

## **SECTION 3: CONDITIONS OF CONTRACT**

**Conditions of Contract**

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## Conditions of Contract

### A. General

#### 1. Definitions

- 1.1 Terms which are defined in the Contract Data are not also defined in the Conditions of Contract but keep their defined meanings. Capital initials are used to identify defined terms.

The **Adjudicator** is the person appointed jointly by the Employer and the Contractor to resolve disputes in the first instance, as provided for in Clauses 24 and 25. The name of the Adjudicator is defined in the Contract Data.

**Bill of Quantities** means the priced and completed **Bill of Quantities** forming part of the Bid.

**Compensation Events** are those defined in Clause 44 hereunder.

The **Completion Date** is the date of completion of the Works as certified by the Engineer in accordance with Sub Clause 55.1.

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 Clause 2.3 below.

The **Contract Data** defines the documents and other information which comprise the Contract.

The **Contractor** is a person or corporate body whose Bid to carry out the Works has been accepted by the Employer.

The **Contractor's Bid** is the completed Bidding document submitted by the Contractor to the Employer.

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

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

A **Defect** is any part of the Works not completed in accordance with the Contract.

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

The **Employer** is the party who will employ the Contractor to carry out the Works.

The **Engineer** is the person named in the Contract Data (or any other competent person appointed and notified to the contractor to act in replacement of the Engineer) who is responsible for supervising the execution of the works and administering the Contract.

**Equipment** is the Contractor's machinery and vehicles brought temporarily to the Site to construct the Works.

The **Initial Contract Price** is the Contract Price listed in the Employer's Letter of

Acceptance.

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 Contract Data. The Intended Completion Date may be revised only by the Engineer by issuing an extension of time.

**Materials** are all supplies, including consumables, used by the contractor for incorporation in the Works.

**Plant** is any integral part of the Works which is to have a mechanical, electrical, electronic or chemical or biological function.

The **Site** is the area defined as such in the Contract Data.

**Site Investigation Reports** are those which were included in the Bidding documents and are factual interpretative reports about the surface and sub-surface conditions at the site.

**Specification** means the Specification of the Works included in the Contract and any modification or addition made or approved by the Engineer.

The **Start Date** is given in the Contract Data. It is the date when the Contractor shall commence execution of the works. It does not necessarily coincide with any of the Site Possession Dates.

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.

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

A **Variation** is an instruction given by the Engineer which varies the Works.

The **Works** are what the Contract requires the Contractor to construct, install, and turn over to the Employer, as defined in the Contract Data.

## **2. Interpretation**

- 2.1 In interpreting these Conditions of Contract, singular also means plural, male also means female or neuter, and the other way around. Headings have no significance. Words have their normal meaning under the language of the Contract unless specifically defined. The Engineer will provide instructions clarifying queries about the Conditions of Contract.
- 2.2 If sectional completion is specified in the Contract Data, references in the Conditions of Contract to the Works, the Completion Date, and the Intended Completion Date apply to any Section of the Works (other than references to the 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:
  - (1) Agreement
  - (2) Letter of Acceptance, notice to proceed with the works
  - (3) Contractor's Bid

- (4) Contract Data
- (5) Conditions of Contract including Special Conditions of Contract
- (6) Specifications
- (7) Drawings
- (8) **Bill of Quantities** and
- (9) any other document listed in the Contract Data 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 Contract Data.

### **4. Engineer's Decisions**

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

### **5. Delegation**

- 5.1 The Engineer may delegate any of his duties and responsibilities to other people except to the Adjudicator after notifying the Contractor and may cancel any delegation after notifying the Contractor.

### **6. Communications**

- 6.1 Communications between parties which are referred to in the conditions are effective only when in writing. A notice shall be effective only when it is delivered (in terms of Indian Contract Act).

### **7. Subcontracting**

- 7.1 The Contractor may subcontract with the approval of the Engineer but may not assign the Contract without the approval of the Employer in writing. Subcontracting does 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. The Contractor shall as referred to in the Contract Data, also provide 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**

- 9.1 The Contractor shall employ the key personnel named in the Schedule of Key Personnel as referred to in the Contract Data to carry out the functions stated in the Schedule or other personnel approved by the Engineer. The Engineer will approve any proposed replacement of key personnel only if their qualifications, abilities, and relevant experience are substantially equal to or better than those of the personnel listed in the Schedule.
- 9.2 If the Engineer asks the Contractor to remove a person who is a member of the Contractor's staff or his 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 The Employer is responsible for the excepted risks which are (a) in so far as they directly affect the execution of the Works in the Employer's country, the risks of war, hostilities, invasion, act of foreign enemies, rebellion, revolution, insurrection or military or usurped power, civil war, riot commotion or disorder (unless restricted to the Contractor's employees), and contamination from any nuclear fuel or nuclear waste or radioactive toxic explosive, or (b) a cause due solely to the design of the Works, other than the Contractor's design.

## **12. Contractor's Risks**

- 12.1 All risks of loss of or damage to physical property and of personal injury and death which arise during and in consequence of the performance of the Contract other than the excepted risks are the responsibility of the Contractor.

## **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 Contract Data 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 of 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 Engineer for the Engineer'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 affect 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 Engineer.

13.5 Both parties shall comply with any conditions of the insurance policies.

#### **14. Site Investigation Reports**

14.1 The Contractor, in preparing the Bid, shall rely on any site Investigation Reports referred to in the Contract Data, supplemented by any information available to the Bidder.

#### **15. Queries about the Contract Data**

15.1 The Engineer will clarify queries on the Contract Data.

#### **16. Contractor to Construct the Works**

16.1 The Contractor shall construct and install the Works in accordance with the Specification and Drawings, and as per instructions of Engineer.

#### **17. The Works to Be Completed by the Intended Completion Date**

17.1 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 Engineer, and complete them by the Intended Completion Date.

#### **18. Approval by the Engineer**

18.1 The Contractor shall submit Specifications and Drawings showing the proposed Temporary Works to the Engineer, who is to approve them if they comply with the Specifications and Drawings.

18.2 The Contractor shall be responsible for design of Temporary Works.

18.3 The Engineer's approval shall not alter the Contractor's responsibility for design of the Temporary Works.

18.4 The Contractor shall obtain approval of third parties to the design of the Temporary Works where required.

18.5 All Drawings prepared by the Contractor for the execution of the temporary or permanent Works, are subject to prior approval by the Engineer before their use.

#### **19. Safety**

19.1 The Contractor shall be responsible for the safety of all activities on the Site.



**20. Discoveries**

20.1 Anything of historical or other interest or of significant value unexpectedly discovered on the Site is the property of the Employer. The Contractor is to notify the Engineer of such discoveries and carry out the Engineer's instructions for dealing with them.

**21. Possession of the Site**

21.1 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 Contract Data the Employer is deemed to have delayed the start of the relevant activities and this will be Compensation Event.

**22. Access to the Site**

22.1 The Contractor shall allow the Engineer and any person authorized by the Engineer access to the Site, to any place where work in connection with the Contract is being carried out or is intended to be carried out and to any place where materials or plant are being manufactured / fabricated / assembled for the works.

**23. Instructions**

23.1 The Contractor shall carry out all instructions of the Engineer which comply with the applicable laws where the Site is located.

23.2 The Contractor shall permit, and shall cause its Subcontractors and sub-consultants to 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 the submission of the bid, and to have such accounts and records audited by auditors appointed by the Bank and the Employer if requested. The Contractor's and its Subcontractors' and sub-consultants' attention is drawn to Sub-Clause 64.1 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 23.2 constitute a prohibited practice subject to contract termination (as well as to a determination of ineligibility pursuant to the Bank's prevailing sanctions procedures).

**24. Disputes**

24.1 If the Contractor believes that a decision taken by the Engineer was either outside the authority given to the Engineer 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 Engineer's decision.

**25. Procedure for Disputes**

25.1 The Adjudicator shall give a decision in writing within 28 days of receipt of a notification of a dispute.

25.2 The Adjudicator shall be paid daily at the rate specified in the Contract Data together with reimbursable expenses of the types specified in the Contract Data 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 will be final and binding.

- 25.3 The arbitration shall be conducted in accordance with the arbitration procedure stated in the Special Conditions of Contract.

## **26. Replacement of Adjudicator**

- 26.1 Should the Adjudicator resign or die, or should the Employer and the Contractor agree that the Adjudicator is not fulfilling his functions in accordance with the provisions of the Contract; a new Adjudicator will 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 Contract Data at the request of either party, within 14 days of receipt of such request.

## **B. Time Control**

### **27. Program**

- 27.1 Within the time stated in the Contract Data the Contractor shall submit to the Engineer for approval a Program including Environmental Management Plan showing the general methods, arrangements, order, and timing for all the activities in the Works along with monthly cash flow forecast.
- 27.2 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.
- 27.3 The Contractor shall submit to the Engineer, for approval, an updated Program at intervals no longer than the period stated in the Contract Data. If the Contractor does not submit an updated Program within this period, the Engineer may withhold the amount stated in the Contract Data 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.
- 27.4 The Engineer's approval of the Program shall not alter the Contractor's obligations. The Contractor may revise the Program and submit it to the Engineer again at any time. A revised Program is to show the effect of Variations and Compensation Events.

### **28. Extension of the Intended Completion Date**

- 28.1 The Engineer 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 and which would cause the Contractor to incur additional cost.
- 28.2 The Engineer shall decide whether and by how much to extend the Intended Completion Date within 21 days of the Contractor asking the Engineer 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.

**29. Deleted**

**30. Delays Ordered by the Engineer**

30.1 The Engineer may instruct the Contractor to delay the start or progress of any activity within the Works.

**31. Management Meetings**

31.1 Either the Engineer 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.

31.2 The Engineer shall record the business of management meetings and is to provide copies of his record to those attending the meeting and to the Employer. The responsibility of the parties for actions to be taken is to be decided by the Engineer either at the management meeting or after the management meeting and stated in writing to all who attended the meeting.

**32. Early Warning**

32.1 The Contractor is to warn the Engineer 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 works. The Engineer 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 is to be provided by the Contractor as soon as reasonably possible.

32.2 The Contractor shall cooperate with the Engineer 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 Engineer.

**C. Quality Control**

**33. Identifying Defects**

33.1 The Engineer 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 Engineer may instruct the Contractor to search for a Defect and to uncover and test any work that the Engineer considers may have a Defect.

33.2 The contractor shall permit the Employer's Technical auditor to check the contractor's work and notify the Engineer and Contractor of any defects that are found. Such a check shall not affect the Contractor's or the Engineer's responsibility as defined in the Contract Agreement.

**34. Tests**

34.1 If the Engineer 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.

### **35. Correction of Defects**

35.1 The Engineer 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 Contract Data. The Defects Liability Period shall be extended for as long as Defects remain to be corrected.

35.2 Every time notice of a Defect is given, the Contractor shall correct the notified Defect within the length of time specified by the Engineer's notice.

### **36. Uncorrected Defects**

36.1 If the Contractor has not corrected a Defect within the time specified in the Engineer's notice, the Engineer will assess the cost of having the Defect corrected, and the Contractor will pay this amount.

*Note: Where in certain cases, the technical specifications provide for acceptance of works within specified tolerance limits at reduced rates, Engineer will certify payments to Contractor accordingly.*

## **D. Cost Control**

### **37. Bill of Quantities**

37.1 The Bill of Quantities shall contain items for the construction, installation, testing, and commissioning work to be done by the contractor.

37.2 The Bill of Quantities is used to calculate the Contract Price. The Contractor is paid for the quantity of the work done at the rate in the Bill of Quantities for each item.

### **38. Changes in the Quantities**

38.1 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% of Initial Contract Price, the Engineer shall adjust the rate to allow for the change.

38.2 The Engineer 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.

38.3 If requested by the Engineer, the Contractor shall provide the Engineer with a detailed cost breakdown of any rate in the Bill of Quantities.

### **39. Variations**

39.1 All Variations shall be included in updated Programs produced by the Contractor.

### **40. Payments for Variations**

40.1 The Contractor shall provide the Engineer with a quotation (with breakdown of unit rates) for carrying out the Variation when requested to do so by the Engineer. The Engineer shall

assess the quotation, which shall be given within seven days of the request or within any longer period stated by the Engineer and before the Variation is ordered.

- 40.2 If the work in the Variation corresponds with an item description in the Bill of Quantities and if, in the opinion of the Engineer, 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 form of new rates for the relevant items of work.
- 40.3 If the Contractor's quotation is unreasonable (or if the contractor fails to provide the Engineer with a quotation within a reasonable time specified by the engineer in accordance with Clause 40.1), the Engineer may order the Variation and make a change to the Contract Price which shall be based on Engineer's own forecast of the effects of the Variation on the Contractor's costs
- 40.4 If the Engineer 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.
- 40.5 The Contractor shall not be entitled to additional payment for costs that could have been avoided by giving early warning.

#### **41. Cash flow forecasts**

- 41.1 When the Program is updated, the contractor is to provide the Engineer with an updated cash flow forecast.

#### **42. Payment Certificates**

- 42.1 The Contractor shall submit to the Engineer monthly statements of the estimated value of the work completed less the cumulative amount certified previously along with details of measurement of the quantity of works executed in a tabulated form as approved by the Engineer.
- 42.2 The Engineer shall check the details given in the Contractor's monthly statement and within 14 days certify the amounts to be paid to the Contractor after taking into account any credit or debit for the month in question in respect of materials for the works in the relevant amounts and under conditions set forth in sub-clause 51(3) of the Contract Data (Secured Advance).
- 42.3 The value of work executed shall be determined by the Engineer after due check measurement of the quantities claimed as executed by the contractor.
- 42.4 The value of work executed shall comprise the value of the quantities of the items in the Bill of Quantities completed..
- 42.5 The value of work executed shall include the valuation of Variations and Compensation Events.

42.6 The Engineer 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.

### **43. Payments**

43.1 Payments shall be adjusted for deductions for advance payments, retention, other recoveries in terms of the contract and taxes, at source, as applicable under the law. The Employer shall pay the Contractor the amounts certified by the Engineer 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 8% per annum.

43.2 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.

43.3 Items of the Works for which no rate or price has been entered in will not be paid for by the Employer and shall be deemed covered by other rates and prices in the Contract.

### **44. Compensation Events**

44.1 The following are Compensation Events unless they are caused by the Contractor:

- a. The Employer does not give access to a part of the Site by the Site Possession Date stated in the Contract Data.
- b. The Employer modifies the schedule of other contractors in a way which affects the work of the contractor under the contract.
- c. The Engineer orders a delay or does not issue drawings, specifications or instructions required for execution of works on time.
- d. The Engineer instructs the Contractor to uncover or to carry out additional tests upon work which is then found to have no Defects.
- e. The Engineer unreasonably does not approve for a subcontract to be let.
- f. Ground conditions are substantially more adverse than could reasonably have been assumed before issuance of 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 Engineer 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 effect on the Contractor of any of the Employer's Risks.
- k. The Engineer unreasonably delays issuing a Certificate of Completion.
- l. Other Compensation Events listed in the Contract Data or mentioned in the Contract.

44.2 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 is extended. The Engineer 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.

44.3 As soon as information demonstrating the effect of each Compensation Event upon the Contractor's forecast cost has been provided by the Contractor, it is to be assessed by the Engineer and the Contract Price shall be adjusted accordingly. If the Contractor's forecast is deemed unreasonable, the Engineer shall adjust the Contract Price based on Engineer's own forecast. The Engineer will assume that the Contractor will react competently and promptly to the event.

44.4 The Contractor shall not be entitled to compensation to the extent that the Employer's interests are adversely affected by the Contractor not having given early warning or not having cooperated with the Engineer.

#### **45. Tax**

45.1 The rates quoted by the Contractor shall be deemed to be inclusive of the sales and other taxes that the Contractor will have to pay for the performance of this Contract. The Employer will perform such duties in regard to the deduction of such taxes at source as per applicable law.

#### **46. Currencies**

46.1 All payments shall be made in Indian Rupees.

#### **47. Price Adjustment**

47.1 Contract price shall be adjusted for increase or decrease in rates and price of labour, materials, fuels and lubricants in accordance with the following principles and procedures and as per formula given in the contract data:

(a) The price adjustment shall apply for the work done from the start date given in the contract data up to end of the initial intended completion date or extensions granted by the Engineer and shall not apply to the work carried out beyond the stipulated time for reasons attributable to the contractor.

(b) The price adjustment shall be determined during each quarter from the formula given in the contract data.

(c) Following expressions and meanings are assigned to the work done during each quarter:

R = Total value of work done during the quarter. It would include the amount of secured advance for materials paid for (if any) during the quarter, less the amount of the secured advance recovered, during the quarter. It will exclude value for works executed under variations for which price adjustment will be worked separately based on the terms mutually agreed.

47.2 To the extent that full compensation for any rise or fall in costs to the contractor is not

covered by the provisions of this or other clauses in the contract, the unit rates and prices included in the contract shall be deemed to include amounts to cover the contingency of such other rise or fall in costs.

#### **48. Retention**

48.1 The Employer shall retain from each payment due to the Contractor the proportion stated in the Contract Data until Completion of the whole of the Works.

48.2 On Completion of the whole of the Works half the total amount retained is repaid to the Contractor and half when the Defect Liability Period has passed and the Engineer has certified that all Defects notified by the Engineer to the contractor before the end of this period have been corrected.

48.3 On completion of the whole works, the contractor may substitute retention money (balance half) with an “on demand” Bank guarantee.

#### **49. Liquidated Damages**

49.1 The Contractor shall pay liquidated damages to the Employer at the rate per day stated in the Contract Data for each day that the Completion Date is later than the Intended Completion Date (for the whole of the works or the milestone as stated in the contract data). The total amount of liquidated damages shall not exceed the amount defined in the Contract Data. The Employer may deduct liquidated damages from payments due to the Contractor. Payment of liquidated damages does not affect the Contractor's liabilities.

49.2 If the Intended Completion Date is extended after liquidated damages have been paid, the Engineer shall correct any overpayment of liquidated damages by the Contractor by adjusting the next payment certificate. The Contractor shall be paid interest on the over payment calculated from the date of payment to the date of repayment at the rates specified in Sub Clause 43.1.

#### **50. Deleted**

#### **51. Advance Payment**

51.1 The Employer shall make advance payment to the Contractor of the amounts stated in the Contract Data by the date stated in the Contract Data, 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 will not be charged on the advance payment. The bank guarantee of a joint venture shall be in the name of the joint venture

51.2 The Contractor is to use the advance payment only to pay for Equipment, Plant and Mobilization expenses required specifically for execution of the Works. The Contractor shall demonstrate that advance payment has been used in this way by supplying copies of invoices or other documents to the Engineer.



51.3 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 (mobilization and equipment only) payment or its repayment in assessing valuations of work done, Variations, price adjustments, Compensation Events, or Liquidated Damages.

**51.4 Secured Advance:**

The Engineer shall make advance payment in respect of materials intended for but not yet incorporated in the Works in accordance with conditions stipulated in the Contract Data.

**52. Securities**

52.1 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 and form and by a bank or surety acceptable to the Employer, and denominated in Indian Rupees. The Performance Security shall be valid until a date 28 days from the date of expiry of Defects Liability Period and the additional security for unbalanced bids shall be valid until a date 28 days from the date of issue of the certificate of completion. The performance security of a joint venture shall be in the name of the joint venture'

**53. Deleted**

**54. Cost of Repairs**

54.1 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**

**55. Completion**

55.1 The Contractor shall request the Engineer to issue a Certificate of Completion of the Works and the Engineer will do so upon deciding that the Work is completed.

**56. Taking Over**

56.1 The Employer shall take over the Site and the Works within seven days of the Engineer issuing a certificate of Completion.

**57. Final Account**

57.1 The Contractor shall supply to the Engineer a detailed account of the total amount that the Contractor considers payable under the Contract before the end of the Defects Liability Period. The Engineer shall issue a Defect 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 Engineer 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 Engineer shall decide on the amount

payable to the Contractor and issue a payment certificate, within 56 days of receiving the Contractor's revised account.

## **58. Operating and Maintenance Manuals**

58.1 If "as built" Drawings and/or operating and maintenance manuals are required, the Contractor shall supply them by the dates stated in the Contract Data.

58.2 If the Contractor does not supply the Drawings and/or manuals by the dates stated in the Contract Data, or they do not receive the Engineer's approval, the Engineer shall withhold the amount stated in the Contract Data from payments due to the Contractor.

## **59. Termination**

59.1 The Employer or the Contractor may terminate the Contract if the other party causes a fundamental breach of the Contract.

59.2 Fundamental breaches of Contract 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 Engineer;
- b. the Engineer 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 Engineer is not paid by the Employer to the Contractor within 56 days of the date of the Engineer's certificate;
- e. the Engineer 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 Engineer;
- f. the Contractor does not maintain a security which is required;
- g. the Contractor has delayed the completion of works by the number of days for which the maximum amount of liquidated damages can be paid as defined in the Contract data; and
- h. if the Contractor, in the judgment of the Employer has engaged in fraud and corruption, as defined in GCC Clause 64, in competing for or in executing the Contract.
- i. "The contractor (in case of joint venture) has modified the composition of the joint venture and/or the responsibility of each member of the joint venture from what is stated in joint venture agreement without prior approval of the Employer".

59.3 When either party to the Contract gives notice of a breach of contract to the Engineer for a cause other than those listed under Sub Clause 59.2 above, the Engineer shall decide whether the breach is fundamental or not.

59.4 Notwithstanding the above, the Employer may terminate the Contract for convenience.

59.5 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.

**60. Payment upon Termination**

- 60.1 If the Contract is terminated because of a fundamental breach of Contract by the Contractor, the Engineer shall issue a certificate for the value of the work done less advance payments received up to the date of the issue of the certificate, less other recoveries due in terms of the contract, less taxes due to be deducted at source as per applicable law and less the percentage to apply to the work not completed as indicated in the Contract Data. Additional Liquidated Damages shall not apply. If the total amount due to the Employer exceeds any payment due to the Contractor the difference shall be a debt payable to the Employer.
- 60.2 If the Contract is terminated at the Employer's convenience or because of a fundamental breach of Contract by the Employer, the Engineer shall issue a certificate for the value of the work done, 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, less other recoveries due in terms of the contract and less taxes due to be deducted at source as per applicable law.

**61. Property**

- 61.1 All materials on the Site, Plant, Equipment, Temporary Works and Works are deemed to be the property of the Employer, if the Contract is terminated because of a Contractor's default.

**62. Release from Performance**

- 62.1 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 Engineer 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 commitment was made.

**63. Suspension of World Bank Loan or Credit**

- 63.1 In the event that the World 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 World Bank's suspension notice.
  - b. If the Contractor has not received sums due to it upon the expiration of the 28 days for payment provided for in Sub-Clause 43.1, the Contractor may immediately issue a 14-day termination notice.

**64. Fraud and Corruption**

- 64.1 If the Employer determines that the Contractor and/or any of its personnel, or its agents, or its Subcontractors, sub-consultants, services providers, suppliers and/or their employees

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 59 shall apply as if such expulsion had been made under Sub-Clause 59.5 [Termination by Employer].

64.2 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.

64.3 For the purposes of this Sub-Clause:

- (i) “corrupt practice” is the offering, giving, receiving or soliciting, directly or indirectly, of anything of value to influence improperly the actions of another party<sup>1</sup>;
- (ii) “fraudulent practice” 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<sup>2</sup>;
- (iii) “collusive practice” is an arrangement between two or more parties<sup>3</sup> designed to achieve an improper purpose, including to influence improperly the actions of another party;
- (iv) “coercive practice” 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<sup>4</sup>;
- (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 23.2.

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<sup>1</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>2</sup> “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>3</sup> “Parties” refers to participants in the procurement process (including public officials) attempting to establish bid prices at artificial, non competitive levels.

<sup>4</sup> “Party” refers to a participant in the procurement process or contract execution.

## **F. Special Conditions of Contract**

### **1. LABOUR**

The Contractor shall, unless otherwise provided in the Contract, make his own arrangements for the engagement of all staff and labour, local or other, and for their payment, housing, feeding and transport.

The Contractor shall, if required by the Engineer, deliver to the Engineer a return in detail, in such form and at such intervals as the Engineer may prescribe, showing the staff and the numbers of the several classes of labour from time to time employed by the Contractor on the Site and such other information as the Engineer may require.

### **2. COMPLIANCE WITH LABOUR REGULATIONS:**

During continuance of the contract, the Contractor and his sub-contractors shall abide at all times by all existing labour enactments and rules made thereunder, regulations, notifications and bye laws of the State or Central Government or local authority and any other labour law (including rules), regulations, bye laws that may be passed or notification that may be issued under any labour law in future either by the State or the Central Government or the local authority. Salient features of some of the major labour laws that are applicable to construction industry are given below. The Contractor shall keep the Employer indemnified in case any action is taken against the Employer by the competent authority on account of contravention of any of the provisions of any Act or rules made thereunder, regulations or notifications including amendments. If the Employer is caused to pay or reimburse, such amounts as may be necessary to cause or observe, or for non-observance of the provisions stipulated in the notifications/bye laws/Acts/Rules/regulations including amendments, if any, on the part of the Contractor, the Engineer/Employer shall have the right to deduct any money due to the Contractor including his amount of performance security. The Employer/Engineer shall also have right to recover from the Contractor any sum required or estimated to be required for making good the loss or damage suffered by the Employer.

The employees of the Contractor and the Sub-Contractor in no case shall be treated as the employees of the Employer at any point of time.

**SALIENT FEATURES OF SOME MAJOR LABOUR LAWS APPLICABLE TO ESTABLISHMENTS ENGAGED IN BUILDING AND OTHER CONSTRUCTION WORK**

**(The law as current on the date of bid opening will apply)**

- a) Workmen Compensation Act 1923: The Act provides for compensation in case of injury by accident arising out of and during the course of employment.
- b) Payment of Gratuity Act 1972: Gratuity is payable to an employee under the Act on satisfaction of certain conditions on separation if an employee has completed 5 years service or more or on death the rate of 15 days wages for every completed year of service. The Act is applicable to all establishments employing 10 or more employees.
- c) Employees P.F. and Miscellaneous Provision Act 1952 (since amended): The Act Provides for monthly contributions by the employer plus workers @ 10% or 8.33%. The benefits payable under the Act are :
  - (i) Pension or family pension on retirement or death, as the case may be.
  - (ii) Deposit linked insurance on the death in harness of the worker.
  - (iii) payment of P.F. accumulation on retirement/death etc.
- d) Maternity Benefit Act 1951: The Act provides for leave and some other benefits to women employees in case of confinement or miscarriage etc.
- e) Contract Labour (Regulation & Abolition) Act 1970: The Act provides for certain welfare measures to be provided by the Contractor to contract labour and in case the Contractor fails to provide, the same are required to be provided, by the Principal Employer by Law. The Principal Employer is required to take Certificate of Registration and the Contractor is required to take license from the designated Officer. The Act is applicable to the establishments or Contractor of Principal Employer if they employ 20 or more contract labour.
- f) Minimum Wages Act 1948: The Employer is supposed to pay not less than the Minimum Wages fixed by appropriate Government as per provisions of the Act if the employment is a scheduled employment. Construction of Buildings, Roads, Runways are scheduled employments.
- g) Payment of Wages Act 1936: It lays down as to by what date the wages are to be paid, when it will be paid and what deductions can be made from the wages of the workers.
- h) Equal Remuneration Act 1979: The Act provides for payment of equal wages for work of equal nature to Male and Female workers and for not making discrimination against Female employees in the matters of transfers, training and promotions etc.
- i) Payment of Bonus Act 1965: The Act is applicable to all establishments employing 20 or more employees. The Act provides for payments of annual bonus subject to a minimum of 8.33% of wages and maximum of 20% of wages to employees drawing Rs.3500/-per month

or less. The bonus to be paid to employees getting Rs.2500/- per month or above up to Rs.3500/- per month shall be worked out by taking wages as Rs.2500/-per month only. The Act does not apply to certain establishments. The newly set-up establishments are exempted for five years in certain circumstances. Some of the State Governments have reduced the employment size from 20 to 10 for the purpose of applicability of this Act.

- j) Industrial Disputes Act 1947: The Act lays down the machinery and procedure for resolution of Industrial disputes, in what situations a strike or lock-out becomes illegal and what are the requirements for laying off or retrenching the employees or closing down the establishment.
- k) Industrial Employment (Standing Orders) Act 1946: It is applicable to all establishments employing 100 or more workmen (employment size reduced by some of the States and Central Government to 50). The Act provides for laying down rules governing the conditions of employment by the Employer on matters provided in the Act and get the same certified by the designated Authority.
- l) Trade Unions Act 1926: The Act lays down the procedure for registration of trade unions of workmen and employers. The Trade Unions registered under the Act have been given certain immunities from civil and criminal liabilities.
- m) Child Labour (Prohibition & Regulation) Act 1986: The Act prohibits employment of children below 14 years of age in certain occupations and processes and provides for regulation of employment of children in all other occupations and processes. Employment of Child Labour is prohibited in Building and Construction Industry.
- n) Inter-State Migrant workmen's (Regulation of Employment & Conditions of Service) Act 1979: The Act is applicable to an establishment which employs 5 or more inter-state migrant workmen through an intermediary (who has recruited workmen in one state for employment in the establishment situated in another state). The Inter-State migrant workmen, in an establishment to which this Act becomes applicable, are required to be provided certain facilities such as housing, medical aid, travelling expenses from home up to the establishment and back, etc.
- o) The Building and Other Construction workers (Regulation of Employment and Conditions of Service) Act 1996 and the Cess Act of 1996: All the establishments who carry on any building or other construction work and employs 10 or more workers are covered under this Act. All such establishments are required to pay cess at the rate not exceeding 2% of the cost of construction as may be modified by the Government. The Employer of the establishment is required to provide safety measures at the Building or construction work and other welfare measures, such as Canteens, First-Aid facilities, Ambulance, Housing accommodations for workers near the work place etc. The Employer to whom the Act applies has to obtain a registration certificate from the Registering Officer appointed by the Government.
- p) Factories Act 1948: The Act lays down the procedure for approval at plans before setting up a factory, health and safety provisions, welfare provisions, working hours, annual earned leave and rendering information regarding accidents or dangerous occurrences to designated

authorities. It is applicable to premises employing 10 persons or more with aid of power or 20 or more persons without the aid of power engaged in manufacturing process.

### **3. SUB-CONTRACTING (GCC Clause 7)**

Please add the following as Clause 7.2<sup>5</sup>:

The contractor shall not be required to obtain any consent from the employer for:

- a) the sub-contracting of any part of the Works for which the Sub-contractor is named in the contract;
- b) the provision of labour; and
- c) the purchase of materials which are in accordance with the standards specified in the Contract.

Beyond this if the contractor proposes sub-contracting any part of the work during execution of works, because of some unforeseen circumstances to enable him to complete the work as per terms of the contract; the Engineer will consider the following before according approval:

- The contractor shall not sub-contract the whole of the Works.
- The contractor shall not sub-contract any part of the Work without prior consent of the Engineer. Any such consent shall not relieve the contractor from any liability or obligations under the contract and he shall be responsible for the acts, defaults and neglects of any sub-contractor, his agents or workmen as fully as if they were the acts, defaults or neglects of the contractor, his agents or workmen.
- The Engineer should satisfy whether (a) the circumstances warrant such sub-contracting; and (b) the sub-contractors so proposed for the Work possess the experience, qualifications and equipment necessary for the job proposed to be entrusted to them in proportion to the quantum of work to be sub-contracted.
- If payments are proposed to be made directly to that sub-contractor, this should be subject to specific authorization by the prime contractor so that this arrangement does not alter the contractor's liability or obligations under the contract.

However, the Contractor may subcontract with the approval of the Employer only up to a max of 25% of the Contract Price.

### **4. ARBITRATION (GCC Clause 25.3)**

The procedure for arbitration will be as follows:

25.3 (a) In case of Dispute or difference arising between the Employer and a domestic

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<sup>5</sup> *The sub-contracting is allowed and acceptable only for certain specialized items of work like piling works for bridge foundation, bearings, Expansion joints or any similar other specialized works for carrying out the Works more effectively.*

*Sub-contracting of the works by vertical splitting (Milestone/part of a Milestone i.e., all the items of Works in the part or full road length of the Milestone) of the Works is not acceptable. For each, the qualifications and experience of the identified sub-contractor in the relevant field should be annexed.*

*The Contractor may subcontract with the approval of the Employer only up to a max of 25% of the Contract Price.;*



contractor relating to any matter arising out of or connected with this agreement, such disputes or difference shall be settled in accordance with the Arbitration and Conciliation Act, 1996. The arbitral tribunal shall consist of 3 arbitrators one each to be appointed by the Employer and the Contractor. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties and shall act as Presiding arbitrator. In case of failure of the two arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the arbitrator appointed subsequently, **the Presiding Arbitrator shall be appointed by the Chairman of the Executive Committee of The Indian Roads Congress.**

- (b) In the case of dispute with a Foreign contractor the dispute shall be settled in accordance with provisions of UNCITRAL Arbitration Rules. The Arbitral Tribunal shall consist of three Arbitrators one each to be appointed by the Employer and the Contractor. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties, and shall act a presiding arbitrator. In case of failure of the two arbitrators appointed by the parties to reach upon a consensus within a period of 30 days from the appointment of the arbitrator appointed subsequently, the Presiding arbitrator shall be appointed by the Indian Council of Arbitration.
- (c) If one of the parties fails to appoint its arbitrator in pursuance of sub-clause (a) and (b) above within 30 days after receipt of the notice of the appointment of its arbitrator by the other party, then the Chairman of the Executive Committee of Indian Roads Congress, both in cases of the Foreign Contractor as well as Indian Contractor, shall appoint the arbitrator. A certified copy of the order of the Chairman of the Executive Committee of Indian Roads Congress, making such an appointment shall be furnished to each of the parties.
- (d) Arbitration proceedings shall be held at **Gandhinagar (Gujarat)**, India, and the language of the arbitration proceedings and that of all documents and communications between the parties shall be English.
- (e) The decision of the majority of arbitrators shall be final and binding upon both parties. The cost and expenses of Arbitration proceedings will be paid as determined by the arbitral tribunal. However, the expenses incurred by each party in connection with the preparation, presentation, etc. of its proceedings as also the fees and expenses paid to the arbitrator appointed by such party or on its behalf shall be borne by each party itself.
- (f) Where the value of the contract is Rs.50 million and below, the disputes or differences arising shall be referred to the Sole Arbitrator. The Sole Arbitrator should be appointed by agreement between the parties; failing such agreement, by the appointing authority, namely the Chairman of the Executive Committee, Indian Roads Congress.
- (g) Performance under the contract shall continue during the arbitration proceedings and payments due to the contractor by the owners shall not be withheld, unless they are the subject matter of the arbitration proceedings.

**5. PROTECTION OF ENVIRONMENT:**

Add the following as GCC Clause 16.2:

The contractor shall take all reasonable steps to protect the environment on and off the Site and to avoid damage or nuisance to persons or to property of the public or others resulting from pollution, noise or other causes arising as a consequence of his methods of operation.

***Clause for Nonconformity to EMP - Protection of the Environment***

***The Contractor shall implement all mitigation measures for which responsibility is assigned to him as stipulated in the EMP Report. Any lapse in implementing the same will attract the damage clause as detailed below:***

***1. All lapse in obtaining clearances / permissions under statutory regulations and violations of any regulations with regard to eco-sensitive areas shall be treated as a major lapse.***

***2. Any complaints of public, within the scope of the Contractor, formally registered with the CSC, R & BD or with the GoG and communicated to the Contractor, which is not properly addressed within the time period intimated by the CSC / R & BD, GoG shall be treated as a major lapse.***

***3. Non-conformity to any of the mitigation measures stipulated in the EMP Report (other than stated above) shall be considered as a minor lapse.***

***4. On observing any lapses, CSC shall issue a notice to the Contractor, to rectify the same.***

***5. Any minor lapse for which notice was issued and not rectified, first and second reminders shall be given after ten days from the original notice date and first reminder date respectively. Any minor lapse, which is not rectified, shall be treated as a major lapse from the date of issuing the second reminder.***

***6. If a major lapse is not rectified upon receiving the notice CSC shall invoke reduction, in the subsequent interim payment certificate.***

***7. For major lapses, 10% of the interim payment certificate will be withheld, subject to a maximum limit of Rs. 56 lakhs.***

***8. If the lapse is not rectified within one month after withholding the payment, the amount withheld shall be forfeited***

During continuance of the contract, the contractor and his sub-contractors shall abide at all times by all existing enactments on environmental protection and rules made thereunder, regulations, notifications and bye-laws of the State or Central Government, or local authorities and any other law, bye-law, regulations that may be passed or notification that may be issued in this respect in future by the State or Central Government or the local authority.

Salient features of some of the major laws that are applicable are given below:

- The Water (Prevention and Control of Pollution) Act, 1974: This provides for the prevention and control of water pollution and the maintaining and restoring of wholesomeness of water. 'Pollution' means such contamination of water or such alteration of the physical, chemical or biological properties of water or such discharge of

any sewage or trade effluent or of any other liquid, gaseous or solid substance into water (whether directly or indirectly) as may, or is likely to, create a nuisance or render such water harmful or injurious to public health or safety, or to domestic, commercial, industrial, agricultural or other legitimate uses, or to the life and health of animals or plants or of aquatic organisms.

- The Air (Prevention and Control of Pollution) Act, 1981: This provides for prevention, control and abatement of air pollution. 'Air Pollution' means the presence in the atmosphere of any 'air pollutant', which means any solid, liquid or gaseous substance (including noise) present in the atmosphere in such concentration as may be or tend to be injurious to human beings or other living creatures or plants or property or environment.
- The Environment (Protection) Act, 1986: This provides for the protection and improvement of environment and for matters connected therewith, and the prevention of hazards to human beings, other living creatures, plants and property. 'Environment' includes water, air and land and the inter-relationship which exists among and between water, air and land, and human beings, other living creatures, plants, micro-organism and property.
- The Public Liability Insurance Act, 1991: This provides for public liability insurance for the purpose of providing immediate relief to the persons affected by accident occurring while handling hazardous substances and for matters connected herewith or incidental thereto. Hazardous substance means any substance or preparation which is defined as hazardous substance under the Environment (Protection) Act 1986, and exceeding such quantity as may be specified by notification by the Central Government.

Refer Environmental Management Plan attached as Annexure B to Special Conditions of Contract F.

*[Employers should note that the Loan Agreement between IBRD and the borrowing country may establish specific measures to be taken during construction of the Works for the protection of the environment. Sub-clause 16.2 should be modified/expanded to take into account such specific measures or other measures considered appropriate by the Employer]*

**6. Clause no 19 Safety**

Please add the following at the end of Clause 19

“Safety is of paramount importance in the contract and payment or deduction of Safety premium shall not relieve the contractor from his obligation to procure, install and maintain Safety measures, complete the work as per agreed construction program and milestones or from any other of the contractor’s obligations and liabilities under the contract. Safety of persons working on the project, road users and properties adjoining the highway is primarily the responsibility of the Contractor.

The Contractor shall prepare Safety Plan detailing measures to be adopted for each activity and for each section and sub-section to be undertaken during next 15 days every fortnight. The first Safety Plan shall be submitted to the Engineer at the start of work. The Engineer shall review and approve with or without modifications the Safety Plan. The Contractor shall procure, install and maintain Safety measures specified in approved Safety Plan. The Engineer shall maintain record

of compliance / non-compliance of Safety Plan.

In case of non-compliance of Safety Plan, the Engineer will order stoppage of Works. This stoppage of Works shall be considered as stoppage due to Contractor's default. Consistent non-compliance of Safety Plan aggregating to more than 180 days shall entitle the Employer / Engineer to terminate the Contract.”

**7. Clause No 23 Instructions**

**Add after Sub-Clause 23.2**

**Sub-Clause 23.3**

The Contractor shall follow the Environmental Management Plan specified in Annexure B to Special Conditions of Contract. The Engineer shall maintain record of compliance or non-compliance of Environmental Management Plan. On observing any non – compliances, the Engineer shall issue a notice to the Contractor, to rectify the same. In case of any failure to rectify the non-compliance within the specified / stipulated timeframe, the contractor is liable for the below mentioned penalties.

The contractor achieving the compliance to EMP will be appreciated through:

- a) Certificate of appreciation from R&BD with regard to compliance to EMP provisions;
- b) The contractors' environmental performance will be disclosed in the GSHP-II website for their compliance in achieving the EMP;

In case of non- compliance, the contractor is liable for the following penalties:

- a) deduction of 0.15% of Contract value in the next interim payments for not obtaining any of the statutory clearances as mentioned under Applicable Laws and Regulations in the EMP;
- b) deduction of 0.15% of Contract value in the next interim payments if they have failed to implement any of the mentioned management/ mitigation measures as suggested in the EMP;
- c) deduction of 0.15% of Contract value in the next interim payments for not addressing the corrective action/ measures to the hindrance / obstructions caused due to the construction activities to the public/ locals based on the request to the Contractor through the Engineer/PIU.
- d) deduction of 0.15% of Contract value in the next interim payments for non-compliance in implementing environmental monitoring plan as specified in the EMP;
- e) Additional deduction of 0.15% of Contract value in the next interim payments for non-compliance for labour camp management, which includes infrastructure provisions, maintenance, upkeep and handling;
- f) Additional deduction of 0.15% of Contract value in the next interim payments for non-compliance found in case of rehabilitation of borrow area, quarry area and haul roads.

**8. Clause No 38 Changes in the Quantities**

**Sub-Clause 38.2**

The words “more than 15 percent” has been replace by the words “more than 5 percent”

**9. Clause 48 Retention:**

Sub-Clause 48.2 has been replaced as follows

On Completion of the whole of the Works half the total amount retained is repaid to the Contractor and half when the Maintenance guarantee period has passed.

**10. LIQUIDATED DAMAGES:**

Sub-clause 49.1:

Please substitute the last sentence with the following:

“Time is the essence of the contract and payment or deduction of liquidated damages shall not relieve the contractor from his obligation to complete the work as per agreed construction program and milestones or from any other of the contractor’s obligations and liabilities under the contract.”

**11.** Add the following as GCC Clause 35.3:

**MAINTENANCE OF PROJECT HIGHWAY:** The Contractor shall maintain the Project Highway beyond the Defect Liability Period (including extension thereof if any) for a period specified in the Contract Data in accordance with Annexure A to Special Conditions of Contract.

**12. Inspections and Audit by the Bank**

The Contractor shall permit the Bank and/or persons appointed by the Bank to inspect the Site and/or the Contractor’s accounts and records 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.

## ANNEXURE A TO SPECIAL CONDITIONS OF CONTRACT MAINTENANCE OF PROJECT HIGHWAY

### Clause 1 - General

- I. In accordance with the terms of the contract all components of the constructed road corridor shall be of very high standard, requiring no major repairs for at least three (3) years (One year Defect Liability Period and two Years Maintenance Period) after the completion of works.
- II. The Employer will take over the works and Sections on issue of completion certificate as per the provisions of Clause 56 of Conditions of Contract. However, the Contractor will continue to be responsible to make good the defects and maintain the road corridor during defect liability period and maintenance period respectively.
- III. Clause 1.1 of Conditions of Contract is extended to include the following definitions:
  - a. **Routine Maintenance** is the maintenance activities performed during maintenance period as specified for maintaining the road in traffic worthy condition.
  - b. **Corrective Maintenance** is the maintenance activities performed of roads for maintenance period as specified for restoring the functionality of road..
- IV. The scope of works is extended to include the following:  
The works include remedying of defects / distresses observed during the defect liability period. The works also include maintaining the road corridor during the maintenance period.

### Clause 2 –Maintenance:

**The Clause 3000, 3001, 3002, 3003, 3004 and 3005 of Specifications for Road and Bridge Works (Fourth Revision) published by MORT&H shall be followed except the respective sub-clauses on measurements, rates and payment shall be deleted and payment shall be made as per conditions of this annex. Wherever there is conflict between specifications in this annex and MORT&H specifications specified above, the specifications in this annex shall govern.**

**2.1 - Routine Maintenance:** This includes all items of work required for maintaining the road in traffic worthy condition. The Routine Maintenance includes making good or remedying defects like Surface Defects, Cracks, Deformation and Disintegration to make road traffic worthy. These defects are further described hereunder. Several other items of work required to be undertaken periodically like renewal of road marking, white washing of guard stones, cutting or pruning of tree branches, white washing of parapets of culverts are included in routine maintenance.

**Surface Defects:** These include fatty surface, smooth surface, streaking and hungry surface etc.

**Cracks:** These include hairline cracks, alligator cracks, longitudinal cracks, edge cracks, shrinkage cracks, and reflection cracks etc.

**Deformation:** This includes slippage, rutting, corrugations, shoving, shallow depressions, settlements and upheavals etc.

**Disintegration:** This includes stripping, loss of aggregates, raveling, pot-holes, edge breaking etc.

**2.2 - Corrective Maintenance:** This includes all items of work not covered under Routine Maintenance. However, this mainly includes restoration or replacement of items like guard stones, kilometer stones, 200 meter stones, road signs etc., as well as overlays, resurfacing, rehabilitation etc.

**Clause 3 - Correction of Defects noticed during the Defect Liability Period**

The Defects Liability Period begins at Completion and ends after Defects Liability Period. If any defect or defects appear and is observed by the Engineer during the Defects Liability Period, the Engineer shall give notice to the Contractor before the end of the Defects Liability Period. Every time notice of Defect/Defects is given, the Contractor shall rectify the notified Defect/Defects at his own cost within the length of time specified by the Engineer's notice. The Defects Liability Period shall be extended for as long as Defects remain to be rectified after the Defects Liability Period.

If any defect or defects are not rectified within length of time specified in the notice, the Employer shall be at liberty to rectify the defect or defects as the case may be at risk and cost to the Contractor. The cost of such rectification shall be recovered from amount of Performance Security/Balance Retention Money available with the Employer or from any amount due to the Contractor. The Performance Security/Balance Retention Money shall be released when the Defect Liability and Maintenance periods are over, the Engineer has certified that the Defects, if any, notified by the Engineer to the Contractor before the end of this period have been corrected, the Contractor has submitted "As Built Drawings"; and that the contractor has satisfactorily carried out the maintenance of the road.

**Clause 4 - Maintenance of road corridor during Maintenance Period**

The Maintenance Period shall start after completion of Defects Liability Period (including Extension).

The Contractor shall carry out the routine and corrective maintenance of roads, including pavement, shoulders, road sides, bridges, structures, cross drains, surface drains and all other components included in the Work to the required standards and in the manner as specified hereunder and keep all components of the entire road surface and structures in defect free and traffic worthy condition during the entire maintenance period as pay items.

If the Routine Maintenance part of the contract is not carried out by the Contractor as per this contract, the employer will be at liberty to carry out Routine Maintenance work at the risk and cost to the Contractor and the amount required for this work will be recovered from the amount of Performance Security/Balance Retention Money available with the employer and / or from any amounts of the Contractor whatever is due.

To fulfil the objectives laid down above, the Contractor shall undertake detailed inspection of the roads at least once in a month or as specified in Clause 5. The Contractor shall forward to the Engineer the record of inspection and rectification each month. The Contractor shall pay particular attention on those road sections which are likely to be damaged or inundated during rainy season.

**Clause 5 - Inspection:**

Inspection of drainage system and structures shall be a routine task. If it is not possible then the inspections should be carried out at least on four occasions every year. Firstly before onset of monsoon, Secondly, during monsoon particularly after first flash floods, thirdly after heavy floods, and fourthly after monsoon.

**5.1 Inspection before monsoon:** Following points shall be inspected:

- (i) Waterway is clear and not blocked by debris or silt
- (ii) Settlement cracks in foundations or in superstructure
- (iii) Cracks or damages in pavement.
- (iv) Guide stones are properly fixed and pointed
- (v) Warning signs are placed on both sides of cross drainage structures giving clear warning that when water is flowing above the guide stones, vehicles shall not cross the cross drainage structure
- (vi) Approaches are in good conditions and there is no erosion.
- (vii) Debris arrestors if provided are properly fixed.

**5.2 Inspection after first flash flood:** It is generally observed that during first flash flood or during next two, three spells, there is substantial load of floating debris along with floodwater. If the vents are not of sufficient opening, then waterway is blocked by the debris and water starts flowing on approaches or by breaching the adjoining road sections. It is, therefore, essential to remove this blocked debris from pipe vents or waterway immediately so that there will be minimum damages in subsequent floods. In view of this, close and repeated inspections are essential during rainy season.

**5.3 Inspection after heavy floods:** During heavy floods, causeways are generally overtopped. This results in heavy damages to pavement, approaches as well as scouring on downstream side of structures. In some cases there is breaching of approaches. All these points shall be closely inspected after every heavy flood, so that timely protective measures can be taken.

**5.4 Inspection after monsoon:** Once the monsoon season is over, the structures shall be inspected closely for any damage, any heavy silting or scouring to pavement damages to guide stones etc. Repairs to these damages shall be carried out promptly.

**5.5 Inspection by the Engineer:** The Engineer may issue notice to the Contractor to carry out maintenance of defects, if any, noticed during his inspection, or brought to his notice. The Contractor shall remove the defects within the period specified in the notice and submit to the Engineer a compliance report.

**Clause 6 -Distresses/Defects in Pavements**

Various types of distress/defects of pavements are listed below:

**I. Flexible Pavements**

- (i) Cracks: Separation of the pavement due to natural causes, traffic action, or reflections from an underlying pavement.



- (ii) Alligator Cracks: Interconnected cracks forming a series of small blocks resembling an alligator's skin or chicken wire mesh.
- (iii) Bleeding: The upward movement of bitumen in a bituminous pavement resulting in the formation of a film of bitumen on the surface.
- (iv) Corrugations: A form of plastic movement typified by ripples across the pavement surface.
- (v) Depression/Settlement: Localized low areas of limited size that may or may not be accompanied by cracking.
- (vi) Disintegration: The breaking up of a pavement surface from its original shape.
- (vii) Raveling: The progressive separation of aggregate particles in a pavement from the surface downward or from the edges inward.
- (viii) Rutting: Channelized depressions that may develop in the wheel tracks of the bituminous pavement.
- (ix) Potholes: Bowl shaped holes of varying sizes in the pavement, resulting from localized disintegration.
- (x) Shoving: A form of plastic movement resulting in localized bulging of pavement.
- (xi) Upheaval: The localized upward displacement of a pavement due to swelling of the subgrade or some portion of the pavement structure.

**Clause 7 Maintenance Activities:**

Whenever and wherever the defects/distress described above are observed on the road corridor, they shall be made good or remedied. The routine maintenance shall meet the following minimum requirements:-

- (a) Potholes and cracks on the road surface to be repaired soon after these appear or brought to his notice either during contractor's monthly inspection or by the Engineer.
- (b) Road shoulders to be maintained in proper condition to make them free from excessive edge drop offs, roughness, scouring or potholes.
- (c) Cleaning of surface drains including reshaping to maintain free flow of water.
- (d) Cleaning of culverts and pits for free flow of water.
- (e) Any other maintenance operation required to keep the road traffic worthy at all time during the maintenance period.
- (f) Routine maintenance and up-keep of road components such as road formation, retaining walls, breast walls, culverts, bridges, causeways, pavement and other appurtenances.
- (g) Clearance of landslides/slips caused by rains or other natural causes.

**Clause 8: Periodicity of Maintenance**

Further to the activities described in Clause 7 regarding maintenance activities, the Contractor shall carry out following activities regularly at frequencies shown against them.

<i>S. No.</i>	<i>Name of Item/ Activity</i>	<i>Frequency of operation in one year</i>
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**Section 3: Conditions of Contract**

<i>S. No.</i>	<i>Name of Item/ Activity</i>	<i>Frequency of operation in one year</i>
1	<i>Routine Maintenance of roads as per clause 3001 of MORT&amp;H Specifications</i>	<i>As and when required</i>
2	<i>Restoration of rain cuts and dressing of berms as per clause 3002 of the MORT&amp;H Specifications.</i>	<i>Once generally after rains (In case of areas having rainfall more than 1500 mm per year, as and when required).</i>
3	<i>Making up of shoulders as per clause 3003 of the MORT&amp;H Specifications</i>	<i>As and when required.</i>
4	<i>Maintenance of Bituminous surface road including filling pot holes and patch repairs etc. as per clause 3004 of the MORT&amp;H Specifications.</i>	<i>As and when required.</i>
5	<i>Maintenance of slopes and drains as per clause 5 – 1 below</i>	<i>Twice in a year</i>
6	<i>Maintenance of culverts, cause ways and small bridges as per clause 5 – 2 and 5 – 3 below</i>	<i>Twice in a year</i>
7	<i>Maintenance of road signs as per clause 5 – 4 below</i>	<i>Maintenance as and when required. Repainting once in every two years.</i>
8	<i>Maintenance of road markings as per clause 5 – 5 below</i>	<i>Maintenance as and when required. Repainting once in every two years.</i>
8	<i>Maintenance of guard rails and parapet rails</i>	<i>Maintenance as and when required. Repainting once in a year.</i>
9	<i>Maintenance of 200 m and Kilo Meter stones</i>	<i>Maintenance as and when required. Repainting once in a year.</i>
10	<i>White washing guard stones</i>	<i>Twice in a year</i>
11	<i>Re-fixing displaced guard stones</i>	<i>Once in a year</i>
12	<i>Cutting of branches of trees, shrubs and trimming of grass and weeds etc.</i>	<i>Once generally after rains (In case of areas having rainfall more than 1500 mm per year, as and when required).</i>
13	<i>White washing parapets of C.D. Works</i>	<i>Once in a year</i>

**Clause 9 -Maintenance of Slopes, Drains, Culverts, Causeways, Road signs, Guard rails, Parapet rails, 200m and Kilometer stones, Guard stones etc.****1. Maintenance of Slopes and Drains**

- 1.1 Together with clearing unwanted vegetation on shoulders, clearing of slopes and drains / ditches shall also be carried out.
- 1.2 Carryout reshaping, re-grading and deepening of ditches / drains preferably by tractor-towed grader, wherever possible, otherwise by manual methods. Alignment shall be set by string-line and the materials within string-line shall be cut and removed. Cross-section, grade and depth shall be checked and corrected. Excess material must be removed from the site and shall never be spread over any component of road.
- 1.3 Any object which can interfere with water flow must be removed.
- 1.4 Repair drains erosion by replacing and backfilling the lost soil. In case of recurring problems of erosion, permanent measures like masonry lining shall be considered.
- 1.5 Check for any settled or damaged precast drain sections or loose stone, which shall be removed and underlying soil compacted. After addition of fresh soils, the levels shall be corrected and then only fresh stone or precast drain shall be laid.

- 1.6 For vegetation control, tractor-towed mower can be employed where available and as an alternative hand-guided mower can also be used.
- 1.7 For erosion control, turfing (grass sodding) is suitable when climate and soil conditions are favorable. Seek advice of local agriculture department on topsoil required, seed type and rate of spread, fertilizer types and rate of spread and most favorable season and weather for seeding. Suitable mulch like jute netting can be provided for preventing seeds from getting washed away before the seeds sprout.
- 1.8 Quality control requirements
  - 1.8.1 Materials: All soils and other materials used for maintenance shall satisfy all quality requirements for use in shoulders, along slopes and in roadside ditches / drains as laid down for original construction.
  - 1.8.2 Surface Finish: All maintenance works must be carried out to the finish surface standards laid down in original designs.
  - 1.8.3 Camber / Cross Fall / Side Slopes: Check that the maintenance work has been carried out to the specified camber / cross-section and side slopes.

## **2. Maintenance of Culverts and Small Bridges**

### **2.1 Methodology**

- 2.1.1 Inspect approaches of the CD works for possible erosion and settlement, besides any damage due to movement of cattle/human beings/vehicles between stream and roadway.
- 2.1.2 Examine floor protection to assess extent of cracking/damage to the floor, cut off walls, aprons etc.
- 2.1.3 Observe any abnormal change of channel flow and movement of debris, floating material, sand, silt and boulders.
- 2.1.4 Examine the general condition of foundation, pier, abutment, wing walls, return walls, springing of arches, headwalls, cut off walls for any damage due to scouring/earth pressure.
- 2.1.5 Check for growth of vegetation in all structural components for cracking in concrete, loosening of brick/stone masonry work, opening of joints at crown section, separation of arch rings/spandrel walls, settlement/tilt of foundation etc.
- 2.1.6 Check for condition of inlets, outlets and catch pits of pipe culverts/arches/boxes from inside and on outer faces for growth of vegetation, erosion and choking of culverts.
- 2.1.7 For concrete members examine for signs of distress such as cracking, spalling /corrosion of embedded steel etc.
- 2.1.8 Examine drainage spouts, guide posts, railings, parapets, guard stones, kerbs and wearing coat for durability and for safety of pedestrians and animals.

### **2.2 Quality Control Requirements**

- 2.2.1 Clear and clean debris of sand and silt from culvert opening and catch water pit including growth of vegetation at inlet and outlet. Remove and dump the same far away from water channel.
- 2.2.2 Undertake repairs for damages caused due to erosion, cracks and spalls to substructures and protection works.
- 2.2.3 Inspect general condition of foundation and for separation of arch rings and spandrel walls and carry out repairs.

2.3 Materials

- 2.3.1 Carry out repairs on cement based components / parts with cement mortar.
- 2.3.2 Inject epoxy grout for sealing of cracks and filling of voids in concrete, under pressure, following Manufacturer's specification.
- 2.3.3 Carry out repairs on concrete deck slabs with Methyl Methacrylate (MMA) or Trimethyl Propane, Trimethacrylate as per Manufacturer's specification.
- 2.3.4 Carry out repairs to approaches and banks periodically with local soil.
- 2.3.5 Use brick or stone masonry for repair of components made of same materials.

**3. Maintenance of Causeways**

3.1 Methodology

- 3.1.1 Check for adequacy of waterway and any abnormal change in flow pattern of channel on upstream and downstream side after each flood season including out flanking
- 3.1.2 Examine major damages caused by outflanking or cavitation, causing collapse of headwalls, damages to paved surface and fill material that holds multiple pipes / openings.
- 3.1.3 Check the condition of vents for accumulation of sand/debris etc. and check for accumulation of debris on the surface of causeway after each submergence and clean.
- 3.1.4 Check the approaches for erosion/wash out and face walls and headwalls for loosening of material.
- 3.1.5 Check the condition of guideposts/guard stones/kerbs including slopes of approaches.
- 3.1.6 Check any damages to downstream protection works like CC Blocks, stone pitching and wire crates.
- 3.1.7 Check the functioning of flood gauge of causeways and submersible bridges before onset of monsoon.

3.2 Quality Control Requirements

- 3.2.1 Carryout repairs to the submerged portions of the structure with the same parent material.
- 3.2.2 Remove growth of vegetation in different components, debris/floating material on both upstream and downstream side of causeway as well as roadway.
- 3.2.3 Carryout repairs to guideposts/guard stones/kerbs, debris arresters and roadway.
- 3.2.4 Undertake minor repairs to flood gauges and other ancillaries.
- 3.2.5 Undertake repairs to the damages caused by out flanking, collapse of headwalls and to paved roadway surface.

3.3 Materials

- 3.3.1 Carryout repairs to concrete components or cement plaster with the same material.
- 3.3.2 Use stones / bricks for replacement of parts or to repair local damages.
- 3.3.3 Use local soil if suitable, for repairs to embankments, approaches etc.

**4. Maintenance of Road Signs**

4.1 Methodology

- 4.1.1 All road signs shall be inspected at least four times a year both in day and night.

- 4.1.2 All signs along with the posts shall be maintained in proper position and kept clean and legible at all times.
- 4.1.3 Damaged signs shall be replaced immediately.
- 4.1.4 A schedule of painting of the posts and signs shall be maintained. Painting of road signs shall be done every two years.
- 4.1.5 Tree branches, plantation, weeds, shrubbery and mud etc. shall not be allowed to obscure the road signs.
- 4.2 Quality Control Requirements
- 4.2.1 The material for repair/fabrication of signs shall confirm to IRC 67.

## **5. Maintenance of Markings and Appurtenances**

### **5.1 Methodology**

- 5.1.1 All road markings shall be maintained so as to be clearly visible to the driver of vehicle. Yearly schedule of re-painting the markings shall be adhered to, in order to ensure proper maintenance of markings.
- 5.1.2 The material for maintenance of road markings shall be in conformity with IRC 35: Code of Practice for Road Markings with Paint and IS 164.
- 5.1.3 Repainting and lettering on kilometer and 200 meter stones shall be as per guidelines indicated in IRC 8 and IRC 26. The stones shall be maintained in proper position and kept clean and legible at all times. Damaged as well as tilted stones shall be fixed, repaired/replaced immediately.
- 5.1.4 Plantation, weeds, shrubbery and mud etc. shall not be allowed to obscure the stones/signs.
- 5.1.5 Iron, wooden or concrete posts for road delineators shall be repainted regularly, especially after the rains to keep them clean and visible. The ground around the delineators, hazard markers, road way indicators and object markers shall be kept clean by cutting grass/weeds and bushes etc. periodically to maintain the visibility of the delineators.
- 5.1.6 The material for repair/replacement of road delineators, hazard markers, roadway indicators and object markers shall confirm to the guidelines included in IRC 79.
- 5.1.7 All branches of trees extending above roadway shall be cut or trimmed so as to provide a clear height of 5 meter above the road surface and shoulders.
- 5.1.8 All shrubs, grass and weeds in the roadway land shall be trimmed and debris removed to a suitable location as directed by Engineer to ensure unobstructed sight distance of adequate length.
- 5.1.9 The parapet walls of culverts, minor bridges and tree trunks shall be cleaned of all scales, dirt or loose material and applied two coats of white wash using good unslaked lime.

## **Clause 10 Payment:**

The Bill of Quantities shall contain items for the construction, installation, testing, and commissioning, and maintaining works, and lump sum figures for yearly routine maintenance for each year of the Maintenance Period separately, to be done by the Contractor.

The payment to the Contractor shall be performance based for routine maintenance of roads.

For Corrective Maintenance, the Employer reserves the right either to get the works executed through another agency or against the Contract. In the latter case payment to the Contractor shall

be based on quantity of actual work done and rates quoted by him for same or similar item of work for the construction contract with price adjustment or as a variation in accordance with Clause 13.

**Clause 11 - The procedure for payment to the contractor:**

The Contractor shall submit to the Engineer a bill every month for the routine maintenance of the roads from the date the maintenance period starts. It will be supported with a copy of the record of contractor's monthly inspection and other instructions received from the Engineer.

The payment will be made every six-month for the monthly bills received during the previous six-months.

If the bill for a month is not received from the contractor by the 10th day of the succeeding month or/ and if the Engineer has not certified that the contractor has carried out the maintenance work for defects brought to his notice within specified period, no payment will become due to the Contractor for that month.

If any unfulfilled maintenance requirement is found by the Engineer, he will issue notice to the Contractor for fulfilling the requirement within specified time. If the Contractor fails to carry out the maintenance during the time specified by the Engineer, no payment of any kind will be due to the Contractor for that month.

Following technical personnel shall be available throughout the Defect liability and Maintenance Period for attending to routine maintenance requirements.

Technical Personnel	Number	Experience in Road Works
A. Degree Holder in Civil Engineering	One	5 Years
B. Diploma Holder in Civil Engineering	Two	5 Years

**Bill of Quantities**

For the routine maintenance of roads, there is lump sum provision for each year of maintenance. The payments will be based on satisfactory performance of routine maintenance activities.

## ANNEXURE B TO SPECIAL CONDITIONS OF CONTRACT

### ENVIRONMENTAL MANAGEMENT PLAN (EMP)

The Contractor shall implement the Environmental Management Plan and attachment to the Environmental Management Plan specified below as part of Work.

### ENVIRONMENTAL MANAGEMENT PLAN (EMP)

1. The Environmental Management Plan (EMP) forms part of the Bid Document. The aspects given in EMP are mandatory in nature and thus, the Contractor is contractually bound to abide by the same.

It is deemed that the costs associated with carrying out the requirements of the EMP are, unless separate items are included in Bill No.10 of the Bill of Quantities, as incidental to the works therefore, no excuses towards non-compliance during construction shall be entertained. All these clauses are applicable to sub-contractors as well. However, the main contractor will be held responsible in the case of any non-compliance on part his sub-contractors. The Engineer and PIU, shall regularly monitor the compliance of EMP by the contractor. The Contractor shall regularly monitor the compliance of EMP by their Sub-contractors. **The Contractor shall submit monthly environmental reports in the format prescribed by the PIU. (Additional reports shall be submitted upon request from the PIU).**

Clause for Nonconformity to EMP - Protection of the Environment

The Contractor shall implement all mitigation measures for which responsibility is assigned to him as stipulated in the EMP Report. Any lapse in implementing the same will attract the damage clause as detailed below:

1. All lapse in obtaining clearances / permissions under statutory regulations and violations of any regulations with regard to eco-sensitive areas shall be treated as a major lapse.
2. Any complaints of public, within the scope of the Contractor, formally registered with the CSC, R & BD or with the GoG and communicated to the Contractor, which is not properly addressed within the time period intimated by the CSC / R & BD, GoG shall be treated as a major lapse.
3. Non-conformity to any of the mitigation measures stipulated in the EMP Report (other than stated above) shall be considered as a minor lapse.
4. On observing any lapses, CSC shall issue a notice to the Contractor, to rectify the same.
5. Any minor lapse for which notice was issued and not rectified, first and second reminders shall be given after ten days from the original notice date and first reminder date respectively. Any minor lapse, which is not rectified, shall be treated as a major lapse

from the date of issuing the second reminder.

6. If a major lapse is not rectified upon receiving the notice CSC shall invoke reduction, in the subsequent interim payment certificate.

7. For major lapses, 10% of the interim payment certificate will be withheld, subject to a maximum limit of about 0.5 % of contract Value.

8. If the lapse is not rectified within one month after withholding the payment, the amount withheld shall be forfeited

**(a) Table 1: Environmental Management Plan**

Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
<b>1 Pre-Construction Stage</b>					
<b>1.1. Pre-construction activities by PIU</b>					
	<b>1.1.1.</b> Utility Relocation and Common Property Resources (CPRs)	<b>Clause 110.1. and 110.7 of MoRTH</b>	<ul style="list-style-type: none"> <li>PIU and concerned line departments shall take necessary precautions, and shall provide barricades/delineation of such sites to prevent accidents including accidental fall into bore holes, pits, drains both during demolition and construction/ relocation of such facilities. Standard safety practices shall be adopted for all such works.</li> </ul>	Corridor of Impact.	PIU
<b>1.2. Pre-construction activities by the Contractor/Engineer</b>					
	<b>1.2.1.</b> Joint Field Verification		<ul style="list-style-type: none"> <li>The Engineer and Contractor shall ascertain the feasibility of implementing the Environmental Management Plan (EMP) through Joint field verification.</li> <li>Any observations / modification required in updating EMP shall be done by the Engineer and a copy of the modified EMP shall be submitted to the PIU for review and approval.</li> </ul>	Along the project corridor	Contractor under the supervision of the Engineer
	<b>1.2.2.</b> Procurement of Machinery				

<sup>6</sup> All locations are referred to design chainages



**Section 3: Conditions of Contract**

Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
1.2.2.	Crushers, Hot-mix Plants & Batching Plants	(i) Emission control legislations of <b>CPCB/ GPCB</b> for air, noise etc.  (ii) <b>Clause 111.5 of MoRTH</b> (Pollution from Hot mix and Batching Plant)	<ul style="list-style-type: none"> <li>The contractor shall follow all stipulated conditions for pollution control as suggested by the GPCB in the consent/ NoC for establishing and operating the Hot-mix and Batching Plant.</li> <li>No such installation by the Contractor shall be allowed till all the required legal clearances are obtained from the competent authority and the same is submitted to the PIU.</li> <li>The location of the hot-mix and batching plant shall be at least (i) 1000m away from settlements and shall be placed in the downwind direction and (ii) 10 km aerial distance away from the protected areas (sanctuary, national parks etc.).</li> <li>The contractor shall submit the detailed layout plan for approval to the Engineer before getting into formal agreement with landowners for setting up of such site. Actions by Engineer and PIU against any non-compliance shall be borne by the Contractor at his own cost.</li> </ul>	All construction machineries (Crushers, Hot-mix Plants & Batching Plants) should be kept/stationed 1000m away from settlements: <u>SH-02:</u> <ul style="list-style-type: none"> <li>Lunawada (130+000)</li> <li>ChavadiyaPatia (134+500)</li> <li>Rampatel Na MuvadaPatia (139+000)</li> <li>HarigamaMuvadaPatia (145+200)</li> <li>Godhar (147+000)</li> <li>Moti Sarsan (151+500)</li> <li>Santrampur (162+000)</li> </ul> <u>SH-152:</u> <ul style="list-style-type: none"> <li>Sangawada (2+100)</li> <li>Ukhreli (6+400)</li> <li>GhatiyaSindhya (12+450)</li> </ul>	Contractor under the supervision of the Engineer
				<u>Sensitive location:</u> Reserved Forest locations Ch141+925 to 143+400, Ch158+575 to 161+500, Ch162+250 to 162+600, Ch 2+500 to 3+550, Ch 4+050 to 4+225, Ch 5+150 to 06+050, Ch 8+400 to 9+400, Ch 15+250 to 15+600, and Ch 15+600 to 22+200)	

**Section 3: Conditions of Contract**

Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
	1.2.2.2	Other Construction Vehicles, Equipment and Machinery	<p>Discharge standards and Noise limits as per <b>Environment Protection Act, 1986 (EPA)</b></p> <p>Emission standards as per <b>Bureau of Indian Standard (BIS)</b> preferably <b>Bharat IV emission norms</b></p> <ul style="list-style-type: none"> <li>Equipment's conforming to the latest noise and emission control measures shall be used.</li> <li>Pollution under Control (PUC) certificates for all vehicles and machinery shall be made available to the Engineer and PIU for verification whenever required.</li> </ul>	Along the project corridor	Contractor under the supervision of the Engineer
	1.2.3.	Identification & Selection of Material Sources			
	1.2.3.1	Borrow Areas	<p><b>Clause 305.2.2. of MoRTH</b></p> <p><b>Clause 111.2</b> (borrow pits for embankment construction)</p> <ul style="list-style-type: none"> <li>The Engineer shall inspect every borrow area location prior to issuing approval for use of such sites.</li> <li>Care shall be taken to avoid agriculture areas for planning haul roads for accessing borrow materials. In case of damage, the contractor shall be solely responsible and shall rehabilitate it, as approved by Engineer.</li> <li>All borrow areas shall be restored either to the original condition or as per the approved rehabilitation plan by the Engineer, immediately upon completion of the use of such a source.</li> </ul>	<p>Source of borrow area at :</p> <p>SH-02: Moti saran ( Ch 153+000) and Kanawada (Ch 159+000)</p> <p>SH-152: Surrounding Area Near Sharmi Khedapa (Ch 17+400)</p>	Contractor under the supervision of the Engineer

**Section 3: Conditions of Contract**

Environmental Issues	Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
1.2.3.2 Quarries	<b>Clause 111.3. of MoRTH</b> (procuring Quarry materials)	<ul style="list-style-type: none"> <li>No quarry and/or crusher units shall be established, which is within 1000m from the residential/ settlement locations, forest boundary, wildlife movement path, breeding and nesting habitats and national parks/sanctuaries.</li> <li>Contractor shall work out haul road network to be used for transport of quarry materials and report to Engineer who shall inspect and approve the same.</li> </ul>	<p>Nearest Quarry locations are at: SH-02:Durga, Sathamba, Chogamada (130+000)</p> <p>New quarry area should be located 1000m from the following locations: (i) Settlement locations: <b>SH-02:</b></p> <ul style="list-style-type: none"> <li>Lunawada (130+000)</li> <li>ChavadiyaPatia (134+500)</li> <li>Rampatel Na MuvadaPatia (139+000)</li> <li>HarigarnaMuvadaPatia (145+200)</li> <li>Godhar (147+000)</li> <li>MotiSarsan (151+500)</li> <li>Santrampur (162+000)</li> </ul> <p><b>SH-152:</b></p> <ul style="list-style-type: none"> <li>Sangawada (2+100)</li> <li>Ukhreli (6+400)</li> <li>GhatiyaSindhya (12+450)</li> </ul>	Contractor under the supervision of the Engineer
1.2.3.3 Arrangement for Construction Water		<ul style="list-style-type: none"> <li>The contractor shall source the requirement of water preferably from surface water bodies, rivers, canals and tanks in the project area.</li> <li>To avoid disruption/disturbance to other water users, the contractor shall extract water from fixed locations. The contractor shall consult the local people before finalizing the locations.</li> <li>Only at locations where surface water sources are not available, the contractor can contemplate extraction of ground water, after intimation and consent from the Engineer.</li> <li>The contractor shall comply with the requirements of Gujarat Groundwater Authority and seek their approval for extraction of ground water.</li> </ul>	All rivers / surface water bodies that can be utilized within the project area	Contractor under the supervision of the Engineer

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Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
1.2.3.4	Sand (all river and stream beds used directly or indirectly for the project)	<b>Clause 111.3. of MoRTH</b>	<ul style="list-style-type: none"> <li>In case of selection of new sites for sand quarrying, the Contractor shall obtain prior approval and concurrence from Competent District Authority.</li> <li>To avoid accidents and caving in of sand banks at quarry sites, sand shall be removed layer by layer. Digging deeper than the permissible limit (0.9 metres) shall not be allowed. Such quarry shall be barricaded 10m away from the periphery on all sides except the entry point, so as to prevent accidental fall of domestic cattle, wildlife and human beings.</li> </ul>	Nearest sand quarries locations:  SH-02: Panam River (162+000)	Contractor under the supervision of the Engineer
1.2.4.	Setting up construction sites				
1.2.4.	Construction Camp Locations – Selection, Design & Layout		Construction camps shall not be proposed: <ul style="list-style-type: none"> <li>(i) Within 1000m of ecologically sensitive areas (if any)</li> <li>(ii) Within 1000m from the nearest habitation to avoid conflicts and stress over the infrastructure facilities, with the local community</li> </ul>	(i)Reserved Forest locations (Ch141+925 to 143+400, Ch158+575 to 161+500, Ch162+250 to 162+600, Ch 2+500 to 3+550, Ch 4+050 to 4+225, Ch 5+150 to 06+050, Ch 8+400 to 9+400, Ch 15+250 to 15+600, and Ch 15+600 to 22+200)  (ii)Nearest Habitations: <u>SH-02:</u> <ul style="list-style-type: none"> <li>Lunawada (130+000)</li> <li>ChavadiyaPatia (134+500)</li> <li>Rampatel Na MuvadaPatia (139+000)</li> <li>HarigamaMuvadaPatia (145+200)</li> <li>Godhar (147+000)</li> <li>MotiSarsan (151+500)</li> <li>Santrampur (162+000)</li> </ul> <u>SH-152:</u> <ul style="list-style-type: none"> <li>Sangawada (2+100)</li> <li>Ukhreli (6+400)</li> <li>GhatiyaSindhya (12+450)</li> </ul>	Contractor under the supervision of the Engineer

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Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility	
	1.2.4.2	Arrangements for Temporary Land Requirement	<b>Clause 108.3. of MoRTH</b>	<ul style="list-style-type: none"> <li>The Engineer shall ensure that the temporary site is cleared prior to handing over to the owner (after construction or completion of the activity) and it is included in the contract</li> </ul>	Areas temporarily acquired for construction sites / hot mix plants / borrow areas / diversions / detours	Contractor under the supervision of the Engineer
	1.2.4.3	Stock-yards	<ul style="list-style-type: none"> <li>The contractor shall identify the location for stockyards for construction materials at least 1000m from water courses.</li> <li>Separate enclosures shall be planned for storing construction materials containing fine particles such that sediment-laden water does not drain into nearby storm water drains</li> </ul>	Construction labor camps Nearest water body locations are at : Ponds: Ch 133+200, 134+700, 139+100, 140+600, 144+025, 150+900, 154+900 and 13+200 Lakes: Ch157+700 and 161+150 River/Canal crossings: Minor: Ch 136+600 (Canal- parallel to the corridor), 157+500, 10+150. Major: Ch 162+750 and 5+300	Contractor under the supervision of the Engineer	
	1.2.4.4	Fuel storage and refuelling areas	<b>Clause 2.1.1.7. of EMP (Stripping of Soil)</b> <b>Clause 2.1.4.1.2 of EMP (dispose the spent oil and grease)</b>	<ul style="list-style-type: none"> <li>The contractor shall ensure that all construction vehicle parking locations, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance and refuelling sites are located at least 500 m from rivers and irrigation canal/ponds.</li> </ul>	Construction labor camps Canals and Ponds locations are at: Water body location: Ponds: Ch 133+200, 134+700, 139+100, 140+600, 144+025, 150+900, 154+900 and 13+200 Lakes: Ch157+700 and 161+150 River/Canal crossings: Minor: Ch 136+600 (Canal- parallel to the corridor), 157+500 and 10+150. Major: Ch 162+750 and 5+300	Contractor under the supervision of the Engineer
	1.2.5.	Labour Camp Management				

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Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
	1.2.5. Location of Construction labour camps:  Accommodation	<b>Factories Act, 1948 and Building &amp; other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996</b> (construction & maintenance of labor camp)	<ul style="list-style-type: none"> <li>The contractor shall provide, if required, erect and maintain necessary (temporary) living accommodation and ancillary facilities for labourers, to standards approved by the Engineer.</li> <li>Labour camps shall not be located within 1000m from the nearest habitation to avoid conflicts and stress over the infrastructure facilities, with the local community. The location, layout and basic facility provision of labour camps shall be submitted to Engineer for approval prior to construction.</li> </ul>	Along the project corridor at the location of construction labor camps	Contractor under the supervision of the Engineer
	1.2.5. Potable Water	<b>The Contract Labour (Regulation and Abolition) Act, 1970 and Factories Act, 1948</b>	<ul style="list-style-type: none"> <li>The contractor shall supply potable water through municipal/ panchayat sources. In case of groundwater it shall be treated prior to supply.</li> </ul>	Construction labor camps	Contractor under the supervision of the Engineer
	1.2.5. Sanitation facilities	<b>Factories Act, 1948</b> for sanitation	<ul style="list-style-type: none"> <li>The sanitation facilities for the camp shall be designed, built and operated in such a fashion that no health hazards occurs and no pollution to the air, ground water or adjacent water courses take place.</li> </ul>	Construction labor camps	Contractor under the supervision of the Engineer
	1.2.5. Waste Disposal	<b>Municipal Solid Waste (Management and Handling) Rules – 2000</b> for effective waste disposal	<ul style="list-style-type: none"> <li>The contractor shall provide garbage bins in the camps and ensure that these are regularly emptied and disposed off in a hygienic manner</li> </ul>	Construction labor camps	Contractor under the supervision of the Engineer

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Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
	1.2.5.1	HIV/ AIDS Prevention Measures		Construction & labor camps	Contractor under the supervision of the Engineer
<p><b>2 CONSTRUCTION STAGE</b></p>					
	2.	<b>Construction Stage Activities by Contractor</b>			
	2.1.1.	Site Clearance			
	2.1.1.1	Clearing and Grubbing	<p><b>Clause 201. of MoRTH</b></p> <ul style="list-style-type: none"> <li>All works shall be carried out in a manner such that the damage or disruption to flora is minimal. Only ground cover/shrubs that impinge directly on the permanent works or necessary temporary works shall be removed with prior approval from the Engineer.</li> </ul>	Along the project corridor at construction sites	

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Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility	
	2.1.1.2	Dismantling of Bridgework/ Culverts	<b>Clause 202. of MoRTH</b>	<ul style="list-style-type: none"> <li>The contractor shall follow all necessary measures (including safety) especially while working close to cross drainage channels to prevent earthwork, stonework, materials and appendages from impeding cross drainage at rivers, streams, water canals and existing irrigation and drainage systems.</li> </ul>	At locations where bridge works and culverts are proposed. Minor: Ch 136+600 (Canal- parallel to the corridor), 157+500 and 10+150. Major: Ch 162+750 and 5+300 Culvert locations: 17 existing culverts and 14 proposed culverts.	Contractor under the supervision of the Engineer
	2.1.1.3	Generation & disposal of Debris	<b>Clause 202.5 of MoRTH.</b> For Disposal of materials	<ul style="list-style-type: none"> <li>Disposal of unutilized non-toxic debris shall be either through filling up of borrow areas or at pre-designated disposal sites, subject to the approval of the Engineer.</li> <li>At locations identified for the disposal of residual bituminous wastes, the disposal shall be carried out on top of a 60 mm thick layer of rammed clay so as to eliminate the possibility of leaching of wastes into the ground water.</li> <li>Debris generated due to the driving of piles or other construction activities along the rivers, streams and drainage channels shall be carefully disposed in such a manner that it does not flow into the surface water bodies or form puddles in the area.</li> <li>The pre-designated disposal locations shall be part of Comprehensive Solid Waste Management Plan that has to be prepared by the Contractor in consultation and with approval of Engineer.</li> </ul>	Throughout Project Corridor	Contractor under the supervision of the Engineer



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Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
	2.1.1.4 Non-bituminous construction wastes disposal	<b>Clause 202. of MoRTH</b>	<ul style="list-style-type: none"> <li>• The contractor shall finalise the location of disposal sites based on the following. <ul style="list-style-type: none"> <li>○ not located within designated forest area</li> <li>○ does not impact natural drainage courses</li> <li>○ No endangered/rare flora is impacted by such dumping.</li> <li>○ Settlements are located at least 1000m away from the site.</li> </ul> </li> </ul> <p>The Engineer shall approve disposal sites after conformation</p>	Disposal site locations	Contractor under the supervision of the Engineer
	2.1.1.5 Bituminous wastes disposal	<b>Clause 202.5. of MoRTH</b>	<ul style="list-style-type: none"> <li>• The disposal of residual bituminous wastes shall be done by the contractor at secure land fill sites, with the requisite approvals for the same from the concerned government agencies.</li> </ul>	Disposal site locations	Contractor under the supervision of the Engineer
	2.1.1.6 Stripping, stacking and preservation of top soil	<p><b>Clause 301.3.2</b> for stripping and preservation</p> <p><b>Clause 305.3.3</b> for construction and for embankments</p> <p><b>Clause 301.7.</b> for preservation of Top Soil</p>	<ul style="list-style-type: none"> <li>• Contractor shall strip the topsoil at all locations that has been opened up for construction, including temporarily acquired land for traffic detours, storage, materials handling or any other construction related or incidental activities.</li> </ul>	At all construction sites	Contractor under the supervision of the Engineer

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Environmental Issues	Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility		
	2.1.1.7	Accessibility		<ul style="list-style-type: none"> <li>The Contractor shall provide safe and convenient passage for vehicles; pedestrians and livestock to and from roadsides and property accesses by providing temporary connecting road, as necessary.</li> <li>Construction activities that shall affect the use of side roads and existing accesses to individual properties, whether public or private, shall not be undertaken without providing adequate provisions to ensure uninterrupted access, as approved by the Engineer.</li> <li>The Contractor shall take care that the cross roads are constructed in such a sequence that construction work over the adjacent cross roads are taken up in a manner that traffic movement in any given area does not get affected.</li> </ul>	Throughout Project Corridor	Contractor under the supervision of the Engineer
	2.1.1.8	Planning for Traffic Diversions and Detours	<b>Clause 112. of MoRTH</b>	<ul style="list-style-type: none"> <li>Detailed traffic control plans shall be prepared by the contractor and the same shall be submitted to the Engineer.</li> <li>The Contractor shall provide specific measures for safety of pedestrians and workers as a part of traffic control plans. The Contractor shall ensure that the diversion/detour is always maintained in running condition, particularly during the monsoon to avoid disruption to traffic flow.</li> <li>The Contractor shall inform local community of changes in traffic routes and pedestrian access arrangements with assistance from Engineer and PIU.</li> </ul>	All along the project corridor, all access roads. Attention is required at: <u>SH-02:</u> <ul style="list-style-type: none"> <li>Lunawada ( Ch 130+000)</li> <li>ChavadiyaPatia (Ch 134+500)</li> <li>Rampatel Na MuvadaPatia (Ch 139+000)</li> <li>HarigamaMuvadaPatia (Ch145+200)</li> <li>Godhar (Ch 147+000)</li> <li>MotiSarsan (Ch 151+500)</li> <li>Santrampur (Ch 162+000)</li> </ul>	Contractor under the supervision of the Engineer

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Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility	
				<u>SH-152:</u> <ul style="list-style-type: none"> <li>• Sangawada (Ch 2+100)</li> <li>• Ukhreli (Ch 6+400)</li> <li>• GhatiyaSindhya (Ch12+450)</li> </ul>		
	<b>2.1.2.</b>	Construction Materials				
	2.1.2.	Earth from Borrow Areas for Construction	<b>IRC 010-1961</b> (procurement of earth materials)	All along the project corridor, all access roads, temporarily acquired sites & all borrow areas	Contractor under the supervision of the Engineer	
	2.1.2.2	Quarries	<b>Clause 111.3. of MoRTH</b> (procurement of materials)	Nearest Quarry locations: SH-02:Durga, Sathamba, Chogamada (Ch 130+000)	Contractor under the supervision of the Engineer	
	2.1.2.3	Blasting	<b>Clause of 302. of MoRTH</b>	All blasting and Pre-splitting Sites.	Contractor under the supervision of the Engineer	
	2.1.2.4	Transporting Construction Materials	<b>Clause 111.9. of MoRTH</b>	<ul style="list-style-type: none"> <li>• All vehicles that are delivering materials to the site shall be covered to avoid spillage of materials.</li> <li>• The unloading of materials at construction sites close to settlements shall be restricted to daytime only.</li> </ul>	All along the Project corridor and all haul roads	Contractor under the supervision of the Engineer
	<b>2.1.3.</b>	<b>Construction work</b>				
	2.1.3.	Disruption to other users of Water	<b>Annexure “A” Protection of the Environment of MoRTH and Clause 2 Water Quality of MoRTH</b>	<ul style="list-style-type: none"> <li>• In case of diversion of water bodies, the Contractor shall take prior approval from the Irrigation Department and Engineer for any such activity. The PIU shall ensure that Contractor has served a notice to the downstream users of water, well in advance, where such diversion of the flow is likely to affect the downstream population subject to the condition that under no circumstances the downstream flow shall be stopped.</li> </ul>	Contractor under the supervision of the Engineer	

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Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
2.1.3.1	Drainage and Flood Control	<b>Clause 202. of MoRTH</b>	<ul style="list-style-type: none"> <li>Contractor shall ensure that construction materials like earth, stone, ash or appendages disposed off does not block the flow of water of any water course and cross drainage channels.</li> <li>Where necessary, adequate mechanical devices to bailout accumulated water from construction sites, camp sites, storage yard, excavation areas are to be arranged well in advance before the rainy season besides providing temporary cross drainage systems.</li> <li>The contractor shall take all adequate precautions to ensure that construction materials and excavated materials are enclosed in such a manner that erosion or run-off of sediments is controlled. Silt fencing shall be installed prior to the onset of the monsoon at all the required locations, as directed by Engineer and PIU.</li> <li>The contractor shall ensure that no material blocks the natural flow of water in any water course or cross drainage channel. Prior to monsoon, the contractor shall provide either permanent or temporary drains to prevent water logging.</li> </ul>	Surface water sources/ drains/ Nalahs/ Ponds etc. Silt fencing should be given near at: Ponds: Ch133+200, 134+700, 139+100, 140+600, 144+025, 150+900, 154+900 and 13+200 Lakes: 157+700, 161+150 River/Canal crossings: Minor: Ch136+600 (Canal- parallel to the corridor) 157+500 and 10+150. Major: Ch 162+750 and 5+300	Contractor under the supervision of the Engineer
2.1.3.2	Siltation of Water Bodies and Degradation of Water Quality	<b>Clause 306. of MoRTH</b> for soil erosion and sedimentation control		Surface water sources/ drains/ Nalahs/ Ponds etc. Silt fencing at: Water body location: Ponds: Ch133+200, 134+700, 139+100, 140+600, 144+025, 150+900, 154+900 and 13+200 Lakes: 157+700, 161+150 River/Canal crossings: Minor: Ch136+600 (Canal- parallel to the corridor) 157+500 and 10+150. Major: Ch 162+750 and 5+300	Contractor under the supervision of the Engineer

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Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility	
	2.1.3.4	Slope Protection and Control of Soil Erosion	<p><b>Clause 306. of MoRTH</b> for soil erosion and sedimentation control</p> <p><b>Clause 307. of MoRTH</b> for Turfing works</p> <p><b>Clause 308. of MoRTH</b> for other measures of Slope Protection</p>	<ul style="list-style-type: none"> <li>The contractor shall construct slope protection as per the design or as directed by the Engineer</li> </ul>	<p>High raise embankments and surface water bodies locations have been carried out by adopting Stone Pitching method at</p> <p>Minor: Ch136+600 (Canal- parallel to the corridor) 157+500 and 10+150</p> <p>Major: Ch162+750 and 5+300</p>	Contractor under the supervision of the Engineer
	<b>2.1.4.</b>	<b>Pollution Control</b>				
	2.1.4.	Water Pollution				
	2.1.4.1	1. Water Pollution from Construction Wastes	<p><b>Schedule VI - General Standards for Discharge of Environmental Pollutants</b> (Liquid Waste Disposal) - <b>CPCB</b></p> <p><b>The Environment (Protection) Rules, 1986 and Water Act, 1974</b></p>	<ul style="list-style-type: none"> <li>The Contractor shall take all precautionary measures to prevent the generated wastewater from entering into streams, water bodies or the irrigation channels arising due to construction activity.</li> <li>Contractor shall avoid construction works close to the streams or water bodies during monsoon.</li> </ul>	<p>Surface water sources/ drains/ Nalahs/ Ponds etc. At locations:</p> <p>Ponds: Ch 133+200, 134+700, 139+100, 140+600, 144+025, 150+900, 154+900 and 13+200</p> <p>Lakes: 157+700, 161+150</p> <p>River/Canal crossings: Minor: Ch 136+600 (Canal- parallel to the corridor), 157+500 and 10+150</p> <p>Major: Ch 162+750 and 5+300</p>	Contractor under the supervision of the Engineer
	2.1.4.1	2. Water Pollution from Fuel, Lubricants and Chemicals	<p><b>Petroleum Act and Rules and Environment (Protection) Rules, 1986 (Standards for Emission or Discharge of Environmental Pollutants Schedule – I)</b> for Liquid Waste Disposal</p> <p><b>Clause 111.</b> (Precaution and Safeguarding the Environment)</p> <p><b>Annexure ‘A’ to Clause 501</b> (Protection of Environment) - <b>Section 2 water quality</b></p> <p><b>Clause 301.3.2 of MoRTH.</b> (Stripping and preservation of top soil)</p>	<ul style="list-style-type: none"> <li>Oil interceptors shall be provided at vehicle parking locations, wash down and refuelling areas.</li> <li>When fuel storage and refuelling areas are located on agricultural land or areas supporting vegetation, the top soil shall be stripped, stockpiled and returned after cessation of such storage.</li> </ul>	<p>Surface water sources/ drains/ Nalahs/ Ponds etc. At locations:</p> <p>Ponds: Ch 133+200, 134+700, 139+100, 140+600, 144+025, 150+900, 154+900 and 13+200</p> <p>Lakes: 157+700, 161+150</p> <p>River/Canal crossings: Minor: Ch 136+600 (Canal- parallel to the corridor), 157+500 and 10+150</p> <p>Major: Ch 162+750 and 5+300</p>	Contractor under the supervision of the Engineer
	2.1.4.2	Air Pollution				

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Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
2.1.4.2.1.	Dust Pollution	<p><b>Annexure 'A' to Clause 501</b> (Protection of Environment) - <b>Section 3 Air Quality</b></p> <p><b>Clause 111.5. of MoRTH.</b> (Hot mix plant and batch mix plant)</p>	<ul style="list-style-type: none"> <li>The conditions for pollution control given in the <b>NoC (consent for establish and operate)</b> by the GPCB shall strictly be followed.</li> <li>Air pollution monitoring shall be conducted as per the Environmental Monitoring Plan and results shall be used to identify any additional pollution control measures that require to be adopted.</li> </ul>	Construction area/ site, Construction camps, Materials Loading / unloading facilities	Contractor under the supervision of the Engineer
2.1.4.2.2.	Emission from Construction Vehicles, Equipment and Machineries	<p><b>Schedule-I: Standards for Emission</b> suggested by <b>CPCB/ GPCB</b></p>	<ul style="list-style-type: none"> <li>Certificates issued for such contrivances that were obtained from designated/approved authority shall be submitted along with the specified reporting format to the Engineer.</li> <li>The contractor shall maintain a separate file and submit PUC certificates for all vehicles/equipment/machinery that are being used for the project. Monitoring results shall be submitted to Engineer and PIU.</li> </ul>	Construction camps, Materials Loading / unloading facilities	Contractor under the supervision of the Engineer
2.1.4.3	Noise Pollution				

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Environmental Issues	Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
2.1.4.3 1. Noise Pollution: Noise from Vehicles, Plants and Equipments	<p><b>Noise Limits for vehicles (Environment Protection) Amendment Rules, 2000) and Part ‘E’, Schedule – VI of Environment (Protection) Rules, 1986.</b></p> <p><b>Clause 5A The Noise Pollution (Regulation and Control) Rules, 2000</b> (sound emitting construction equipments)</p> <p><b>Clause 201.2 of MoRTH</b> for Idling of temporary trucks</p>	<ul style="list-style-type: none"> <li>All plants and equipment used in construction shall strictly conform to the MoEF/ CPCB noise standards.</li> <li>Noisy construction activities (such as crushing, concrete mixing, batching etc.) within 150m of the nearest habitation/ educational institutes/health centres (silence zones) shall be stopped during the night time between 9.00 pm to 6.00 am.</li> <li>Contractor shall provide noise barriers to the suggested locations of identified schools/ Temples/health centres prior to commencement of work.</li> <li>Monitoring shall be carried out at the construction sites as per the monitoring schedule and results shall be submitted to Engineer. Based on the monitoring results, the Engineer, if required, shall recommend any additional noise mitigation measures required to be implemented by the Contractor.</li> </ul>	<p>Sensitive receptors: P.D.Pandya Arts College (Ch130+100), Chanakya School (Ch132+850), Primary School at Harigirna Muvada (Ch145+200), Govt. Boys Schools(Ch0+200) Malanpur Primary School (Ch1+050), Ghatiya Primary School (Ch 12+750), Simalia Primary School (Ch 13+850), Secondary School, Khedapa (Ch 18+900), Hospital at Patharia village (Ch 147+400) Primary Health Centres at Ch 144+900 and 150+800.</p>	Contractor under the supervision of the Engineer
			<p>Sensitive habitations: Reserved Forest locations (Ch141+925 to 143+400, Ch158+575 to 161+500, Ch162+250 to 162+600, Ch 2+500 to 3+550, Ch 4+050 to 4+225, Ch 5+150 to 06+050, Ch 8+400 to 9+400, Ch 15+250 to 15+600, and Ch 15+600 to 22+200)</p>	
2.1.4.4	Safety			

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Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
2.1.4.4 1	Safety Procedures		<p>The Contractor shall:</p> <ul style="list-style-type: none"> <li>• Comply with all applicable safety regulations,</li> <li>• Take care of the safety of all personnel who are entitled to be on the Site,</li> <li>• Use reasonable efforts to keep the site and works clear of unnecessary obstructions so as to avoid danger to personnel,</li> <li>• Fencing, lighting, guarding and supervision of the works shall be carried out and provided until completion and taking over .It is necessary to provide any temporary works (including roadways, footways, guards and fences) as necessary, since the execution of these works, shall not raise a concern for the purpose of use and protection of the public and of owners as well as occupiers of adjacent land</li> <li>• A construction safety checklist has been included (<b>Appendix 1 Form EM-7</b>)</li> </ul>	All construction sites	Contractor under the supervision of the Engineer
2.1.4.4 2	Care and supply of Documents		<ul style="list-style-type: none"> <li>• The contractor shall prepare, submit and obtain approval from the Engineer for construction of the Safety Management Plan, and the same shall be prepared 14 days prior to commencement of construction works at site.</li> </ul>		Contractor under the supervision of the Engineer



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Environmental Issues	Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
<p>2.1.4.4 3</p> <p>Contractors general obligations</p>		<ul style="list-style-type: none"> <li>All design calculations and fabrication drawings for temporary works (such as form-work, staging, centring, scaffolding, specialized construction, handling and launching equipment and the like) material lists for structural fabrication as well as detailed drawings for templates, and anchorage and temporary support details for pre stressing cables as well as bar bending and cutting schedules for reinforcement, etc shall be prepared by the contractor at his own cost and forwarded to the Engineer at least six weeks in advance of the actual constructional requirements. The Engineer will check the same for the contractor's use with amendments.</li> </ul>		<p>Contractor under the supervision of the Engineer</p>

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Environmental Issues	Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
2.1.4.4 Personal Safety Measures for Labour, Material handling , Painting etc.	<p><b>Factory Act, 1948, Factories (Amendment) Act, 1987 (Chapter -5 Safety)</b></p> <p><b>Building and Other Construction Workers (Regulation of Employment and Conditions of Services) Act, 1996</b></p>	<p>Construction Safety Plan shall be prepared by the Contractor during mobilization and approved by Engineer and shall be adhered to by the Contractor throughout the construction period, and shall include provision of:</p> <ul style="list-style-type: none"> <li>• Protective footwear and protective goggles to all workers employed in mixing asphalt materials, cement, lime mortars, concrete etc.</li> <li>• Welders protective eye-shields to the workers engaged in welding works</li> <li>• Protective goggles and clothing to workers engaged in stone breaking activities and workers shall be seated at sufficiently safe intervals</li> <li>• The contractor shall comply with all regulations regarding safe scaffolding, ladders, working platforms, gangway, stairwells, excavations, trenches and safe means of entry and egress.</li> <li>• The contractor shall ensure that no paint containing lead or lead products is used except in the form of paste or readymade paint.</li> <li>• Contractor shall provide facemasks to the workers when paint is applied in the form of spray or a surface having dry lead paint when it is rubbed and scrapped.</li> <li>• The Contractor shall mark ‘hard hat’ and ‘no smoking’ and other ‘high risk’ areas and enforce non-compliance of use of PPE with zero tolerance.</li> </ul>	All construction sites	Contractor under the supervision of the Engineer

**Section 3: Conditions of Contract**

Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
2.1.4.4 5	Health and Safety		<ul style="list-style-type: none"> <li>The Contractor shall at all times take all reasonable precautions to maintain the health and safety of the contractor's personnel. In collaboration with local health authorities, the contractor shall ensure that medical staff, first aid facilities, sick bay and ambulance service are available at all times at the site.</li> <li>The contractor shall appoint an accident prevention officer at the site, responsible for maintaining safety and protection against accidents. This person shall be qualified for this responsibility, and shall have the authority to issue instructions and take protective measures to prevent accidents. Throughout the execution of the works, the contractor shall provide whatever is required by this person to exercise this responsibility and authority.</li> <li>The contractor shall send, to the Engineer, details of any accident as soon as practicable after its occurrence.</li> <li>The contractor shall maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as the Engineer may reasonably require.</li> </ul>	All construction sites and labour camps	Contractor under the supervision of the Engineer
2.1.4.4 6	Traffic Safety & Pedestrian Safety	<b>Clause 112. of MoRTH</b> (Arrangement for traffic during construction)	<ul style="list-style-type: none"> <li>Pedestrian Safety shall be ensured. Pedestrian circulation shall be demarcated prior to start &amp; unsafe areas shall be cordoned off.</li> </ul>	All along the project corridor	Contractor under the supervision of the Engineer

**Section 3: Conditions of Contract**

Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility	
	2.1.4.4 7	Risk from Electrical Equipment(s)	<b>Factory Act, 1948 – Chapter -5 (Safety) and Factories (Amendment) Act, 1987</b>	<ul style="list-style-type: none"> <li>No material shall be so stacked or placed as to cause danger or inconvenience to any person or the public.</li> <li>All machines to be used in the construction shall conform to the relevant Indian Standards (IS) codes, shall be free from patent defect, shall be kept in good working order, shall be regularly inspected and properly maintained as per IS provision and to the satisfaction of the Engineer</li> </ul>	All construction equipment	Contractor under the supervision of the Engineer
	2.1.4.4 8	Safety during Road Works	<b>Clause 112.4. of MoRTH (Traffic safety) Clause 112.5. of MoRTH (Maintenance and Diversions) IRC:SP:55 (Road signage and markings )</b>	<ul style="list-style-type: none"> <li>The contractor shall provide adequate signage and markings as per the instruction of the Engineer in the construction zones.</li> </ul>	All along the project corridor and all haul roads	Contractor under the supervision of the Engineer
	2.1.4.4 9	First Aid	<b>Section 36 (First Aid) of Building and the other Construction Workers(Regulation of Employment and Conditions of Service) Act, 1996</b>	<ul style="list-style-type: none"> <li>First aid measures shall be provided in the construction zones and labour camps.</li> </ul>	All construction sites and labour camps	Contractor under the supervision of the Engineer
	2.1.4.5	Cultural Property				
	2.1.4.5 1.	Chance Found Archaeological Property	<b>Ancient Monuments and Archaeological Sites and Remains Rules 1959</b>  <b>Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act 2010</b>	<ul style="list-style-type: none"> <li>All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or archaeological interest discovered on the site are the property of the Government and shall be dealt as per provisions of the relevant legislation.</li> <li>The contractor shall take reasonable precautions to prevent his workmen or any other persons from removing and damaging any such article or thing.</li> </ul>	Along the project corridor	Contractor under the supervision of the Engineer
	<b>2.2.</b>	Environmental enhancement and special issues				

**Section 3: Conditions of Contract**

Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
2.2.1.	Enhancement measures		<ul style="list-style-type: none"> <li>Landscaping at junctions to improve aesthetics etc.</li> <li>Rehabilitation of cultural and community properties</li> </ul>	At suitable locations along the project road	Contractor under the supervision of the Engineer
2.2.2.	Rehabilitation/enhancement of Cultural and Religious Properties	<b>Physical Cultural Resources (WB OP/BP 4.11)</b>	<ul style="list-style-type: none"> <li>The architectural elements of the structure shall be conserved/reflected/translated into the design of new structures/enhancements in accordance with wishes of the community.</li> </ul>		
2.2.3.	Flora and Chance found Fauna		<ul style="list-style-type: none"> <li>The contractor shall take reasonable precaution to prevent his workmen or any other persons from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body and hunting of any animal.</li> <li>If any wild animal is found near the construction site at any point of time, the contractor shall acquaint the Engineer and execute the Engineer's instructions for dealing with the same.</li> <li>The Engineer shall report to the nearby forest office (range office) and shall take appropriate steps/measures in consultation with the forest officials.</li> </ul>	Along the project road / forest	Contractor under the supervision of the Engineer

**Section 3: Conditions of Contract**

Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
2.2.4.	Sensitive receptors		<ul style="list-style-type: none"> <li>Sensitive receptors like schools, hospitals are provided with permanent noise barriers prior to the start of work in order to minimize the dust and noise impacts due to vehicle movement (during / post construction). Their effectiveness needs to be checked during operation phase.</li> <li>Construction activities shall be confined within the present available CoI, regular strict monitoring/supervision shall be done to minimize/control air-noise pollution and abatement of dust particles at minimum level possible using well maintained modern machineries.</li> </ul>	Sensitive Receptors at: P.D.Pandya Arts College (Ch 130+100), Chanakya School (Ch 32+850), Primary School Harigirna Muvada (Ch 145+200), Govt. Boys School (Ch 0+200), Malanpur Primary School (Ch 1+050), Ghatiya Primary School (Ch 12+750), Simalia Primary School (Ch 13+850), Secondary School, Khedapa (Ch 18+900) Hospital at Patharia village (Ch 147+400) and Primary Health Centres at Ch 144+900 and 150+800.	Contractor under the supervision of the Engineer
2.3.	Contractor Demobilization				
2.3.1.	Clearing of Construction of Camps & Restoration		<ul style="list-style-type: none"> <li>Contractor to prepare site restoration plans for approval by the Engineer. The plan shall be implemented by the contractor prior to demobilization.</li> <li>On completion of the works, all temporary structures shall be cleared, all rubbish burnt, excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at the Contractor's expense, to the entire satisfaction of the Engineer.</li> <li>The topsoil removed and conserved earlier shall be spread over the restoration area as per the direction of the Engineer to facilitate the growth of vegetation.</li> <li>Residual topsoil shall be distributed on adjoining/proximate barren/rocky areas as identified by the Engineer in a layer of thickness of 75mm – 150mm.</li> </ul>	All Construction Workers' Camps	Contractor under the supervision of the Engineer

**Section 3: Conditions of Contract**

Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
2.3.2.	Redevelopment of Borrow Areas		<ul style="list-style-type: none"> <li>Redevelopment of borrow areas shall be taken up in accordance with the plans approved by the Engineer</li> </ul>	At all borrow area locations suggested for the project. SH 02: Motisaran (Ch153+000) and Kanawada (Ch159+000)  SH 152: Surrounding Area Near SharmiKhedapa (Ch17+400)	Contractor under the supervision of the Engineer
<b>OPERATION STAGE (Activities to be Carried Out by the Contractor/Engineer/PIU)</b>					
3	Monitoring and Evaluation of Operational Performance of Environmental Mitigation Measures		<ul style="list-style-type: none"> <li>The PIU shall monitor the operational performance of the various mitigation/enhancement measures carried out as part of the project. Monitoring and performance indicators have been indicated in <b>Environmental Monitoring Plan (Table 3)</b>.</li> </ul>	All along the project corridor	Contractor under the supervision of the Engineer
3	Maintenance of Drainage		<ul style="list-style-type: none"> <li>PIU shall ensure that all drains (side drains and all cross drainages) are periodically cleared especially before monsoon season to facilitate the quick passage of rainwater and avoid flooding without damaging the spurs and check dams erected to stabilize the course and flow of all such drainage channels.</li> <li>PIU shall ensure that all the sediment/oil and grease traps set up at the water bodies are cleared once in every three months.</li> </ul>	At locations where bridge works and culverts are proposed. Bridge locations: Minor: 13 existing Minor bridges Major: Ch162+750 and 5+300  Culvert locations: 17 are existing Culverts and 14 Culverts are proposed to develop.	Contractor under the supervision of the Engineer

**Section 3: Conditions of Contract**

Environmental Issues	Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
3 Pollution Monitoring		<ul style="list-style-type: none"> <li>The periodic monitoring of the ambient air quality, noise level, water (both ground and surface water) quality, soil pollution/contamination are to be continued at pre-designated locations as identified in the <b>Environmental Monitoring Plan (Table 3)</b> and if necessary, at additional locations for comparative study of pre and post operation data in order to ensure further improvement/modification in similar future works.</li> </ul>	All along the project corridor	Contractor under the supervision of the Engineer
3 Atmospheric Pollution		<ul style="list-style-type: none"> <li>Ambient air concentrations of various pollutants shall be monitored as envisaged in the Environmental Monitoring Plan at pre designated locations to compare the levels with the pre-construction data.</li> <li>Additional data at other location may be collected as per any site specific requirement.</li> </ul>	All along the project corridor	Contractor under the supervision of the Engineer
3 Noise Pollution		<ul style="list-style-type: none"> <li>Noise pollution shall be monitored as per <b>Environmental Monitoring Plan</b> at sensitive locations where pre-construction noise data were collected. The functioning of the noise barriers shall be supervised and monitored for further improvement/replication at other affected points if necessary.</li> <li>Signage near sensitive locations shall be maintained and kept clean. Monitoring the effectiveness of the pollution attenuation measures shall be taken up as per <b>Environmental Monitoring Plan (Table 3)</b>.</li> </ul>	All along the project corridor	Contractor under the supervision of the Engineer



**Section 3: Conditions of Contract**

Environmental Issues		Ref: Clauses	Additional Measures to be Adopted by the Contractor	Location <sup>6</sup>	Responsibility
3	Soil Erosion and Monitoring of Borrow Areas		<ul style="list-style-type: none"> <li>Visual monitoring and inspection of soil erosion at borrow areas, quarries (if closed and rehabilitated), embankments and other places expected to be affected, shall be carried to record and monitor the effectiveness of such structures after the completion of project, so as to evaluate the beneficial effects of each type of activity together with the cost involved.</li> </ul>	Borrow areas: SH 02: Motisaran (Ch 153+000) and Kanawada (Ch 159+000)  SH 152: Surrounding Area Near Sharmi Khedapa (Ch 17+400)	Contractor under the supervision of the Engineer
3	Road Safety and Maintenance of Assets		<ul style="list-style-type: none"> <li>No advertisement/hoardings shall be allowed within the Right of Way limits of the project road.</li> <li>Regular maintenance and cleaning of assets such as sign boards, bus stops, drains etc. shall be undertaken.</li> </ul>	All along the project corridor	Contractor under the supervision of the Engineer

**(ii) Environmental Monitoring Plan**

The monitoring programme is devised to ensure that the envisaged purpose of the project is achieved and results in the desired benefit to the target population. To ensure the effective implementation of the EMP, it is essential that an effective monitoring programme be designed and carried out. Broad objectives of the monitoring programme are:

- To evaluate the performance of mitigation measures proposed in the EMP;
- To suggest improvements in the management plans, if required;
- To satisfy the statutory and community obligations; and,
- To provide feedback on adequacy of Environmental Impact Assessment

**Monitoring Indicators**

The monitoring programme contains monitoring plan for all performance indicators, reporting formats and necessary budgetary provisions. Physical, biological and environmental management components identified as of particular significance in affecting the environment at critical locations have been suggested as Performance Indicators (PIs). The Performance Indicators shall be evaluated under two heads as:

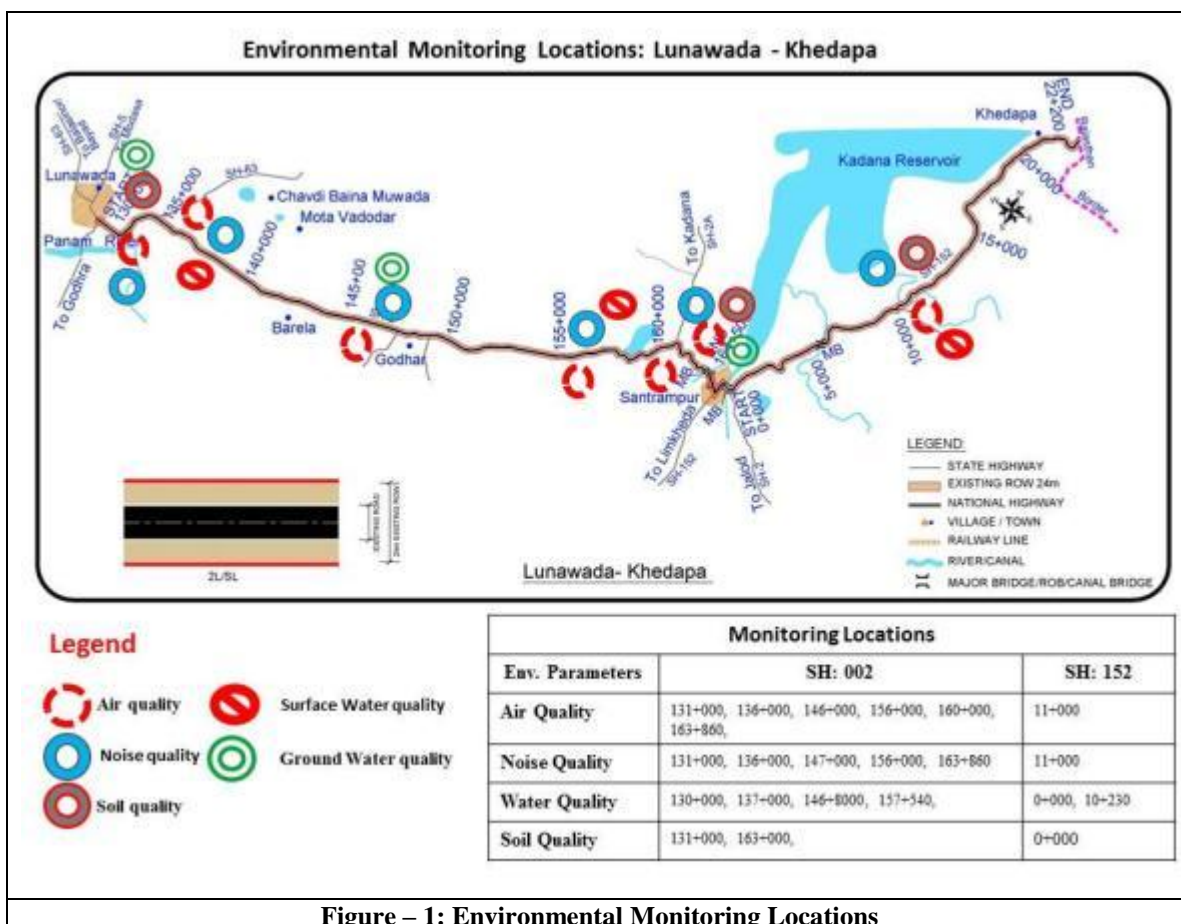
- Environmental condition indicators to determine efficacy of environmental management measures in control of air, noise, water and soil pollution;
- Environmental management indicators to determine compliance with the suggested environmental management measures.

**Table 2: Environmental Monitoring Indicators**

Sl. No.	Indicator	Details	Stage	Responsibility
<b>A Environmental Condition Indicators and Monitoring Plan</b>				
1	Air Quality	The parameters to be monitored, frequency and duration of monitoring as well as the locations to be monitored will be as per the Monitoring Plan prepared (Refer <b>Table 3</b> )	Pre-Construction	PIU through DPR Consultants
			Construction	Contractor under the supervision of Engineer/ PIU
			Operation (DL Period)	Contractor under the supervision of Engineer/ PIU
2	Noise Levels		Pre-Construction	PIU through DPR Consultants
			Construction	Contractor under the supervision of Engineer/ PIU
			Operation (DL Period)	Contractor under the supervision of Engineer/ PIU
3	Water Quality		Pre-Construction	PIU through DPR Consultants
			Construction	Contractor under the supervision of Engineer/ PIU
4	Soil Quality		Pre-Construction	PIU through DPR Consultants
		Construction	Contractor under the supervision of Engineer/ PIU	
<b>B Environmental Management Indicators and Monitoring Plan</b>				
1	Tree Cutting	Progress of tree removal marked for cutting is to be reported.	Pre-construction	Forest Department/PIU
2	Construction Camps	Location of construction camps have to be identified and parameters indicative of environment in the area has to be reported.	Pre-construction	Contractor under the supervision of Engineer/ PIU
3	Borrow Areas	Location of borrow areas have to be identified and parameters indicative of environment in the area has to be reported.	Pre-construction	Contractor under the supervision of Engineer/ PIU
4	Rehabilitation of Borrow Areas	Engineer will undertake site visits to verify that all borrow areas have been rehabilitated in line with the landowner's request and to their full satisfaction.	Construction	Contractor under the supervision of Engineer/ PIU

**Section 3: Conditions of Contract**

For each of the environmental condition indicator, the monitoring plan (Table 3) specifies the parameters to be monitored, location of the monitoring sites (**Figure 1**), frequency and duration of monitoring. The monitoring plan also specifies the applicable standards, implementation and supervising responsibilities. The monitoring plan for environmental condition indicators of the project in construction and operation stages is presented in Table 3.



**Figure – 1: Environmental Monitoring Locations**

**Table 3: Environmental Monitoring Plan**

Attribute	Project Stage	Parameter	Special Guidance	Standards	Frequency	Duration	Location	Implementation
Air	Construction	SO <sub>2</sub> , NO <sub>x</sub> , PM <sub>10</sub> , PM <sub>2.5</sub> , CO	High volume sampler to be located 50m from the plant in the Downwind direction. Use method specified by CPCB for analysis. Environmental monitoring shall be conducted by NABL	Air (prevention and Control of Pollution) Rules, CPCB, 2009	Three seasons per year	24 hours Sampling	Along the road Hot mix / batching plant	Contractor under the supervision of the Engineer
	Operation <sup>7</sup>						Along the road	

<sup>7</sup> Parameters to be monitored for Operation stage is same as Construction stage

**Section 3: Conditions of Contract**

Attribute	Project Stage	Parameter	Special Guidance	Standards	Frequency	Duration	Location	Implementation
			aggregated laboratory.					
<b>Noise</b>	Construction	Noise levels on dB (A) scale	Equivalent noise levels using an integrated noise level meter kept at a distance of 15 from edge of pavement Equivalent noise levels using an integrated noise level meter kept at a distance of 15 from edge of pavement. Environmental monitoring shall be conducted by NABL aggregated laboratory.	MoEF Noise Rules, 2000	Three seasons per year	Leq in dB(A) of day time and night time	Along the road Hot mix / batching plant	Contractor under the supervision of the Engineer
	Operation						Along the road	
<b>Water</b>	Construction	All essential characteristics and some of desirable characteristics as decided by the Environmental Specialist of the SC and PIU	Grab sample collected from source and Analyse as per Standard Methods for Examination of Water and Wastewater. Environmental monitoring shall be conducted by NABL aggregated laboratory.	Indian Standards for Inland Surface Waters (IS: 2296, 1982)	Three seasons per year	Grab Sampling	Along the road Surface water sources	Contractor under the supervision of the Engineer
<b>Soil</b>	Construction	Monitoring of Pb, SAR and Oil & Grease	Sample of soil collected to acidified and analysed using absorption Spectrophotometer. Environmental monitoring shall be conducted by NABL aggregated laboratory.	Threshold for each contaminant set by IRIS database of USEPA until national standards are promulgated	Once in a year	Grab Sampling	Along the road Hot mix / batching plant	Contractor under the supervision of the Engineer
<b>Borrow area</b>	Pre-construction	Suitability of the material as per IS 2720	-	IS 2720	Once	Once	Borrow area location	Contractor under the supervision of the Engineer
<b>Rehabilitation of Borrow Areas</b>	Construction	As per Guidelines	Visual Observation	-	Once in a month	-		
<b>HIV/ AIDS Prevention Measures</b>	Construction	Awareness campaign	-	-	Annual	-	Construction and Labour Camp sites	Contractor under the supervision of the Engineer/ R&BD/PIU
		HIV/ AIDS Screening			Within 3 months of mobilisation			

**Section 3: Conditions of Contract**

<b>Attribute</b>	<b>Project Stage</b>	<b>Parameter</b>	<b>Special Guidance</b>	<b>Standards</b>	<b>Frequency</b>	<b>Duration</b>	<b>Location</b>	<b>Implementation</b>
		of construction personnel's			on and every quarter during construction			
		IEC materials distribution			Quarterly			
		Condom Distribution			Once a month			

**(iii) Reporting System**

Reporting system for the suggested monitoring program operates at two levels as:

- Reporting for environmental management (EM) indicators (except tree cutting indicator)
- Reporting for environmental condition (EC) indicators at the PIU level

Contractor and Engineer operate the reporting system for environmental condition and environmental management indicators (except tree cutting). The Environmental Cell of PIU will operate the reporting system for environmental management tree cutting indicator and operation performance indicators. The PIU will set the targets for each activity envisaged in the EMP beforehand and all reports will be against these targets.

Contractor will report to the Engineer on the progress of the implementation of environmental conditions and management measures as per the monitoring plans. The Engineer will in turn report to the PIU on a quarterly basis which will be reviewed. Along with these reports, Environmental Cell of the PIU shall report progress of tree cutting, compensatory plantation, landscaping and survival rate as per the monitoring plan. Reporting formats have been prepared, which will form the basis of monitoring, by the Engineer and/or the Environmental Cell as required and presented as Appendix 1.

**Table 4: Summary details of Reporting**

Format No.	Item	Stage	Contractor	Engineer		Project Implementation Unit (PIU)
			Implementation & Reporting to Engineer	Supervision	Reporting to PIU	Oversee / Field Compliance Monitoring
EM 1	Identification of Disposal Locations	Pre-Construction	One Time	One Time	One Time	One Time
EM 2	Setting up of Construction Camp	Pre-Construction	One Time	One Time	One Time	One Time
EM 3	Borrow Area Identification	Pre-Construction	One Time	One Time	One Time	One Time
EM 4	Tree Cutting	Pre-Construction	-	-	-	Monthly
EM 5	Top Soil Monitoring	Construction	Quarterly	Continuous	Quarterly	Quarterly
EM 6	Status Regarding Rehabilitation of Borrow Areas	Construction	-	-	-	Half Yearly
EM 7	Construction Safety	Construction	Quarterly	Continuous	Quarterly	Quarterly
EC 1	Pollution Monitoring	Construction	As Per Monitoring Plan	Quarterly	Quarterly	Quarterly
EC 2	Pollution Monitoring	Post Construction (DL Period)	As Per Monitoring Plan	Quarterly	Quarterly	Quarterly

In addition to these formats, to ensure that the environmental provisions are included at every activity of the implementation by the contractor, it is suggested that the approval of the environmental personnel of the engineer is required in the request for application to proceed or other similar reporting formats used by the contractor. These will not only ensure that the environmental provisions are addressed but also link the satisfactory compliance to environmental procedures prior to approval of the Interim Payment Certificate (IPC) by the Engineer. The activities by the contractor that can impact the environment will be identified based on discussions between the Environmental Specialist of the PIU, team leader of the Engineer and the Environmental personnel of the Engineer. The decisions will be communicated to the contractor prior to the start of the construction activities.

(iv) Clearance Requirements of Government of Gujarat

Sr. No.	Clearances	Acts	Approving Agency	Applicability to the Project	Time Required	Responsibility	
						Execution	Supervision
<b>PROJECT IMPLEMENTATION STAGE</b>							
1	Permission for Withdrawal of Surface Water from Rivers, Nala, Water harvesting structure/ Reservoirs/ Ponds/ Irrigation canals	Gujarat Water Supply and Sewerage Board Act, 1978	Gujarat Water Supply and Sewerage Board	Applicable (If the contractor is extracting surface water)	3 months	Contractor	Engineer, Supervision Consultant
2	Permission for Sand Mining from river bed	Mines and Minerals (Development and Regulation) Act, 1957	Commissioner of geology and mining, GoG	Applicable	2 month	Contractor	Engineer, Supervision Consultant
3	Permission for Opening of New Quarry	Mines and Minerals (Development and Regulation) Act, 1957	Commissioner of geology and mining, GoG	Applicable	2 month	Contractor	Engineer, Supervision Consultant
4	Hot mix plant, Crushers, Cement Batching Plant	Air (Prevention and Control of Pollution) Act. 1981	Gujarat Pollution Control Board	Applicable	3 months	Contractor	Engineer, Supervision Consultant
5	Storage of Hazardous Chemicals	Hazardous Waste (Management and Handling) Rules 1989 and Manufacturing Storage and Import of Hazardous Chemicals Rules 1989	Gujarat Pollution Control Board	Applicable	3 months	Contractor	Engineer, Supervision Consultant
6	Disposal of Hazardous Waste	Hazardous Waste (Management and Handling) Rules 1989	Gujarat Pollution Control Board	Applicable	2 months	Contractor	Engineer, Supervision Consultant
7	Disposal of Construction Waste and liquid effluent from Labour camps	Water (Prevention and Control of Pollution) Act 1974	Gujarat Pollution Control Board	Applicable	2 months	Contractor	Engineer, Supervision Consultant
8	Pollution Under Control Certificate	Central Motor Vehicles Act 1988	Transport Department (GoG)	Applicable	1 Month	Contractor	Engineer, Supervision Consultant
9	Employing Labour	Executing Agency of Building and other construction act, 1996	Labour & Employment Department, GoG	Applicable	1 Week	Contractor	Engineer, Supervision Consultant
10	Registration of Workers	Labour welfare Acts.	Labour & Employment Department, GoG	Applicable	1 Month	Contractor	Engineer, Supervision Consultant

## Appendix - 1: Environmental Monitoring Formats

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### Format EM1: Selection of disposal site locations

From \_\_\_\_\_ To \_\_\_\_\_

(Give chainage and nearest settlements from both ends)

Criteria on which information for each site is to be collected	Site 1	Site 2	Site 3	Site 4
Area covered (m <sup>2</sup> )				
Total Material that can be dumped within the site (m <sup>3</sup> )				
Depth to which disposal is feasible (m)				
Distance of nearest watercourse (m)				
Nearest Settlement (m)				
Date/s of Community Consultation/s				
Whether the community is agreeable to siting of dumping site (Y/N)				
Date of Permission from Village Council President(VCP)				
Proposed future use of the Site				

Selected Site (tick any one column only)

Certified that the above information is correct to the best of my knowledge and belief.

#### Contractor

Signed:

Name & Designation:

Date:

Recommendation on the suitability of the site

Decision Taken (tick one):

Approved/Not Approved

#### Engineer – In-Charge

Signed:

Name and Designation of Deciding Authority

Date:

#### Enclosures

(Tick as appropriate)

- 1 Maps of each location
- 2 Photographs
- a Each disposal location
- b Each community consultation
- 3 Photocopies of permissions from VCPs



**Format EM2: Construction Camp and Storage Area**

Construction Stage: Report - Date\_\_\_\_\_ Month\_\_\_\_\_ Year\_\_\_\_\_

(Site Layout of Construction camp and working drawings of dwelling units with allied facilities to be attached with format) Format to be submitted before target date (decided by PIU) of establishing camps

Location of Camp (km\_\_\_\_\_)

Sl. No	Item	Unit	Details	Remarks
<b>1</b>	<b>Detail of item camp</b>			
a	Size of Camp	mxm		
b	Area of Camp	sq.m		
c	Distance from Nearest Settlement			
d	Distance from Nearest Water Source	Type/Size/Capacity/Present Use/Ownership		
e	Date of camp being operational dd/mm/yy			
f	Present land use			
g	No other trees with girth > 0.3m.			
h	Details of Storage area(Availability of impervious surface)	mxm		
i	Availability of separate waste disposal from storage area	Cum		
<b>2</b>	<b>Details of top soil stacking</b>			
a	Quantity of top soil removed	Cum		
b	Detail of storage of topsoil	Describe stacking arrangement		
<b>3</b>	<b>Details of workforce</b>			
a	Total No of Labourers	nos		
b	Total no of Male Workers	nos		
c	No of Male Workers below 18 years of age	nos		
d	Total No of Female Workers	nos		
e	No of Female workers below 18 years of age	nos		
f	No of children	nos		
<b>4</b>	<b>Details of dwelling units</b>			
a	No of dwellings/huts	nos		
b	Minimum Size of Dwelling	mxm		
c	No of openings per dwelling	nos		
d	Minimum size of opening	mxm		
e	Walls	specifications		
f	Roofing	specifications		
g	Flooring	specifications		
h	Drinking Water Tank	specifications		
i	Capacity of Drinking water Tank	cum		
j	Size of Drinking Water Tank	mxmxm		
k	Total no of WC	nos		
l	No of Wcs for female workers	nos		
m	Minimum Size of WC	mxm		
n	Total No of Bathrooms for female workers	nos		
o	Size of septic tank for WC/Baths	mxmxm		
p	Capacity of Water Tank for WCs/ Bathrooms and general purpose			
q	Fencing around camp	Y/N		
<b>5</b>	<b>Details of facilities</b>			
a	Availability of security guard 24 hrs a day	Yes/No		
b	Details of First Aid Facility	Yes/No		
c	Availability of Day Care Centre	Yes/No		
d	Availability of dust bins (capacity 60 ltr)	nos		

Certified that the furnished information is correct the quality of work is as per god practice and all relevant information as required is attached

**Contractor**

**Engineer – In -Charge**

**Format EM3: Reporting for Borrow Areas**

Construction Stage Report: Date \_\_\_\_ Month \_\_\_\_\_ Year \_\_\_\_\_ Site Layout of Borrow Area and Proposed Borrow Area Redevelopment Plan to be attached with format Format to be submitted before target date as (decided by PIU) for establishing Borrow Areas Borrow Area No. BA \_\_\_\_\_ Location of Borrow Area (Km \_\_\_\_\_)

Sl. No	Item	Unit	Details	Remarks by CSC, if any
<b>1</b>	<b>Details of Borrow Area</b>			
a	Date of Borrow Area becoming operational dd/mm/yy			
b	Current Landuse			
c	Distance from Nearest Settlement	Km		
d	No of settlements within 200m of Haul Road	No.		
e	No of settlements within 500m of Borrow Area	No.		
f	Total Capacity	cum		
g	No of Trees with girth more than 0.3 m	No.		
h	Length of Haul Road	km		
i	Width of Haul road	m		
j	Type of Haul Road	metal/dirt		
k	Size of Borrow Area	sqkm		
l	Area of Borrow Area	km x km		
m	Quantity Available	cum		
n	Distance of Nearest Water Source	Type/Size/Capacity/Present Use/Ownership		
o	Quantity of top soil removed	cum		
p	Detail of storage of topsoil			
q	Daily/occasional use of the Borrow Area by the community, if any	-		
r	Probable reuse of Borrow pit-ask community	-		
s	Drainage channels/slope/characteristics of the area	-		
<b>2</b>	<b>Enhancement Elements</b>			
a	Quantity of top soil removed	sq.m		
b	Detail of storage of topsoil	sq.m		
c	Adjoining land use/Natural elements			
d	Near by catchment for storing water			
e	Erosion Control Programme			
f	Preventive measures for			
i	Leaching			
ii	Mosquito Breeding			
iii	Water run-off/contamination			
iv	Any other environmental degradation			
<b>3</b>	<b>Details of workforce</b>			
a	Total No of Labourers	No.		
b	Total no of Male Workers	No.		
c	No of Male Workers below 18 years of age	No.		
d	Total No of Female Workers	No.		
e	No of Female workers below 18 years of age	No.		
<b>4</b>	<b>Details of redevelopment, Plan to be enclosed</b>			

Certified that the furnished information is correct the quality of work is as per good practice and all relevant information as required is attached

**Contractor**

**Engineer – In -Charge**

**Format EM4: Tree Felling**

S.No	Links	Physical Target				Completion Target		
		Total	Target	Target Achieved	% of task completed	Target Date	Date of Completion if task completed	Reason for Delay if any
		Unit						
1		nos						
2		nos						
3		nos						
4		nos						

**Contractor**

**Engineer – In -Charge**

**EM 5 Topsoil Conservation Monitoring**

Contract \_\_\_\_\_  
Report No. \_\_\_\_\_

Date \_\_\_\_\_

Location (Chain age)	Original Use of Topsoil removed	Measures for preventing spillage of topsoil on Haul Roads(Earthen/Metalled)	Present Method of Storage	Anticipated period of Storage (Months)	Distance of nearest Water course (m)	Present Slope of Pile (V: H)	Whether silt fencing provided?	Is any other covering / measure provided? If yes, what is it?	Improvements required	Extent of Compliance as on date of report

Certified that the above is true.

Signed \_\_\_\_\_

**Contractor**

Verified

Signed \_\_\_\_\_

**Engineer – In-charge**

**EM 6 Redevelopment of Borrow Areas**

Operation Stage: Report: Date \_\_\_\_ Month\_\_\_\_ Year\_\_\_\_

To be monitored by PIU during operation period

Details of remarks to be appended wherever necessary.

Sl. No	Activity	Particulars	Drawbacks Identified			Improvements Required		
			Construction	Financial	Others (Ask Community)	Technical	Financial	Remarks/ Suggestions
1	Details of Borrow area and Surrounding Landuse							
2	End use of the borrow area							
3	Whether rehabilitation has been carried out in line with owners request							
4	Erosion Control Measures							
5	Number of trees planted							
6	Reuse of topsoil							
7	Preventive measures taken for -Mosquito Breeding -Water runoff/contamination -Other Environmental Degradation							
8	Any problems faced by owner							
9	Any problems faced by the local community							
10	If it has been developed as a fish pond,							
a	Details of available catchment for storing water							
b	Economic Benefits/Utility							
11	If it has been developed as an orchard							
a	Details of suitability of soil and water.							
B	Type of Plantation							
c	Economic Benefits/Utility							
12	Any Other End use							
a	Particulars							
b	Economic Benefits/Utility							

**Contractor**

**Engineer – In -Charge**



**EM 7 Checklist for Construction Safety**

Sl. No.	Safety Issues	Yes	No	Non compliance	Corrective Action	Penalty	Remarks
<b>Safety during Construction Stage</b>							
1	Appointment of qualified Construction safety officers						
2	Approval for Construction Safety Management Plan by the Engineer.						
3	Approval for Traffic Management/control Plan in accordance with IRC: SP: 55-2001						
4	Maintenance of the existing road stretches handed over to the Contractor.						
5	Provision of Temporary Traffic Barriers/Barricades/caution tapes in construction zones						
6	Provision of traffic sign boards						
7	Provision for flags and warning lights						
8	Provision of metal drum/empty bitumen drum delineator, painted in circumferential strips of alternate black and white 100mm wide 2 coats fitted with reflectors 3 Nos of 7.5cm diameter						
9	Providing plastic crash barrier						
10	Provision of adequate staging, form work and access (ladders with handrail) for works at a height of more than 3.0 m						
11	Provision of adequate shoring / bracing / barricading / lighting for all deep excavations of more than 3.0 m depth.						
12	Demarcations (fencing, guarding and watching) at construction sites						
13	Provision for sufficient lighting especially for night time work						
14	Arrangements for controlled access and entry to Construction zones						
15	Safety arrangements for Road users / Pedestrians						
16	Arrangements for detouring traffic to alternate facilities						
17	Regular Inspection of Work Zone Traffic Control Devices by authorized contractor personnel						
18	Construction Workers safety - Provision of personnel protective equipments						
19	A. Helmets						
	B. Safety Shoe						
	C. Dust masks						
	D. Hand Gloves						
	E. Safety Belts						
	F. Reflective Jackets						
	G. Earplugs for labour						
20	Workers employed on bituminous works, stone crushers, concrete batching plants etc. provided with protective goggles, gloves, gumboots etc.						

**Section 3: Conditions of Contract**

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<b>Sl. No.</b>	<b>Safety Issues</b>	<b>Yes</b>	<b>No</b>	<b>Non compliance</b>	<b>Corrective Action</b>	<b>Penalty</b>	<b>Remarks</b>
21	Workers engaged in welding work shall be provided with welder protective shields						
22	All vehicles are provided with reverse horns.						
23	All scaffolds, ladders and other safety devices shall be maintained in as safe and sound condition						
24	Regular healthcheckup for labour/ Contractor's personnel						
25	Ensuring the sanitary conditions and all waste disposal procedures & methods in the camps.						
26	The Contractor shall provide adequate circuit for traffic flow around construction areas, control speed of construction vehicles through road safety and training of drivers, provide adequate signage, barriers and flag persons for traffic control						
27	Provision for insurance coverage to the contractor's personnel						

**Contractor**

**Engineer – In -Charge**

**Format EC1: Target Sheet for Pollution Monitoring**

Construction Stage: Report -                      Date\_\_\_\_\_                      Month\_\_\_\_\_                      Year\_\_\_\_\_

( Locations at which monitoring to be conducted as per EMP)

Sl. No	Chainage	Details of Location	Duration of Monitoring	Instruments Used	Completion Target		Reason for Delay if any
					Target Date	Date of Completion if task completed	
<b>Air Monitoring</b>							
1							
2							
3							
4							
5							
<b>Water Monitoring</b>							
1							
2							
3							
4							
5							
<b>Noise Monitoring</b>							
1							
2							
3							
4							
5							

Certified that the Pollution Monitoring has been conducted at all the locations specified in the EMP



**Format EC 2: Target Sheet for Pollution Monitoring**

Operation Stage: Report -                      Date \_\_\_\_\_                      Month \_\_\_\_\_                      Year \_\_\_\_\_

( Locations at which monitoring to be conducted )

Sl. No	Chainage	Details of Location	Duration of Monitoring	Instruments Used	Completion Target		Reason for Delay if any
					Target Date	Date of Completion if task completed	
<b>Air Monitoring</b>							
1							
2							
3							
4							
5							
<b>Water Monitoring</b>							
1							
2							
3							
4							
5							
<b>Noise Monitoring</b>							
1							
2							
3							
4							
5							

Certified that the Pollution Monitoring has been conducted at all the locations specified in the EMP

**Contractor**

**Engineer – In -Charge**

Attachment to "Environmental Management Plan"

Examples of some good practice in traffic control and safety during construction, Figures 1 to 9  
.Figure 1: Diversion of traffic on half of the road width (say left)

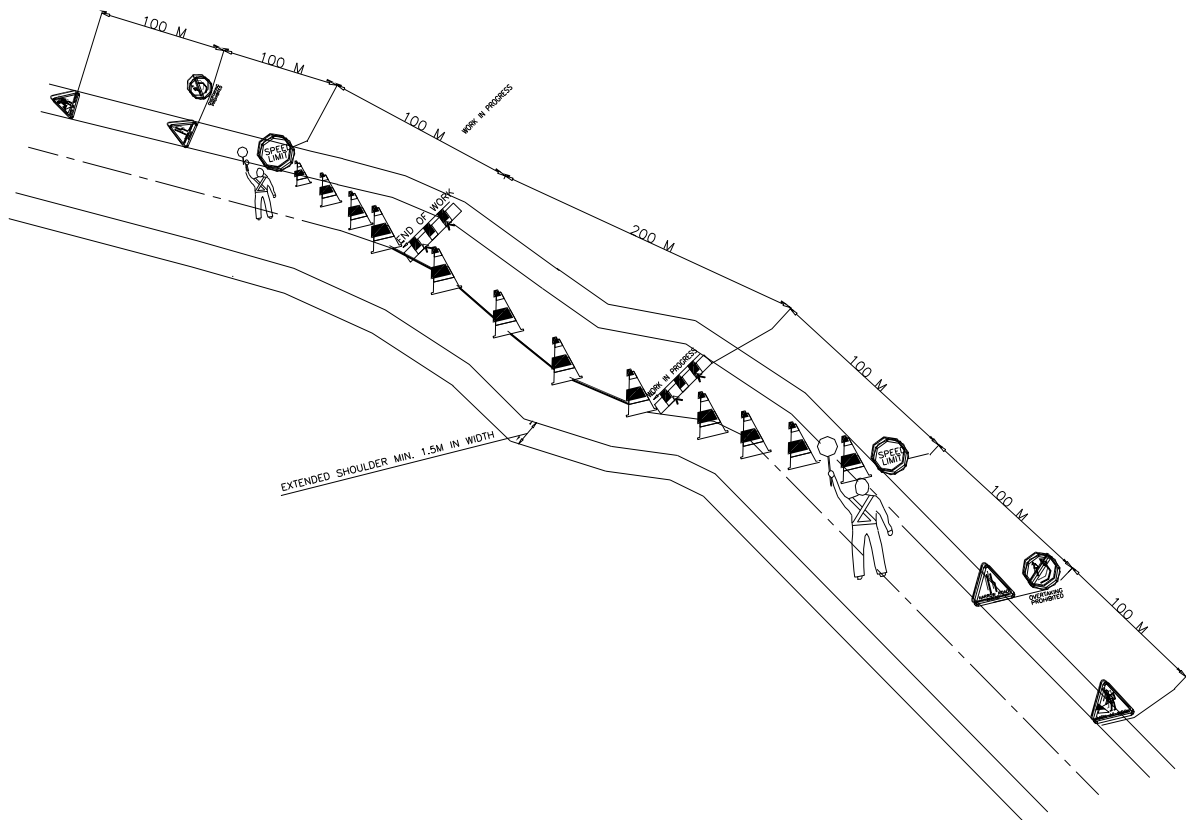
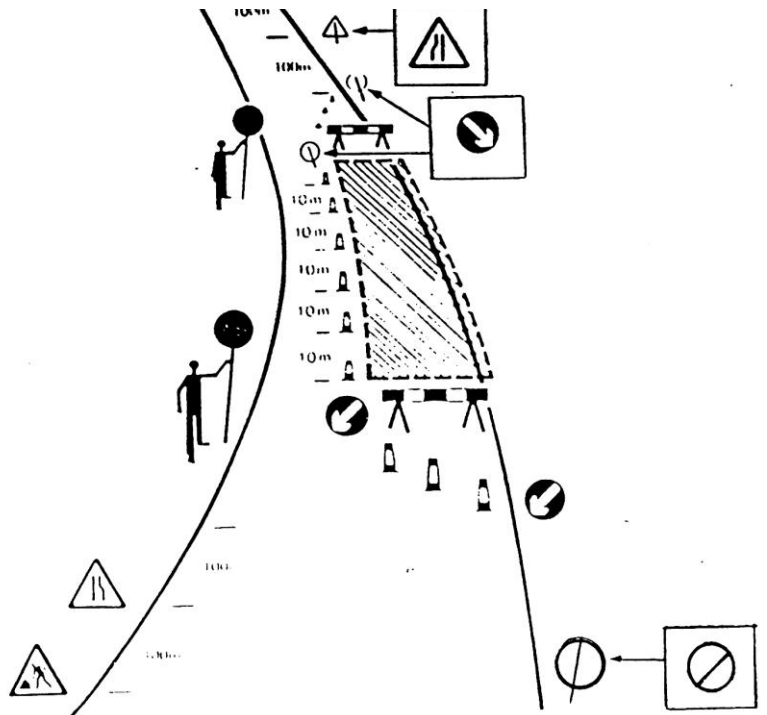
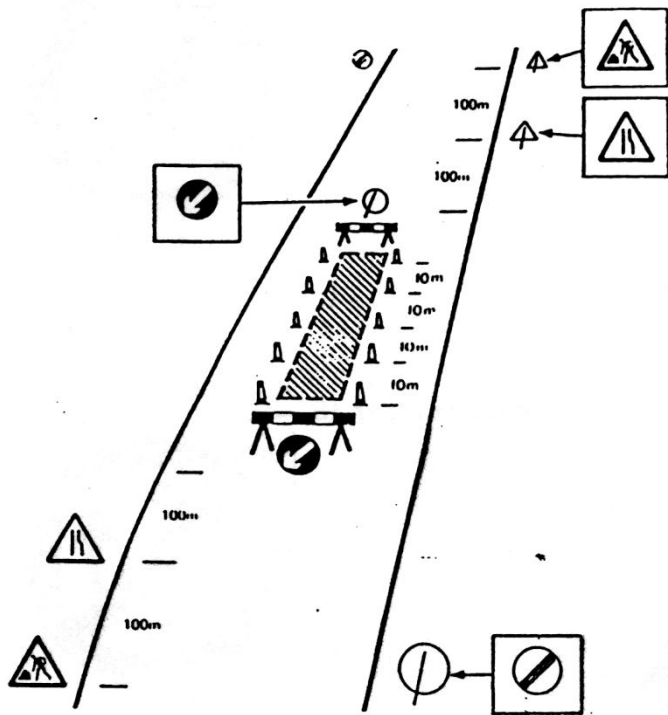


Figure: 4

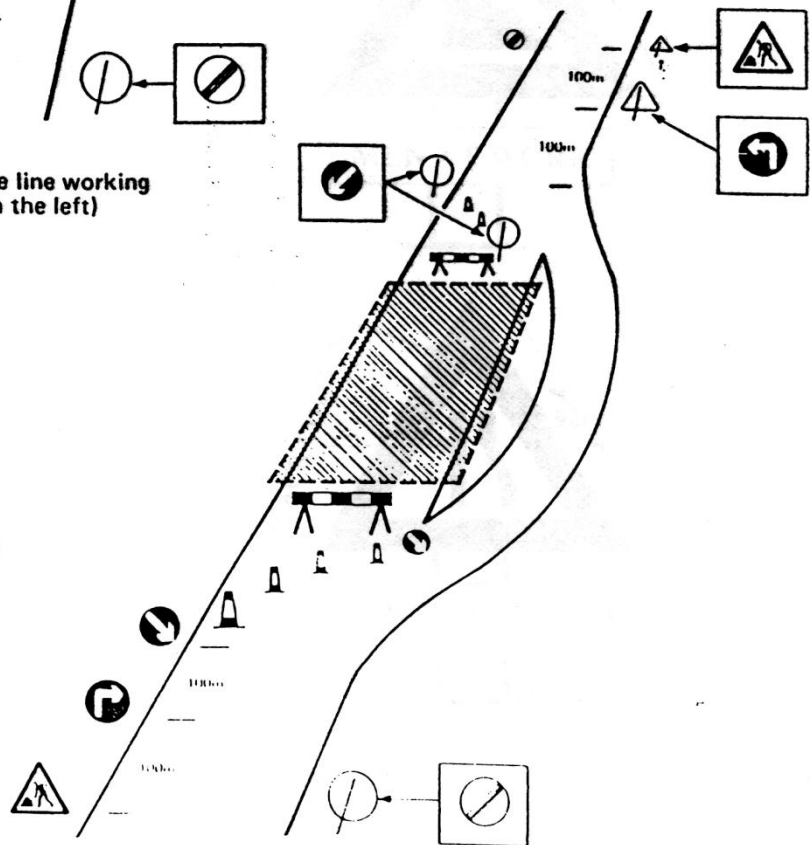


Sign layout for lane closure (drawn for driving on left)



Sign layout for centre line working  
(drawn for driving on the left)

Figure: 6



Sign layout for diversion (drawn for  
driving on the left)

Figure: 5

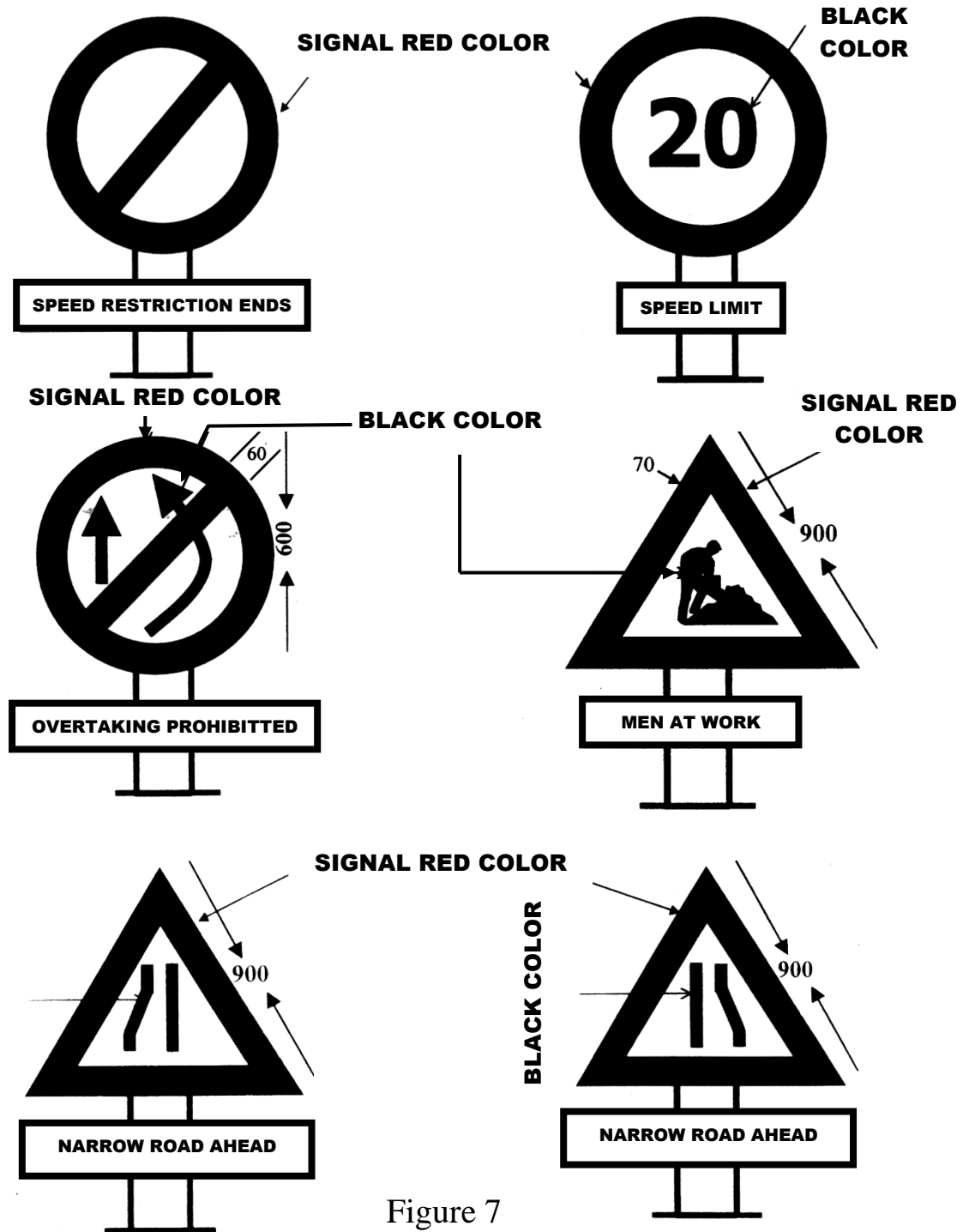


Figure 7

Note : Background : White Color                      Letters : Signal Red Color  
 Post : Alternate Black & White Stripes  
 Height of post between bottom of road sign, caution board and crown of road shall be 1.5 m

