other reasons connected to quarry operations, even after taking all mitigatory measures.</p>		

**Pl. refer item no. G) 7 (i) - Risks and Safety issues and mitigations when handling explosives**

### (E). Crusher Plant

No.	Activity	Environmental Issues	Mitigation Measures	Monitoring	
				Frequency	Responsibility
1.	Crusher plant Operation	(i). Air pollution due to dust emission from crusher plant	<ul style="list-style-type: none"> <li>The crusher plant shall be sited in accordance with the CEA guidelines.</li> </ul>	At the beginning	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>A tall fence to be made around the crusher plants to minimize the dust and emission spread to surrounding area.</li> </ul>	Once a month	PRDD / DS / PS PIU
			<ul style="list-style-type: none"> <li>Water sprinkler system to be installed to crusher to control dust.</li> </ul>	Once a week	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>Plant, machinery and equipment shall be handled carefully (including dismantling) so as to minimize generation of dust.</li> </ul>	Once a month	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>All crushers used for construction shall conform to relevant dust emission levels as stated in the EPL</li> </ul>	Once a month	PRDD / DS / PS PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		(ii). Noise and vibration generation from crusher plant	<ul style="list-style-type: none"> <li>• Contractor shall take appropriate action to ensure that activities do not result in damage to adjacent properties due to vibration as stated in the EPL.</li> <li>• Maintaining noise level at the boundary of the crusher plant below 55 dB (A) as stated in the EPL. Operation period of the crusher plant to be limited to day- time between 8 hrs to 18 hrs.</li> </ul>	Once a month	PRDD / DS / PS / PIU

**(F). Access roads to/ from establishments to the site areas**

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Movement of heavy vehicles	(i). Damages to access/ local roads due to the movement of vehicles loaded with heavy construction related materials.	<ul style="list-style-type: none"> <li>• The maintenance and rehabilitation of the access roads in the event of damage by the contractor's operations shall be the responsibility of the contractor and to be attended as directed by EE.</li> <li>• Contractor to strictly limit loads to authorized values</li> </ul>	Routine	PRDD / DS / PS / PIU

**(G). Other Issues**

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Health and safety	(i). Protection of workers	<ul style="list-style-type: none"> <li>The contractor shall comply with requirements for the safety of the workmen as per the ILO convention No. 62 and Safety and Health Regulations of the Factory Ordinance of Sri Lanka to the extent that those are applicable to this contract. The contractor shall supply all necessary safety appliances such as safety goggles, helmets, masks, boots etc. to the workers and staff. The contractor has to comply with all regulations, regarding safe scaffolding, ladders, working platforms, gangway, stairways, excavators, trenches and safe means of entry.</li> <li>Recording day to day safety arrangements and incidents.</li> </ul>	Once a month	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>Measuring safety level- using checklist.</li> <li>Employing trained and experienced personnel when handling explosives.</li> <li>Informing public and workers about blasting by using siren at the places where blasting.</li> </ul>	Once a month	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
2.	First Aid		<ul style="list-style-type: none"> <li>Provision of an ambulance with required medicine and also trained person.</li> </ul>	Routine	PRDD / DS / PS / PIU
3.	Portable Water		<ul style="list-style-type: none"> <li>In every workplace and labor camps, potable water shall be available through out of the day in sufficient quantities. Water should be easily accessible. In general cold potable water is acceptable.</li> <li><u>Removing all used and empty cans, containers, tires etc. from accommodation and project area.</u></li> </ul>	Routine	PRDD / DS / PS / PHI / PIU
4.	Hygiene		<ul style="list-style-type: none"> <li>Approved chemicals to be regularly applied to destroy mosquitoes.</li> </ul>	Once a month	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>Office building and accommodation to be cleaned everyday.</li> <li>Giving education about vector based diseases to the workers.</li> <li>Quality mosquito nets to be provided to workers.</li> </ul>	Once a month	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>Contractor shall keep all places of work, labor camps, and office and store buildings clean, devoid of garbage to prevent breeding of rats and other vectors such as files.</li> </ul>	Once a month	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>Measuring health level of workers - using checklists. Measuring health level of workers by keeping interpersonal relationship with workers</li> </ul>	Once a month	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>Keeping interpersonal relationship with local public (project area) and get information about vector based diseases at village level.</li> <li>Clean and maintain drain lines properly to prevent stagnation of water.</li> <li>Arranging awareness programs about vector based diseases to the workers.</li> <li>Provide proper solid waste management facility at the camp and office premises and educate all workers on properly handle the facility in consultation with PS.</li> </ul>	Twice a month	PRDD / DS / PS / PIU
5.	Extraction of natural resources such as sand, metal, earth	(i). Depletion of natural Resources	<ul style="list-style-type: none"> <li>Any extractive natural resources for project activities shall not be extracted from designated Forest Reserves under the Forest Ordinance and designated protected areas under the Fauna and Flora Protection Ordinance.</li> </ul>	Routine	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>Forest Reserves and Protected areas shall not be encroached upon temporarily or permanently either for road expansion, parking of vehicles disposal of debris, stockpiling of earth, garbage disposal etc. or any activity under this project</li> </ul>	Routine	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>• All applicable approvals/ licenses of Government of Sri Lanka to operate facilities and road construction work shall be obtained prior to commencing the relevant work. The conditions contained in these approvals/ licenses shall not be violated under any circumstances.</li> <li>• If construction related resources are to be obtained from commercial sources, the contractor shall ensure that the commercial suppliers have the requisite approvals/ licenses to extract/ supply such resources and will be responsible for having copies of such approvals/ licenses at the site office.</li> </ul>	Routine Routine	PRDD / DS / PS / PIU PRDD / DS / PS / PIU
6.	Use of fuel	i) Risk of contamination and accidents by fuel	<ul style="list-style-type: none"> <li>• Vehicle/ machinery and equipment serving and maintenance work shall be carried- out only in designated locations/ service stations approved by the EE. Avoid sensitive location such as close to streams/ rivers, upstream of wells and springs used by community and areas of flooding.</li> </ul>	Routine	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>Waste oil, other petroleum products and untreated waste water shall not be discharged on ground so that it causes soil pollution. Adequate measures shall be taken against pollution of soil by spillage of petroleum/ oil products from storage tanks and containers. All waste petroleum products shall be disposed of in accordance with the guidelines issued by the CEA or the EE.</li> </ul>	Once a month	PRDD / DS / PS / CEA / PIU
			<ul style="list-style-type: none"> <li>Sites used for vehicle and plant service and maintenance shall be cleaned thoroughly and free of waste, oil product etc. and all debris shall be disposed in designated sites of the LA. Sites restoration will be considered as incidental to work.</li> </ul>	Once a month	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>All vehicles and plant maintenance and servicing stations shall be located and operated as per the conditions and/ or guidelines issued by the CEA. In general, these should be located away from water-bodies. Wastewater shall not be disposed without meeting the disposal standards of the CEA. Waste water from vehicle and plant maintenance and servicing stations shall be removed of oil and grease and other contaminants to meet the relevant standards before discharging to the environment.</li> </ul>	Once a month	PRDD / DS / PS / CEA / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>Vehicle, machinery and equipment maintenance and refueling shall be done as required by the Manual to prevent water pollution as well.</li> </ul>	Once a month	PRDD / DS / PS / PIU
7.	Handling of explosives	(i). Risk and Safety issues due to blasting at mining and Quarry site	<ul style="list-style-type: none"> <li>Safety measures at mining/ quarry site are as follows:</li> <li>The warning sign boards have to be permanently erected around the proposed site to inform/ warn general public that this is a blasting site and entry is dangerous. The method of signaling the firing of blast round to be in the same sign board. The flagmen with red flags will be stationed in close vicinity around the blasting area, in order to prevent unauthorized persons including other workers of the site except members of blasting gang, when charging proceeds.</li> <li>Smoking or other sources of fire will not be allowed while charging proceeds. Standard guidelines to be strictly followed during storing, transporting, handling, charging and blasting of explosives in order to prevent accident misfire etc.</li> </ul>	During blasting	PRDD / DS / PS / Police / Explosive Controller / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>When the charging is completed and it is ready to fire, red flagmen will inform the houses in close proximity. An air siren, which can be heard more than 500 m from the site, will be operated three times before firing a shot. Soon after the firing of shot, Mine Engineer or blasting Headman will inspect the blasted area for detecting undetonated explosive devices, if any. If he is satisfied that every thing is in order to the work and machinery will be allowed to proceed on, after a short intermittent, siren spell to inform people that blasting is completed.</li> <li>During any project related activity (borrow pit, quarry etc.) if a rare/ threatened/ endangered fauna or flora species, is found, it shall be immediately informed to the EE. All activities that could destroy such species and or its habitat shall be stopped with immediate effect. Such activities shall be started only after obtaining the EE's approval.</li> <li>Contractor shall carry - out all activities and plans that the EE instructed him to undertake to conserve such flora and fauna and / or its habitat.</li> </ul>	Once a month	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
8.	All activities	(i). Loss of green cover vegetations and fauna by clearing of green surface cover for development, cutting of trees and important vegetations during project activities.			
		(ii). Parking and servicing of construction vehicle and equipment other than working	<ul style="list-style-type: none"> <li>• All works shall be carried-out in such a manner that the destruction or disruption to the ground vegetations, fauna and their habitats are minimal.</li> </ul>	At the beginning	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
9.	Operation of heavy vehicles and equipments	<p>areas or other than designated areas.</p> <p>(iii). Carelessness of workers</p> <p>(iv). Accidents with wild animals by vehicles or equipment, hunting of wild animals by workers.</p> <p>(i). Noise and vibration</p>	<ul style="list-style-type: none"> <li>Construction workers, drivers, workers shall be instructed to protect fauna including wild animals and aquatic life as well as their habitats. Hunting, poaching, unauthorized fishing by project workers is not allowed. Construction workers shall not be allowed to trespass into Sanctuaries, National Parks and protected areas if the road is traversing through such areas.</li> </ul>	Once a month	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>All vehicles, equipment and machinery used for construction work should be regularly serviced and well maintained to ensure that emission levels comply with the relevant standards. For this purpose, experienced officer and supporting staff may be engaged.</li> </ul>	Once a month	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>Working time shall be limited to 7.00 am to 6.00 pm.</li> <li>Workers working at strong noisy areas provided with ear plugs, helmets, masks, other protective gears.</li> </ul>	Routine	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
10.	Disposal of Harmful Construction Wastes	(i) Risk of contamination and accidents by fuel	<ul style="list-style-type: none"> <li>• Noise limits for construction equipment used in this project (measured at one meter from the edge of the equipment in free field) such as compactors, rollers, front-end loaders, concrete mixers, cranes (movable), vibrators and saws shall not exceed 75 dB (A)</li> </ul>	Routine	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>• All machinery and equipment should be well maintained and fitted with noise reduction device in accordance with manufacturer's instructions.</li> </ul>	Once a month	PRDD / DS / PS / PIU
			<ul style="list-style-type: none"> <li>• Contractor prior to the commencement of work shall provide list of harmful, hazardous and risky chemicals/ material that will be used in the project work to the Engineer. Contractor shall also provide the list of places where such chemicals/materials or their containers or other harmful materials have been dumped as waste at the end of the project.</li> <li>• All disposal sites should be approved by the engineer and approved by CEA and relevant local authority.</li> <li>• The contractor shall clean up any area including water-bodies affected/ contaminated (if any) as directed by the engineer at his own cost</li> </ul>	Routine	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
11.	Storage & Handling of Construction Materials	Emmision of Dust	<ul style="list-style-type: none"> <li>Storage locations of sand, metal, soil should be located away from settlements and other sensitive receptors and covered (with artificial barriers or natural vegetation).</li> <li>All access roads within the storage site should be sprinkled with water for dust suspension.</li> </ul>	Routine	PRDD / DS / PS / PIU
		Storage of fuel, oil and chemicals (avoid fumes and offensive odour)	<ul style="list-style-type: none"> <li>All cement, bitumen (barrels), oil and other chemicals should be stored and handled on an impervious surface (concrete slab) above ground level.</li> <li>Storage facility of cement, bitumen (barrels), oil and other chemicals should be an enclosed structure ensuring that no storm water flows in to the structure.</li> <li>A ridge should be placed around the storage facility to avoid runoff getting in to the structure.</li> <li>Adequate ventilation should be kept to avoid accumulation of fumes and offensive odour that could be harmful to material handlers.</li> </ul>	Routine	PRDD / DS / PS PIU
12.	Flood Prevention	Blockage of drainage paths & drains	<ul style="list-style-type: none"> <li>Contractor's activities shall not lead to flooding conditions as a result of blocked drainage paths and drains. The contractor shall take all measures necessary or as directed by the Engineer to keep all drainage paths and drains clear of blockage at all times.</li> <li>If flooding or stagnation of water is caused by contractor's activities, contractors shall provide suitable means to (a) prevent loss</li> </ul>	Routine	PRDD / DS / PS / ID / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			of access to any land or property and (b) prevent damage to land and property. Contractor shall compensate for any loss of income or damage as a result		
		Work in flood prone areas	<ul style="list-style-type: none"> <li>Contractor's activities shall not lead to aggravate floods in flood prone areas when working in flood prone areas.</li> <li>When working in flood prone areas during rainy season the contractor shall avoid storing materials, chemicals and other items of work in areas where those can be washed away by the floods.</li> </ul>	Routine	PRDD / DS / PS / ID / PIU
13..	Environmental enhancement	Utilities & roadside amenities	<ul style="list-style-type: none"> <li>Contractor shall replace all amenities such as bus shelters that were removed/ relocated during the construction unless the Engineer directed the contractor not to do so.</li> <li>Contractor shall take care not to damage/destroy or affect the functional purposes of utilities such as water, electricity, telephone posts. The arrangements the contractor made with those service providers shall be informed to the Engineer in writing (advance work). Contractor shall assist the service providers in whatever possible manner to minimize disruption to such services.</li> <li>In case of an inadvertent damage cause to a utility, the contractor shall immediately inform the service provider and help to restore the service without delay.</li> </ul>	During replacement	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
		Road Furniture	<ul style="list-style-type: none"> <li>Road furniture including footpaths, railings, storm water drains, crash barrier, traffic signs, speed zone signs, pavement markers and any other such items will be provided as per design given in the Bid Documents.</li> <li>Intersections, rotaries, traffic islands, roadside protection and other structures or furniture shall be constructed, complete with the landscape elements as per design in the above manner.</li> </ul>	When providing such items	PRDD / DS / PS / PIU
14..	Handling environmental issues		<ul style="list-style-type: none"> <li>The Contractor will appoint a suitably qualified Environmental Officer following the award of the contract. The Environmental Officer will be the primary point of contact for assistance with all environmental issues during the pre-construction and construction phases. He/ She shall be responsible for ensuring the implementation of EMAP.</li> <li>The Contractor shall appoint a person responsible for community liaison and to handle public complaints regarding environmental/ social related matters. All public complaints will be entered into the Complaints Register. The Environmental Officer will promptly investigate and review environmental complaints and implement the appropriate corrective actions to arrest or mitigate the cause of the complaints. A register of all complaints is to be passed to the Engineer within 24 hrs they are received, with the action taken by the Environmental Officer on complaints thereof.</li> </ul>	Routine	PRDD / DS / PS / PIU

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
			<ul style="list-style-type: none"> <li>• Contractor shall develop suitable method to receive complaints. The complain register shall be placed at a convenient place, easily accessible by the public.</li> <li>• Contractor shall prepare detailed Environmental Method Statement (EMS) clearly stating the approach, actions and manner in which the EMAP is implemented. It is required from the contractor to prepare the EMS for each work site, if work will be carried out at more than one site at once and time plan for implementation. The EMS shall be updated regularly and submit for Engineers review.</li> </ul>		

### 3. Operational Stage

No.	Activity	Environmental Issues	Mitigatory Measures	Monitoring	
				Frequency	Responsibility
1.	Stagnation of water at culverts during heavy rains due to siltation and blocking of openings with debris.		<ul style="list-style-type: none"> <li>Regular clearing/ cleaning and maintenance of all culverts to reduce the chances of failures and blocking due to debris. Maintenance manual of PRDA should be followed to maintain the road drainage system</li> </ul>	Routine	PRDD / DS / PS / PIU
	Road safety		<ul style="list-style-type: none"> <li>All road furniture described under item 15 of construction stage should be maintained by PRDA</li> <li>A management plan should be formulated with the local police to avoid any vehicle to carry loads that exceed the carrying capacity (load) of the rehabilitated road.</li> <li>Weigh stations could be introduced at selected locations to measure the load of vehicle.</li> </ul>	Routine	PRDD / DS / PS / Police / PIU
	Encochement of new ROW		<ul style="list-style-type: none"> <li>Continuous monitoring and strict regulations should be followed to avoid the encroachment. Executive Engineers under direct supervision of Chief Engineer and Provincial Director should conduct regular checking along the road and remove any unauthorized activities within the ROW.</li> </ul>	Routine and when an complaint is received	PRDD / DS / PS / Police / PIU

## **ANNEXES**

**ANNEX – I:** Roadside Built Structures / Part of Built Structures to be Removed

**ANNEX - II:** List & Chainage of Culverts, Cross Culverts, Box Culverts, Bridges (Minor & Main), Irrigation Turn Outs (Minor & Main), Earth Drains, Roadside Irrigation Canals, Retaining Walls, Toe Walls to be Repaired / Erected / Widen / Replacing Damaged Ones, Side walls of Culverts, Box Culverts, Bridges, Irrigation Turn Outs to be Extended / Repaired / Replaced, Roadside Leaderways to be Repaired / Erected, Silttraps to be Erected, Stretches with No Irrigation Canals & Stretches with No Side Drains

**ANNEX – III:** List of Trees to be Removed or Affected due to Development of RHS / LHS Roadway

**ANNEX – IV:** List & Chainage of Removal of Unsuitable Soil, Road to be Filled & Lifted, Roadside Paddy Fields, Stretches of Road Sections to be Widen by Filling Roadside Paddy Fields, Raise the Road to Enable Rain Water Drain Properly, Maintain the 0.75 - 2.5m Deep Roadside Downward Slope in 1:4 Ratio and Grass Turf to Control Erosion, Eroded Sections in Roadside Downward Slope and Roadside Eroded Sections to be Filled with Suitable Soil and Strengthen,

**ANNEX – V:** List & Chainages of Environmentally Sensitive Sites along the Roadway (Noise Pollution and Air Pollution Sensitive Sites)

**ANNEX – VI:** Summary of Procedure to Obtain Mining License for Borrow Pit Operation

**ANNEX – VII:** Summary of Procedure to Obtain Mining License for Quarry Operation

**ANNEX – I****Roadside Built Structures / Part of Built Structures to be Removed**

<b>Chainage</b>	<b>Activity</b>
0+000 – 0+100	0+000 – 0+090 Remove barb wire fence in RHS

**ANNEX – II**

**List & Chainage of Culverts, Cross Culverts, Box Culverts, Bridges (Minor & Main), Irrigation Turn Outs (Minor & Main), Earth Drains, Roadside Irrigation Canals, Retaining Walls, Toe Walls to be Repaired / Erected / Widen / Replacing Damaged Ones, Side walls of Culverts, Box Culverts, Bridges, Irrigation Turn Outs to be Extended / Repaired / Replaced, Roadside Leaderways to be Repaired / Erected, Silttraps to be Erected, Stretches with No Irrigation Canals & Stretches with No Side Drains**

<b>Chainage</b>	<b>Activity</b>
0+000 – 0+100	0+000 – 0+100 Earth drains in both RHS & LHS.
0+100 – 0+200	0+100 – 0+200 Earth drain in RHS 0+100 – 0+175 Earth drain in LHS 0+175 – 0+200 Minor irrigation canal in LHS 0+175 Erect silttrap at the entry point of earth drain to irrigation canal 0+120 Side road to LHS. Erect cross culvert.
0+200 – 0+300	0+200 – 0+240 Earth drain in RHS 0+240 – 0+300 Minor irrigation canal in RHS 0+200 – 0+240 Minor Irrigation canal in LHS 0+240 – 0+300 No irrigation canal or earth drain in LHS 0+240 Remove damaged box culvert and erect new box culvert 0+240 Erect silttraps at two connection points of LHS & RHS irrigation canals with box culvert
0+300 – 0+400	0+300 – 0+340 No side drains in LHS 0+300 – 0+355 Minor irrigation canal in RHS 0+350 – 0+355 Minor bridge over branch of Malwatta Oya. Minor repairs to side walls. Erect siltrap at RHS entry point of paddy drain water to the Oya. 0+355 – 0+365 Erect retaining wall in LHS 0+365 – 0+372 Existing bridge over Malwatta Oya. Minor repairs to side walls. 0+375 – 0+380 Existing damaged bridge over Malwatta Oya (wing walls are highly damaged). Erect new bridge. 0+380 – 0+400 Main Inginiyagala irrigation canal in LHS 0+380 – 0+400 Minor irrigation canal in RHS.
0+400 – 0+500	0+400 – 0+500 Main Inginiyagala Irrigation canal in LHS 0+400 – 0+500 Minor irrigation canal in RHS.
0+500 – 0+600	0+500 – 0+600 Main Inginiyagala Irrigation canal in LHS 0+500 – 0+600 Minor irrigation canal in RHS.

<b>Chainage</b>	<b>Activity</b>
0+600 – 0+700	0+600 – 0+700 Main Inginiyagala Irrigation canal in LHS 0+600 – 0+700 Minor irrigation canal in RHS.
0+700 – 0+800	0+700 – 0+800 Main Inginiyagala Irrigation canal in LHS 0+700 – 0+800 Minor irrigation canal in RHS.
0+800 – 0+900	0+800 – 0+900 Main Inginiyagala Irrigation canal in LHS 0+800 – 0+900 Minor irrigation canal in RHS. 0+845 – 0+855 Existing retaining wall in LHS to be lifted and do minor repairs. 0+820 – 0+825 Erect new retaining wall at the bottom of downward slope between road & main irrigation canal in LHS 0+840 – 0+845 Erect new retaining wall at the bottom of downward slope between road & main irrigation canal in LHS 0+855 – 0+865 Erect new retaining wall at the bottom of downward slope between road & main irrigation canal in LHS
0+900 – 1+000	0+900 – 1+000 Main Inginiyagala Irrigation canal in LHS 0+900 – 1+000 Minor irrigation canal in RHS. 0+910 – 0+960 Erect new retaining wall at the bottom of downward slope between road and main irrigation canal in LHS, as roadside downward slope is heavily eroded. 0+982 – 0+987 Erect new retaining wall at the bottom of downward slope between road and main irrigation canal in LHS, as roadside downward slope is heavily eroded.
1+000 – 1+100	1+000 – 1+100 Main Inginiyagala Irrigation canal in LHS 11+000 – 1+100 Minor irrigation canal in RHS.
1+100 – 1+200	1+100 – 1+200 Main Inginiyagala Irrigation canal in LHS 1+100 – 1+200 Minor irrigation canal in RHS. 1+157 – 1+170 Erect new retaining wall at the bottom of downward slope between road and main irrigation canal in LHS, as roadside downward slope is heavily eroded. 1+190 – 1+195 Erect new retaining wall at the bottom of downward slope between road and main irrigation canal in LHS, as roadside downward slope is heavily eroded.
1+200 – 1+300	1+200 – 1+300 Main Inginiyagala Irrigation canal in LHS 1+200 – 1+300 Minor irrigation canal in RHS. 1+205 – 1+225 Erect new retaining wall at the bottom of downward slope between road and main irrigation canal in LHS, as roadside downward slope is heavily eroded. 1+267 – 1+273 Erect new retaining wall at the bottom of downward

Chainage	Activity
	<p>slope between road and minor irrigation canal in RHS, as roadside downward slope is heavily eroded.</p> <p>1+286 – 1+291 Erect new retaining wall at the bottom of downward slope between road and main irrigation canal in LHS, as roadside downward slope is heavily eroded.</p>
1+300 – 1+400	<p>1+300 – 1+400 Main Inginiyagala Irrigation canal in LHS</p> <p>1+300 – 1+400 Minor irrigation canal in RHS.</p> <p>1+318 – 1+323 Erect new retaining wall at the bottom of downward slope between road and main irrigation canal in LHS, as roadside downward slope is heavily eroded.</p> <p>1+370 – 1+380 Erect new retaining wall at the bottom of downward slope between road and main irrigation canal in LHS, as roadside downward slope is heavily eroded.</p>
1+400 – 1+500	<p>1+400 – 1+500 Main Inginiyagala Irrigation canal in LHS</p> <p>1+400 – 1+500 Minor irrigation canal in RHS.</p> <p>1+430 – 1+450 Erect new retaining wall at the bottom of downward slope between road and main irrigation canal in LHS, as roadside downward slope is heavily eroded.</p> <p>1+490 – 1+495 Erect new retaining wall at the bottom of downward slope between road and main irrigation canal in LHS, as roadside downward slope is heavily eroded.</p>
1+500 – 1+600	<p>1+500 – 1+550 Main Inginiyagala Irrigation canal in LHS</p> <p>1+500 – 1+550 Minor irrigation canal in RHS.</p> <p>1+550 – 1+560 Irrigation canal sluice structure, as main irrigation canal crossing from LHS to RHS. Re-build damaged wing walls and widen it.</p> <p>1-560 – 1600 Both sides minor irrigation canals.</p> <p>1+565 Minor repairs to irrigation outlet</p>
1+600 – 1+700	<p>1+600 – 1+700 Both sides minor irrigation canals.</p> <p>1+680 Existing irrigation outlet to be replaced by new one with widening</p>
1+700 – 1+800	1+700 – 1+800 Both sides minor irrigation canals
1+800 – 1+900	1+800 – 1+900 Both sides minor irrigation canals
1+900 – 2+000	<p>1+900 – 1+920 Minor irrigation canal in LHS &amp; no irrigation canal in RHS</p> <p>1+920 Existing irrigation turn out. Side walls to be repaired.</p> <p>1+920 – 2+000 Minor irrigation canal in RHS &amp; no irrigation canal in</p>

<b>Chainage</b>	<b>Activity</b>
	LHS
2+000 – 2+100	2+000 – 2+100 Both sides minor irrigation canals 2+000 – Main irrigation canal crossing
2+100 – 2+200	2+100 – 2+200 Minor irrigation canal in RHS & no irrigation canal in LHS 2+160 Minor repairs to existing irrigation canal 2+190 – 2+200 Erect new retaining wall in LHS
2+200 – 2+300	2+200 – 2+220 Erect new retaining wall in LHS 2+210 – 2+220 Erect retaining wall upto the western edge of the main irrigation turn out in RHS. 2+220 – 2+225 Main irrigation turn out. Widen it in LHS 2+225 – 2+235 Erect retaining wall upto the eastern edge of the main irrigation turn out in LHS 2+225 – 2+228 Erect retaining wall upto the eastern edge of the main irrigation turn out in RHS 2+225 – 2+300 Both sides irrigation canals 2+300 Repairs to irrigation turn out
2+300 – 2+400	2+300 – 2+400 Irrigation canal in RHS & no irrigation canal in LHS 2+340 – 2+350 Erect retaining wall in RHS 2+380 – 2+385 Erect retaining wall in RHS
2+400 – 2+500	2+400 – 2+455 Irrigation canal in RHS & no irrigation canal in LHS 2+455 – 2+500 Irrigation canal in LHS & no irrigation canal in RHS 2+455 Irrigation turn out (box culvert). Widen it.
2+500 – 2+600	2+500 – 2+520 Irrigation canal in LHS 2+520 – 2+600 No irrigation canal in LHS 2+500 – 2+600 No irrigation canal in RHS 2+520 Demolish existing irrigation turn out and erect new one by widening.
2+600 – 2+700	2+600 – 2+700 No irrigation canals in both LHS & RHS
2+700 – 2+800	2+700 – 2+800 Erect both sides earth drains
2+800 – 2+900	2+800 – 2+860 Erect earth drain in LHS 2+800 – 2+900 Erect earth drain in RHS 2+825 Side road to LHS. Repairs to existing cross culvert 2+860 LHS earth drain enters the paddy field. Erect silttrap to avoid entering silt materials into the paddy field.
2+900 – 3+000	2+940 RHS earth drain enters the main irrigation canal. Erect silttrap to avoid entering silt materials into the irrigation canal 2+900 – 2+945 No irrigation canal in LHS

Chainage	Activity
	2+956 – 3+000 Irrigation canals in both RHS & LHS sides 2+945 – 2+956 Demolish damaged existing bridge over main irrigation canal and erect a new bridge with four wing walls.
3+000 – 3+100	3+000 – 3+100 Irrigation canal in LHS at the bottom of 1.5m deep roadside downward slope & no irrigation canal in RHS 3+085 Irrigation turn out (box culvert). Do minor repairs.
3+100 – 3+200	3+100 – 3+200 Irrigation canal in LHS at the bottom of 1.5m deep roadside downward slope & no irrigation canal in RHS
3+200 – 3+300	3+200 – 3+220 Irrigation canal in LHS at the bottom of 1.5m deep roadside downward slope & no irrigation canal in RHS 3+220 – 3+290 Both sides irrigation canals 3+290 – 3+300 Both sides no irrigation canals 3+290 Irrigation turn out. Minor repairs
3+300 – 3+400	3+300 – 3+400 Both sides no irrigation canals
3+400 – 3+500	3+400 – 3+500 Both sides no irrigation canals
3+500 – 3+600	3+500 – 3+600 Both sides no irrigation canals 3+510 Irrigation turn out. Erect side walls
3+600 – 3+700	3+600 – 3+700 Both sides no irrigation canals 3+625 Irrigation turn out (box culvert). Erect both sides guard stones.
3+700 – 3+800	3+700 – 3+745 Both sides no irrigation canals 3+745 – 3+770 Irrigation canal in RHS 3+770 – 3+800 No irrigation canal in RHS 3+745 – 3+800 Irrigation canal in LHS 3+745 Irrigation turn out. Do minor repairs.
3+800 – 3+900	3+800 – 3+900 Irrigation canal in LHS & no irrigation canal in RHS
3+900 – 4+000	3+900 – 3+965 Irrigation canal in LHS & no irrigation canal in RHS 3+965 – 4+000 Irrigation canal in RHS & no irrigation canal in LHS 3+960 – 3+965 Minor bridge over irrigation canal. Widen it by 0.5m in both sides. Minor repairs (fix guard stones). 3+965 – 3+975 Existing retaining wall in RHS. Fix guard stones.
4+000 – 4+100	4+035 – 4+100 Both sides irrigation canals 4+030 – 4+035 Minor bridge over irrigation canal. Fix guard stones.
4+100 – 4+200	4+100 – 4+200 Both sides irrigation canals
4+200 – 4+300	4+200 – 4+300 Irrigation canal in LHS 4+200 – 4+270 Irrigation canal in RHS

<b>Chainage</b>	<b>Activity</b>
	4+270 – 4+300 No irrigation canal in RHS
4+300 – 4+400	4+300 – 4+400 Irrigation canal in LHS 4+300 – 4+385 No irrigation canal in RHS 4+385 – 4+400 Irrigation canal in RHS
4+400 – 4+500	4+400 – 4+500 Both sides irrigation canals
4+500 – 4+600	4+500 – 4+600 Both sides irrigation canals
4+600 – 4+700	4+600 – 4+700 Both sides irrigation canals 4+670 Existing culvert to drain extra water from paddy fields. Rebuild this damaged culvert.
4+700 – 4+800	4+700 – 4+800 Both sides irrigation canals
4+800 – 4+900	4+800 – 4+900 Both sides irrigation canals
4+900 – 4+950	4+900 – 4+950 Both sides irrigation canals 4+950 RHS irrigation canal enters the Oya. Erect a silttrap at the corner of the irrigation canal (before entering into the Oya).

**ANNEX – III****List of Trees to be Removed or Affected due to Development of RHS / LHS Roadway**

Total number of 19 individual trees belonging to 4 species will be removed or affected due to proposed project. Details are given in the following table.

**Abbreviations:**

**RHS** – Right Hand Side      **RS** – Roadside    **I** – Introduced    **cm** – centimeter

**LHS** – Left Hand Side      **ST** – Status      **N** - Native

**DBH** – Diameter at Breast Height

<b>Chainage</b>	<b>Side</b>	<b>Habitat</b>	<b>Tree Species</b>	<b>Local Name</b>	<b>ST</b>	<b>DBH/cm</b>	<b>Note</b>
0+140	LHS	RS	<i>Borassus flabellifer</i>	Tal / Palmyrah	I	35	Cut
0+150	RHS	RS	<i>Borassus flabellifer</i>	Tal / Palmyrah	I	35	Cut
0+150	RHS	RS	<i>Borassus flabellifer</i>	Tal / Palmyrah	I	30	Cut
0+155	RHS	RS	<i>Borassus flabellifer</i>	Tal / Palmyrah	I	30	Cut
0+157	LHS	RS	<i>Borassus flabellifer</i>	Tal / Palmyrah	I	25	Cut
0+230	LHS	RS	<i>Borassus flabellifer</i>	Tal / Palmyrah	I	30	Cut
0+260	RHS	RS	<i>Borassus flabellifer</i>	Tal / Palmyrah	I	35	Cut
0+262	RHS	RS	<i>Borassus flabellifer</i>	Tal / Palmyrah	I	30	Cut
0+290	LHS	RS	<i>Borassus flabellifer</i>	Tal / Palmyrah	I	30	Cut
0+390	LHS	RS	<i>Tamarindus indica</i>	Tamarind	I	25	Cut
0+416	LHS	RS	<i>Morinda coreia</i>	Ahu	N	30	Cut
0+445	RHS	RS	<i>Borassus flabellifer</i>	Tal / Palmyrah	I	35	Cut
0+470	LHS	RS	<i>Borassus flabellifer</i>	Tal / Palmyrah	I	35	Cut
0+510	RHS	RS	<i>Borassus flabellifer</i>	Tal / Palmyrah	I	35	Cut
0+560	RHS	RS	<i>Borassus flabellifer</i>	Tal / Palmyrah	I	35	Cut
0+560	LHS	RS	<i>Borassus flabellifer</i>	Tal / Palmyrah	I	30	Cut
0+618	LHS	RS	<i>Borassus flabellifer</i>	Tal / Palmyrah	I	30	Cut
3+055	RHS	RS	<i>Samanea saman</i>	Para Mara	I	70	Cut
3+065	LHS	RS	<i>Samanea saman</i>	Para Mara	I	100	Cut

**ANNEX – IV**

**List & Chainage of Removal of Unsuitable Soil, Road to be Filled & Lifted, Roadside Paddy Fields, Stretches of Road Sections to be Widen by Filling Roadside Paddy Fields, Raise the Road to Enable Rain Water Drain Properly, Maintain the 0.75 - 2.5m Deep Roadside Downward Slope in 1:4 Ratio and Grass Turf to Control Erosion, Eroded Sections in Roadside Downward Slope and Roadside Eroded Sections to be Filled with Suitable Soil and Strengthen,**

<b>Chainage</b>	<b>Activity</b>
0+100 – 0+200	0+150 – 0+200 Paddy fields in RHS
0+200 – 0+300	0+200 – 0+300 Paddy fields in LHS 0+240 – 0+300 Paddy fields in RHS
0+300 – 0+400	0+300 – 0+340 Paddy fields in LHS 0+300 – 0+355 Paddy fields in RHS 0+380 – 0+400 Roadside downward slope upto main irrigation canal in LHS is 2.5m deep. Maintain the slope in 1:4 ratio and grass turf. 0+380 – 0+400 Roadside downward slope upto minor irrigation canal in RHS is 0.75m deep. Maintain the slope in 1:4 ratio and grass turf. 0+380 – 0+400 Both sides paddy fields.
0+400 – 0+500	0+400 – 0+500 Roadside downward slope upto main irrigation canal in LHS is 2.5m deep. Maintain the slope in 1:4 ratio and grass turf.. 0+400 – 0+500 Roadside downward slope upto minor irrigation canal in RHS is 0.75m deep. Maintain the slope in 1:4 ratio and grass turf. 0+400 – 0+500 Both sides paddy fields.
0+500 – 0+600	0+500 – 0+600 Roadside downward slope upto main irrigation canal in LHS is 2.5m deep. Maintain the slope in 1:4 ratio and grass turf. 0+500 – 0+600 Roadside downward slope upto minor irrigation canal in RHS is 0.75m deep. Maintain the slope in 1:4 ratio and grass turf. 0+540 Roadside downward slope in LHS is eroded. Fill with suitable soil and strengthen it. 0+550 Roadside downward slope in LHS is eroded. Fill with suitable soil and strengthen it. 0+500 – 0+600 Both sides paddy fields.
0+600 – 0+700	0+600 – 0+700 Roadside downward slope upto main irrigation canal in LHS is 2.5m deep. Maintain the slope in 1:4 ratio and grass turf. 0+600 – 0+700 Roadside downward slope upto minor irrigation canal in RHS is 0.75m deep. Maintain the slope in 1:4 ratio and grass turf.

Chainage	Activity
	<p>0+618 Roadside downward slope in LHS is eroded. Fill with suitable soil and strengthen it.</p> <p>0+650 – 0+660 Roadside downward slope in LHS is eroded. Fill with suitable soil and strengthen it.</p> <p>0+670 – 0+678 Roadside downward slope in LHS is eroded. Fill with suitable soil and strengthen it.</p> <p>0+680 – 0+685 Roadside downward slope in LHS is eroded. Fill with suitable soil and strengthen it.</p> <p>0+685 Rodeside downward slope in RHS is eroded. Fill with suitable soil and strengthen it.</p> <p>0+600 – 0+700 Both sides paddy fields.</p>
0+700 – 0+800	<p>0+700 – 0+800 Roadside downward slope upto main irrigation canal in LHS is 2.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>0+700 – 0+800 Roadside downward slope upto minor irrigation canal in RHS is 0.75m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>0+715 – 0+725 Roadside downward slope in LHS is eroded. Fill with suitable soil and strengthen it.</p> <p>0+700 – 0+800 Both sides paddy fields.</p>
0+800 – 0+900	<p>0+800 – 0+865 Roadside downward slope upto main irrigation canal in LHS is 2.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>0+865 – 0+900 Roadside downward slope upto main irrigation canal in LHS is 1m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>0+800 – 0+900 Roadside downward slope upto minor irrigation canal in RHS is 0.75m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>0+800 – 0+805 Roadside downward slope in LHS is eroded. Fill with suitable soil and strengthen it.</p> <p>0+860 – 0+870 Remove unsuitable soil, fill with suitable soil and lift the road.</p> <p>0+800 – 0+900 Both sides paddy fields.</p>
0+900 – 1+000	<p>0+900 – 1+000 Roadside downward slope upto main irrigation canal in LHS is 2.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>0+900 – 1+000 Roadside downward slope upto minor irrigation canal in RHS is 1m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>0+900 – 1+000 Both sides paddy fields.</p>
1+000 – 1+100	<p>1+000 – 1+100 Roadside downward slope upto main irrigation canal in LHS is 2.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+000 – 1+100 Roadside downward slope upto minor irrigation canal in RHS is 1m deep. Maintain the slope in 1:4 ratio and grass turf.</p>

<b>Chainage</b>	<b>Activity</b>
	1+000 – 1+100 Both sides paddy fields.
1+100 – 1+200	<p>1+100 – 1+200 Roadside downward slope upto main irrigation canal in LHS is 2.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+100 – 1+200 Roadside downward slope upto minor irrigation canal in RHS is 1m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+100 – 1+200 Both sides paddy fields.</p>
1+200 – 1+300	<p>1+200 – 1+300 Roadside downward slope upto main irrigation canal in LHS is 2.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+200 – 1+300 Roadside downward slope upto minor irrigation canal in RHS is 1m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+200 – 1+300 Both sides paddy fields.</p>
1+300 – 1+400	<p>1+300 – 1+400 Roadside downward slope upto main irrigation canal in LHS is 2.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+300 – 1+400 Roadside downward slope upto minor irrigation canal in RHS is 1m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+300 – 1+400 Both sides paddy fields.</p>
1+400 – 1+500	<p>1+400 – 1+500 Roadside downward slope upto main irrigation canal in LHS is 2.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+400 – 1+500 Roadside downward slope upto minor irrigation canal in RHS is 1m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+400 – 1+500 Both sides paddy fields.</p>
1+500 – 1+600	<p>1+500 – 1+550 Roadside downward slope upto main irrigation canal in LHS is 2.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+500 – 1+550 Roadside downward slope upto minor irrigation canal in RHS is 1m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+580 – 1+590 Widen the road by 1.5m by filling paddy fields in LHS</p> <p>1+560 – 1+600 Roadside downward slope upto minor irrigation canal in LHS is 1m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+560 – 1+600 Roadside downward slope upto minor irrigation canal in RHS is 1m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+595 Eroded section in RHS downward slope. Fill with suitable soil and strengthen it.</p> <p>1+500 – 1+600 Both sides paddy fields.</p>
1+600 – 1+700	1+600 – 1+700 Roadside downward slope upto minor irrigation canal in LHS is 1m deep. Maintain the slope in 1:4 ratio and grass turf.

Chainage	Activity
	<p>1+600 – 1+700 Roadside downward slope upto minor irrigation canal in RHS is 1m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+640 Eroded section in RHS downward slope. Fill with suitable soil and strengthen it.</p> <p>1+600 – 1+700 Both sides paddy fields.</p>
1+700 – 1+800	<p>1+700 – 1+800 Roadside downward slope upto minor irrigation canal in LHS is 0.75m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+700 – 1+800 Roadside downward slope upto minor irrigation canal in RHS is 0.75m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+730 – 1+800 Widen the road by 1.5m by filling RHS paddy fields.</p> <p>1+700 – 1+800 Both sides paddy fields</p>
1+800 – 1+900	<p>1+800 – 1+900 Roadside downward slope upto minor irrigation canal in LHS is 0.75m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+800 – 1+900 Roadside downward slope upto minor irrigation canal in RHS is 0.75m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+800 – 1+900 Widen the road by 1.5m by filling RHS paddy fields.</p> <p>1+800 – 1+900 Both sides paddy fields</p>
1+900 – 2+000	<p>1+900 – 2+000 Widen the road by 1.5m by filling RHS paddy fields.</p> <p>1+900 – 2+000 Both sides paddy fields</p> <p>1+900 – 2+000 Roadside downward slopes in both sides are 0.75m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>1+900 – 1+905 Eroded section in RHS. Fill with suitable soil and strengthen it.</p> <p>1+945 – 1+950 Eroded section in RHS. Fill with suitable soil and strengthen it.</p> <p>1+948 – 1+955 Eroded section in LHS. Fill with suitable soil and strengthen it.</p> <p>1+970 – 1+980 Eroded section in RHS. Fill with suitable soil and strengthen it.</p>
2+000 – 2+100	<p>2+000 – 2+100 Both sides paddy fields</p> <p>2+000 – 2+100 Lift the road by 0.5m</p> <p>2+000 – 2+100 Roadside downward slopes in both sides will be 1m deep (after lifting). Maintain the slope in 1:4 ratio and grass turf.</p> <p>2+000 – 2+020 Widen the road by 1.5m by filling RHS paddy fields.</p> <p>2+095 – 2+100 Eroded section in RHS. Fill with suitable soil and strengthen it.</p>
2+100 – 2+200	<p>2+100 – 2+200 Both sides paddy fields</p> <p>2+100 – 2+200 Roadside downward slopes in both sides are 1m deep.</p>

Chainage	Activity
	<p>Maintain the slope in 1:4 ratio and grass turf.</p> <p>2+100 – 2+105 Eroded section in RHS. Fill with suitable soil and strengthen it.</p> <p>2+155 – 2+170 Widen the road by filling the RHS paddy fields</p> <p>2+190 – 2+200 Widen the road by filling the LHS paddy fields</p>
2+200 – 2+300	<p>2+200 – 2+220 Both sides paddy fields</p> <p>2+200 – 2+215 Widen the road by filling the LHS paddy fields</p> <p>2+220 – 2+300 Widen the road by filling in paddy fields in LHS</p> <p>2+225 – 2+300 Both sides paddy fields</p> <p>2+225 – 2+300 Roadside downward slopes in both sides are 1.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>2+270 – 2+275 Eroded section in LHS. Strengthen it by filling suitable soil.</p> <p>2+225 – 2+300 Lift the road</p>
2+300 – 2+400	<p>2+300 – 2+400 Both sides paddy fields</p> <p>2+300 – 2+400 Lift the road</p> <p>2+300 – 2+400 Roadside downward slopes in both sides will be 1.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p>
2+400 – 2+500	<p>2+400 – 2+500 Both sides paddy fields</p> <p>2+400 – 2+500 Lift the road</p> <p>2+400 – 2+500 Roadside downward slopes in both sides will be 1.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>2+455 – 2+500 Widen the road by filling RHS paddy fields.</p>
2+500 – 2+600	<p>2+500 – 2+600 Widen the road by filling RHS paddy fields</p> <p>2+500 – 2+600 Both sides paddy fields</p> <p>2+500 – 2+600 Lift the road</p> <p>2+500 – 2+600 Roadside downward slopes in both sides will be 1.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p>
2+600 – 2+700	<p>2+600 – 2+700 Widen the road by filling RHS paddy fields</p> <p>2+600 – 2+700 Both sides paddy fields</p> <p>2+600 – 2+700 Lift the road</p> <p>2+600 – 2+700 Roadside downward slopes in both sides will be 1m deep. Maintain the slope in 1:4 ratio and grass turf.</p>
2+700 – 2+800	<p>2+700 – 2+800 Paddy fields in RHS</p> <p>2+700 – 2+800 Lift the road</p>
2+800 – 2+900	<p>2+800 – 2+860 Paddy fields in RHS</p> <p>2+860 – 2+900 Both sides paddy fields</p> <p>2+860 – 2+900 Widen the road by filling in LHS</p>

<b>Chainage</b>	<b>Activity</b>
	2+860 – 2+900 Roadside downward slopes in both sides are 2m deep. Maintain the slope in 1:4 ratio and grass turf.
2+900 – 3+000	2+900 – 2+945 Both sides paddy fields 2+856 – 3+000 Both sides paddy fields 2+900 – 3+000 Widen the road by filling in LHS 2+956 – 3+000 Roadside downward slopes in both sides are 1.5m deep. Maintain the slope in 1:4 ratio and grass turf. 2+956 – 3+000 Widen the road by filling in RHS paddy fields
3+000 – 3+100	3+000 – 3+100 Both sides paddy fields 3+000 – 3+100 Road widen by filling in both RHS and LHS paddy fields 3+000 – 3+100 Roadside downward slopes in both sides are 1 -1.5m deep. Maintain the slope in 1:4 ratio and grass turf.
3+100 – 3+200	3+100 – 3+200 Both sides paddy fields 3+100 – 3+200 Road widen by filling in both RHS and LHS paddy fields 3+100 – 3+200 Roadside downward slopes in both sides are 1m deep. Maintain the slope in 1:4 ratio and grass turf.
3+200 – 3+300	3+200 – 3+300 Both sides paddy fields 3+200 – 3+300 Road widen by filling in both RHS and LHS paddy fields 3+200 – 3+300 Roadside downward slopes in both sides are 1m deep. Maintain the slope in 1:4 ratio and grass turf.
3+300 – 3+400	3+300 – 3+400 Both sides paddy fields 3+300 – 3+400 Road widen by filling in both RHS and LHS paddy fields 3+300 – 3+400 Roadside downward slopes in both sides are 1 – 1.5m deep. Maintain the slope in 1:4 ratio and grass turf. 3+300 – 3+400 Remove unsuitable soil, fill with suitable oil and road lifting
3+400 – 3+500	3+400 – 3+500 Both sides paddy fields 3+400 – 3+500 Road widen by filling in both RHS and LHS paddy fields 3+400 – 3+500 Roadside downward slopes in both sides are 1 – 1.5m deep. Maintain the slope in 1:4 ratio and grass turf. 3+400 – 3+500 Remove unsuitable soil, fill with suitable oil and road lifting
3+500 – 3+600	3+500 – 3+600 Both sides paddy fields

<b>Chainage</b>	<b>Activity</b>
	<p>3+500 – 3+600 Road widen by filling in both RHS and LHS paddy fields</p> <p>3+500 – 3+600 Roadside downward slopes in both sides are 1 – 1.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>3+500 – 3+600 Remove unsuitable soil, fill with suitable oil and road lifting</p>
3+600 – 3+700	<p>3+600 – 3+700 Both sides paddy fields</p> <p>3+600 – 3+700 Road widen by filling in both RHS and LHS paddy fields</p> <p>3+600 – 3+700 Roadside downward slopes in both sides are 1 – 1.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>3+600 – 3+700 Remove unsuitable soil, fill with suitable oil and road lifting</p>
3+700 – 3+800	<p>3+700 – 3+800 Both sides paddy fields</p> <p>3+700 – 3+745 Road widen by filling in both RHS and LHS paddy fields</p> <p>3+700 – 3+800 Roadside downward slopes in both sides are 1 – 1.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>3+700 – 3+800 Remove unsuitable soil, fill with suitable oil and road lifting</p>
3+800 – 3+900	<p>3+800 – 3+900 Both sides paddy fields</p> <p>3+800 – 3+900 Road widen by filling in both RHS and LHS paddy fields</p> <p>3+800 – 3+900 Remove unsuitable soil, fill with suitable soil and road lifting.</p> <p>3+800 – 3+900 Roadside downward slopes in both sides are 1 – 1.5m deep. Maintain the slope in 1:4 ratio and grass turf.</p>
3+900 – 4+000	<p>3+900 – 4+000 Both sides paddy fields</p> <p>3+900 – 4+000 Remove unsuitable soil, fill with suitable soil and road lifting.</p> <p>3+900 – 4+000 Roadside downward slopes in both sides will be 1 – 1.5m deep after lifting. Maintain the slope in 1:4 ratio and grass turf.</p> <p>3+970 – 3+980 Eroded section in LHS. Fill with suitable soil and strengthen</p>
4+000 – 4+100	<p>4+000 – 4+100 Both sides paddy fields</p> <p>4+000 – 4+100 Remove unsuitable soil, fill with suitable soil and road</p>

Chainage	Activity
	<p>lifting.</p> <p>4+000 – 4+100 Roadside downward slopes in both sides will be 1 – 1.5m deep after lifting. Maintain the slope in 1:4 ratio and grass turf.</p> <p>4+000 – 4+100 Eroded section in RHS. Fill with suitable soil and strengthen</p>
4+100 – 4+200	<p>4+100 – 4+200 Both sides paddy fields</p> <p>4+100 – 4+200 Remove unsuitable soil, fill with suitable soil and road lifting.</p> <p>4+100 – 4+200 Roadside downward slopes in both sides will be 1 – 1.5m deep after lifting. Maintain the slope in 1:4 ratio and grass turf.</p> <p>4+195 Eroded section in RHS due to tractor driving into paddy fields. Develop the section by keeping provisions for tractor moving into the paddy field.</p>
4+200 – 4+300	<p>4+200 – 4+300 Both sides paddy fields</p> <p>4+200 – 4+275 Widen the road by filling RHS paddy fields</p> <p>4+200 – 4+300 Lift the road</p> <p>4+200 – 4+300 Roadside downward slopes in both sides will be 1 – 1.5m deep after lifting. Maintain the slope in 1:4 ratio and grass turf.</p> <p>4+275 Eroded section in RHS due to tractor driving into paddy fields. Develop the section by keeping provisions for tractor moving into the paddy field</p>
4+300 – 4+400	<p>4+300 – 4+400 Both sides paddy fields</p> <p>4+300 – 4+330 Widen the road by filling RHS paddy fields</p> <p>4+300 – 4+400 Lift the road</p> <p>4+300 – 4+400 Roadside downward slopes in both sides will be 1 – 1.5m deep after lifting. Maintain the slope in 1:4 ratio and grass turf.</p>
4+400 – 4+500	<p>4+400 – 4+500 Both sides paddy fields</p> <p>4+400 – 4+500 Remove unsuitable soil, fill with suitable soil and road lifting.</p> <p>4+400 – 4+500 Roadside downward slope in RHS is 2m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>4+400 – 4+500 Roadside downward slope in LHS is 1m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>4+430 – 4+500 Widen the road by filling RHS paddy fields</p>

<b>Chainage</b>	<b>Activity</b>
4+500 – 4+600	<p>4+500 – 4+600 Both sides paddy fields</p> <p>4+500 – 4+600 Remove unsuitable soil, fill with suitable soil and road lifting.</p> <p>4+500 – 4+600 Roadside downward slope in RHS is 2m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>4+500 – 4+600 Roadside downward slope in LHS is 1m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>4+500 – 4+600 Widen the road by filling RHS paddy fields</p>
4+600 – 4+700	<p>4+600 – 4+700 Both sides paddy fields</p> <p>4+600 – 4+700 Remove unsuitable soil, fill with suitable soil and road lifting.</p> <p>4+600 – 4+700 Roadside downward slope in RHS is 2m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>4+600 – 4+700 Roadside downward slope in LHS is 1m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>4+600 – 4+700 Widen the road by filling RHS paddy fields</p>
4+700 – 4+800	<p>4+700 – 4+800 Both sides paddy fields</p> <p>4+700 – 4+800 Remove unsuitable soil, fill with suitable soil and road lifting.</p> <p>4+700 – 4+800 Roadside downward slopes in both sides are 1.5 – 2m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>4+700 – 4+800 Road widen by filling RHS paddy fields</p>
4+800 – 4+900	<p>4+800 – 4+900 Both sides paddy fields</p> <p>4+800 – 4+900 Remove unsuitable soil, fill with suitable soil and road lifting.</p> <p>4+800 – 4+900 Roadside downward slopes in both sides are 1.5 – 2m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>4+800 – 4+900 Road widen by filling RHS paddy fields</p>
4+900 – 4+950	<p>4+900 – 4+950 Both sides paddy fields</p> <p>4+900 – 4+950 Remove unsuitable soil, fill with suitable soil and road lifting.</p> <p>4+900 – 4+950 Roadside downward slopes in both sides are 1.5 – 2m deep. Maintain the slope in 1:4 ratio and grass turf.</p> <p>4+900 – 4+950 Road widen by filling RHS paddy fields</p>

**ANNEX – V**

**List & Chainages of Environmentally Sensitive Sites along the Roadway**  
**(Noise Pollution and Air Pollution Sensitive Sites)**

<b>Chainage</b>	<b>Activity</b>
2+400 – 2+500	2+455 Mallikaitivu Government Tamil School in LHS
2+700 – 2+800	2+700 – 2+800 Mallikaitivu Village in LHS
2+800 – 2+900	2+800 – 2+860 Mallikaitivu Village in LHS 2+830 Mariamman Kovil in LHS

**Note:** 0+000 – 4+000 – Existing Partly Damaged Tar Road  
 4+000 – 4+950 – Existing Gravel Road  
 2+700 – 2+900 - Human Settlements in LHS

**ANNEX - VI****Summary of Procedure to Obtain Mining License for Borrow Pit Operation**

1. Identify the site and verify ownership (land clearing)
26. Obtain letters of consent from the owners (Private / Government)
27. Contractor applies for site clearance from CEA
28. CEA may request an IEE or EIA to be carried out by the contractor
29. CEA gives clearance.
30. Contractor applies for Mining License (IML/A, IML/B or IML/C) from GSMB.
31. GMSB conducts joint inspection with a committee comprising with CEA, DS, and PS.
32. Contractor has to make bank guarantee specified by the GSMB based on the situation of the land, prior to issuing Mining License.
33. Contractor applies for Trade license from PS.

## **ANNEX – VII**

### **Summary of Procedure to Obtain Mining License for Quarry Operation**

1. Identify the site and verify ownership (land clearing)
35. Obtain letters of consent from the owners (Private/ Government)
36. Contractor applies for site clearance from CEA
37. CEA may request an IEE or EIA to be carried out by the contractor
38. CEA gives clearance
39. Contractor applies for Mining License (IML/A, IML/B or IML/C) from GSMB.
40. GMSB conducts joint inspection with a committee comprising with CEA, DS, and PS who would decide whether the test blast is needed for IML-A and IML-B which depends on the sensitivity of the site. Test blast will be carried out prior to issuing Mining License
41. Contractor applies for EPL from CEA
42. EPL is issued by CEA
43. GSMB monitors noise and vibrations annually and renews license
44. Contractor applies for explosive license from the Ministry of Defense
45. Contractor applies for Trade license/ Approval from PS

### **Abbreviations**

CEA	-	Central Environment Authority
DS	-	Divisional Secretariat
PIU	-	Project Implement Unit
GSMB	-	Geological Survey and Mines Bureau
NWS&DB	-	National Water Supply and Drainage Board
ADD	-	Agrarian Development Department
PRDD	-	Provincial Road Development Department
SLT	-	Sri Lanka Telecom
STC	-	State Timber Corporation
CEB	-	Ceylon Electricity Board
ICTAD	-	Institute for Construction Training and Development
ID	-	Irrigation Department
LA	-	Local Authority
ILO	-	International Labor Organization
IAD	-	International Development Agency
WB	-	World Bank
PS	-	Pradeshiya Sabha
CRWB	-	Colombo – Ratnapura – Wellawaya – Batticaloa
IE	-	Irrigation Engineer
ME	-	Mining Engineer
EE	-	Executive Engineer
MOH	-	Medical Officer of Health
PHI	-	Public Health Inspector
RoW	-	Right of Way
EIA	-	Environmental Impact Assessment
IEE	-	Initial Environmental Examination
RHS	-	Right Hand Side
LHS	-	Left Hand Side
Co-op	-	Co-operative
DBH	-	Diameter at Breast Height
IML	-	Industrial Mining License
EPL	-	Environmental Protection License
VET	-	Vehicular Emission Test
EMP	-	Environmental Management Plan
EA	-	Environmental Assessment

## **6.6 DRAWINGS (Bound separately)**

*Insert here a list of Drawings. The actual Drawings, including site plans, should be attached to this section or annexed in a separate folder.*

## **PART 3 – Conditions of Contract and Contract Forms**

## **Section VII. General Conditions of Contract**

These General Conditions of Contract (GCC), read in conjunction with the Particular Conditions of Contract (PCC) and other documents listed therein, should be a complete document expressing fairly the rights and obligations of both parties.

These General Conditions of Contract have been developed on the basis of considerable international experience in the drafting and management of contracts, bearing in mind a trend in the construction industry towards simpler, more straightforward language.

The GCC can be used for both smaller admeasurement contracts and lump sum contracts.

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## General Conditions of Contract

### A. General

- 1. Definitions** 1.1 Boldface type is used to identify defined terms.
- (a) The Accepted Contract Amount means the amount accepted in the Letter of Acceptance for the execution and completion of the Works and the remedying of any defects.
  - (b) The Activity Schedule is a schedule of the activities comprising the construction, installation, testing, and commissioning of the Works in a lump sum contract. It includes a lump sum price for each activity, which is used for valuations and for assessing the effects of Variations and Compensation Events.
  - (c) The Adjudicator is the person appointed jointly by the Employer and the Contractor to resolve disputes in the first instance, as provided for in GCC 23.
  - (d) Bank means the financing institution **named in the PCC**.
  - (e) Bill of Quantities means the priced and completed Bill of Quantities forming part of the Bid.
  - (f) Compensation Events are those defined in GCC Clause 41 hereunder.
  - (g) The Completion Date is the date of completion of the Works as certified by the Project Manager, in accordance with GCC Sub-Clause 52.1.
  - (h) The Contract is the Contract between the Employer and the Contractor to execute, complete, and maintain the Works. It consists of the documents listed in GCC Sub-Clause 2.3 below.
  - (i) The Contractor is the party whose Bid to carry out the Works has been accepted by the Employer.
  - (j) The Contractor's Bid is the completed bidding document submitted by the Contractor to the Employer.
  - (k) The Contract Price is the Accepted Contract Amount stated in the Letter of Acceptance and thereafter as adjusted in accordance with the Contract.
  - (l) Days are calendar days; months are calendar months.
  - (m) Dayworks are varied work inputs subject to payment on a

time basis for the Contractor's employees and Equipment, in addition to payments for associated Materials and Plant.

- (n) A Defect is any part of the Works not completed in accordance with the Contract.
- (o) The Defects Liability Certificate is the certificate issued by Project Manager upon correction of defects by the Contractor.
- (p) The Defects Liability Period is the period **named in the PCC** pursuant to Sub-Clause 33.1 and calculated from the Completion Date.
- (q) Adjudicator means the single person appointed under Clause 23.
- (r) Drawings means the drawings of the Works, as included in the Contract, and any additional and modified drawings issued by (or on behalf of) the Employer in accordance with the Contract, include calculations and other information provided or approved by the Project Manager for the execution of the Contract.
- (s) The Employer is the party who employs the Contractor to carry out the Works, **as specified in the PCC**.
- (t) Equipment is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.
- (u) "In writing" or "written" means hand-written, type-written, printed or electronically made, and resulting in a permanent record;
- (v) The Initial Contract Price is the Contract Price listed in the Employer's Letter of Acceptance.
- (w) The Intended Completion Date is the date on which it is intended that the Contractor shall complete the Works. The Intended Completion Date is **specified in the PCC**. The Intended Completion Date may be revised only by the Project Manager by issuing an extension of time or an acceleration order.
- (x) Materials are all supplies, including consumables, used by the Contractor for incorporation in the Works.
- (y) Plant is any integral part of the Works that shall have a mechanical, electrical, chemical, or biological function.
- (z) The Project Manager is the person **named in the PCC**

(or any other competent person appointed by the Employer and notified to the Contractor, to act in replacement of the Project Manager) who is responsible for supervising the execution of the Works and administering the Contract.

- (aa) PCC means Particular Conditions of Contract
- (bb) The Site is the area **defined as such in the PCC**.
- (cc) Site Investigation Reports are those that were included in the bidding documents and are factual and interpretative reports about the surface and subsurface conditions at the Site.
- (dd) Specification means the Specification of the Works included in the Contract and any modification or addition made or approved by the Project Manager.
- (ee) The Start Date is **given in the PCC**. It is the latest date when the Contractor shall commence execution of the Works. It does not necessarily coincide with any of the Site Possession Dates.
- (ff) A Subcontractor is a person or corporate body who has a Contract with the Contractor to carry out a part of the work in the Contract, which includes work on the Site.
- (gg) Temporary Works are works designed, constructed, installed, and removed by the Contractor that are needed for construction or installation of the Works.
- (hh) A Variation is an instruction given by the Project Manager which varies the Works.
- (ii) The Works are what the Contract requires the Contractor to construct, install, and turn over to the Employer, **as defined in the PCC**.

- 2. Interpretation**
- 2.1 In interpreting these GCC, words indicating one gender include all genders. Words indicating the singular also include the plural and words indicating the plural also include the singular. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Project Manager shall provide instructions clarifying queries about these GCC.
  - 2.2 If sectional completion is **specified in the PCC**, references in the GCC to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the Completion Date and Intended Completion

- Date for the whole of the Works).
- 2.3 The documents forming the Contract shall be interpreted in the following order of priority:
- (a) Agreement,
  - (b) Letter of Acceptance,
  - (c) Contractor's Bid,
  - (d) Particular Conditions of Contract,
  - (e) General Conditions of Contract,
  - (f) Specifications,
  - (g) Drawings,
  - (h) Bill of Quantities,<sup>8</sup> and
  - (i) any other document **listed in the PCC** as forming part of the Contract.
- 3. Language and Law** 3.1 The language of the Contract and the law governing the Contract are **stated in the PCC**.
- 4. Project Manager's Decisions** 4.1 Except where otherwise specifically stated, the Project Manager shall decide contractual matters between the Employer and the Contractor in the role representing the Employer.
- 5. Delegation** 5.1 Otherwise specified in the PCC, the Project Manager may delegate any of his duties and responsibilities to other people, except to the Adjudicator, after notifying the Contractor, and may revoke any delegation after notifying the Contractor.
- 6. Communications** 6.1 Communications between parties that are referred to in the Conditions shall be effective only when in writing. A notice shall be effective only when it is delivered.
- 7. Subcontracting** 7.1 The Contractor may subcontract with the approval of the Project Manager, but may not assign the Contract without the approval of the Employer in writing. Subcontracting shall not alter the Contractor's obligations.
- 8. Other Contractors** 8.1 The Contractor shall cooperate and share the Site with other contractors, public authorities, utilities, and the Employer between the dates given in the Schedule of Other Contractors, as **referred to in the PCC**. The Contractor shall also provide

<sup>8</sup> In lump sum contracts, delete "Bill of Quantities" and replace with "Activity Schedule."

facilities and services for them as described in the Schedule. The Employer may modify the Schedule of Other Contractors, and shall notify the Contractor of any such modification.

- 9. Personnel and Equipment**
- 9.1 The Contractor shall employ the key personnel and use the equipment identified in its Bid, to carry out the Works or other personnel and equipment approved by the Project Manager. The Project Manager shall approve any proposed replacement of key personnel and equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid.
- 9.2 If the Project Manager asks the Contractor to remove a person who is a member of the Contractor's staff or work force, stating the reasons, the Contractor shall ensure that the person leaves the Site within seven days and has no further connection with the work in the Contract.
- 10. Employer's and Contractor's Risks**
- 10.1 The Employer carries the risks which this Contract states are Employer's risks, and the Contractor carries the risks which this Contract states are Contractor's risks.
- 11. Employer's Risks**
- 11.1 From the Start Date until the Defects Liability Certificate has been issued, the following are Employer's risks:
- (a) The risk of personal injury, death, or loss of or damage to property (excluding the Works, Plant, Materials, and Equipment), which are due to
    - (i) use or occupation of the Site by the Works or for the purpose of the Works, which is the unavoidable result of the Works or
    - (ii) negligence, breach of statutory duty, or interference with any legal right by the Employer or by any person employed by or contracted to him except the Contractor.
  - (b) The risk of damage to the Works, Plant, Materials, and Equipment to the extent that it is due to a fault of the Employer or in the Employer's design, or due to war or radioactive contamination directly affecting the country where the Works are to be executed.
- 11.2 From the Completion Date until the Defects Liability Certificate has been issued, the risk of loss of or damage to the Works, Plant, and Materials is an Employer's risk except loss or damage due to

- (a) a Defect which existed on the Completion Date,
- (b) an event occurring before the Completion Date, which was not itself an Employer's risk, or
- (c) the activities of the Contractor on the Site after the Completion Date.

**12. Contractor's Risks**

- 12.1 From the Starting Date until the Defects Liability Certificate has been issued, the risks of personal injury, death, and loss of or damage to property (including, without limitation, the Works, Plant, Materials, and Equipment) which are not Employer's risks are Contractor's risks.

**13. Insurance**

- 13.1 The Contractor shall provide, in the joint names of the Employer and the Contractor, insurance cover from the Start Date to the end of the Defects Liability Period, in the amounts and deductibles **stated in the PCC** for the following events which are due to the Contractor's risks:

- (a) loss of or damage to the Works, Plant, and Materials;
- (b) loss of or damage to Equipment;
- (c) loss of or damage to property (except the Works, Plant, Materials, and Equipment) in connection with the Contract; and
- (d) personal injury or death.

- 13.2 Policies and certificates for insurance shall be delivered by the Contractor to the Project Manager for the Project Manager's approval before the Start Date. All such insurance shall provide for compensation to be payable in the types and proportions of currencies required to rectify the loss or damage incurred.

- 13.3 If the Contractor does not provide any of the policies and certificates required, the Employer may effect the insurance which the Contractor should have provided and recover the premiums the Employer has paid from payments otherwise due to the Contractor or, if no payment is due, the payment of the premiums shall be a debt due.

- 13.4 Alterations to the terms of an insurance shall not be made without the approval of the Project Manager.

- 13.5 Both parties shall comply with any conditions of the insurance policies.

**14. Site Data**

- 14.1 The Contractor shall be deemed to have examined any Site Data

**referred to in the PCC**, supplemented by any information available to the Contractor.

**15. Contractor to Construct the Works**

15.1 The Contractor shall construct and install the Works in accordance with the Specifications and Drawings.

**16. The Works to Be Completed by the Intended Completion Date**

16.1 The Contractor may commence execution of the Works on the Start Date and shall carry out the Works in accordance with the Program submitted by the Contractor, as updated with the approval of the Project Manager, and complete them by the Intended Completion Date.

**17. Approval by the Project Manager**

17.1 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Project Manager, for his approval.

17.2 The Contractor shall be responsible for design of Temporary Works.

17.3 The Project Manager's approval shall not alter the Contractor's responsibility for design of the Temporary Works.

17.4 The Contractor shall obtain approval of third parties to the design of the Temporary Works, where required.

17.5 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Project Manager before this use.

**18. Safety**

18.1 The Contractor shall be responsible for the safety of all activities on the Site.

**19. Discoveries**

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

**20. Possession of the Site**

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

**21. Access to the Site**

21.1 The Contractor shall allow the Project Manager and any person authorized by the Project Manager access to the Site and to any place where work in connection with the Contract is being

- carried out or is intended to be carried out.
- 22. Instructions, Inspections and Audits**
- 22.1 The Contractor shall carry out all instructions of the Project Manager which comply with the applicable laws where the Site is located.
  - 22.2 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 57.1 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 22.2 constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility under the Procurement Guidelines).
- 23. Appointment of the Adjudicator**
- 23.1 The Adjudicator shall be appointed jointly by the Employer and the Contractor, at the time of the Employer's issuance of the Letter of Acceptance. If, in the Letter of Acceptance, the Employer does not agree on the appointment of the Adjudicator, the Employer will request the Appointing Authority **designated in the PCC**, to appoint the Adjudicator within 14 days of receipt of such request.
  - 23.2 Should the Adjudicator resign or die, or should the Employer and the Contractor agree that the Adjudicator is not functioning in accordance with the provisions of the Contract, a new Adjudicator shall be jointly appointed by the Employer and the Contractor. In case of disagreement between the Employer and the Contractor, within 30 days, the Adjudicator shall be designated by the Appointing Authority **designated in the PCC** at the request of either party, within 14 days of receipt of such request.
- 24. Procedure for Disputes**
- 24.1 If the Contractor believes that a decision taken by the Project Manager was either outside the authority given to the Project Manager by the Contract or that the decision was wrongly taken, the decision shall be referred to the Adjudicator within 14 days of the notification of the Project Manager's decision.
  - 24.2 The Adjudicator shall give a decision in writing within 28 days of receipt of a notification of a dispute.
  - 24.3 The Adjudicator shall be paid by the hour at the **rate specified in the PCC**, together with reimbursable expenses of the types **specified in the PCC**, and the cost shall be divided equally

between the Employer and the Contractor, whatever decision is reached by the Adjudicator. Either party may refer a decision of the Adjudicator to an Arbitrator within 28 days of the Adjudicator's written decision. If neither party refers the dispute to arbitration within the above 28 days, the Adjudicator's decision shall be final and binding.

- 24.4 The arbitration shall be conducted in accordance with the arbitration procedures published by the institution named and in the place specified **in the PCC**.

## B. Time Control

### 25. Program

- 25.1 Within the time **stated in the PCC**, after the date of the Letter of Acceptance, the Contractor shall submit to the Project Manager for approval a Program showing the general methods, arrangements, order, and timing for all the activities in the Works. In the case of a lump sum contract, the activities in the Program shall be consistent with those in the Activity Schedule.
- 25.2 An update of the Program shall be a program showing the actual progress achieved on each activity and the effect of the progress achieved on the timing of the remaining work, including any changes to the sequence of the activities.
- 25.3 The Contractor shall submit to the Project Manager for approval an updated Program at intervals no longer than the period **stated in the PCC**. If the Contractor does not submit an updated Program within this period, the Project Manager may withhold the amount **stated in the PCC** from the next payment certificate and continue to withhold this amount until the next payment after the date on which the overdue Program has been submitted. In the case of a lump sum contract, the Contractor shall provide an updated Activity Schedule within 14 days of being instructed to by the Project Manager.
- 25.4 The Project Manager's approval of the Program shall not alter the Contractor's obligations. The Contractor may revise the Program and submit it to the Project Manager again at any time. A revised Program shall show the effect of Variations and Compensation Events.

### 26. Extension of the Intended Completion Date

- 26.1 The Project Manager shall extend the Intended Completion Date if a Compensation Event occurs or a Variation is issued which makes it impossible for Completion to be achieved by the Intended Completion Date without the Contractor taking steps to accelerate the remaining work, which would cause the Contractor

- to incur additional cost.
- 26.2 The Project Manager shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Project Manager for a decision upon the effect of a Compensation Event or Variation and submitting full supporting information. If the Contractor has failed to give early warning of a delay or has failed to cooperate in dealing with a delay, the delay by this failure shall not be considered in assessing the new Intended Completion Date.
- 27. Acceleration**
- 27.1 When the Employer wants the Contractor to finish before the Intended Completion Date, the Project Manager shall obtain priced proposals for achieving the necessary acceleration from the Contractor. If the Employer accepts these proposals, the Intended Completion Date shall be adjusted accordingly and confirmed by both the Employer and the Contractor.
- 27.2 If the Contractor's priced proposals for an acceleration are accepted by the Employer, they are incorporated in the Contract Price and treated as a Variation.
- 28. Delays Ordered by the Project Manager**
- 28.1 The Project Manager may instruct the Contractor to delay the start or progress of any activity within the Works.
- 29. Management Meetings**
- 29.1 Either the Project Manager or the Contractor may require the other to attend a management meeting. The business of a management meeting shall be to review the plans for remaining work and to deal with matters raised in accordance with the early warning procedure.
- 29.2 The Project Manager shall record the business of management meetings and provide copies of the record to those attending the meeting and to the Employer. The responsibility of the parties for actions to be taken shall be decided by the Project Manager either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.
- 30. Early Warning**
- 30.1 The Contractor shall warn the Project Manager at the earliest opportunity of specific likely future events or circumstances that may adversely affect the quality of the work, increase the Contract Price, or delay the execution of the Works. The Project Manager may require the Contractor to provide an estimate of the expected effect of the future event or circumstance on the Contract Price and Completion Date. The estimate shall be

provided by the Contractor as soon as reasonably possible.

- 30.2 The Contractor shall cooperate with the Project Manager in making and considering proposals for how the effect of such an event or circumstance can be avoided or reduced by anyone involved in the work and in carrying out any resulting instruction of the Project Manager.

## C. Quality Control

### 31. Identifying Defects

- 31.1 The Project Manager shall check the Contractor's work and notify the Contractor of any Defects that are found. Such checking shall not affect the Contractor's responsibilities. The Project Manager may instruct the Contractor to search for a Defect and to uncover and test any work that the Project Manager considers may have a Defect.

### 32. Tests

- 32.1 If the Project Manager instructs the Contractor to carry out a test not specified in the Specification to check whether any work has a Defect and the test shows that it does, the Contractor shall pay for the test and any samples. If there is no Defect, the test shall be a Compensation Event.

### 33. Correction of Defects

- 33.1 The Project Manager shall give notice to the Contractor of any Defects before the end of the Defects Liability Period, which begins at Completion, and is **defined in the PCC**. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.
- 33.2 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Project Manager's notice.

### 34. Uncorrected Defects

- 34.1 If the Contractor has not corrected a Defect within the time specified in the Project Manager's notice, the Project Manager shall assess the cost of having the Defect corrected, and the Contractor shall pay this amount.

## D. Cost Control

### 35. Contract Price

- 35.1 In the case of an admeasurement contract, the Bill of Quantities shall contain priced items for the Works to be performed by the Contractor. The Bill of Quantities is used to calculate the Contract Price. The Contractor will be paid for the quantity of the work accomplished at the rate in the Bill of Quantities for each item.
- 35.2 In the case of a lump sum contract, the Activity Schedule shall

contain the priced activities for the Works to be performed by the Contractor. The Activity Schedule is used to monitor and control the performance of activities on which basis the Contractor will be paid. If payment for Materials on Site shall be made separately, the Contractor shall show delivery of Materials to the Site separately on the Activity Schedule.

### **36. Changes in the Contract Price**

36.1 In the case of an admeasurement contract:

- (a) If the final quantity of the work done differs from the quantity in the Bill of Quantities for the particular item by more than 25 percent, provided the change exceeds 1 percent of the Initial Contract Price, the Project Manager shall adjust the rate to allow for the change.
- (b) The Project Manager shall not adjust rates from changes in quantities if thereby the Initial Contract Price is exceeded by more than 15 percent, except with the prior approval of the Employer.
- (c) If requested by the Project Manager, the Contractor shall provide the Project Manager with a detailed cost breakdown of any rate in the Bill of Quantities.

36.2 In the case of a lump sum contract, the Activity Schedule shall be amended by the Contractor to accommodate changes of Program or method of working made at the Contractor's own discretion. Prices in the Activity Schedule shall not be altered when the Contractor makes such changes to the Activity Schedule.

### **37. Variations**

37.1 All Variations shall be included in updated Programs, and, in the case of a lump sum contract, also in the Activity Schedule, produced by the Contractor.

37.2 The Contractor shall provide the Project Manager with a quotation for carrying out the Variation when requested to do so by the Project Manager. The Project Manager shall assess the quotation, which shall be given within seven (7) days of the request or within any longer period stated by the Project Manager and before the Variation is ordered.

37.3 If the Contractor's quotation is unreasonable, the Project Manager may order the Variation and make a change to the Contract Price, which shall be based on the Project Manager's own forecast of the effects of the Variation on the Contractor's costs.

37.4 If the Project Manager decides that the urgency of varying the work would prevent a quotation being given and considered

without delaying the work, no quotation shall be given and the Variation shall be treated as a Compensation Event.

37.5 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning.

37.6 In the case of an admeasurement contract, if the work in the Variation corresponds to an item description in the Bill of Quantities and if, in the opinion of the Project Manager, the quantity of work above the limit stated in Sub-Clause 38.1 or the timing of its execution do not cause the cost per unit of quantity to change, the rate in the Bill of Quantities shall be used to calculate the value of the Variation. If the cost per unit of quantity changes, or if the nature or timing of the work in the Variation does not correspond with items in the Bill of Quantities, the quotation by the Contractor shall be in the form of new rates for the relevant items of work.

## **38. Cash Flow Forecasts**

38.1 When the Program, or, in the case of a lump sum contract, the Activity Schedule, is updated, the Contractor shall provide the Project Manager with an updated cash flow forecast. The cash flow forecast shall include different currencies, as defined in the Contract, converted as necessary using the Contract exchange rates.

## **39. Payment Certificates**

39.1 The Contractor shall submit to the Project Manager monthly statements of the estimated value of the work executed less the cumulative amount certified previously.

39.2 The Project Manager shall check the Contractor's monthly statement and certify the amount to be paid to the Contractor.

39.3 The value of work executed shall be determined by the Project Manager.

39.4 The value of work executed shall comprise:

(a) In the case of an admeasurement contract, the value of the quantities of work in the Bill of Quantities that have been completed; or

(b) In the case of a lump sum contract, the value of work executed shall comprise the value of completed activities in the Activity Schedule.

39.5 The value of work executed shall include the valuation of Variations and Compensation Events.

39.6 The Project Manager may exclude any item certified in a

previous certificate or reduce the proportion of any item previously certified in any certificate in the light of later information.

**40. Payments**

- 40.1 Payments shall be adjusted for deductions for advance payments and retention. The Employer shall pay the Contractor the amounts certified by the Project Manager within 28 days of the date of each certificate. If the Employer makes a late payment, the Contractor shall be paid interest on the late payment in the next payment. Interest shall be calculated from the date by which the payment should have been made up to the date when the late payment is made at the prevailing rate of interest for commercial borrowing for each of the currencies in which payments are made.
- 40.2 If an amount certified is increased in a later certificate or as a result of an award by the Adjudicator or an Arbitrator, the Contractor shall be paid interest upon the delayed payment as set out in this clause. Interest shall be calculated from the date upon which the increased amount would have been certified in the absence of dispute.
- 40.3 Unless otherwise stated, all payments and deductions shall be paid or charged in the proportions of currencies comprising the Contract Price.
- 40.4 Items of the Works for which no rate or price has been entered in shall not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.

**41. Compensation Events**

- 41.1 The following shall be Compensation Events:
  - (a) The Employer does not give access to a part of the Site by the Site Possession Date pursuant to GCC Sub-Clause 20.1.
  - (b) The Employer modifies the Schedule of Other Contractors in a way that affects the work of the Contractor under the Contract.
  - (c) The Project Manager orders a delay or does not issue Drawings, Specifications, or instructions required for execution of the Works on time.
  - (d) The Project Manager instructs the Contractor to uncover or to carry out additional tests upon work, which is then found to have no Defects.
  - (e) The Project Manager unreasonably does not approve a

subcontract to be let.

- (f) Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of the Letter of Acceptance from the information issued to bidders (including the Site Investigation Reports), from information available publicly and from a visual inspection of the Site.
  - (g) The Project Manager gives an instruction for dealing with an unforeseen condition, caused by the Employer, or additional work required for safety or other reasons.
  - (h) Other contractors, public authorities, utilities, or the Employer does not work within the dates and other constraints stated in the Contract, and they cause delay or extra cost to the Contractor.
  - (i) The advance payment is delayed.
  - (j) The effects on the Contractor of any of the Employer's Risks.
  - (k) The Project Manager unreasonably delays issuing a Certificate of Completion.
- 41.2 If a Compensation Event would cause additional cost or would prevent the work being completed before the Intended Completion Date, the Contract Price shall be increased and/or the Intended Completion Date shall be extended. The Project Manager shall decide whether and by how much the Contract Price shall be increased and whether and by how much the Intended Completion Date shall be extended.
- 41.3 As soon as information demonstrating the effect of each Compensation Event upon the Contractor's forecast cost has been provided by the Contractor, it shall be assessed by the Project Manager, and the Contract Price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Project Manager shall adjust the Contract Price based on the Project Manager's own forecast. The Project Manager shall assume that the Contractor shall react competently and promptly to the event.
- 41.4 The Contractor shall not be entitled to compensation to the extent that the Employer's interests are adversely affected by the Contractor's not having given early warning or not having cooperated with the Project Manager.

- 42. Tax** 42.1 The Project Manager shall adjust the Contract Price if taxes, duties, and other levies are changed between the date 28 days before the submission of bids for the Contract and the date of the last Completion certificate. The adjustment shall be the change in the amount of tax payable by the Contractor, provided such changes are not already reflected in the Contract Price or are a result of GCC Clause 44.
- 43. Currencies** 43.1 Where payments are made in currencies other than the currency of the Employer's country **specified in the PCC**, the exchange rates used for calculating the amounts to be paid shall be the exchange rates stated in the Contractor's Bid.
- 44. Price Adjustment** 44.1 Prices shall be adjusted for fluctuations in the cost of inputs only if **provided for in the PCC**. If so provided, the amounts certified in each payment certificate, before deducting for Advance Payment, shall be adjusted by applying the respective price adjustment factor to the payment amounts due in each currency. A separate formula of the type indicated below applies to each Contract currency:
- $$P_c = A_c + B_c \frac{Imc/Ioc}{}$$
- where:
- $P_c$  is the adjustment factor for the portion of the Contract Price payable in a specific currency "c."
- $A_c$  and  $B_c$  are coefficients<sup>9</sup> **specified in the PCC**, representing the nonadjustable and adjustable portions, respectively, of the Contract Price payable in that specific currency "c;" and
- $Imc$  is the index prevailing at the end of the month being invoiced and  $Ioc$  is the index prevailing 28 days before Bid opening for inputs payable; both in the specific currency "c."
- 44.2 If the value of the index is changed after it has been used in a calculation, the calculation shall be corrected and an adjustment made in the next payment certificate. The index value shall be deemed to take account of all changes in cost due to fluctuations in costs.
- 45. Retention** 45.1 The Employer shall retain from each payment due to the

<sup>9</sup> *The sum of the two coefficients  $A_c$  and  $B_c$  should be 1 (one) in the formula for each currency. Normally, both coefficients shall be the same in the formulae for all currencies, since coefficient  $A$ , for the nonadjustable portion of the payments, is a very approximate figure (usually 0.15) to take account of fixed cost elements or other nonadjustable components. The sum of the adjustments for each currency are added to the Contract Price. [To be transferred to the User Guide]*

Contractor the proportion **stated in the PCC** until Completion of the whole of the Works.

- 45.2 Upon the issue of a Certificate of Completion of the Works by the Project Manager, in accordance with GCC 51.1, half the total amount retained shall be repaid to the Contractor and half when the Defects Liability Period has passed and the Project Manager has certified that all Defects notified by the Project Manager to the Contractor before the end of this period have been corrected. The Contractor may substitute retention money with an “on demand” Bank guarantee.
- 46. Liquidated Damages**
- 46.1 The Contractor shall pay liquidated damages to the Employer at the rate per day **stated in the PCC** for each day that the Completion Date is later than the Intended Completion Date. The total amount of liquidated damages shall not exceed the amount **defined in the PCC**. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages shall not affect the Contractor’s liabilities.
- 46.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Project Manager shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the overpayment, calculated from the date of payment to the date of repayment, at the rates specified in GCC Sub-Clause 40.1.
- 47. Bonus**
- 47.1 The Contractor shall be paid a Bonus calculated at the rate per calendar day **stated in the PCC** for each day (less any days for which the Contractor is paid for acceleration) that the Completion is earlier than the Intended Completion Date. The Project Manager shall certify that the Works are complete, although they may not be due to be complete.
- 48. Advance Payment**
- 48.1 The Employer shall make advance payment to the Contractor of the amounts **stated in the PCC** by the date **stated in the PCC**, against provision by the Contractor of an Unconditional Bank Guarantee in a form and by a bank acceptable to the Employer in amounts and currencies equal to the advance payment. The Guarantee shall remain effective until the advance payment has been repaid, but the amount of the Guarantee shall be progressively reduced by the amounts repaid by the Contractor. Interest shall not be charged on the advance payment.
- 48.2 The Contractor is to use the advance payment only to pay for Equipment, Plant, Materials, and mobilization expenses required

specifically for execution of the Contract. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the Project Manager.

- 48.3 The advance payment shall be repaid by deducting proportionate amounts from payments otherwise due to the Contractor, following the schedule of completed percentages of the Works on a payment basis. No account shall be taken of the advance payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, Bonuses, or Liquidated Damages.
- 49. Securities**
- 49.1 The Performance Security shall be provided to the Employer no later than the date specified in the Letter of Acceptance and shall be issued in an amount **specified in the PCC**, by a bank or surety acceptable to the Employer, and denominated in the types and proportions of the currencies in which the Contract Price is payable. The Performance Security shall be valid until a date 28 days from the date of issue of the Certificate of Completion in the case of a Bank Guarantee, and until one year from the date of issue of the Completion Certificate in the case of a Performance Bond.
- 50. Dayworks**
- 50.1 If applicable, the Dayworks rates in the Contractor's Bid shall be used only when the Project Manager has given written instructions in advance for additional work to be paid for in that way.
- 50.2 All work to be paid for as Dayworks shall be recorded by the Contractor on forms approved by the Project Manager. Each completed form shall be verified and signed by the Project Manager within two days of the work being done.
- 50.3 The Contractor shall be paid for Dayworks subject to obtaining signed Dayworks forms.
- 51. Cost of Repairs**
- 51.1 Loss or damage to the Works or Materials to be incorporated in the Works between the Start Date and the end of the Defects Correction periods shall be remedied by the Contractor at the Contractor's cost if the loss or damage arises from the Contractor's acts or omissions.
- E. Finishing the Contract**
- 52. Completion**
- 52.1 The Contractor shall request the Project Manager to issue a Certificate of Completion of the Works, and the Project Manager shall do so upon deciding that the whole of the Works is

completed.

- 53. Taking Over** 53.1 The Employer shall take over the Site and the Works within seven days of the Project Manager's issuing a certificate of Completion.
- 54. Final Account** 54.1 The Contractor shall supply the Project Manager with a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Project Manager shall issue a Defects Liability Certificate and certify any final payment that is due to the Contractor within 56 days of receiving the Contractor's account if it is correct and complete. If it is not, the Project Manager shall issue within 56 days a schedule that states the scope of the corrections or additions that are necessary. If the Final Account is still unsatisfactory after it has been resubmitted, the Project Manager shall decide on the amount payable to the Contractor and issue a payment certificate.
- 55. Operating and Maintenance Manuals** 55.1 If "as built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates **stated in the PCC**.
- 55.2 If the Contractor does not supply the Drawings and/or manuals by the dates **stated in the PCC** pursuant to GCC Sub-Clause 55.1, or they do not receive the Project Manager's approval, the Project Manager shall withhold the amount **stated in the PCC** from payments due to the Contractor.
- 56. Termination** 56.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.
- 56.2 Fundamental breaches of Contract shall include, but shall not be limited to, the following:
- (a) the Contractor stops work for 28 days when no stoppage of work is shown on the current Program and the stoppage has not been authorized by the Project Manager;
  - (b) the Project Manager instructs the Contractor to delay the progress of the Works, and the instruction is not withdrawn within 28 days;
  - (c) the Employer or the Contractor is made bankrupt or goes into liquidation other than for a reconstruction or amalgamation;
  - (d) a payment certified by the Project Manager is not paid by the Employer to the Contractor within 84 days of the date of the Project Manager's certificate;

- (e) the Project Manager gives Notice that failure to correct a particular Defect is a fundamental breach of Contract and the Contractor fails to correct it within a reasonable period of time determined by the Project Manager;
  - (f) the Contractor does not maintain a Security, which is required;
  - (g) the Contractor has delayed the completion of the Works by the number of days for which the maximum amount of liquidated damages can be paid, as **defined in the PCC**; or
  - (h) 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 57.1.
- 56.3 When either party to the Contract gives notice of a breach of Contract to the Project Manager for a cause other than those listed under GCC Sub-Clause 56.2 above, the Project Manager shall decide whether the breach is fundamental or not.
- 56.4 Notwithstanding the above, the Employer may terminate the Contract for convenience.
- 56.5 If the Contract is terminated, the Contractor shall stop work immediately, make the Site safe and secure, and leave the Site as soon as reasonably possible.
- 57.1 If the Employer determines that the Contractor has engaged in corrupt, fraudulent, collusive, coercive or obstructive practices, in competing for or in executing the Contract, then the Employer may, after giving 14 days notice to the Contractor, terminate the Contractor's employment under the Contract and expel him from the Site, and the provisions of Clause 56 shall apply as if such expulsion had been made under Sub-Clause 56.5 [Termination by Employer].
- 57.2 Should any employee of the Contractor be determined to have engaged in corrupt, fraudulent, collusive, coercive, or obstructive practice during the execution of the Works, then that employee shall be removed in accordance with Clause 9.
- 57.3 For the purposes of this Sub-Clause:

## 57. Fraud and Corruption

- (i) “corrupt practice”<sup>10</sup> is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party;
- (ii) “fraudulent practice”<sup>11</sup> is any act or omission, including a misrepresentation, that knowingly or recklessly misleads, or attempts to mislead, a party to obtain a financial or other benefit or to avoid an obligation;
- (iii) “collusive practice”<sup>12</sup> is an arrangement between two or more parties designed to achieve an improper purpose, including to influence improperly the actions of another party;
- (iv) “coercive practice”<sup>13</sup> is impairing or harming, or threatening to impair or harm, directly or indirectly, any party or the property of the party to influence improperly the actions of a party;
- (v) “obstructive practice” is
  - (aa) deliberately destroying, falsifying, altering or concealing of evidence material to the investigation or making false statements to investigators in order to materially impede a Bank investigation into allegations of a corrupt, fraudulent, coercive or collusive practice; and/or threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or
  - (bb) acts intended to materially impede the exercise of the Bank’s inspection and audit rights provided for under Sub-Clause 22.2.

## 58. Payment upon Termination

- 58.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Project Manager shall issue a certificate for the value of the work done and Materials ordered less advance payments received up to the date of the issue of the certificate and less the percentage to apply to the value of the work not completed, as **indicated in the PCC**. Additional Liquidated Damages shall not apply. If the total amount due to the Employer

<sup>10</sup> “another party” refers to a public official acting in relation to the procurement process or contract execution]. In this context, “public official” includes World Bank staff and employees of other organizations taking or reviewing procurement decisions.

<sup>11</sup> a “party” refers to a public official; the terms “benefit” and “obligation” relate to the procurement process or contract execution; and the “act or omission” is intended to influence the procurement process or contract execution.

<sup>12</sup> “parties” refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non competitive levels.

<sup>13</sup> a “party” refers to a participant in the procurement process or contract execution.

exceeds any payment due to the Contractor, the difference shall be a debt payable to the Employer.

58.2 If the Contract is terminated for the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Project Manager shall issue a certificate for the value of the work done, Materials ordered, the reasonable cost of removal of Equipment, repatriation of the Contractor's personnel employed solely on the Works, and the Contractor's costs of protecting and securing the Works, and less advance payments received up to the date of the certificate.

## **59. Property**

59.1 All Materials on the Site, Plant, Equipment, Temporary Works, and Works shall be deemed to be the property of the Employer if the Contract is terminated because of the Contractor's default.

## **60. Release from Performance**

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

## **61. Suspension of Bank Loan or Credit**

61.1 In the event that the Bank suspends the Loan or Credit to the Employer, from which part of the payments to the Contractor are being made:

- (a) The Employer is obligated to notify the Contractor of such suspension within 7 days of having received the Bank's suspension notice.
- (b) If the Contractor has not received sums due it within the 28 days for payment provided for in Sub-Clause 40.1, the Contractor may immediately issue a 14-day termination notice.

## Section VIII. Particular Conditions of Contract

<b>A. General</b>	
<b>GCC 1.1 (d)</b>	The financing institution is: The World Bank
<b>GCC 1.1 (s)</b>	The Employer is <b><i>Eastern Provincial Council, Trincomalee, Sri Lanka.</i></b> Address:
<b>GCC 1.1 (w)</b>	The Intended Completion Date for the whole of the Works shall be: <b>18(eighteen) months from the Start Date</b>
<b>GCC 1.1 (z)</b>	The Project Manager is : <b>To be nominated</b>
<b>GCC 1.1 (bb)</b>	The Site is located at: <i>Pl refer Section 6.1 A</i> and is defined in drawings
<b>GCC 1.1 (ee)</b>	The Start Date shall be: <b>14 days after the receipt date of Letter of Acceptance</b>
<b>GCC 1.1 (ii)</b>	The Scope of Works is <i>briefly described in the Section 6.</i>
<b>GCC 2.2</b>	Sectional Completions are: <i>Not applicable</i>
<b>GCC 2.3(i)</b>	The following documents also form part of the Contract: <i>None</i>
<b>GCC 3.1</b>	The language of the contract is <i>English</i> The law that applies to the Contract is the <b>Laws of Democratic Socialist Republic of Sri Lanka</b>
<b>GCC 4.1</b>	<p><b>The Project Manager shall obtain the approval of the Employer before taking action with respect to the following:</b></p> <ul style="list-style-type: none"> <li>i. <b>Granting an extension of time – vide sub clause 1.1 (w)</b></li> <li>ii. <b>Approving a variation exceeding 0.1% of the Accepted Contract Price in value – vide sub clause 37.3.</b></li> <li>iii. <b>Approving any variation after the total of all variation has reached 5% of the accepted contract price in value – vide sub clause 37.3</b></li> </ul>

	<p>iv. <b>Suspension of works except in an emergency.</b></p> <p>v. <b>Before approving sub-contracting</b></p> <p>vi. <b>Approving new rates.</b></p> <p><b>The Project Manager shall observe special care if the total of variations exceed the contingency provisions. Project Manager shall keep the Employer informed of such situations, and if required, obtain Employer's approval for all variations beyond this limit.</b></p>
<b>GCC 5.1</b>	The Project Manager <b>may</b> Delegate any of his duties and responsibilities only with the consent of the Employer
<b>GCC 8.1</b>	Schedule of other contractors: Not Applicable
<b>GCC 9.1</b>	<p><b>Insert an additional Para 9.3 after para 9.2 as follows:</b></p> <p><b>9.2 The Contractor shall appoint a Site Representative who shall be designated as the Site Manager and shall be responsible for all activities taking place at the site and who shall be the person to communicate with the Project Manager and Employer. The name and qualification of the Representative shall be informed to the Project Manager and Employer for approval. Any replacement of the Site Manager shall be approved by the Project Manager and Employer.</b></p>
<b>GCC 13.1</b>	<p>The minimum insurance amounts and deductibles shall be:</p> <p>(a) For loss or damage to the Works, Plant and Materials: <b>For one hundred and ten percent (110%) of the Contract Price. Deductible to be Sri Lanka Rupees Five Hundred Thousand (LKR 0.5 Million) per claim without limit to the number of claims..</b></p> <p>(b) For loss or damage to Equipment: <b>For the replacement value of the Equipment. Deductible to be Sri Lanka Rupees Fifty Thousand (LKR 50, 000.00) per claim without limit to the number of claims.</b></p> <p>(c) For loss or damage to property (except the Works, Plant, Materials, and Equipment) in connection with Contract: <b>Rupees one million for each occurrence without any limit on the number of occurrences. Deductible to be rupees fifty thousand (SLR 50, 000.00).</b></p> <p>(d) for personal injury or death:</p> <p>(i) Of the Contractor's employees: <b>Sri Lanka Rupees one (1) million per each occurrence without any limit on the number of occurrences. No deductibles.</b></p> <p>(ii) Of other people: <b>Sri Lanka Rupees two (2) million per each</b></p>

	<b>occurrence without any limit on the number of occurrences. No deductibles.</b>
<b>GCC 14.1</b>	Site Data are: <i>Pl refer Section 6.1</i>
<b>GCC 15.1</b>	<p>Add the following after 15.1</p> <p><b>15.2 The Contractor shall take all reasonable steps to protect the environment (both on and off the site) and to limit damage and nuisance to people and property resulting from pollution, noise and other results of his operations. The Contractor shall implement all environmental requirements indicated in Environment Management Plan – Annex B Section 6.5</b></p>
<b>GCC 18</b>	<p><b>Insert additional four sub clauses as follows:</b></p> <p><b>18.2 The Contractor shall also take reasonable steps to protect the health of his personnel. He shall provide first aid facilities at the site for use of the employees and shall maintain this at all times.</b></p> <p><b>18.3 The Contractor shall appoint an officer to take care of the health and safety requirements of the employees and any other persons visiting the site.</b></p> <p><b>18.4 The Contractor, in consultation with the local health authorities, shall carry out information and education programmes for the welfare of the local community including the Contractor's staff, workers and their families at site with respect to health. Particular reference shall be made with regard to HIV/AIDS and other sexually communicable deceases in these programmes.</b></p> <p><b>18.5 Payment for these activities is deemed to be included within the Contractor's rates.</b></p>
<b>GCC 20.1</b>	The Site Possession Date(s) shall be: <b>Within seven (7) days from the date of Letter of Acceptance. The actual date shall be fixed by Project Manager in consultation with the Employer.</b>
<b>GCC 23.1 &amp; GCC 23.2</b>	Appointing Authority for the Adjudicator: <b><i>The Adjudicator shall be appointed by the Institute for Construction Training and Development (ICTAD), Sri Lanka at the request of either the Employer or the Contractor.</i></b>
<b>GCC 24.3</b>	Hourly rate and types of reimbursable expenses to be paid to the Adjudicator: <b><i>The hourly fee reimbursable shall be Rs.5000.00. Hourly fee shall be shared equally by Employer and Contractor.</i></b>
<b>GCC 24.4</b>	<p>Institution whose arbitration procedures shall be used: <b><i>The Arbitration Act of Sri Lanka No.11 of 1995 of the Government of the Democratic Socialist Republic of Sri Lanka</i></b></p> <p>Any dispute arising out of or in connection with this Contract, shall be referred to and finally resolved by arbitration under the Rules of the</p>

	<p>Arbitration Act of Sri Lanka No.11 of 1995 and the Laws of Sri Lanka. Arbitration shall be conducted in the English Language.</p> <p>The place of the arbitration shall be: <b>National Arbitration Center, Colombo, Srilanka.</b></p> <p><b>Arbitration Board shall comprise of One Member appointed jointly by the Parties to the Contract. Failing to agree by the Parties for One Member the Arbitration Board shall comprise of Three Members appointed in accordance with the arbitration rules.</b></p>
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### **B. Time Control**

<b>GCC 25.1</b>	The Contractor shall submit for approval a Program for the Works within <b>21 days</b> from the date of the Letter of Acceptance.
<b>GCC 25.3</b>	<p>The period between Program updates is: <b>90 days. An updated schedule of cash flow shall also be submitted at the same time.</b></p> <p>The amount to be withheld for late submission of an updated Program is <i>Rupeess five hundred thousand (Rs 500,000)</i></p>

### **C. Quality Control**

<b>GCC 33.1</b>	The Defects Liability Period is: <b>365 days</b> .
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### **D. Cost Control**

<b>36.1 (a)</b>	<p>Add the following at the end of Sub-Clause 36.1 (a)</p> <p>Provided further that no change in the rate for any item contained in the Bill of Quantity shall be considered in case of any decrease in the actual quantity of work executed and the Contractor shall not be entitled to claim any loss of profit or other loss or damage sustained by the Contractor as a result of decrease in the actual quantities of work executed.</p>
<b>GCC 43.1</b>	The currency of the Employer's country is: Sri Lankan Rupee (LKR)
<b>GCC 44.1</b>	<p>GCC 44 is replaced as follows.</p> <p>The Contract "is" subject to price adjustment in the following manner.</p> <p>The Contract is subject to price adjustment in accordance with the provisions listed hereunder.</p> <p><i>The amounts certified in each payment Certificate shall be adjusted by</i></p>

applying the method described below.

The adjustment to the Payment Certificates in respect of changes in Cost and legislation shall be determined from the following formula :

$$F = \frac{0.966 (V - V_{na})}{100} \sum_{\text{All inputs}} P_x \frac{(I_{xc} - I_{xb})}{I_{xb}}$$

Where:

$F$  = Price adjustment for the period concerned

$V$  = Current valuation of work done for the period.

$V_{na}$  = Value of non adjustable element or value of work not considered for price adjustment.

$P_x$  = Input percentage of input named  $X$ .

$I_{xc}$  = Current index of input  $X$ .

$I_{xb}$  = Base index of input  $X$ .

- (a) The “Input Percentage” means the percentage proportionate contribution of any input in terms of cost of the construction and listed below at the end of this clause.
- (c) The “Non adjustable elements” means,
  - (i) The work done under the BOQ items that shall not be considered for valuation of price adjustment which are listed below at the end of this clause;
  - (ii) Variations carried out by the Contractor on orders of the Project Manager and are valued under Clause 37 based on the prices prevailing at the time of execution; and
  - (iii) Works done under Day Works rates.
- d. The “Current Valuation” means the certified gross value of work executed during the current valuation period and will include the 80% of invoiced value of materials the Contractor has delivered to site but were not consumed in the physical work done.
- e. The “Index” means the monthly index published by the Institute for Construction Training and Development for each Input.
- f. For the purpose of determining the applicable indices, the Month is defined as the time period between the first and the last day of any month in the Gregorian calendar inclusive of the first and the last day.
- g. “Base Index” means the index for the input, prevailing for the Month, one month prior to the Month on which the deadline for submission of bids falls.
- h. In the case of first monthly statement, the current indices shall be taken as the indices prevailing on the Month where the Start Date falls. For any other monthly statement or for the statement at completion the current indices shall be taken as the indices prevailing for the Month on which the first date of the current valuation period falls.

	<p><i>If the Contractor fails to complete the Works within the time for completion prescribed under Clause 16 or 26, the price adjustment for the work performed after the due date of completion shall be made using the current indices prevailed at the due date for completion.</i></p> <p><i>The weightings for each of the Inputs of cost given in this Clause shall be adjusted if, in the opinion of the Project Manager, they have been rendered unreasonable, unbalanced or inapplicable as a result of varied or additional work already executed or instructed under Clause 37.</i></p>																																																			
	<p style="text-align: center;"><b>INPUT PERCENTAGES</b></p> <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th><i>Input Indices</i></th> <th><i>Input Elements</i></th> <th><i>Input Percentage</i></th> </tr> </thead> <tbody> <tr> <td>M3</td> <td>Cement</td> <td>8.62</td> </tr> <tr> <td>M7</td> <td>Metal</td> <td>5.10</td> </tr> <tr> <td>M48</td> <td>ABC Road Metal</td> <td>8.91</td> </tr> <tr> <td>M8</td> <td>Sand</td> <td>0.55</td> </tr> <tr> <td>M13</td> <td>Reinforcement</td> <td>15.26</td> </tr> <tr> <td>M21</td> <td>Timber Form work</td> <td>9.62</td> </tr> <tr> <td>M30</td> <td>Bitumen</td> <td>6.13</td> </tr> <tr> <td>M41</td> <td>Pre stressed bridge beams roads and buildings components</td> <td>1.96</td> </tr> <tr> <td>M45</td> <td>Soil/ Gravel</td> <td>1.22</td> </tr> <tr> <td>L1</td> <td>Skilled Labour</td> <td>2.97</td> </tr> <tr> <td>L2</td> <td>Semi skilled Labour</td> <td>3.63</td> </tr> <tr> <td>L3</td> <td>Unskilled Labour</td> <td>0.61</td> </tr> <tr> <td>P1</td> <td>Small Equipment</td> <td>2.30</td> </tr> <tr> <td>P2</td> <td>Heavy Equipment</td> <td>15.91</td> </tr> <tr> <td>P3</td> <td>Fuel</td> <td>7.21</td> </tr> <tr> <td colspan="2"><i>Total</i></td><td><i>90.00</i></td></tr> </tbody> </table>	<i>Input Indices</i>	<i>Input Elements</i>	<i>Input Percentage</i>	M3	Cement	8.62	M7	Metal	5.10	M48	ABC Road Metal	8.91	M8	Sand	0.55	M13	Reinforcement	15.26	M21	Timber Form work	9.62	M30	Bitumen	6.13	M41	Pre stressed bridge beams roads and buildings components	1.96	M45	Soil/ Gravel	1.22	L1	Skilled Labour	2.97	L2	Semi skilled Labour	3.63	L3	Unskilled Labour	0.61	P1	Small Equipment	2.30	P2	Heavy Equipment	15.91	P3	Fuel	7.21	<i>Total</i>		<i>90.00</i>
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	Non Adjustable Elements shall be <b><i>all items in the Bill No 01 - General</i></b>																																																			
<b>GCC 45.1</b>	The proportion of payments retained is: <b>Ten percent (10%) of the certified work done up to a maximum of 5% of the Initial Contract Price.</b>																																																			
<b>GCC 45.2</b>	<i>Format for the on demand Bank Guarantee is given in Section IX.</i>																																																			
<b>GCC 46.1</b>	The liquidated damages for the whole of the Works are <b>decimal one percentage (0.1%)</b> per day. The maximum amount of liquidated damages for the whole of the works is <b>Ten percent (10.0%)</b> of the Accepted Contract Amount of the Final Contract Price.																																																			
<b>GCC 47.1</b>	The Bonus for the whole of the Works is : Not applicable																																																			

GCC 48.1	<p>The Advance Payments shall be :</p> <p><b>Twenty Percent (20%) of the Accepted Contract Amount</b> This advance payment shall be made in three separate installments in three stages as follows.</p> <ul style="list-style-type: none"> <li>i. Ten percent (10%) to be paid within 14 days of the Contractor submitting an acceptable Performance Security and an acceptable Advance Payment Security.</li> <li>ii. Five percent (5%) after the Contractor have satisfactorily completed providing all of the Project Manager's facilities.</li> <li>iii. Five percent (5%) after the Contractor have satisfactorily mobilized his staff and equipment and obtained the Project Manager's approval for same.</li> </ul> <p>Each of the above payments shall be made only after the Contractor submits an acceptable security/ guarantee to the Employer through the Project Manager. The advance payment guarantee shall be issued (a) by a bank registered with the Central Bank of Sri Lanka or (b) if issued by a foreign bank situated outside Sri Lanka, such guarantee shall be authenticated by its correspondent bank located in Sri Lanka registered with the Central Bank of Sri Lanka.</p>
GCC 48.3	<p>Insert additional Para as follows:</p> <p><b>Deduction shall commence in the next interim certificate to the Contractor, when the cumulative amount payable has reached thirty percent (30%) of the Accepted Contract Amount.</b> Amount to be recovered from each interim certificate shall be calculated based on the following amortization formula.</p> <p><b>Amount of amortization shall be calculated using the following formula until full recovery is made.</b></p> <p><b>Y =[(X-0.3)*Z] / (0.8-0.3) where:</b></p> <p><b>Y = Cumulative repayment.</b></p> <p><b>Z = Total amount of advance.</b></p> <p><b>X = Percentage value of the cumulative work done expressed as a fraction.</b></p>
GCC 49.1	<p>The Performance Security amount is <b>The minimum amount of Performance Security shall be five percent (5.0%) of the Initial Contract Price in Sri Lanka Rupees (Rs.).</b></p> <p>a. At the Bidders option, it shall be in the form of either (i) a bank guarantee; (ii) a banker's cheque or (iii) a bank draft issued by a commercial bank registered with the Central Bank of Sri Lanka</p>

	<p><b>and located in Sri Lanka.</b></p> <p><b>b. In the case of a bank guarantee for the performance security it shall be in accordance with the form of Performance Bank Guarantee included in section IX – Contract Forms (See Section IX Contract forms)</b></p> <p><b>c. Remain valid for a period of 28 days beyond the completion of the “Defects Notification Period” or any extended “Defects Notification Period”</b></p>
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### **E. Finishing the Contract**

<b>GCC 55.1</b>	The date by which operating and maintenance manuals are required is <b>Within three (3) months from the Date of Completion.</b>  The date by which “as built” drawings are required is <b>Within thirty (30) days from the Date of Completion.</b>
<b>GCC 55.2</b>	The amount to be withheld for failing to produce “as built” drawings and/or operating and maintenance manuals by the date required in GCC 55.1 is:  <b>Sri Lanka Rupees One Million (Rs.1,000,000.00).</b>
<b>GCC 56.2 (g)</b>	The maximum number of days is: <b>100 days</b>
<b>GCC 58.1</b>	The percentage to apply to the value of the work not completed, representing the Employer’s additional cost for completing the Works, is <b>25%</b>

## **Section IX - Contract Forms**

This Section contains forms which, once completed, will form part of the Contract. The forms for Performance Security and Advance Payment Security, when required, shall only be completed by the successful Bidder after contract award.

### **Table of Forms**

<b>Letter of Acceptance .....</b>	<b>562</b>
<b>Contract Agreement .....</b>	<b>563</b>
<b>Performance Security .....</b>	<b>565</b>
<b>Advance Payment Security .....</b>	<b>567</b>
<b>Retention Money Security.....</b>	<b>569</b>

## Letter of Acceptance

*[on letterhead paper of the Employer]*

..... *[date]* .....

To: ..... *[name and address of the Contractor]* .....

Subject: ..... *[Notification of Award Contract No.]* .....

This is to notify you that your Bid dated ..... *[insert date]* .... for execution of the .....  
.....*[insert name of the contract and identification number, as given in the Appendix to Bid]* .....  
for the Accepted Contract Amount of the equivalent of .....*[insert amount in numbers  
and words and name of currency]*, as corrected and modified in accordance with the Instructions  
to Bidders is hereby accepted by our Agency.

You are requested to furnish the Performance Security within 28 days in accordance with  
the Conditions of Contract, using for that purpose the of the Performance Security Form  
included in Section IX (Contract Forms) of the Bidding Document.

*[Choose one of the following statements:]*

We accept that ..... *[insert the name of Adjudicator proposed by the  
Bidder]* be appointed as the Adjudicator.

*[or]*

We do not accept that ..... *[insert the name of the Adjudicator proposed by  
the Bidder]* be appointed as the Adjudicator, and by sending a copy of this Letter of  
Acceptance to ..... *[insert name of the Appointing  
Authority]*, the Appointing Authority, we are hereby requesting such Authority to appoint the  
Adjudicator in accordance with ITB 42.1 and GCC 23.1.

Authorized Signature: .....

Name and Title of Signatory: .....

Name of Agency: .....

Attachment: Contract Agreement

## Contract Agreement

THIS AGREEMENT made the ..... day of ..... , ..... , between ..... *[name of the Employer]* ..... (hereinafter “the Employer”), of the one part, and ..... *[name of the Contractor]* ..... (hereinafter “the Contractor”), of the other part:

WHEREAS the Employer desires that the Works known as ..... *[name of the Contract]* ..... should be executed by the Contractor, and has accepted a Bid by the Contractor for the execution and completion of these Works and the 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 documents referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. This Agreement shall prevail over all other Contract documents.
  - (a) the Letter of Acceptance
  - (b) the Bid
  - (c) the Addenda Nos ..... *[insert addenda numbers if any]* .....
  - (d) the Particular Conditions
  - (e) the General Conditions;
  - (f) the Specification
  - (g) the Drawings; and
  - (h) the completed Schedules,
3. 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 execute the Works and to remedy defects therein in conformity in all respects with the provisions of the Contract.
4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the Works and the remedying of defects therein, the Contract Price or such other sum as may become payable under the provisions of the Contract at the times and in the manner prescribed by the Contract.

IN WITNESS whereof the parties hereto have caused this Agreement to be executed in accordance with the laws of . . . . *[name of the borrowing country]*. . . . on the day, month and year indicated above.

Signed by: \_\_\_\_\_  
for and on behalf of the Employer

Signed by: \_\_\_\_\_  
for and on behalf the Contractor

in the  
presence of: \_\_\_\_\_  
Witness, Name, Signature, Address, Date

in the  
presence of: \_\_\_\_\_  
Witness, Name, Signature, Address, Date

## Performance Security

*[Bank's Name, and Address of Issuing Branch or Office]*

**Beneficiary:** ..... *[Name and Address of Employer]* .....

**Date:** .....

**Performance Guarantee No.:** .....

We have been informed that ..... *[name of the Contractor]* ..... (hereinafter called “the Contractor”) has entered into Contract No. .... *[reference number of the Contract]*.... dated ... .... with you, for the execution of .... *[name of contract and brief description of Works]*.... (hereinafter called “the Contract”).

Furthermore, we understand that, according to the conditions of the Contract, a performance guarantee is required.

At the request of the Contractor, we .... *[name of the Bank]*.... hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of .... *[name of the currency and amount in figures]*<sup>1</sup>.... (.... *[amount in words]*.... ) such sum being payable in the types and proportions of currencies in which the Contract Price is payable, upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation(s) under the Contract, without your needing to prove or to show grounds for your demand or the sum specified therein.

This guarantee shall expire, no later than the .... Day of ...., ....<sup>2</sup>, and any demand for payment under it must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458, except that subparagraph (ii) of Sub-article 20(a) is hereby excluded.

.....  
*[Seal of Bank and Signature(s)]*

**Note –**

All italicized text is for guidance on how to prepare this demand guarantee and shall be deleted from the final document.

<sup>1</sup> The Guarantor shall insert an amount representing the percentage of the Contract Price specified in the Contract and denominated either in the currency(ies) of the Contract or a freely convertible currency acceptable to the Employer.

<sup>2</sup> Insert the date twenty-eight days after the expected completion date. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: “The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months][one year], in response to the Employer’s written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.”

## Advance Payment Security

*[Bank's Name, and Address of Issuing Branch or Office]*

**Beneficiary:** ..... *[Name and Address of Employer]* .....

**Date:** .....

**Advance Payment Guarantee No.:** .....

We have been informed that ..... *[name of the Contractor]* ..... (hereinafter called "the Contractor") has entered into Contract No. .... *[reference number of the Contract]* .... dated .... with you, for the execution of .... *[name of contract and brief description of Works]* .... (hereinafter called "the Contract").

Furthermore, we understand that, according to the Conditions of the Contract, an advance payment in the sum .... *[name of the currency and amount in figures]*<sup>1</sup> .... (.... *[amount in words]*....) is to be made against an advance payment guarantee.

At the request of the Contractor, we .... *[name of the Bank]* .... hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of .... *[name of the currency and amount in figures]*\* .... (.... *[amount in words]*....) upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor used the advance payment for purposes other than the costs of mobilization in respect of the Works.

It is a condition for any claim and payment under this guarantee to be made that the advance payment referred to above must have been received by the Contractor on its account number .... *[Contractor's account number]*.... at .... *[name and address of the Bank]*....

The maximum amount of this guarantee shall be progressively reduced by the amount of the advance payment repaid by the Contractor as indicated in copies of interim statements or payment certificates which shall be presented to us. This guarantee shall expire, at the latest, upon our receipt of a copy of the interim payment certificate indicating that eighty (80) percent of the Contract Price has been certified for payment, or on the ... day of ...., ....<sup>2</sup>, whichever is earlier. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

..... *[Seal of Bank and Signature(s)]* .....

**Note –**

*All italicized text is for guidance on how to prepare this demand guarantee and shall be deleted from the final document.*

<sup>1</sup> The Guarantor shall insert an amount representing the amount of the advance payment denominated either in the currency(ies) of the advance payment as specified in the Contract, or in a freely convertible currency acceptable to the Employer.

2 *Insert the expected expiration date of the Time for Completion. The Employer should note that in the event of an extension of the time for completion of the Contract, the Employer would need to request an extension of this guarantee from the Guarantor. Such request must be in writing and must be made prior to the expiration date established in the guarantee. In preparing this guarantee, the Employer might consider adding the following text to the form, at the end of the penultimate paragraph: “The Guarantor agrees to a one-time extension of this guarantee for a period not to exceed [six months][one year], in response to the Employer’s written request for such extension, such request to be presented to the Guarantor before the expiry of the guarantee.*

## Retention Money Security

### Demand Guarantee

\_\_\_\_\_  
[Bank's Name, and Address of Issuing Branch or Office]

**Beneficiary:** \_\_\_\_\_ [Name and Address of Employer]

**Date:** \_\_\_\_\_

**RETENTION MONEY GUARANTEE No.:** \_\_\_\_\_

We have been informed that \_\_\_\_\_ [name of Contractor] (hereinafter called "the Contractor") has entered into Contract No. \_\_\_\_\_ [reference number of the contract] dated \_\_\_\_\_ with you, for the execution of \_\_\_\_\_ [name of contract and brief description of Works] (hereinafter called "the Contract").

Furthermore, we understand that, according to the conditions of the Contract, when the Taking-Over Certificate has been issued for the Works and the first half of the Retention Money has been certified for payment, payment of *insert the second half of the Retention Money or if the amount guaranteed under the Performance Guarantee when the Taking-Over Certificate is issued is less than half of the Retention Money, the difference between half of the Retention Money and the amount guaranteed under the Performance Security/* is to be made against a Retention Money guarantee.

At the request of the Contractor, we \_\_\_\_\_ [name of Bank] hereby irrevocably undertake to pay you any sum or sums not exceeding in total an amount of \_\_\_\_\_ [amount in figures] (\_\_\_\_\_ ) [amount in words]<sup>1</sup> upon receipt by us of your first demand in writing accompanied by a written statement stating that the Contractor is in breach of its obligation under the Contract because the Contractor used the advance payment for purposes other than the costs of mobilization in respect of the Works.

It is a condition for any claim and payment under this guarantee to be made that the payment of the second half of the Retention Money referred to above must have been received by the Contractor on its account number at \_\_\_\_\_ [name and address of Bank].

This guarantee shall expire, at the latest, 21 days after the date when the Employer has received a copy of the Performance Certificate issued by the Engineer. Consequently, any demand for payment under this guarantee must be received by us at this office on or before that date.

This guarantee is subject to the Uniform Rules for Demand Guarantees, ICC Publication No. 458.

\_\_\_\_\_  
[signature(s)]

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<sup>1</sup>*The Guarantor shall insert an amount representing the amount of the second half of the Retention Money or or if the amount guaranteed under the Performance Guarantee when the Taking-Over Certificate is issued is less than half of the Retention Money, the difference between half of the Retention Money and the amount guaranteed under the Performance Security and denominated either in the currency(ies) of the second half of the Retention Money as specified in the Contract, or in a freely convertible currency acceptable to the Employer.*