GOVERNEMENT OF GUJARAT

ROADS AND BUILDINGS DEPARTMENT

Second Gujarat State Highway Project (GSHP-II)

(Under Assistance From World Bank)

BIDDING DOCUMENTS

PART - 2

International Competitive Bidding (ICB)
GSHP-II/ICB/02

For

Output and Performance based Road Contract (OPRC) for Improvement, Rehabilitation, Resurfacing Works and Network Performance of Roads: Dhandhuka - Dholera, Dhandhuka – Paliyad and Limbdi - Dhandhuka

Issued to:

Superintending Engineer
Project Implementation Unit (PIU)
Roads and Buildings Department, Government of Gujarat
Ground Floor, Nirman Bhawan, Sector- 10/A
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INVITATION FOR BIDS

International Competitive Bidding (ICB)
Second Gujarat State Highway Project (GSHP-II)
(Under Assistance From World Bank)
Loan No. IBRD-8313-IN

Output and Performance based Road Contract (OPRC) for Improvement, Rehabilitation, Resurfacing Works and Network Performance of Roads: Dhandhuka - Dholera, Dhandhuka – Paliyad and Limbdi - Dhandhuka

Date: ___ /___ / 2018
Bid No.: GSHP-II/ICB/02

1. The Government of Gujarat through Government of India has received a loan from the International Bank for Reconstruction & Development (IBRD) towards the cost of Gujarat State Highway Project II (GSHP II) and intends to apply a part of the funds to cover eligible payments under the contract - Output and Performance based Road Contract (OPRC) for Improvement, Rehabilitation, Resurfacing Works and Network Performance of Roads: Dhandhuka - Dholera, Dhandhuka – Paliyad and Limbdi – Dhandhuka. Bidding is open to all Bidders from eligible source countries as defined in the IBRD Guidelines for Procurement. Bidders from India should, however get registered with the Government of Gujarat or other State Governments/Government of India or State/Central Government Undertakings before submission of bid. Bidders are advised to note the minimum qualification criteria specified in the Instructions to Bidders to qualify for the award of the contract.

2. On behalf of The Governor of Gujarat, Chief Engineer (World Bank), R&BD, GOG now invites the bids for the OPRC Contract as detailed in this invitation. The bidders may submit bids for the OPRC work.

3. The bid document (in three sets) may be purchased from the office of the Superintending Engineer, Project Implementation Unit, Nirman Bhavan, Ground Floor, Sector 10 A, Gandhinagar-Gujarat from Date: / / 2018 to / /2018, up to 1600 hrs (IST) for a non-refundable fee of INR 18,000 (Indian Rupees Eighteen Thousand only) in the form of Demand Draft of scheduled bank payable at Rajkot in favour of The Executive Engineer, State Road Project Division, Rajkot. Interested bidders may obtain further information from the office of Superintending Engineer, PIU-Gandhinagar. Bidding documents if requested by interested bidder through post; bid documents will be dispatched by Speed Post against payment of

Document Fees and extra charges by the bidder in advance; INR 10,000 for overseas delivery and INR 8,000 for local delivery. No claim whatsoever will be entertained, if bidding documents sent by the SE-PIU-Gandhinagar to the aspired bidder through Speed Post/Economical Means are not received or received late by such interested bidder.

4. Bids must be accompanied by security of the amount specified for the work in the table below, drawn in favour of The Executive Engineer, State Road Project Division, Rajkot; payable at Rajkot. Bid security will have to be in the form as specified in the bidding document and shall have validity accordingly.
5. Bids must be delivered to The Superintending Engineer, Project Implementation Unit (PIU), Ground Floor, Nirman Bhavan, Sector- 10/A, Gandhinagar, Gujarat-India, PIN: 382010 on or before / /2018, 12:00 Hours (***IST***) and will be opened on the same day at 12:30 Hours ***(IST),*** in the presence of the bidders who wish to attend. If the office happens to be closed on the last date of bid submission as specified, the bids will be received and opened on the next working day at the same time and venue.
6. A pre-Bid meeting will be held on / /2018 at 15:00 Hrs (***IST***) at the PIU office, Conference Room, Ground Floor, Nirman Bhavan Sector 10A, Gandhinagar to clarify the queries that may be raised at that stage as stated in Clause 7.4 of 'Instructions to Bidders' of the bidding document.
7. Other details can be referred through the bidding documents.

TABLE

Bid No.	**Name of work**	**Bid Security (INR)**	**Bid Document fee Nonrefundable (INR)**
GSHPII/ICB/02	Output and Performance based Road Contract (OPRC) for Improvement, Rehabilitation, Resurfacing Works and Network Performance of Roads: Dhandhuka - Dholera, Dhandhuka – Paliyad and Limbdi – Dhandhuka	INR 48.30 Million (INR Four Crores eighty three lakh only)	INR 18,000/-

The bids received after last date and time of bid submission shall be treated as Late Bid and shall not be opened. Such bids shall stand rejected without any liability whatsoever on the bid accepting authority.

Superintending Engineer,
Project Implementation Unit (PIU),
Ground Floor, Nirman Bhavan,
Sector- 10/A, Gandhinagar, Gujarat
PIN : 382010, India

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Output and Performance based Road Contract (OPRC) for Improvement, Rehabilitation, Resurfacing Works and Network Performance of Roads: Dhandhuka - Dholera, Dhandhuka – Paliyad and Limbdi - Dhandhuka

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1. GENERAL

1.1. Definitions

Accepted Programme The programme of works approved by the Engineer.

Analysis period: The time period used for comparing design alternatives. An analysis period may contain several maintenance and rehabilitation activities during the life cycle of the pavement being evaluated.

Annual Average Daily Traffic (AADT) is estimate of typical traffic on the road segment for all the days of the week over the period of a year.

Asphaltic Concrete (AC) /Bituminous Concrete (BC) as defined and detailed in MORT&H specifications.

Audit Length / Road Audit Length is the aggregate length of the road section(s) considered for auditing for performance evaluation/ non-conformance scoring as per the contract.

Axle load is the sum of all tyre loads on an axle.

Bank - Whenever used in the context of the project funding agency/bank, the bank means the ‘’World Bank’’.

Borrower is the government entity which borrows loan for part or full funding of the project. Here the borrower is R&BD, GoG.

Bridge means a structure with a span greater than 6m between the inner faces of the dirt walls for carrying traffic or other moving loads over a depression or obstruction such as a channel, road or railway.

Built-up Area is any section of road that is contained within the defined limits of Towns or Villages, or where there is continuous Residential and/or Commercial development on both sides of the road for more than one km (centreline) in length measured from the first and last building unless otherwise agreed with the Employer.

Commencement Date is the Start Date as defined under cl 10.1 of Particular Conditions of Contract.

Completed Works means completed works of Improvement and Rehabilitation.

Conceptual Design means the **design** by which the Employer defines, at a fundamental level, output to be achieved by the Contractor.

Conforming Design means a design that meets all accepted standards and best practice criteria for road construction including but not limited to geometrics, safety, pavement, drainage, delineation, lighting and aesthetics**.**

Conformance Management Unit (CMU) is Contractor‘s personnel responsible for managing, measuring and reporting conformance to the Contractor and the Engineer.

Construction Works means all Improvement, Rehabilitation and Resurfacing Works under this contract. It excludes all works undertaken under Network Performance and Emergency Works.

Contract Area is the division of the project based on the roads forming the road-network of the OPRC Contract.

Culvert is a cross-drainage structure having a total length of 6m or less between the inner faces of the dirt walls or extreme waterway boundaries measured at right angles thereto.

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

Deflection is vertical deformation of a pavement under an applied load.

Design life of pavement is the length of time for which a pavement structure is being designed.

Detailed Design means the increased level of detail the Contractor must provide, over and above the information presented in the Conceptual Design, to satisfy the requirements of the specification, construction practices, traffic management, applicable design codes and standards, legislation, the Employer, the Engineer and all other approving agencies.

Emergency works: As defined in Particular Conditions of Contract.

Equivalent Single Axle Load (ESAL): A numerical factor that expresses the relationship of a given axle load to another axle load in terms of the relative effects of the two loads on the serviceability of a pavement structure. Often expressed in terms of 18 kips (8.2 tons) single axle loads

Expected Service Life: The age (in years) that the surfacing or pavement is expected to reach before it requires rehabilitation or replacement.

Falling Weight Deflect meter (FWD) is a Non-destructive equipment used to measure the deflection bowl or basin of a given pavement structure. It is an indicator of the structural condition of the road.

International Roughness Index (IRI): a pavement roughness index computed from a longitudinal profile measurement.

Intervention (type): the type of intervention to be carried out on a road section based on the current condition (structural and functional)

IRC means Indian Roads Congress

Lane distribution factor is a factor describing the percentage (of traffic in one direction) of a given vehicle class using a given lane.

Lifespan is the period of time during which something is functional or fit for purpose.

Lump Sum Price means the single Lump Sum price offered to complete the contract works excluding any Provisional Sum or Emergency Works Items.

Maintenance is the preservation of the entire roadway, including surface, shoulders, roadsides, structures, and such traffic control devices as are necessary for its safe and efficient utilization.

Maintenance Services are Network Performance Works (which include Routine Maintenance and Maintenance Management Works) and Resurfacing Works as specified in the contract required to be carried out to achieve and maintain the required Level of Service and achieve the specified performance measures.

Materials means things of all kinds (other than Plant) intended to form or forming part of the Permanent Works, including the supply-only materials (if any) to be supplied by the Contractor under the Contract for incorporation in the Works and for provision of Services.

Milling of existing pavement /Asphalt/Bituminous Surfacing – Removal of desired thickness of bituminous surfacing of the existing pavement by mechanical means like rotary diamond cutter or similar machine capable of providing a uniform surface after milling out of the material.

Monitoring Consultant As detailed in Particular Conditions of Contract.

MORT&H – Ministry of Road Transport & Highways

MSA is Million Equivalent Standard Axels.

Network / Performance Achievement Payment means the payment specified to be made against routine maintenance and maintenance management works; this payment shall be linked with performance measures/non-conformance as stipulated in this contract.

Network Performance means all maintenance activities including their management required to be done during the whole contract period to keep the road asset including all allied works at the specified level of service at all times.

Non-Conformance Report (NCR) – is the instruction issued by the Engineer against use of any materials, works or performance that are not in conformance with the contract specifications.

Non-Conformance clearance - is a closure report issued by the Engineer to the Contractor against any non-conformance report issued earlier.

Overlay is a layer placed on top of an existing pavement structure to improve the performance and strength.

Pavement is the pavement structure which normally consists of sub-base, base and surfacing courses laid over prepared sub grade to facilitate traffic movement.

Pavement condition is the term which tells about the extent to which the pavement provides the intended level of service.

Pavement performance is the measure of accumulated service provided by a pavement, often referred to as the record of pavement condition or serviceability over time or with accumulated traffic.

Performance Period is the period of time till which an initial pavement structure is expected to last before it needs any strengthening/rehabilitation.

Performance Security means the security (or securities, if any) under GC Clause 53.

Periodic Payment Report is the report prepared by the Contractor specifying and detailing their entitlements and substantiated payments

Permanent Works means the permanent works to be executed by the Contractor under the Contract.

Road Manager – is a person appointed by Contractor who shall be in charge of managing all activities of the contractor under the contract for entire duration of contract including Network

Performance period. He will also be contractor's representative for the contract purposes. The words **Program** and **Programme** mean the same within this contract.

Recycling of milled material/Reclaimed Asphalt Product (RAP) – Scarification of existing pavement asphalt using rotary diamond cutter or similar machine capable of providing a uniform surface after scarification and re-use of the scarified material in new pavement courses suitably.

Reliability is the probability that serviceability will be maintained at adequate levels from a user's point of view, throughout the design life of the road.

Resilient modulus is the Modulus of elasticity that represents the resistance of one material to deformation under load (Technical specification).

Resurfacing Works are the works undertaken to lay new pavement surfacing on existing bituminous surfaces to preserve the structural integrity of the pavement structure and to bring the riding quality close to that of the new road surface; one Resurfacing of specified material in specified thickness is mandatory and payable as per this contract..

Response Time is the maximum time to act for repair a defect, based on consideration of the defect type, risk and severity.

Right of Way (RoW) means the defined road corridor under the control and management of the **Government of Gujarat** (India). It includes the land authorized to be used / occupied for construction, operations and maintenance of a project or facility passing over, under, or through such land.

Road Section is an identified portion of the total length of the road.

Road Section Number
means the identification number of the roads as mentioned below.
S1 : Dhandhuka – Dholera corridor
S2 : Dhandhuka – Paliyad corridor
S3 : Limbdi – Dhandhuka corridor

Roadside Any non-pavement area within the Right of Way, including any median area.

Rural Area is any section of road that is outside the Built-up areas.

Safety Sign is the road sign that helps the drivers/road users in making safe use of the road.

Schedules mean the document(s) titled schedules, completed by the Contractor and submitted with the Letter of **Bid**, as included in the Contract. Such document may include the Payment Schedule, data, lists, and schedules of rates and/or prices.

Separable Portion means any part of the Contract Works specified in the Particular Conditions (PC) or agreed between parties as required to be completed to the requirements of substantial completion for payment purposes only.

Site means the places where the Permanent Works are to be executed and to which Plant and Materials are to be delivered, and where the intended Services under the Contract are to be performed, and any other places as may be specified in the Contract as forming part of the Site.

Structure is any bridge, culvert, sign gantry, earth retaining structure or other designated structure.

Temporary Works means all temporary works of every kind (other than Contractor's Equipment) required on Site for the execution and completion of the Permanent Works and the remedying of any defects.

Tender (or Bid) means the Letter of Bid and all other documents which the Contractor submitted with the Letter of Bid, as included in the Contract.

Tests after Completion means the tests (if any) which are specified in the Contract and which are **required to be** carried out in accordance with the Specifications after completion of the Improvement Works, Rehabilitation works and Resurfacing works or a Section (as the case may be).

Tests on Completion means the tests which are specified in the Contract or agreed by both Parties or instructed as a Variation, and which are carried out under GC Clause 20 before the Works or a Section (as the case may be) are paid for by the Employer.

Time for Completion means the time for completing the Works or a Section or Separable Portion (as the case may be) under GC Clause 10.2 and with any extension under GC Clause 64.1, calculated from the Start Date for the Contract Year. The Start Date is defined in the PC.

Traffic growth factor is the factor used to describe the annual growth rate of traffic volume on a roadway.

Unit of Work is any base unit of measurement of a standard job (e.g. meter, square meter).

Works are what the Contract requires the Contractor to construct, install, and turn over to the Employer, as covered under Improvement Works, Rehabilitation Works, **Resurfacing works** and Emergency Works. These can be the Permanent Works as well as the Temporary Works.

Windrow means a longitudinal row of graded or heaped material.

1.2. Basic Concept of Road Asset Management with Output and Performance Based Road Contracts (OPRC)

1. Output- and Performance-based contracting for Roads is designed to increase the efficiency and effectiveness of road asset management and maintenance. It should ensure that the physical condition of the roads under contract is adequately maintained for the need of road users over the entire period of the contract which is normally many years. This type of contract significantly expands the role of the private sector, from the simple execution of works to the management and conservation of road assets.

2. In **traditional road construction and maintenance contracts**, the Contractor is responsible for the execution of works which are normally defined by the Road Administration or the Employer, and the Contractor is paid on the basis of unit prices for different work items, i.e. a contract based on "inputs" to the works. The results of traditional road contracts are in many cases less-than-optimal. The reason is that the Contractor has liability only for short defect liability period. During contract period contractor has to carry out the maximum amount of works, in order to maximize its turnover and profits. Even if the work is carried out according to plan and much money is spent, the overall service quality for the road user depends on the quality of the design given to the Contractor who is not accountable for it. In many cases the roads do not last as long as they should because of deficiencies in the original design, aggravated by inadequate maintenance.

   The OPRC addresses the issue of inadequate incentives. During the Bidding process, contractors compete among each other by essentially proposing fixed lump-sum prices for bringing the road to a certain service level and then maintaining it at that level for a relatively long period. It is important to understand that contractors are not paid directly for "inputs" or physical works (which they will undoubtedly have to carry out), but for achieving specified Service Levels, i.e., the Rehabilitation of the road to pre-defined standards (if so required by the bidding document), the maintenance service of ensuring certain Service Levels on the roads under contract, and specific improvements (if so required by the bidding document), all representing outputs or outcomes. A monthly lump-sum remuneration paid to the Contractor will cover all physical and non-physical maintenance services provided by the Contractor, except for unforeseen emergency works which are remunerated separately. The Rehabilitation and Improvement Works which have been explicitly specified by the Employer in the contract are quoted on the basis of measurable output quantities and paid as performed. In order to be entitled to the monthly payment for maintenance services, the Contractor must ensure that the roads under contract comply with the Service Levels which have been specified in the bidding document. It is possible that during some months he will have to carry out a rather large amount of physical works in order to comply with the required Service Levels and very little work during other months. However, his monthly payment remains the same as long as the required Service Levels are complied with.

3. The OPRC as a model for road asset management is similar to Design, Build, Maintain, Operate and Transfer (DBMOT) model of contracts which addresses the issue of adequate incentives. During the bidding process, contractors compete among each other by essentially proposing fixed lump-sum prices for bringing the road to a certain service level and then maintaining it at that level for a relatively long period. It is important to understand that contractors are not paid directly for ―inputs‖ or physical works (which they will undoubtedly have to carry out), but for achieving specified Service Levels, i.e., the Rehabilitation of the road to pre-defined standards, the maintenance service of ensuring certain Service Levels on the roads under contract, and specific improvements, all represented in outputs or outcomes, expressed in Service-Levels criteria. The overall

cost of projects is apportioned to Civil Construction Works and Maintenance works (which is termed as Network Performance works) with assumption that whatsoever works are executed by Contractor shall be managed and maintained by Contractor during operation period and diversified apportioned amount will cover all maintenance cost including profit of contractor. Likewise Contractor will be benefitted by regular gain during maintenance period. Thus better the quality of works is executed lesser will be the maintenance cost at later stage.

A lump-sum periodic remuneration paid to the Contractor will cover all physical and non-physical services provided by the Contractor, except for unforeseen emergency works which are remunerated separately. In order to be entitled to these periodic payments, the Contractor must ensure that the roads under contract comply with the Service Levels which have been specified in the bidding document. It is possible that during some months he will have to carry out a rather large amount of physical works in order to comply with the required Service Levels and very little work during other months. However, his periodic payment remains the same as long as the required Service Levels are complied with.

4. A fundamental feature of the OPRC is that the "Contractor" must not necessarily and in all cases be a traditional works contractor, but can (if allowed in the Bidding Documents) be any type of firm or business venture having the necessary technical, managerial and financial capacity to fulfill the contract. In any case, the contractor is responsible for designing and carrying out the works, services and actions he believes are necessary in order to achieve and maintain the Service Levels stated in the contract. The Service Levels are defined from a road user's perspective and may include factors such as average travel speeds, riding comfort, safety features, etc. If the Service Level is not achieved in any given month, the payment for that month may be reduced or even suspended.

5. Under the OPRC, the Contractor has a strong financial incentive to be both efficient and effective whenever he undertakes work. In order to maximize profits, he must reduce his activities to the smallest possible volume of intelligently designed interventions, which nevertheless ensure that pre-defined indicators of Service Level are achieved and maintained over time. This type of contract makes it necessary for the Contactor to have a good management capacity. Here, "management" means the capability to define, optimize and carry out on a timely basis the physical interventions which are needed in the short, medium and long term, in order to guarantee that the roads remain above the agreed Service Levels. In other words, within the contract limitations and those required to comply with local legislation, technical and performance specifications and environmental and social regulations, the Contractor is entitled to independently define: (i) what to do, (ii) where to do it, (iii) how to do it, and (iv) when to do it. The role of the Road Administration and of the Employer is to enforce the contract by verifying compliance with the agreed Service Levels and with all applicable legislation and regulations.

6. Maintaining a road network includes both **routine** and **periodic** tasks. Routine maintenance consists of many different tasks frequently necessary to maintain the function of the road (such as pothole repairs, cleaning of drainage, sealing of cracks, cutting of vegetation, etc.). Periodic maintenance consists of predictable and more costly measures of a less frequent nature designed to avoid road degradation (such as, drainage work, resurfacing, asphaltic concrete overlays, etc.). Intelligent management, the timeliness of interventions and the adequacy of technical solutions are critical. It is expected that the use of private specialized firms under output- and performance-based contracts will unleash significant efficiency gains, and stimulate innovation in comparison with traditional road administration practices.

7. Minimum road conditions and Service Levels are defined through output and performance measures, and these are used under the OPRC to define and measure the desired performance of the Contractor. In the OPRC, the defined performance measures are thus the accepted minimum thresholds for the quality levels of the roads for which the Contractor is responsible.

8. The performance criteria should ideally cover all aspects of the contract and take account of the fact that different sub-areas within the contract area might require different Service Levels. Criteria can be defined at three levels (although simpler contracts will not use all of the criteria identified below):

a) **Road User Service and Comfort** measures, which can be expressed in terms such as:
- Road Roughness
- Road and lane width
- Rutting
- Skid resistance
- Vegetation control
- Visibility of road signs and markings
- Availability of each lane-km for use by traffic
- Response times to rectify defects that compromise the comfort and the safety of road users
- Attendance at road accidents
- Drainage off the pavement (standing water is dangerous for road users)

b) Road Durability measures, which can be expressed in terms such as:
- Longitudinal profile
- Pavement strength
- The extent of repairs permissible before a more extensive periodic maintenance treatment is required
- Degree of sedimentation in drainage facilities

c) Management Performance Measures, which define the information the Employer, requires both to govern the asset during the term of the contract, and to facilitate the next tender round. Requirements should include:

- Delivery of regular progress reports to the Road Controlling Authority
- Inventory updates and other data sharing requirements
- Maintenance history (so subsequent tenderer's can price the work).

To avoid ambiguity, all performance measures must be clearly defined and objectively measurable.

9. Together the performance measures define the minimum acceptable Service Level for the particular road. In setting the measures various criteria (both technical and practical) need to be carefully considered, such as (i) traffic volume and composition, (ii) urban vs. rural roads (iii) flat, hilly or mountainous terrain, (iv) sub grade quality and type, (v) quality of available construction materials, (vi) capacity of available contractors, (vii) any environmental constraints, such as protected areas, parks, forest reserves, etc.

10. Under the terms of the contract, the Contractor will also be responsible for the continuous monitoring and control of road conditions and Service Levels for all roads or road sections included in the contract. This will not only be necessary to fulfill the

contract requirements, but it is an activity which will provide him with the information needed to be able (i) to know the degree of his own compliance with Service Level requirements, and (ii) to define and plan, in a timely fashion, all physical interventions required to ensure that service quality indicators never fall below the indicated thresholds. Under the OPRC modality, the Contractor will not receive instructions from the Engineer/Employer concerning the type and volume of road maintenance works to be carried out. Instead, all initiative rests with the Contractor who must do whatever is necessary and efficient to achieve the quality levels required. This concept is expected to lead not only to significant efficiency gains, as mentioned earlier, but also to technological innovation. However the Engineer will judge and monitor all operations of contractor as per approved methodology and will confirm the execution in order and precedence of documents and Technical Specifications.

11. The beneficiaries of the new concept are expected to be the road users, the Road Administration, and the contractors or other private sector enterprises. In a wider sense, future generations will be able to benefit from a better preservation of past investments in roads. Road users will be able to know the Service Level they can expect in return for the payments they make for the use of the infrastructure (tolls, tariffs, user fees, taxes, etc.). The Road Administrations should benefit by obtaining better overall road conditions at the same levels of expenditure. For contractors and other private sector enterprises, the new type of contracts should open up new business opportunities, in which longer contract periods provide a more stable business environment, and for the establishment of true Public-Private Partnership relations. However, it may be the future generations who will perhaps benefit most, since they will not have to pay for the reconstruction of roads destroyed because of a lack of maintenance today.

12. Although the design of the works and services to be carried out is under the responsibility of the Contractor, this type of procurement requires good preparatory engineering work. It is necessary to prepare comprehensive information on the actual condition of the roads covered by the contract. If rehabilitation works are required, the Engineer shall define the level of quality (or standard) to be achieved by the Contractor for delivery and completion during the contract. If improvement works are sought, the Engineer shall define the level of quality (or standard) to be achieved by the Contractor for delivery and completion during the contract. Emergency works, although impossible to quantify in advance, will therefore be taken care on a case to case basis as per the relevant clauses in GC and PC. Another important area requiring sound engineering advice is to define if the Rehabilitation Works should be included in the contract or be carried out in advance under a separate "standard" civil works contract. This decision depends in each case on the risks that the Borrower (and his advisor) understands as possible to be administered cost-effectively by the Contractor.

13. When Rehabilitation Works and Improvement Works are not specifically required in the bidding documents, it is expected that in order to comply with the contract, the Contractor will most likely have to carry out different types of works, including some small initial rehabilitation and improvements, routine maintenance activities and periodic maintenance works. The definition of the exact nature of the works, their timing, their costing and their implementation is left to the judgment of the Contractor. This means that his capacity must be above the usual capacity of a traditional civil works contractor. In fact, an essential attribute is the capacity to manage roads, while the actual physical execution may either be carried out by the Contractor himself, or by different specialized firms participating in a Joint Venture with the main contractor, or under subcontracts. Joint Ventures may include Engineering firms and medium, small and even micro-enterprises. Consequently, a well-designed prequalification process is highly recommended in order to ensure that only qualified bidders participate in the bidding process, even though, the present bidding document can also be used when post-

qualification is envisaged. In the design of the prequalification requirements the borrower should consider if the experience of specialist sub-contractors (like an engineering consultant) should be allowed to be added to those of the applicants. The activities which may be delegated by the main contractor to subcontractors not participating in the prequalification process should be listed in the Particular Conditions and bidders should be alerted about this point in the Bid Data Sheet.

14. Output- and Performance-based Road Contracts transfer a significant burden of risk onto the contractor. It is important that this burden is both equitable and within the capacity of the industry. The contract defines the risk profile carried by the contractor arising from storm events, legislation changes, changes in traffic volumes, and roadside development.

15. Emergency works are meant to remedy unexpected damage which occurs as a result of extraordinary natural phenomena, and which affect the normal use of the road network, or the safety and security of the users. For emergency works, the contract holds the responsibility of the Contractor, establishing that the Engineer after obtaining Employer's approval will approve execution of services and separate remuneration shall be made in accordance with the Particular Conditions (PC).

16. Bidders will present their financial offer for:

- **the Maintenance Services (Network Performance)** in the form of the amount of the monthly lump-sum payment demanded by the bidder according to the conditions of contract (this will be a monthly amount applicable throughout the post construction period of Network performance. During the Construction Period the routine maintenance cost is included in Improvement and Rehabilitation cost, so as to meet the defined service level management for construction period i.e. 24 months, the payment of these item shall be in proportion of the satisfactory maintenance of road to the defined and detailed service levels. During post construction maintenance period, resurfacing may be required to cover defects either due to cracking /roughness or recurring defects in close vicinity as mentioned in service level parameters. Such kind of resurfacing will be treated as routine maintenance.

- **the Rehabilitation Works** (if so required in the Bid Data Sheet), in the form of a lump-sum amount, while indicating the quantities of measurable outputs to be executed in order that the road achieves the performance standards specified in the bidding documents. Rehabilitation Cost shall be inclusive of Enhancement cost and routine maintenance cost during construction period Payments will be made in accordance with the progress in the execution of those measured outputs;

- **the Improvement Works** (if so required and for the improvements indicated in the bidding documents) in the form of a lump-sum amount, while indicating the quantities of measurable outputs to be executed in order that the road achieves the performance standards specified in the bidding documents.; Improvement cost shall be inclusive of Enhancement cost and routine maintenance cost during construction period.

- **Resurfacing work** - Mandatory Resurfacing is proposed to be done during 9^{th} and/ or 10^{th} year of contract period in Improvement and Rehabilitation Sections respectively. The mandatory Resurfacing work is separate from Resurfacing which will be required to maintain the road due to specified IRI (roughness) and or due to other defect like Cracking, deflection etc and shall be considered as routine maintenance of the road to meet defined service levels.

17. Quarterly payment against Network Performance shall be worked out by dividing the total Network Performance Price by 32.

The quarterly payment to the Contractor shall comprise of two parts:

1) Upfront payment of 10% of the specified quarterly network performance payment at the end of each month provided that Contractor doesn't neglect maintenance works grossly; gross negligence shall be the case when there is 100% reduction in the Network performance payments in the particular month, in that case the upfront payment of next month shall not be paid.

- Contractor shall mandatorily report the result of his own evaluation of compliance on monthly basis with the required Service Levels, based on his own monitoring system (called Contractor's audit report) for full project length.
- Contractor's audit report shall then be verified by the Engineer through joint inspections. If the stipulated Service Levels are not met, payments shall be reduced by Non-conformance (NC) length of road as explained with example in the Service Level Criteria-table given in the contract in chapter 17.
- In case of consecutive failure to correct audited defects resulting in continuance of NC more than weighted length of road for acceptance, for three consecutive months, the Employer upon Engineer's recommendation shall have the liberty to terminate the contract or grant additional time up to three months to the Contractor to improve upon the performance.
- The contract presents various service level requirements, the formulae to calculate deduction in payment due to non-achievement of specified service levels, conditions under which upfront payment against network performance would be suspended and potential contract termination situations.

2) Network performance-linked payment of 70% of the payment specified against the network performance at the end of each quarter.
- The quarterly payment for Network performance will be made to the Contractor, subject to compliance with the set criteria of service levels including closure of NCRs if any, as per procedure laid down in the Contract.
- In case of consecutive failure to correct audited defects resulting in continuance of NC length of road than weighted length or above for three consecutive months, the Employer upon Engineer's recommendation shall have the liberty to terminate the contract or grant additional time up to three months to the Contractor to improve upon the performance.
- The contract presents various service level requirements, the formulae to calculate deduction in payment due to non-achievement of specified service levels, conditions under which upfront payment against network performance would be suspended and potential contract termination situations.

1.3. The Contract

This contract is for Output and Performance based Road Contract (OPRC) for Improvement, Rehabilitation, Resurfacing & Network Performance (Routine Maintenance including maintenance management works) of the following corridors:

a) Dhandhuka - Dholera: 27+000 Km (Km 0+000 to Km 27+000)
b) Dhandhuka – Paliyad: 46+246 Km (Km 104+772 to Km 151+018)
c) Limbdi – Dhandhuka: 29+967 Km (Km 65+814 to Km 95+781)

1.4. Contract Area

The area under contract falls in the jurisdiction of the Ahmedabad, Botad & Surendra nagar districts of the State of Gujarat (India).

List of the Roads under the Contract:

Road Section No.	Road Section Name	Classification	Length (kms)
S1	Dhandhuka – Dholera	SH-20	**27.000**
S2	Dhandhuka – Paliyad	SH-01	**46.246**
S3	Limbdi – Dhandhuka	SH-20	**29.967**
		Total Contract Road	**103. 213**

A map of the area showing the location of above mentioned roads is provided in Schedule I of Section VI.

Additional information on location, topography, climate, vegetation, adjacent land use, hydrology etc. is also available in Schedule I of Section VI

1.5. Contract Objectives

a. To increase the efficiency and effectiveness with which the management and maintenance of the road network is carried out.
b. To maximize the value for money being spent on the development and maintenance of the road network
c. To improve the condition and safety of the road network for the benefit of its users
d. To proactively maintain the condition of the road network within the right of way using planned strategies and best practices available.

1.6. Contract Scope

1.6.1. This is a Lump Sum (LS) Contract, which includes all physical works, activities and services necessary to manage 103.213 km aggregate road network length, indicated in the BDS and under Section VI: 1.4 Contract Area. Contract Scope: Works

Contract Scope includes works associated with,

i. **Improvement Works** - including associated drainage improvements and safety improvements Enhancement and Routine maintenance during construction period as per Schedule II, III, IV and service level management of during construction period along with relevant drawings and stipulated Environmental and Social requirements.

ii. **Rehabilitation Works** - including associated drainage improvements and safety improvements Enhancement and Routine maintenance during construction period as per Schedule II, III, IV and service level management of during construction period along with relevant drawings and stipulated Environmental and Social requirements.

iii. **Resurfacing** (Mandatory) in 9^{th} and 10^{th} years of contract period in Improvement and rehabilitation sections respectively. (Refer Schedule II of Section VIB)

iv. Other potential capital improvement works not included or intended in the conceptual designs and not included in the bidding documents but identified afterwards which have the potential to significantly benefit road users and/or the Employer over the life of the asset. At the sole discretion of the Employer such additional improvement works would be undertaken as a variation to the contract.

v. All network performance works and associated activities under routine maintenance such as repair of damaged /defected road portion in pavement surfacing, granular shoulders and drainage (Lined or unlined) maintenance, routine maintenance of bridges and minor structures, sign maintenance, pavement marking, raised reflectorized pavement marker and marker post maintenance, restoration & maintenance of all kinds of accidental damages, vegetation control, rubbish and litter removal, accident reporting and attending to works of emergency nature as required. Any Resurfacing required to upgrade pavement surface due to roughness, deflection, settlement or repeated defects, etc in any length shall be attended under Network Performance activity and its cost shall be deemed to be included in the Lump-sum price of network performance.

vi. Providing appropriate resources to respond to all unplanned incidents which can cause obstruction to the normal flow of traffic on the road (e.g. Road accident, flooding, oil spillages, etc.) i.e. incidental /works needing to be attended on emergency basis.

vii. Structural repairs to bridges and large culverts required to maintain or re-store overall structural integrity of its major components are excluded from scope.

1.6.2. **Contract Scope: Services**

Contract Scope also includes all activities and services associated with:

i. Maintaining the Contract Area

ii. Delivering the Contractor‘s obligations under the Contract

iii. Proactive compliance of conformance measurement and performance systems, and achieving the performance requirements

iv. Contractor‘s self-monitoring and audit reporting of the contract conformance requirements and performance.

Apprising the Employer and Engineer with the development and implementation of a Ten Year Forward Works Programme (10 year FWP), and associated maintenance management strategy for the network roads under the contract.

1.7. Components of the Contract

To execute the Works and Services under this Contract, the Contract is deemed to be sub - divided into the following major components,

1. **IMPROVEMENT WORKS**: consisting of a set of specific improvements, detailed in these Specifications, to add new characteristics to the Roads in response to existing or new traffic, environmental, social and safety or other considerations. (The Improvement Works are also termed as Up gradation Works and typically involve the widening and strengthening of the existing pavement including Enhancement works and routine maintenance of the road during construction period)

2. **REHABILITATION WORKS:** consisting of specific types of pavement strengthening/reconstruction works of the existing pavement to bring the pavement to the desired design life described in the Specifications, including Enhancement works and routine maintenance of the road during construction period.

3. **RESURFACING WORKS**: consisting of a set of mandatory specific pavement resurfacing improvements indicated at clause 2.3 in the Section VIA

4. **MAINTENANCE SERVICES:**

   N**ETWORK PERFORMANCE** (Routine Maintenance) WORKS, consisting of all interventions on the Roads which are to be carried out by the Contractor in order **to maintain** the Road performance standards **as** defined by the Service Levels included in these Specifications, and all activities related to the management and auditing of the road contract performance measures. Resurfacing which if required during routine maintenance to cover defects due to roughness or due to recurring defects in close vicinity of defective area shall be covered under Network Performance Works. Cost of such resurfacing shall be deemed to be included in the Lump-sum price of network performance.

5. **EMERGENCY WORKS:** consisting of works and activities needed to reinstate the Roads, Structures and the Right of Way damaged as a result of natural phenomena, such as strong storms, flooding, earthquakes, etc which the Contractor shall reinstate on top priority.

1.8. Contract Duration

The Contract duration is Ten (10) years with one year defect liability period thereafter.

For the purpose of setting the Time for Completion of the Improvement Works, Rehabilitation Works and Re-surfacing works, the Contract period of 10 years has been divided into 10 annual separable portions which is as follows:

Separable Portion 1: One (1) calendar year from the Start Date of the Contract (Year 1)
Separable Portion 2: One (1) calendar year from the End Date of Year 1
Separable Portion 3: One (1) calendar year from the End Date of Year 2
Separable Portion 4: One (1) calendar year from the End Date of Year 3
Separable Portion 5: One (1) calendar year from the End Date of Year 4
Separable Portion 6: One (1) calendar year from the End Date of Year 5
Separable Portion 7: One (1) calendar year from the End Date of Year 6
Separable Portion 8: One (1) calendar year from the End Date of Year 7
Separable Portion 9: One (1) calendar year from the End Date of Year 8
Separable Portion 10: One (1) calendar year from the End Date of Year 9

1.9. Contract Team

Key Stakeholders responsible for the successful execution of the Contract are,

(a) Employer: the Employer, his representative(s) and staff working in respective offices associated with the administration of the Contract,

(b) Contractor: the Contractor‘s authorized representative(s),

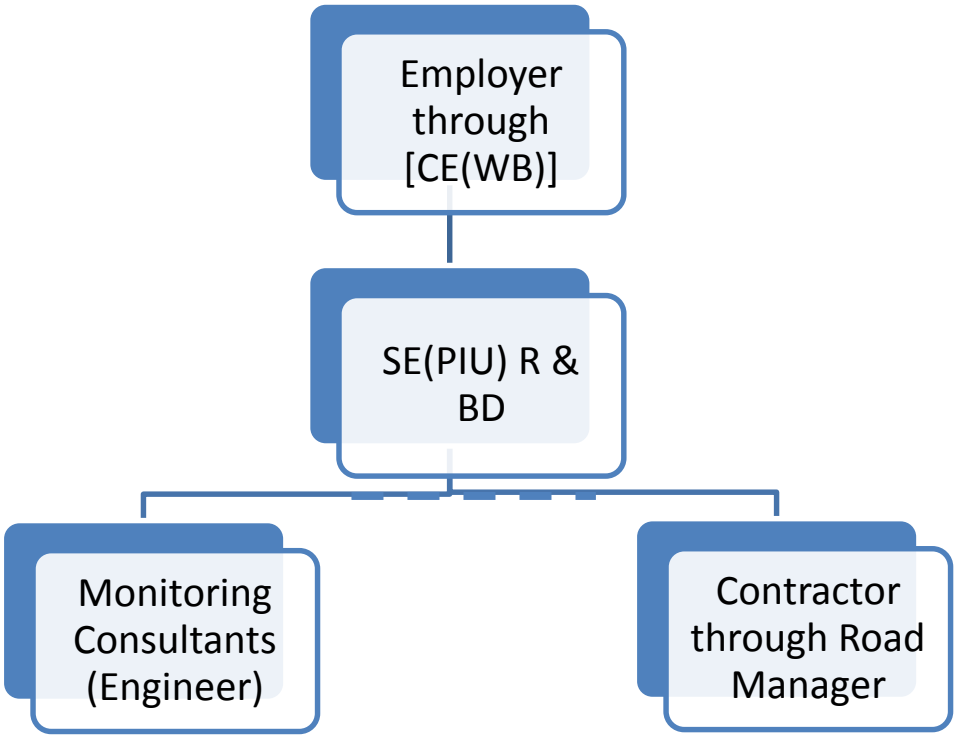
(c) Project Manager, Key **Professionals**, and all the (human) resources provided by the Contractor for the execution of the Contract,

(d) Monitoring Consultant: shall be the Engineer, its Team Leader, authorized representative(s), Key Professionals and other (human) resources provided by the Monitoring Consultant for monitoring of the Contract.

(e) Other Entities: Employer's **Independent** Auditor.

The roles and responsibilities of the key stakeholders are also listed in Annexure 1 – Stakeholder Relationships (in Appendix to Section VIA)

Organogram


Employer through [CE(WB)]
SE(PIU) R & BD
Monitoring Consultants (Engineer)
Contractor through Road Manager

2. WORKS

2.1. Improvement Works

2.1.1. Definition

Works consisting of a set of specific improvements indicated in these Specifications to add new characteristics to the Roads in response to existing or new traffic, environmental, social and safety or other considerations.

Road sections identified for improvements during the first **Two (2.0) years** of the contract have been scheduled by the Employer.

The Improvement work has to be inclusive of Enhancement works of improvement cost as well as routine maintenance work to meet the Network performance requirements and cost during construction period as detailed in this section in Chapter 17 under Service Level Management table.

2.1.2. Road Sections under Improvement Works

Road Sections included in the Improvement Works Component of the Contract are as given in the following table and require the widening of existing Road Section to 12.00m roadway width consisting of 7.0m wide carriageway flanked by 1.50m wide paved shoulders and 1.0 m wide granular shoulders on both the sides.

Road Treatment Sections	**Length (km)**	**Av. ROW (m)**	**Current Paved width (m)**	**Proposed Paved width (m)**	**Conceptual Design Section**
SH 20-Dhandhuka Dholera	27.00	24.00	5.5	10.0	Schedule II- of Section VIB
SH 1-Dhandhuka Paliyad	46.246	30.00	6.1-7.0	10.0	Schedule II- of Section VIB
Total	**73.246**				

2.1.3. Scheduling of Improvement Works

The Annual Improvement Works proposed to be executed during Construction period of the Contract:

Contract Year	**Total Length of Improvement Works (Centreline km)**
1	25.000
2	48.246
Contract Total	**73.246 km**

Year	**Total length along center line (Km)**		
	Dhandhuka-Dholera (Km)	**Dhandhuka –Paliyad (Km)**	
1	13.000	12.000	25.000
2	14.000	34.246	48.246

Total in 2.0 years	**27.000**	**46.246**	**Total length of Improvement = 73.246**

Note: The Employer requires that the Contractor completes the Improvement Works as a Priority as per the table here above.

2.1.4. Construction of Improvement Works

The Improvement Works shall be constructed as per design and construction requirements specified in these Specifications. Detailed design of each section shall be proposed by the Contractor considering the conceptual design section and the traffic loading for the respective road section.

2.1.5. Payment for Improvement Works

Payment for the Improvement Works shall be made after completion of the specified minimum linear length of the road section (defined as milestone for payments), measured along centreline in kilometre. Refer Chapter 17- Payments, Sub Clause 17.2.

Payment for any road section in the contract, shall be made only once in the Contract Period; any rework done to rectify failures or distresses shall be the Contractor's responsibility and its costs shall be deemed to be included in the Lump Sum Price of Works.

In Improvement sections, recycling of existing bituminous and non-bituminous pavement materials is envisaged and these materials are to be used in new pavement layers suitably as per relevant technical standards, specifications and guidelines.

2.2. Rehabilitation Works

2.2.1. Definition

Rehabilitation is defined as the treatment (including any recycling of in-situ pavement materials) across the full width of pavement, including shoulders, over a continuous length of at least 100 meters.

The confirmed sections of the Road(s) requiring Rehabilitation works are to be programmed in Initial Programme by the Contractor.

A profile corrective course (PCC) shall be considered in each Rehabilitation option where necessary to achieve the corrected final profile as per the Conceptual Design of that section.

The Rehabilitation work has to be inclusive of Enhancement works as well as routine maintenance work to meet the Network performance requirements and cost during construction period as detailed in this section in Chapter 17 under Service Level Management table.

2.2.2. Road Sections under Rehabilitation Works

Road Section included in the Rehabilitation Works Component of the Contract is:

Road Treatment Sections	**Length (km)**	**Av. ROW (m)**	**Current Paved width (m)**	**Proposed Paved width (m)**	**Conceptual Design Section**

SH 20- Limbdi – Dhandhuka	29.967.	30.00	7.0	7.0	Schedule II of Section VI
Total	**29.967**				

2.2.3. Scheduling of Rehabilitation Works

The Annual Rehabilitation Works proposed to be executed during the Contract:

Contract Year	Total Length of Rehabilitation Works (Centreline km)
1	**12.000**
2	**17.967**
3	0
4	0
5	0
6	0
7	0
8	0
9	0
10	0
Contract Total	**29.967km**

2.2.4. Construction of Rehabilitation Works

The Rehabilitation Works are to be constructed as per design requirements stipulated in these Specifications. Detailed design of each section shall be proposed considering the conceptual design section and the traffic loading for the respective road section.

2.2.5. Payment for Rehabilitation Works

Payment for the Rehabilitation Works shall be made after completion of specified minimum linear length of the road section (defined as milestone for payments), measured along centerline in kilometre. Refer Chapter 17 Payments, Clause 17.3 of these Specifications.

Payment for any road section in accordance with the contract, shall be made only once in the Contract Period.

2.3. Resurfacing Works

2.3.1 Definition

Resurfacing is defined as providing a new wearing surface to the existing bituminous surface by laying appropriate asphalt coat/ course in required thickness across the full paved width to the required length as per relevant technical specifications; while one Resurfacing Work for each of the roads covered under this contract road network in the Contract Period is mandatory and payable on Lump Sum Price basis, any additional resurfacing work if required and done for required network performance shall be deemed to be included in the Lump Sum Price of the Network Performance Works.

2.3.2 Road sections and Scheduling of Resurfacing works:

The Contractor shall carry out mandatory resurfacing works (other than resurfacing required for Network performance to maintain required service level) of the road sections as per the following table.

Sr No	Road Section	Length	Mandatory Resurfacing	Year of Resurfacing
1	Dhandhuka Dholera	27.00	40mm BC	9^{th} /10^{th} Year*
2	Dhandhuka Paliyad	46.246	40mm BC	9^{th} /10^{th} Year*
3	Limbdi-Dhandhuka	29.967	40mm BC	9^{th} /10^{th} Year*

*Resurfacing schedule shall be decided in Consultation with the Engineer

2.3.3 Construction of Resurfacing Works

The Resurfacing Works other than mandatory are to be constructed as per the service level requirements detailed in these Specifications.

2.3.4. Payment for Resurfacing Works

a) Payment for the mandatory Resurfacing Works shall be made after completion of the specified minimum linear length of the road section, measured along centreline in kilometre. Refer Chapter 17-Payments of these Specifications.

b) Total Payment for the Resurfacing Works under the Contract shall be restricted to the total length of the road network covered under the Contract and shall include the works of road marking, fixing of road studs and raising of shoulders as required to keep the edge-drop within the specified limit.

2.4. Emergency Works

Explained in Chapter 3

2.5. Network Performance Works

Explained in Chapter 13

3. EMERGENCY WORKS

3.1. General

During the execution of the contract, it may be necessary to undertake some works to repair damages to the roads caused directly by unforeseen natural phenomena occurring either in the Contract Area or elsewhere, but with a direct impact on the road network. Emergency Works may also comprise other unforeseen incidents that may occur on the network**.** All such works are deemed as 'Emergency Works'. Examples of Unforeseen Natural Phenomena:

a. Localized rainfall events within the contract area exceeding once in ten years 24 hour rainfall duration intensity, and causing significant and wide spread damage to roads and structures in the network.

b. Flood events which result in significant and wide spread flooding of the contract area and direct damage to pavements and structures. This does not include expected pavement deterioration that may result from normal periodic inundation of adjacent field crops due to normal monsoon rains or irrigation practices or any consequential pavement deterioration that may arise beyond the actual period of inundation.

c. Earthquake events resulting in wide spread damage to the roads and structures.

- The damages caused to the Works executed by the Contractor which are already covered by insurance shall not be payable to the Contractor to the extent of coverage; however such works shall need to be attended on top priority. The payment of work over and above that covered under insurance shall however be made.

Flooding within the RoW is defined as being either,

i. submersion of the carriageway by at least one feet water for a minimum of 12 hours in a 200m continuous length extending over the carriageway centreline
ii. And/or a breach/washout due to flooding of the carriageway extending over the carriageway centreline.

3.2. Other Emergency Works Situations

The following situations can be deemed to result in Emergency Works:

a. War Event
b. Sabotage to work due to riots, terrorist activities
c. Wide-spread damage or loss of road assets as a direct result of the Unforeseen Natural Phenomena outlined above.
d. Oil and Chemical Spillages
   - Oil and Chemical Spill Emergency Situations are defined as being those occurring due to abnormal spillage in quantity of the discharge, and/or the severity of hazard presented to the safe operation of the Contract's roads, to road users, local communities or the general environment. Such spillage is from or out of a structure, vehicle or any container, and is not related to any action or inaction by the Contractor.

e. Slope and Embankment Failure: Slope and Embankment Failure Emergency Situations are defined as being
   - A subsidence or complete failure within the road Right of Way and extending into the sealed carriageway that restricts the safe passage of vehicles
   - Within the adjacent slopes and embankments of greater than 3m height and with the potential to adversely impact upon the safe operation of the road section.

f. Other Situations requiring Emergency Works include:
   - Complete destruction of a culvert as a result of exceptional rainfall discharge, which leads to interruption of road traffic,
   - Interruption of road traffic following washouts or subsidence of more than 100 (one hundred) cubic metres of material on a road section of 500 metres length,
   - Submersion of the road along more than 200 metres, provided that the submersion is not directly the result of deficiencies in the drainage system or from insufficient maintenance of drainage structures for more than 12 hours
   - Scour of major culverts or bridges abutments and/or piers to the extent that their structural integrity is at risk.

The damages caused to the Works executed by the Contractor which are already covered by insurance shall not be payable to the Contractor to the extent of coverage; however such works shall need to be attended on top priority. The payment of work over and above that covered under insurance shall however be made.

3.3. Procedure for Requesting Emergency Works

As soon as practicable upon such an event occurring the Contractor shall submit to the Engineer his contention of works under the category of "Emergency Works". An Emergency Event can also be notified by the Engineer / Employer.

In case of an Emergency event, initiated by any party, the Engineer shall issue a Work Order for Emergency Works [Refer to Section VIII (Particular Conditions) and Section IX (Contract Forms): Work Order] to the Contractor with approval of the Employer. The Engineer, upon receipt of the request and not later than 24 hours thereafter, shall evaluate the request made based on a site visit, and issue an order to carry out the Emergency Works. The order will specify the type of works, the estimated quantities and amount to be paid to the Contractor, and the time allowed for their execution. The order may indicate a requirement for an engineering/ geotechnical assessment of the options for the permanent restorations/ repairs to the Works.

The Contractor must at all times;

a) Keep the Engineer and Employer informed about the status of such emergency events including the duration of occurrence

b) Document the circumstances of the Emergency event and the damages caused, through photographs, video and other suitable means,

c) Prepare a written request, stating the type of works he intends to carry out, their exact location and the estimated quantities and costs, including photographic documentation.

3.4. Obligations of the Contractor during Emergency Events

Given the nature of this Contract and the fact that Emergency Works are to be paid for separately, the Contractor will, during the execution of Emergency Works, continue to be responsible for assuring the normal Service Levels on all roads included in the Contract. In

particular, the Contractor will do everything reasonably possible to ensure the normal use of all the roads under Contract, including the sections affected by emergencies.

If road traffic has been interrupted because of an emergency, the Contractor will take the measures necessary (i) to reopen the road to traffic in the shortest time possible, and (ii) to maintain the road open during emergency works, without being entitled to any specific compensation for those measures.

In order to avoid doubt, it is made clear that certain works not covered under the Emergency Works shall essentially need to be attended on emergency basis under Network Performance Work for which no separate payment shall be admissible to the Contractor; works like removal of fallen trees, dead animals, etc. from the road, restoration to damage to access ramps to bridges, collapse of slopes, clearing of road blockage due to traffic accidents, mitigating flooding effects, oil and/ or chemical spillage, etc. come under this category. Any activity, carried out for Emergency Works, which has or may have an Environmental or Social Impact shall comply with the Environmental and Social Framework (Section VID).

4 PROGRAMMING OF WORKS

4.1. General

This section explains the requirements for Programming under this contract specifically for the Improvement, Rehabilitation and Resurfacing Works.

The Contractor shall submit his programmes to the Engineer detailing the various activities and works to be carried out under the Contract including any imposed milestones, within the agreed time frames. All Programmes should be able to demonstrate the Contractor‘s intention and capability to complete the works within the required Contract Completion times.

The programmes shall assist the Engineer in monitoring the Contractor‘s progress and his future planning. This programme shall form the basis of his assessment of any applicable extensions of time and the effect of delays on the completion of the work activities. The programme must show all milestones required to be met during the various construction phases.

The Contractor‘s programmes must:

a) Provide information to the Engineer regarding the Contractor‘s planned activities, his current resourcing, critical path / activities, milestones, plan for obtaining regulatory clearances / permissions etc.
b) Promote whole-of-life cost effective maintenance works so that all Performance Criteria are achieved
c) Include reporting requirements, (including where necessary grievance handling) and progress with the maintenance needs of the contracts roads.
d) Include schedule of assessments to be undertaken for compliance of Environmental and Social Framework
e) Provide information on the activities requiring clearances / assistance from external agencies for diversion of forest land, tree cutting, land acquisition and shifting utilities and/ or CPRs etc.
f) Provide sufficient information for the Engineer/Employer to respond to the requests from other Governmental Agencies, community and road user issues
g) Make sufficient allowance for adverse events such as inclement weather conditions
h) Manage all known risks along with an assessment and mitigation of any potential or emerging risks
i) Take into account all reasonably foreseeable allowances for planned events, such as known annual or seasonal fairs/melas, festivals, processions, harvest daily/ weekly haats/markets and political events
j) Be prepared and submitted, both in electronic & printed form, using agreed project Programming software such as MS-Project or Primavera. Such software shall be capable of producing programmes and information that complies with the requirements of this clause and shall be in a format that can be read by commercially available proprietary software.

4.2. Programme Development

The following programmes shall be produced by the Contractor.

4.2.1. Initial Programme

An initial programme for the first 2 years of the contract, describing the planned works for improvement works, rehabilitation works including Enhancement works & Routine maintenance during Construction period should be submitted within one (1) month of signing of the Contract Agreement to the Engineer for review and acceptance.

4.2.2. Annual Programme

Thereafter, Annual Programme shall be submitted to the Engineer for review and acceptance at least one (1) month before the end of each year of the Contract after implementation of Initial Programme. This Annual Programme shall describe the planned works for the following year.

4.2.3. Agreed Additional Works (Variation) Programme

A programme clearly showing the milestones and due date for completion of any agreed additional works, to be undertaken under this contract. The Contractor shall provide this programme within 14 days of issue of the Work Order by the Engineer.

4.3. Acceptance of Programmes

The Engineer shall confirm his acceptance or rejection of the submitted programme(s) to the Contractor within two weeks of receipt of the Programme(s), or revised Programme(s). For the Initial Programme, this time period shall be one (1) month.

For rejected Programme(s), all the revised submissions of the Programme(s) shall be made by the Contractor to the Engineer within two (2) weeks of the receipt of the comments from the Engineer.

If no further comments are received from Engineer within two weeks these programmes shall be the deemed as Accepted programme.

The Contractor shall keep a record of the actual progress with respect to the Accepted Programme, and save it at least monthly for record purposes. If there is any additional works/variations, or the works are delayed when compared with accepted Programmes, the Contractor shall submit revisions to the Accepted Programme(s), when requested by the Engineer.

Acceptance by the Engineer of the Contractor‘s programme shall not relieve the Contractor from its responsibility for executing and maintaining works and services as per the requirements and specifications of the Contract. The Contractor at all times shall remain responsible for the construction of the Works in accordance with Clause 11 and 17 of the General conditions of contract.

4.4. Forward Works Programme

The Engineer will develop and maintain a 10 year Forward Works Programme (FWP). This will outline the proposed work for the Contract for each of the next 10 years after completion of the Contract Period. To ensure that the 10 year FWP is robust and incorporates the Contract‘s planned programmes, the Contractor shall assist the Engineer by providing input and help with the programme‘s field validation and to ensure it matches with the Contractor‘s Initial/ Annual Programme.

4.5. Non-Conformance

The submission of the Contractor‘s Programmes within agreed timeframes is deemed as one of the Management Performance Measures under the Network Performance Component of the Contract, and non-conformance of which can result in deduction of payments due to the Contractor under this component (Refer Section 14: Management Performance Measures of these Specifications).

5. DESIGN OF WORKS

5.1. General

This section explains the requirements under the contract for designing the Improvement and Rehabilitation Works.

The Employer has specified the expected service life and geometric standards to be achieved by the required Works within this contract.

The design of the most cost effective long-term treatment is paramount to restoring the required level of service (condition) for any asset component. The Contractor is required to explore and recommend the most appropriate pavement design and resurfacing design for all required pavement rehabilitations and improvement works which provides the required outcome, yet provides an advantage to the Employer, the Road User and the Contractor in terms of enhanced performance (increased lifecycle), construction timeframes, and/or environmental considerations.

Section VIB - Schedule IV lists the specifications and standards.

A number of the MORT&H Clauses and standard IRC Specifications applicable to this contract also contain method-based sections relating to work or construction practices. Should any conflict arise with the application of these specifications to the delivery of outputs by the Contractor, the Contractor shall seek clarification from the Engineer or Employer.

5.2. Conceptual Designs

The Contractor is solely responsible for completing the detailed design of the defined Improvement Works and Rehabilitation and Resurfacing Works in accordance with the intent of the Contract and the scope of the work. This includes, where necessary, the detailed pavement design and any associated drainage and safety works including culvert extensions. Scope of the work is defined in Section VIB – Schedule II

The soft copy of Conceptual Designs is enclosed herewith in a CD for reference purpose only.

The Contractor must note that there can be variance in RoW width from the indicated RoW in these documents. In some places there can be constraints imposed on construction of works that will also be need to be recognized and allowed for in the Lump Sum price and detailed designs. The Contractor will need to work through the Conforming Design and Allowed Dispensation process to reach an agreement with the Employer over the final detailed design at a number of locations.

In detailed concept design of structures, modifications are done to ensure widening of road including improvement after inventory.

6. CONSTRUCTION AND QUALITY CONTROL

6.1. General

The delivery of quality treatments is paramount to realizing the expected service life. The Contractor is required to demonstrate through his quality management programme and quality control testing that all construction meets the appropriate and relevant standards.

The standard of construction must be in accordance with all applicable IRC, MORT&H Standards, Specifications and Guidelines for materials and testing unless otherwise specified or agreed with the Engineer.

6.2. Construction of Works and pavement failure conditions

Construction of all works shall be carried out as per the relevant Construction methodologies specified in the MORT&H 'Specifications for Road and Bridge Works' (latest edition), until & unless any deviation or new methodology is allowed by the Engineer.

A pavement previously constructed or rehabilitated under this contract shall be considered as failed in the affected sections when either of the following conditions occurs:

- There is rutting with or without cracking exceeding 20mm in depth in any wheel-path.
- Any level of pavement deterioration that, in the opinion of the Engineer,
    i. Results in an unacceptable riding quality due to extensive potholes repairs/patching/ravelling/loss of surfacing material or likes or
    ii. Compromises with the safety of road users.

6.3. Design & Construction Risk

The Contract considers Improvement and Rehabilitation of all the network roads as detailed in the contract only once in the contract period. The Contract also considers one mandatory payable Resurfacing on all the network roads at specified years during the Contract Period. Any need to undertake any repeat Rehabilitation/major treatment on part or full length of the network roads during the contract period will be considered as a failure of the Contractor's original construction works and in such case(s), the pavement shall need to be reconstructed/rehabilitated as appropriate as soon as practicable at the sole risk and cost of the Contractor.

The Contractor should design and construct the roads considering above but adhering to the design parameters and minimum thicknesses of pavement layers specified in the Contract which are mandatory.

6.4. Testing Laboratory:

The Contractor shall establish a fully equipped laboratory as per MORT&H specifications to carry out all required tests and quality control works. The Contractor shall permit full access to the laboratory to the Employer, the Engineer and any Independent Auditor authorized by the Employer to undertake any testing/auditing required by the Employer.

6.5. Sampling and Testing

All sampling, whether by the Engineer or the Contractor, shall be carried out in the presence of a representative of the Contractor or the Engineer as the case may be. At least 24 hour notice is required for either the Contractor or the Engineer to attend any joint sampling and testing. In case the Contractor's representative fails to attend, the results of such sampling and /or testing shall be

notified to the Contractor by the Engineer and it shall be deemed as authentic. It's vice versa shall also apply.

6.6. Testing Frequency

Tests shall be carried out by the Contractor at the frequencies specified in the applicable MORT&H Specifications and other relevant standards and specifications. In the event the frequency of testing is not detailed in the Specifications for any specific materials or works, then it shall be as directed by the Engineer.

6.7. Testing Costs

The Contractor shall bear the full expense of all establishments, management and incidental costs, including the testing done by the Engineer/ Employer/ Independent Auditor, in carrying out the required tests for all the works. All such costs shall be deemed to be included in the Lump Sum price of Works.

If the Engineer/Employer 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 and the cost shall be borne by the Employer.

6.8. Employer's testing

In addition to the Contractor's quality control programme, the Employer can identify and undertake an independent programme of Random Verification Testing to verify conformance. The outcomes of any testing undertaken by the Employer shall be provided to the Contractor as soon as reasonably practicable following its completion.

6.9. Test Results

The Contractor shall include a copy of all test results in its monthly report and furnish an earlier copy to the Engineer upon request. It should also include all relevant post-construction QA test results including verification that the construction meets the design and specifications, including pavement deflection test results. The Contractor and the Monitoring Consultant shall use the results of the construction quality control and quality testing to confirm whether the quality outcomes have been successfully delivered.

Results of the testing carried out on all physical works shall be forwarded to the Engineer within 30 days following construction. The failure to submit results or the submission of partial, incomplete or incorrect results will be recorded as a non-Conformance.

Any failure to meet the specified reporting requirements will be recorded as a non-Conformance. The Engineer can verify compliance of the submitted reports on-site anytime after notifying the Contractor.

6.10. Compliance of Environmental and Social Framework

During Contract Period, the Contractor shall ensure compliance with the requirements laid out in Section VID: Environmental and Social.

7. QUALITY ASSURANCE

7.1. General

The Contractor should make proactive efforts to confirm that the standards are being met with, deficiencies are corrected & minimized as the contract progresses and there is continuous improvement in meeting with the quality requirements

7.2. Contract Quality Assurance Management Plan (CQAMP)

The Contractor shall prepare a Contract Quality Assurance Management Plan (CQAMP) conforming to IRC-SP-47 and IRC-SP-57. The CQAMP must clearly describe the systems, procedures and methods that will be used to deliver and monitor the Contract, in particular the Conformance of the Services..

The CQAMP must include as a minimum,

a) The systems, procedures and methods that will be used to deliver and monitor the Network performance measures

b) The documented procedures for at least the following:

i. CQAMP implementation and internal audits
ii. Method Statements detailing flow of activities in line with relevant specifications.
iii. Procedures for inspection and/or testing the work to ensure compliance with the quality requirements. Request For Approval (RFA) submission is necessary but their clearance from Engineer is not mandatory.
iv. Evidence of testing apparatus being recently calibrated
v. Materials supply and delivery processes;
vi. Programming, including routine maintenance and annual work programmes and the maintenance management strategy
vii. Recording, Reporting and Analysis of Data
viii. Document control and management of contract administration documents
ix. Emergency procedures and incident response plan as per service level response time.
x. Internal audits (Minimum 50% of road length along center line) and responsibilities for addressing non-conformances as per service level response time
xi. Staff training
xii. Environmental, Social, Health and Safety conformance including traffic management
xiii. Legislative, labour, community health and safety compliance
xiv. Development and maintenance of a risk register reflecting the Contract‘s risk profile.
xv. Quality standards: Refer MORT&H Specification 900.

The CQAMP shall also integrate the Contract work requirements with the Contractor‘s quality, health and safety and environmental management systems to deliver the Contract Works.

7.3. Submission of the CQAMP

The Contractor shall prepare and submit the CQAMP to meet the requirements of MPM -1 (Refer Chapter 14 of this specification) within one month after issue of letter of acceptance.

7.3.1. Health and Safety Plan

The purpose of the Health and Safety Management Plan is to foster a responsible attitude towards occupational health and safety and to comply with the provisions of the relevant act/regulations detailed in Section VID - Environmental and Social Management Framework.

Because of the nature of the Services, the Contractor may occasionally be exposed to hazardous situations which could involve risk of various degrees of harm, to the contracting staff and/or the public.

Situations will arise when it is not practical to eliminate or isolate significant hazards. In these situations the hazards must be minimized by ensuring planned protection systems (e.g. equipment, clothing) are actually used. The Health and Safety Management Plan and community health and safety requirements must be complied with by the Contractor‘s personnel and all subcontractors at all times.

The Health and Safety Management Plan shall form part of the Contract Quality Assurance Management Plan and when implemented shall,

a. Ensure the systematic identification of existing and new hazards on the work site(s)
b. Ensure the minimization of significant hazards, where elimination and isolation are both impractical
c. Ensure the provision and use of appropriate protective measures
d. Include emergency procedures for dealing with accidental spillage, pollution or imminent danger
e. Ensure regular review and assessment of each hazard identified and monitor employees‘ exposure to these hazards
f. Ensure reporting and recording of work site safety incidents so health and safety problems can be addressed quickly and regularly. It is a requirement of this Contract that any such incident be reported promptly to the Engineer.

The delivery of the Health and Safety Plan shall be with the CQAMP.

7.3.2. Environmental and Social Management Plan

Environmental and Social management framework for the Contract has been provided in Section VID: Environmental and Social Management Framework. The CQAMP shall include the Environmental and Social Management Process developed by the Contractor to address the Environmental and Social requirements of the contract.

The process shall address but not be limited to the Environmental and Social Management Framework. The delivery of the Environmental and Social Management Plan shall be with the CQAMP.

7.3.3. Emergency Procedures and Incident Response Plan

The CQAMP shall include an Emergency Procedures and Incident Response Plan which shall establish the roles, practices and procedures during specific types of emergency events and contingency plans associated with the closure of roads. The Emergency Procedures and Incident Response Plan must be developed by the Contractor and agreed with the Engineer.

The purpose of the Emergency Procedures and Contingency Plan is to ensure the safety of the Contractor‘s personnel and road users in the case of emergency and/or road closure. It should include:

i. An effective communication and event recording system

ii. The name, contact number and specific duties of the Contractor‘s personnel nominated to respond to an emergency event. The contact for Emergency Calls will be the Engineer and the Road Manager or their alternative delegated personnel.
iii. The contact number of other parties who need to be notified in cases of emergency events, e.g. police, hospitals, ambulances, fire brigade, oil companies etc.
iv. Detailed response procedures for all emergency events
v. Possible detour routes in the event of road closure

The delivery of the Emergency Procedures and Incident Response Plan shall be with the CQAMP.

8. MEASUREMENT AND COMPLETION OF WORKS

8.1. General

This is an Output and Performance based contract. Measurement of the Works shall be made for:

a. Improvement, Rehabilitation and Resurfacing Works by linear length measured along the centreline (with minimum continuous stretches of 1km each aggregating to a minimum 5 Km length, last unit of milestone may aggregate to less than 5 Km length and may comprise of continuous 1km or shorter stretches). Each measurement of Works should be substantially complete [1] as per the accepted designs. For substantially completed milestone, payment shall be released @ 90% of prorate cost per Km arrived at by dividing the respective cost by length. The entire milestone shall be considered fully complete upon completion of balance items and the balance 10% payment related to such milestone shall be released.

b. Network Performance: by the conformance of the (i) Management Performance Measures (MPM) (ii) Road User Service and Comfort Performance Measures (RUS & CPM) and (iii) Road Durability Performance Measures (RDPM) as listed and explained later in these specifications.

c. Emergency Works: as per the relevant Construction methodologies followed and as specified in the MORT&H Specifications for Road and Bridge Works (5th revision) mutatis mutandis contract specific modifications if any, until & unless any deviation is allowed by the Engineer.

8.2. Measurements of Road Durability Measures

8.2.1. Pavement Roughness

8.2.1.1. Measurement

The Engineer shall witness the roughness measurement test to be carried out by the Contractor and the result shall be reported in terms of the International Roughness Index (IRI). The equipment required must be a Class 1 precision Profiler according to the specifications as defined by ASTM E-950. The measure of roughness will be made in a continuous way in the wheel paths of each lane of the carriageway, meeting the requirements of ASTM; it shall be reported at 100m intervals unless specifically stated otherwise and average value of roughness of both the lanes shall be reported for each Km length as International Roughness Index (IRI) in m/km. The equipment must be calibrated/validated as per ASTM E-950 or manufacturer's recommendations. The Roughness check must be done every year at interval of six month and check must be done during Pre-Monsoon preferably in month April/May and Post Monsoon preferably in month October/November with due consent of Engineer.

8.2.1.2. Frequency of Measurement

All the Improved, Rehabilitated and Resurfaced roads of the network shall be surveyed by the

[1] Substantial completion for the purpose of this "Payment" Chapter shall be completion of all items for safe passage of vehicles except road markings, Retroreflective studs (Cat's eyes), Painting of kerbs, hand-railing, parapets, etc., Installation of Kilometre, Hectometre and Guard stones, Installation of Cautionary and Informatory Traffic signage (except mandatory Signages), Installation of Crash barrier, Construction of Bus shelters, Construction of Rain water harvesting facility, Turfing of slopes (where required), Installation of Solar light/high mast, Enhancement measures, half of total nos. of Welcome Boards.

Contractor in witness of The Engineer within the first six (6) months following the date of substantial completion and every six (6) months thereafter..

8.2.1.3. Conformance Criteria

The Contractor shall ensure that the roughness of the paved surface conforms to the following criteria throughout the duration of the **C**ontract. Conformance with specified Roughness limits of the paved surface is deemed as important Performance Measures of the Contract (Refer Specifications / Chapter 16: Road Durability Performance Measures / RDPM-1 and RDPM-2)

Maximum Roughness

- Reports the maximum roughness value recorded (averaged using 20m interval data) over a continuous 1 lane km in IRI.
- The method of calculation for maximum IRI: Maximum recorded roughness value from averaged 20m interval lane data (Units = IRI m/km)
- 3.4 IRI is equivalent to roughness index of 2500mm/Km

8.2.1.4. Non-Conformance

Where new pavement construction fails to meet the required roughness thresholds specified above during the initial survey, the Contractor shall provide the Engineer a programme of corrective works within one (1) month of notification of the non-conformance. This programme shall clearly identify what remedial work will be undertaken by the Contractor to achieve conformance along with the proposed time frames. The original non-conformance shall however be considered for withholding payment at the lump sum rate specified in Chapter 17 under the table - Detailed Service Level Worksheet – Post Construction till the time the non-conformance is corrected but within the response time. Payment reduction shall however apply for continuance of any non-conformance beyond the stipulated response time.

8.2.2. Pavement Deflection

The Contractor shall ensure that adequate residual pavement life is being achieved throughout the duration of the contract by FWD Pavement Deflection Testing and data analyses. The following deflection criteria should be met throughout the duration of the Contract.

The Deflection check must be done once in a year during Post Monsoon preferably in month October/November with due consent of the Engineer and residual life of the pavement shall be worked out. Appropriate treatment to the road-pavements shall be made as triggered by FWD deflection values as per guidelines of IRC-115.

Where recorded deflections and curvature measurements depart significantly from expected values, the Engineer and Contractor shall jointly re-examine the construction and testing records to determine the significance of the deflection results. Where any facets of design and/or construction are considered to have contributed to the higher deflection or curvature measurements, the Engineer shall be entitled to instruct the Contractor to reconstruct/ strengthen the deficient sections of pavement at no cost to the Employer.

Deflection information including data analyses and residual life shall be reported for each road separately. FWD test including test intervals shall be done as per IRC 115-2014.

8.2.2.1.Non-Conformance

Where the pavement deflection limits from the consideration of residual life for new construction (improvement/ rehabilitation) are exceeded, then the Engineer may instruct the Contractor to reconstruct (or strengthen, as the Engineer deems appropriate) the non-complying pavement section(s). Payments to the Contractor shall be withheld at the lump sum rate per km specified in Chapter 17 under the table - Detailed Service Level Worksheet – Post Construction till the time the non-conformance is corrected but within the response time. Payment reduction shall however apply for continuance of any non-conformance beyond the stipulated response time.

8.3. Roadway Cut and Embankment Slopes

Maintenance and repair of the earth embankments shall be in accordance with latest IRC-56.

The Contractor shall ensure that existing and recently constructed formation embankments are adequately maintained and that the profile of formation is repaired and restored after any damage or erosion as soon as possible after it is observed. Special attention shall be paid to new constructions following any significant rainfall event and shall include re-vegetation with appropriate grass species. Any re-sowing of exposed earth embankments shall be with grass species that are able to readily establish but do not become invasive or difficult to maintain.

The following criteria should be met throughout the duration of the Contract.

Roadway Cut and Embankment Slopes	
Road Category	**Contract Standard**
All Roads under the Contract.	The maximum aggregated longitudinal length within any continuous 1km lane length where visually evident earth erosion has occurred due to run-off from the road surface or adjacent areas shall not exceed 10m when measured by a tape measure.

8.3.1.Non-Conformance

Non-conformances will be recorded in the monthly audits and will form part of the monthly aggregated non-conformance as per enclosed Service Level upkeep chart. Closure of NCR is must within designated response time. Reference to Chapter 17- Service Level Management work sheets and Chapter 18 –Monthly Non-Conformance applies.

8.4. Rutting

Measured along the length of wheel-path exceeding 10 mm rut depth below a two meter straight edge.

Percentage Rut Depth: Reports the percentage of aggregate wheel path length per km having rutting > 20mm. It will be calculated as follows:

The percentage of rutting exceeding 20mm in any 1 km length =
[LWP length in m + RWP length in m where rut depth > 10mm] x 100 / 4000m;
LWP : Left Wheel Path (in either direction)
RWP : Right Wheel Path (in either direction)
4000m in above formula represents aggregate length of four wheel-paths in 1 km road length.

For example

LWP = 100m and RWP = 200m than
The percentage of rutting exceeding 20mm in any 1 km length = (300/4000)*100 =7.5%

8.5. Equipment for data collection

Unless specified otherwise by the Engineer, the general specifications for the equipment to be used for road data collection are set out in the World Bank Publications:

- Data Collection Technologies for Road Management; Version 2.0 – February 2007,
- Data Collection Technologies for Road Management; Version 1.0 – 6 April 2005

8.6. Completion Time for Works

The Works shall be completed as agreed to in the annual Accepted Programme/ Initial Programme for each year of the Contract and within the 12 Calendar Months allowed for each Separable Portion indicated under GCC Clause 39. The Contractor shall complete all of the identified works within the prescribed timeframes unless otherwise agreed with the Engineer.

Failure by the Contractor to complete the minimum annual Accepted Programme quantity of Asset Preservation Quantities including Improvement and Rehabilitation Works by the due date of completion of each separable portion will result in Liquidated Damages being applied as set out under GC Clause 39.

Along with the approval of Annual Programme, the Engineer shall also notify the Contractor the exact amount of Liquidated Damages to be applied based on the sum indicated under GC Clause 39.3.

8.7. Minor Defects

Minor defects or minor uncompleted work (e.g. small drainage works, or non-regulatory signs) shall not prevent the Contractor from submitting or the Employer from accepting, a Periodic Statement. However, the Contractor shall include with his Periodic Statement confirmation of list of such incomplete works and the period within which such outstanding work is to be completed. The Engineer shall value such listed incomplete works, and shall deduct this value from the Contractor‘s payment. Once any such outstanding works has been verified by the Engineer as being satisfactorily completed the Engineer shall add the value of such completed works to the next subsequent payment.

8.8. Substantial Completion of the Works

In case the Contractor has completed the execution of Work(s) on a section under a separable portion, for the purpose of permitting the Contractor to submit a Periodic Statement to the Engineer for certification to accept any Periodic Statement, the specified minimum quantity of Works must meet the following criteria:

- Minimum quantity of Work has been completed. (Refer Chapter 17 : Payment)
- The full width of the pavement must be completely trafficable and safe, including the completion of new pavement surfacing to the required width and finish
- All unsealed shoulders are correctly shaped and compacted
- All embankment slopes are correctly shaped, compacted All major drainage works are completed
- All required new or reinstated Regulatory Signs and Pavement Markings are installed to the required standards and finish
- All waste materials are removed from site and disposed of in approved dump sites

- All quality assurance and post construction test results have been provided to the Engineer / Employer
- All material properties are conforming and post-construction testing of pavement and surfacing construction confirms that the accepted pavement and surfacing design criteria have been satisfactorily achieved.
- All other works critical to the safe operation of the road section and the protection of the road formation (e.g. drainage works) are all complete to the satisfaction of the Engineer and the Employer.
- Roughness testing results supplied by the Contractor demonstrate conformance with RDPM-1.
- Confirmation that all outstanding minor work and defects from previously constructed and substantially complete claimed lengths have been completed.

All sites considered by the Contractor as complete shall be inspected by the Engineer within two (2) weeks of receipt of the Periodic Statement from the Contractor.

Note: The acceptance and payment of completed works does not infer any taking over the works by the Employer, and responsibility for its maintenance shall reside with the Contractor until the completion of the entire Contract.

8.9. Location Accuracy

The Contractor must record and report the location position of all work and new or replaced assets to an accuracy of 10m when measured from the nearest defined displacement marker along with recorded GPS coordinates. GPS coordinates may be converted to respective linear displacement reference if required but the coordinates must be supplied by the Contractor upon request of the Engineer.

9. INVENTORY DATABASE MANAGEMENT

9.1 General

The Contractor will accurately record road asset inventories and forward this information to the Engineer and Employer on regular basis but not later than quarterly.

9.2 Requirement

The Contractor is required to inspect, collect and verify asset data on the following:

- All surfacing and pavements during their construction including shoulders, (Rehabilitation and Improvement Works)
- All existing, improved or new drainage facilities, lined channels, sumps etc.
- All signs including existing and those installed during the contract
- All pavement markings, both existing and those added during the contract.
- All bridges and culverts
- All project facilities

The Contractor shall inspect and record or update the complete asset inventories for drainage, signage and pavement marking as given in the ensuing paragraphs , and shall forward this information to the Engineer in a form that enables the Employer‘s Asset Inventories to be updated and adequately maintained. A complete set of asset inventories are to form part of the End of Contract Handover Report.

The Contractor shall submit the Inventory Database as on site within 6 weeks of start date of Contract. Thereafter, the Contractor shall update this inventory by providing accurate inventory details for all completed physical work sites, or on any routine maintenance works altering the data inventory in the monthly report. A nil return shall be submitted where physical work does not affect the inventory.

Sample sign and pavement marking inventory update form is to be recorded in the format as here below –

Sr. No.	Type of Sign / Pavement marking	Location	Side (RHS/LHS)	Condition of Signs	Remark

*Contractor may propose the format other than above and same can be agreed and approved by Engineer.

Contractor should ensure that:

- It submits the Inventory Database as on site within 6 weeks of start date of the contract.
- It forwards accurate inventory details to the Engineer and Employer for all completed physical work sites and affecting the asset inventory within 30 days after construction is complete. A nil return shall be submitted where physical work does not affect the inventory.
- It forwards accurate inventory data on any routine maintenance works altering the data inventory to the Engineer and Employer with the monthly report following the completion of the maintenance activity

10. REPORTING

10.1 General

The Contractor shall submit regular reports, on progress of works and performance on the Contract, to the Engineer using the formats, or any other format accepted by the Engineer.

10.2 Initial Contract Area Condition Report

The Initial Contract Area Condition Report shall be submitted within one month of the Start Date of the Contract. This report must include,

- Areas where the existing Levels of Service are below the required standard and the programme for these Service Levels to be achieved
- Any areas where significant deterioration has occurred as a direct result of the defined Unforeseen Natural Phenomena occurring between the time of contract award and possession of site. This is to include a detailed summary of the damage and a Lump Sum quotation for its repair is to be provided for the Engineer‘s consideration
- Any other impediments to the Contractor‘s programme being achieved as a result of encroachments, the actions of other contractors, social or environmental issues or grievances and requiring the Employer’s/Engineer’s intervention
- A statement otherwise confirming the Contractor’s acceptance of the initial condition of the Contract’s assets.

The Engineer will conduct a Joint Verification of the Contract Area and formally accept the Contractor’s Initial Contract Area Condition Report, including any agreed amendments, within 30 days of its submission.

10.3 Performance Measures Conformance Reports

Irrespective of the Contractor’s submission of its Payment Request (Refer Chapter 17: Payments), it shall submit a self-assessed Performance Measures Conformance Report of each month to the Engineer by 10th calendar day of the succeeding month. This Performance Measures Conformance Report shall have the Contractor’s self-recorded Conformance/ Non-Conformance with the Management Performance Measures, Road User Safety & Comfort Performance Measures and Road Durability Performance Measures. Reports format should be as per Service Level Management worksheet shown in Chapter 17.

10.4 Monthly Report

The Monthly Report shall be submitted by 1st week of each succeeding calendar month. Each Monthly Report must include as a minimum the,

i. Monthly Progress of construction works in the format described in Clause 10.6 and summarized to enable the preparation of the Periodic Payment Report, verifying that the work claimed is substantially completed (Refer Specifications Chapter 8.8 for Improvement and Rehabilitation). Reports format to be approved by Engineer.
ii. The list of minor un-completed works and a programme for their completion (Refer Specifications: 8.7:)
iii. All required Quality Control reports including test frequencies on the works completed during the month clearly indicating any non-conformance
iv. Updated Programmes where applicable
v. Cash-flow Estimates

Monthly Report must be enclosed with following Forms, Formats and Reports duly filled:

Forms –

(1) Vehicle Accident Reports (Refer Appendix to Section VIA - Form 1)
(2) Road Assets Damage Report (Refer Appendix to Section VIA - Form 2)
(3) Pavement Repair Work Summary – this information is required to update the Employers Road Asset Information Database and must include all Pavement Repairs greater than $25m^2$ in surface area. The Employer shall confirm the information required and the electronic file format
(4) Network Performance Inspection Form duly completed (Refer Appendix to Section VIA - Form 3)
(5) Emergency Works Reports (Refer Appendix to Section VIA - Form 4)
(6) Road Signs Report (Refer Appendix to Section VIA - Form 5)
(7) Bridge and Other Structures Inspection Form duly completed (Refer Appendix to Section VIA - Form 6)

Formats

(1) Network Performance Payment (Refer Appendix to Section VIA - Format 1)
(2) Management Performance Measure (MPM) (Refer Appendix to Section VIA - Format 2)
(3) Road User Service and Comfort Performance Measure (RUS&CPM) (Refer Appendix to Section VIA - Format 3)
(4) Road Durability Performance Measure (RDPM) (Refer Appendix to Section VIA - Format 4)
(5) Improvement Works Payment (Refer Appendix to Section VIA - Format 5)
(6) Rehabilitation Works Payment (Refer Appendix to Section VIA - Format 6)
(7) Resurfacing Work Payment (Refer Appendix to Section VIA - Format 7)
(8) Advance Payment Recovery
(9) Emergency Works and Agreed Variations Payment (Refer Appendix to Section VIA - Format 8)

Reports

(1) Road Safety and Traffic Management Report (Refer Appendix to Section VIA – Report 1)
(2) Stakeholders Relationship/ Meetings including the Status of actions taken on received complaints and grievances (Refer Appendix to Section VIA – Annexure 1)
(3) Illustration of Performance Measures (Refer Appendix to Section VIA – Report 2)
(4) ESMF Compliance Reporting – Section VID Specifications Environmental and Social Management.

Other than reporting monthly, the Contractor shall inform the following to the Engineer immediately in case occurrence of following is observed,

a) Notify the occurrence of any Emergency Event within 24 hours of occurrence, and then submit report within one week summarizing the event, reason(s) of occurrence, extent of damage, action taken, inspections & investigations carried, recommendation(s), designs and programme (if already not done) to construct and/or repair with photographs .
b) Notify any Damage, theft or act of vandalism to Road Structures which could be hazardous to the road user

10.5 Pre-Construction Report

A separate report for each section is to be compiled for proposed construction (Improvement Works and Rehabilitation Works or any other agreed additional works). The Pre-Construction Report shall be submitted within two month of the Start Date of the Contract. This report must include as a minimum:

- All required investigation, survey plans, design information, construction drawings, Environmental & Social Assessment outcomes, EMP & Enhancement related works and supporting documentation for the required construction works. This would include both conforming and non-conforming designs where necessary.
- All required traffic diversions and detours including all associated ancillary works such as temporary embankments, foundations, pavements, surfacing, drainage, signage and delineations and routine maintenance of the road during construction period.
- Tree cutting and RoW area development (for contractors own use) to be detailed as assigned in work contract and or directed by Engineer as applicable.

10.6 Post Construction Report

This report must be provided separately for each completed road section of Improvement and Rehabilitation works. This Report shall be submitted within one month of the completion of works. As a minimum this report shall include the following information:

- Site location and Construction details
- Construction start and end dates
- As Built Drawings/ As Built information/ plans/ photographs
- Copy of quality assurance test records
- Environment Management Compliance Report
- Enhancement works execution report.
- Summary of future inspection and maintenance requirements e.g. required frequency of inspections, on-going environmental monitoring needs, specific on-going maintenance needs etc.
- Summary of accident records for each road section with location detail and dated photographs where possible.

10.7 Road Asset Damage Reporting

The Contractor shall report the following incidents, if any, in its Monthly Report. This is to include a report on any damage to the network including the following:

- Damage from vehicle accidents
- Vandalism
- Theft
- Deterioration of minor road structures such as parapets, guardrails, handrails etc.
- Deterioration of signs and other delineation
- Other damage from Emergency events (Refer Chapter 3 Emergency Works of this Specification).
- Restoration or repair of damage is included as the Contractor's risk, unless specifically excluded under this Contract.

Reports of significant or persistent damage to assets within the RoW shall include,

- The location and extent of all significant damage
- Where applicable, report the name of the person / people and/or organization responsible for causing the damage. This information will be of value if persistent or willful damage is occurring, and the issue can be elevated to the Employer to resolve

- Where the damage is specifically excluded from the Contractor's scope, a detailed breakdown of the price to repair the damage and the same shall be sent for the Engineer's approval.
- The Form of Report to be as is in Appendix to Section VIA - Form 2

10.8 Structure Inspections and Reporting

Bridge, culverts, drains and other structures (like bus shelter, etc.) require routine visual inspections and an annual detailed structural inspection (to be done in January to March months) along with associated reporting to the Engineer. These requirements are listed in Section VIB - Schedule II - Bridges and Other Structures.

- The Form of Report to be as is in Appendix to Section VIA - Form 6

10.9 End of Contract Handover Report

The Contractor will also be required to provide an End of Contract Handover Report within one (1) month prior to the end of the contract. The purpose of the Handover Report is to provide a smooth transition to the next contract and ensure that the next Contractor and the Engineer is aware of any outstanding issues. In addition this report must include a concise summary of the condition of the road assets, including the residual life of the pavements, being handed back. The overall pavement residual life of the contract's roads must be supported by a rational analysis of the remaining pavement life following their last rehabilitation and the information provided from the results of the pavement deflection surveys completed over the duration of the contract.

The Report shall as a minimum:

- Summaries any unresolved issues
- Provide a schedule of outstanding defects and liabilities and a programme for their correction
- Outline any unresolved issues, especially those that may impact on the next Contract
- Detail any sensitive issues with the potential to impact upon the Employer
- Include the results of the last Roughness, Rutting and Deflection testing results along with a discussion on the implications of these tests, especially those relating to the target residual life of the pavements handed over (Refer to the required performance measures specified for Road Durability Performance Measures outlined in Chapter 16 of the Specifications). The Contractor shall pay particular attention to the detail of the pavement deflection measurements collected over the contract road network in 10^{th} year and the limits set out under RDPM in assessing the residual pavement life of the contract road network at the end of the contract.
- Include a year by year trend analysis of the Roughness, Rutting and Deflection results over the duration of the contract, and in particular the results from the six monthly surveys over the last two years of the contract
- Include updated databases of all data required to be managed under this contract
- Outline any on-going special monitoring/maintenance needs to be included in subsequent contracts
- Include all ―as built drawings, updated to capture the most accurate situation of the road.

10.10 Final Report

This must include a brief summary of the entire Contract, outcomes achieved, lessons learnt, good practices and recommendations to the Engineer for improvements for any future OPRC projects. This should be submitted to the Engineer within 3 months of the contract completion date (after the start of Defect Liability Period).

11. INSPECTION

11.1 Commencement of the Contract Inspections

The Employer along with his Engineer and the Contractor shall undertake a joint inspection before the possession of site. The purpose of this inspection is to provide the Contractor with the opportunity to confirm with the Employer any uncertainties over the location of the Contract boundaries (extent) and any other general matters of contract administration including the condition of the Contract's assets. The Employer /Engineer may video the Contract's roads during this inspection to confirm the condition at the time of handover.

The Contractor is required to accept the condition of all the Road Assets within the Contract Area. All work necessary to achieve the required Levels of Service either through network performance, rehabilitation, or planned improvement works will be deemed to have been included within the Contractor's Lump Sum price. This will include any reasonable deterioration of the road assets or change in the Level of Service that may have occurred between the bid closing date and the start date of the contract, with the only exclusion being damage arising directly from ―Unforeseen Natural Phenomena as indicated under Chapter 3 Emergency Works Clause 3.1 of these Specifications.

11.2 Inspections for Environmental and Social Assessment

The Contractor shall carry out the inspections for Environmental & Social Impact Assessment including Enhancement works as per the requirements laid out in Section VID: Environmental & Social Management and Schedule IV of these Specifications and submit the assessment report within 8 months. For the works to be executed in first year of the Contract, part assessment report shall be submitted within 3 months.

11.3 Routine Contract Inspections to be carried out by the Contractor

The Contractor shall carry out regular patrols to ensure that all roads are inspected on the following frequencies:

Inspection Type	**Required Frequency**
Routine Patrols	Every Week
Combined* Day-time Inspections	Every Month
Combined* Night-time Inspections	Every Three (3) Months
Bridges and Culverts	1. Every Six (6) Months 2. Within 24 hours following the date of an agreed flood event
Emergency / Incident	Immediately on observation / notification
* Combined Inspection : Carried out with Engineer/Employer (Refer Clause 11.6 here below)	

11.4 Inspections for Confirming Damage

It is expected that weekly routine inspections by the Contractor will identify any obvious deficiencies that will generally be the result of vehicle, weather event damage, or wilful damage by the public.

The Contractor should ensure that:

- All damages are reported within 24 hours of observation or notification
- All damages as a result of vandalism or theft are reported within 1 week of observation or notification (Appendix to Section VIA - Form 2)
- Detailed inspections are carried out to assess the extent of damage to the road / road-structures, and submit the summary and recommendations are submitted to the Engineer within one week.
- Any obvious damages to or condition of, other facilities within the RoW which may be hazardous to the public and/or road users are reported to the Engineer within 24 hours of being reported or observed.

Any delay in reporting of damages to the Engineer will attract suitable non-performance scoring as detailed in service level maintenance criteria. Reference Service Level Management Work Sheets in Chapter 17

11.5 Inspections to Address Complaints

At any time, the Employer or the Engineer can instruct the Contractor to undertake specific inspections in response to public complaints.

The Employer and/or the Engineer can accompany the Contractor on these specific inspections and record the outcomes and issues identified.

11.6 Monthly Combined Inspections

Combined inspections, i.e. by the Engineer & Contractor, will be undertaken every month and Night-time inspections undertaken every 3 months. The purpose of these inspections is to:

- Seek solution of Contract related issues affecting all parties.
- Confirm the annual Forward Work Programme (FWP) of Rehabilitations, Improvement, Resurfacing and any agreed additional works.
- Confirm that the social and environment requirements have been taken into consideration in the design and implementation stages for any Planned Improvement and rehabilitation Works.

11.7 Inspections at the End of the Contract

The Engineer / Employer and the Contractor, shall undertake joint inspections over the following times:

a) In the 7th year after completion of Improvement and Rehabilitation Works, with the purpose of determining and agreeing the extent of work required to be completed including those pertaining to ESMF / EMP compliance before the end of the contract period.
b) In the 8th year after completion of Improvement and Rehabilitation Works but not later than six (6) months before the end of the contract with the purpose of identifying and agreeing any additional remedial works that need to be completed before the end of the contract period.
c) No later than ten (10) days after the end of the contract with the purpose of confirming that all required remedial works have been adequately completed.
a) Two months before the end of the Period of Defects Liability as set out under GC clause 41 of this contract with the purpose of ensuring no issues have arisen during the defects liability period that could prevent the release of the remaining performance guarantees.

The purpose of these inspections is to determine and agree the extent of work required to be completed before the incoming Contractor takes possession of the Site and/or hands the Site over at the end of the Contract Period.

The inspections under c) and d) above will involve the Employer, the Engineer, and the Contractor and may involve the incumbent Contractor(s) if any, where the works under this contract have been further sub-contracted out after the expiry of this contract.

11.8 Inspections before the End of the Defects Liability Period

The Employer, along with the Engineer, and the Contractor shall undertake a joint inspection Two (2) months before the end of the Period of Defects Liability as set out under GC clause 41 of this contract.

The purpose of this inspection is to ensure that there are no issues pending that have arisen during the defects liability period that could prevent the release of the remaining performance guarantees and the release of the Defects Liability Certificate.

11.9 Inspections to be carried out by the Employer/ Engineer

Inspections will be completed by the Employer and / or the Engineer, at regular intervals to:

a) Monitor the Contractor's progress and performance and the Contract's asset condition.
b) Determine the adequacy and appropriateness of all performance measures defined in this contract and with specific attention to those defined as Key Performance Measures detailed in Service Level Management in Clause 13.6
c) Verify completeness and construction quality of all Rehabilitations, improvement and Resurfacing, Enhancement and routine maintenance (During /Post Construction) works prior to any payment request certification.
d) The Engineer will undertake specific inspections where the Contractor's conformance management system audits identify areas of repeated non-conformance detailed in Service Level Management in Chapter 13 and Chapter 17 –Service Level Management work sheets to record Non-Conformance.
e) Monitor the Contractor's progress and performance pertaining to ESMF/EMP compliance.

The Engineer shall inform the Contractor of his intention to carry out a formal inspection at least 24 hours in advance, indicating the exact date, hour and location where the formal inspection is to begin. The Contractor is obliged to be present at the date, hour and location specified by the Engineer, providing the physical means needed for the inspection where necessary.

The Engineer will inform the Contractor in writing on specific issues of concern or actions to be undertaken that have arisen from these inspections as soon as practicable following the inspections.

11.10 Inspections to be carried out by Independent Auditor

Where required by the Employer, the Independent Auditor shall carry out specific inspections of the network roads. If requested, representatives of the Employer, Engineer and Contractor shall join the Independent Auditor on these inspections and assist with the provision of any information that is reasonably requested.

12. TRAFFIC MANAGEMENT

12.1 General

The Contractor shall at all times carry out works in a manner creating least interference to the flow of traffic. The management of traffic shall meet the requirements of MPM-4 (Refer Cl. 14.6 of Chapter 14).

12.2 Traffic Management Plan

The Traffic Management Plan (TMP) establishes the practices for traffic management at work sites (both day and night, including manned and unmanned sites) and during planned and unplanned events. The Contractor must develop the TMP and seek approval from the Engineer.

The TMP's objectives are to,

- Provide appropriate transitions into work sites with focus on providing efficient traffic flows.
- Protect all personnel on the contract area and road users from potential harm.
- Establish the minimum traffic management levels including any reviews necessary as a result of changing traffic conditions over the duration of the contract.
- Assist in easing traffic during fairs, festivals, Mela harvest and religious and political processions

The Traffic Management Plan must include at least the following:

- A documented process for preparation, review and approval of the Traffic Management Plan
- A document tracking and control system to ensure that only the latest operative copy of the Traffic Management Plan is in circulation
- Contact details of the Contractor, Engineer, emergency services and other identified stakeholders
- Layout diagrams, method statements etc. for implementation of traffic control while undertaking each aspect of the Services (including site specific layout diagrams and method statements if the Services require traffic control measures not covered by standard codes of practice)
- The Contractor's strategy for informing the general public and adjacent landowners about the nature of the planned work activities or event, the implications of the traffic plan (e.g. detours) and their role in maintaining the overall safety of the site.

Section VIB - Schedule II: Specific Job Requirements for Traffic Management and Safety sets out the minimum requirements that apply.

Where any work site results in a foreseeable and unacceptable level of traffic delay directly due to the Contractor's improper management of the works, this shall be recorded as a non-conformance.

Specific plans requiring either partial (single lane) or full road closure (with detour) shall be submitted to the Engineer for approval at least 2 weeks in advance of the programmed closure. These plans must stipulate the duration of the proposed closure. Any extension to this duration that occurs without reasonable justification shall be considered as a non-conformance.

There are some known traffic accident black spots within the Contract Area. The Contractor shall also pay particular attention to the maintenance of these sites both before and after any improvement works to ensure that any factors that have the potential to contribute to an on- going high crash rate (e.g. delineation, signage, pavement or surface condition etc.) are adequately monitored and defects rectified as quickly as possible.

The following sites and locations have been provided to enable Bidders the opportunity to review their current condition and to include the cost of the design and construction of appropriate safety related improvement works into their Lump Sum price and their detailed design.

I. Accident Black Spots

Road	Black Spot Location/Description
Dhandhuka - Dholera (SH-20)	(Km 27.000) SH-20 Junction with SH-06 & Dholera Town Junction: Multi Leg Junction with heavy commercial traffic of Bhavnagar-Ahmedabad compounded with Dholera Town Traffic results in many accidents.
Dhandhuka - Paliyad (SH-01)	(Km 128.000) Roadside stone quarry results in truck traffic.
Dhandhuka-Paliyad (SH-01)	(Km 130.000) Junction with SH-38. At Junction with SH-38, it is difficult to identify vehicle coming from due to roadside built up.

II. Identification and Reporting of Other General Road Safety Enhancements

Other generic safety improvements that need to be carefully considered by the Contractor during the detailed design phase are to include but are not limited to:

- Appropriate Crash Barriers for the protection of both drivers and other vulnerable road users
- Appropriate road markings - for all junctions and sensitive areas like schools, hospitals, beginning and end of towns etc including pedestrian crossings.
- Consideration of hot applied thermo-plastic with audible and vibratory pavement profiles including reflectorised glass beads
- Appropriate traffic calming devices and warning signage.
- The installation retro-reflective Aluminium foil backed diamond grade flexible prismatic sheeting on road furniture and other surfaces to increase night-time visibility.
- The installation of reflective prismatic conspicuous sheeting on the vertical posts of all new and existing metal beam crash barriers within the network.

The Contractor is required to identify potential locations for the installation of these types of safety enhancements with all Improvement Works and include these within the Lump Sum price.

III. Specific Job Requirements for Traffic Control and Safety:

1. Hours of Work

The Contractor shall programme work such that contract activities affecting traffic flow are not carried out on-site in urban zones during periods of peak traffic flow, other than emergency or emergency maintenance work and then only with the approval of the Engineer

2. **Hours/Days** when work in Prohibited or Restricted: Refer to GC Clause 19.4.

3 **Project Specific Conditions**

All traffic management measures shall fully comply with the agreed Traffic Management Plan Generic Traffic Management Plans will only be accepted for generic cyclic

maintenance activities. Specific Traffic Management Plans will be required for all other maintenance activities or projects that fall outside cyclic activities.

Generic plans are to be registered with the Engineer 5 days prior to the work taking place.

4 **Excessive Traffic Delays**

The steps outlined in the Traffic Management Plan to deal with excessive traffic delays shall be implemented once the traffic delay exceeds 10 (ten) minutes. The Contractor shall be responsible for the monitoring of traffic delay.

5 **Employer Approval of Single Lane Operations**

Approval of the Engineer is required in advance if traffic is restricted to single lane operation.

6 **Advice to Other Parties**

Public Notification will be required when the works make it necessary to advise the public of disruptions to traffic flows.

Parties with Access Affected will need to be advised as necessary. Specific attention shall be given to Schools, Hospitals and Emergency Services, Police and other institutions or businesses located within the work zone or directly affected by the works.

7 **Delineation Devices**

Height of delineation devices will be at least:

a) 900 mm when used on roads

b) 450 mm for protecting wet pavement markings.

12.3 Traffic Management Plan Audits

The Road Manager and the Engineer or their delegated personnel shall jointly audit at least four (4) site locations at random basis each month. The dates of the audit shall be selected by the Engineer. Audit results will be validated by the Engineer.

13. NETWORK PERFORMANCE

13.1 General

Maintenance of the existing road network and of all of the completed construction work forms a critical component of this contract. The objective of introducing this component in the contract is to ensure a high standard of network performance is achieved from the outset of the contract and is sustained throughout its entire duration.

The service levels to be delivered under this contract are defined by a series of performance measures as outlined below

13.1.1 Management Performance Measures (MPM's)

MPM's are a set of performance criteria that are required to be performed by the Contractor to successfully manage the contract, including supply of timely information to the Engineer/ Employer specified in the Contract.

MPM's for this contract are detailed in these specifications: Chapter 14 Management Performance Measures. All the criteria listed under each measure must be satisfied for a compliant result against that measure.

MPM's are measured monthly by the Contractor, in terms of a conformance management system. Results of MPM shall be expressed either as Conformance or as Non-Conformance as per service level criteria. .

13.1.2 Road User Service and Comfort Performance Measures (RUS&CPM's)

RUS & CPM's for this contract are detailed in these specifications: Chapter 15 Road User Service and Comfort Performance Measures.

All the criteria listed under each measure must be satisfied for a compliant result against that measure.

RUS & CPM's are measured monthly by the Contractor, in terms of a conformance management system, as detailed in Chapter 15. Results of RUS & CPM shall be expressed as either as Conformance length of road or as Non-Conformance length of road as per service level criteria.

13.1.3 Road Durability Performance Measures (RDPM's)

These are a set of performance criteria that are required to be performed by the contractor to successfully protect the pavement structure from consumption over the duration of the **C**ontract for future generations. These are listed under Chapter 16.

RDPMs are contractual requirements, which must be met at all times and are to be verified by the Engineer principally through monthly assessment/ inspection**s**. Failure to deliver the specified RDPMs as per the laid down criteria shall result in Non-Conformance scoring for that measure. This non-conformance will continue to be recorded until a programme of rectification work has been agreed with the Engineer.

13.2 Performance Measurement

To monitor the Contracting Entity's compliance with the specified service levels the Contractor shall establish a Conformance Management Unit (CMU) to monitor his compliance with the contract. The performance monitoring system for this contract is based on a non-conformance measuring process, which focuses on ensuring achieving the Employer's delivery obligations to the Government and to the road user. Essential elements to this system include:

- Clearly defined performance criteria and the requirements.
- Objective measures to categorically ascertain conformance.
- Regular performance monitoring and reporting during the contract period.
- It encourages the Contractor to operate proactively but recognizes the network, is dynamic and that it is not possible to maintain the road at "as constructed" level of service uniformly throughout the contract period. .
- Option for the Employer to terminate the Contract should the Contractor not deliver the Contract objectives.

13.3 Performance System Criteria

The Network Performance system is divided in two key groups:

i. Office based review of management criteria

a. Management Performance Measures (MPM's)

ii. Field condition based review of criteria

a. Road User Service and Comfort Performance Measures (RUS&CPM's)
b. Road Durability Performance Measures (RDPM's).

13.4 Recording Performance Measures

Performance Measures are required to be recorded on a regular basis (see table below) by the Contractor in terms of the conformance management criteria with the requirements explained later in Chapters 14, 15 and 16, which is deemed as Contractor's performance audit. Results of this audit are to be forwarded to the Engineer for assessment of the Contractor's Performance and to include it into the monthly Project Performance Report. This audit can be subject to a random audit by the Engineer/ Employer to confirm the accuracy of the assessment.

Where a particular measurement criterion is not applicable to the Contract or any Contract road section at the time of the audit, a Conformance result shall apply.

Where a particular measurement criterion is not applicable to the Contract or any Contract road section at the time of the audit, a Conformance result will apply.

13.5 Monthly Audit Cycle Time Frame

Sl no.	Item Description	Required by:
1	Contractor will conduct self-auditing of entire section for full length as on	27th calendar day of the month
2	Contractor's Monthly Report (Self Audited) to be received by the Engineer.	1st calendar day of the month following or the first working day thereafter.
3	Engineer will review report and will instruct the Contractor for joint inspection to be completed.	Within 7th day of following month

Sl no.	Item Description	Required by:
4	Engineer will complete review of the Contractor's monthly performance audit results after joint inspection. Will evaluate the Performance/Non-Performance measures status report considering audited and unaudited conformance and will do any adjustment to the monthly aggregated performance.	15th calendar day of the month following or the first working day thereafter.
5	Certify the payments (As applicable) after his check and assessment and forward the IPCs to Employer for payment	As applicable

13.6 Key Success Factors

There are subsets of the performance measures that can be said to determine success of the Contract. They are a combination of Management Performance Measures, Road User Service and Comfort Performance Measures (RUS& CPM) and Road Durability Performance Measures (RDPM). This subset has been termed as the Key Success Factors.

The key success factors for this contract are linked to the following specific performance measures:

I. Management Performance Measures (MPM's)

1. MPM-1: Quality Assurance System /QAP including its implementation
2. MPM-2: Contractor's Work Programs
3. MPM-3: Contractor's Reports Submission
4. MPM-4: Traffic Management Plan & Implementation
5. MPM-5: Inventory Database Management
6. MPM-6: Design and Construction Methodology

II. Road User Service and Comfort Performance Measures (RUS&CPM's)

A. RUS&CPM-1: Pavement and Paved Shoulder Related Service Level
B. RUS&CPM-2: Hard Shoulder (Gravel) Related Service Level
C. RUS & CPM-3: Structures and Cross Drain Related Service Level
D. RUS&CPM-4: Road Side Slope and Road Side Drains maintenance and upkeep
E. RUS&CPM-5: Road Safety Related Service Levels
F. RUS&CPM-6: Upkeep of Road Furniture, Road Side amenities & Miscellaneous work Related Service Level
G. RUS&CPM-7: Incident Response and Emergency work Related Service Levels

III. Road Durability Performance Measures (RDPM's)

1. RDPM-1: Pavement Roughness
2. RDPM-2: Pavement Deflection

These Key Success Factors have been deemed very important to the outcome of the contract; hence these attract higher weightings in the Performance System if they are non-compliant.

14. MANAGEMENT PERFORMANCE MEASURE

14.1 General

Management Performance Measures (MPM's) require the Contractor to successfully manage the contract outputs including the quality and efficiency of his reporting of information to the Employer and to the Engineer. In general terms, these are measures of the Contractor's Management of the following.

(a) The development, implementation and management of the Contractor's:

- Quality Assurance system
- Contract Works Programme
- Inspections
- Reporting
- Traffic Management Plan
- Forward Works Programme (FWP)
- Environment Management Plan
- Detailed design process for Works, including all required traffic diversions and ancillary works.

(b) The effort to maintain a strong and sustainable Contractual Relationship

(c) The management of Information and Data

(d) Contractor to observe compliance of "Environmental Impact Assessment (EIA), Environment Management Plan and Social Impact Assessment (SIA)" as detailed in work contract in Section VID

14.2 Management Performance Measures in the Contract

The following Management Performance Measures (MPM's) apply to this contract.

Nomenclature	Management Performance Measures (MPM)
MPM-1	Quality Assurance System/QAP including its implementation
MPM-2	Contractor's Work Programmes
MPM-3	Contractor's Reports Submission
MPM-4	Traffic Management Plan & Implementation
MPM-5	Inventory Database Management
MPM-6	Detailed Designs & Construction Methodology (Submission)

14.3 Quality Assurance System / QAP including its implementation (MPM-1)

MPM-1 has reference to compliances relevant to the Contractor's Quality Assurance System (Refer these Specifications, Chapter 7: Quality Assurance)

14.4 Contractor's Work Programmes (MPM-2)

MPM-2 has reference to compliances relevant to the Contractor's Programming (Refer these Specifications, Chapter 4: Programming of Works)

14.5 Contractor's Reports Submission (MPM-3)

MPM-3 has reference to compliances relevant to the Contractor's Reporting (Refer these Specifications, Chapter 10: Reporting)

14.6 Traffic Management Plan and its implementation (MPM-4)

MPM-4 has reference to compliances relevant to the Contractor's Traffic Management (Refer these Specifications, Chapter 12: Traffic Management)

14.7 Inventory Database Management (MPM-5)

MPM-5 has reference to compliances relevant to the Contractor's Inventory Database Management (Refer these Specifications, Chapter 9: Inventory Database Management)

14.8 Detailed Designs & Construction Methodology (MPM-6)

MPM-6 has reference to compliances relevant to the Contractor's submission of Detailed Designs & Construction Methodology (Refer these Specifications, Chapter 5: Design of Works)

14.9 Management Performance Measures, Levels of Service and Weightings

Since MPM pertains to reporting as a major activity, thus Non-Conformance shall be considered as delay in submissions and accordingly Non-Compliance shall be in full number due to non-submissions.

Any non-conformance recorded for non-submissions of a report, a lump sum payment shall be deducted from the monthly network performance payment as given in table below.

Table: Lump sum payment reduction amount for MPM

Service Level Indicators		Payment Reduction Amount (₹)
MPM-1	Quality Assurance System / QAP including its Implementation	1,00,000
MPM-2	Contractor's work programme	1,00,000
MPM-3	Contractors Report submission	50,000
MPM-4	Traffic Management Plan & Implementation	1,50,000
MPM-5	Inventory Database Management	50,000
MPM-6	Detailed Design and Construction Methodology	1,50,000

If contractor fails to submit any report in stipulated time as given in Chapter 14, it will be counted as one full non-compliance in the monthly audit.

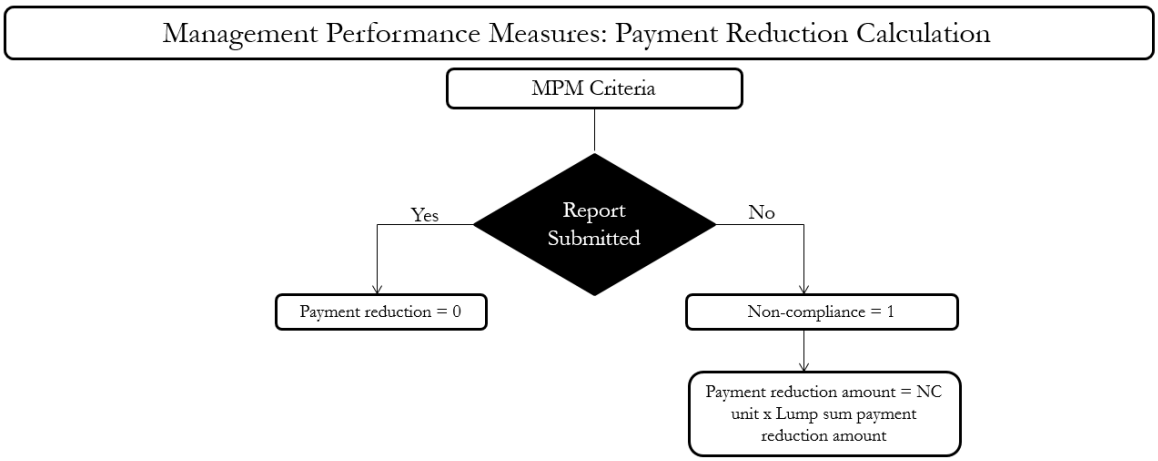


Figure 1 MPM : Illustration of payment reduction mechanism

Sl. No.	Nomenclature	Management Performance Measure	Performance Measure Compliance
1.	**MPM – 1**	**Quality Assurance System /QAP including it's implementation**	1. Submit Initial CQAMP within 30 days of the Date of Signing of the Contract Agreement 2. Submit Final CQAMP within 30 days of receiving the Engineer's written review of the Draft CQAMP 3. Update the CQAMP annually to reflect outputs from any audits, reviews etc. and submit within first month of each year of the Contract (except year one) 4. Remedy the non-conformances recorded from internal or external audits of the Contractor's CQAMP and the application of its associated plans including the requirements of the Health and Safety Plan, Traffic Management Plan and Social and Environmental Management Plan (Refer Section VID: Specifications Environmental and Social Management Environmental and Social Compliance). 5. Comply with all legislative requirements for the execution of the Contract. 6. Non-compliance shall be reckoned from the time the Contractor discovers or is notified by the Engineer of the non-compliance and NC shall be worked out as per performance management table (service level criteria).
2.	**MPM – 2**	**Contractors Programmes**	1. Submit each Programme (except FWP) within stipulated time, stating the planned and achieved progress with respect to approved work programme.
3.	**MPM - 3**	**Contractors Reports Submissions**	1. **Initial Contract Condition** Report : Within One month of the start of the Contract 2. **Performance Measures Conformance Report**: By 10th Calendar day of each month. 3. **Monthly Report**: Within 1st week (7 days) of each succeeding calendar month for which the report is being submitted. (The report of preceding month for which report is being prepared including NCR Closure status (if any). 4. **Emergency event notification**: Within 24 hours from self-observation or receiving notification from third party/ Employer / Engineer. 5. **Emergency event report**: Within one week after the notification of the emergency event to the Contractor 6. **End of Contract Handover Report** : At least a month before the scheduled date of completion of Contract
4.	**MPM - 4**	**Traffic Management Plan and Implementation**	1. **Initial TMP** at least 3 weeks before the start of work on any site. This shall be deemed as final TMP if no comments received from the Engineer at least a week before the actual commencement of work. 2. **Final TMP** to be submitted by the Contractor within one week of the receipt of comments from Engineer on Initial TMP. In case there are major observations on the TMP submitted, the Contractor shall delay the commencement of work until the approval of Final TMP

Sl. No.	Nomenclature	Management Performance Measure	Performance Measure Compliance
			3. Conform to the final TMP while executing the work. 4. Non-compliance shall be reckoned from the time the Contractor discovers or is notified by the Engineer of the non-compliance and NC shall be worked out as per performance management table (service level criteria).
5.	**MPM - 5**	**Inventory Database Management**	1. Submit the Initial Inventory Database : Within Six weeks of signing the Contract Agreement 2. Submit Updated Inventory Database : In the monthly Report
6.	**MPM - 6**	**Detailed Design and Construction Methodology**	1. Submit detailed designs & construction methodology (Method Statement) of the works as per Contractor's Programme for approval of Engineer : At least 1 months before the scheduled commencement date of work, or within 1 weeks after acceptance of the Annual Programme for the year in which works are scheduled (whichever is earlier). Ref Clause 14.8 and Service Level Table MPM 6.

15. ROAD USER SERVICE AND COMFORT PERFORMANCE MEASURES

15.1 General

Road User Service and Comfort Performance Measures (RUS&CPM) reflect the road user's expectation about the day to day serviceability of the roads under the Contract. The Contractor must comply with the Contract Standards specified for each RUS&CPM.

The objectives of the Contract Standards are to ensure that a defined Level of Service is maintained which reflects the road user's day to day serviceability expectations across the range of Contract assets, and to permit auditing of the Contractor's performance.

The Contractor is required to develop and implement a conformance monitoring system to ensure that the Contract Standards are being achieved and to ensure the Conditions specified are met at all times.

The Employer may instruct to the Road Manager and/ or to the Engineer to audit a section of the Contract's roads to determine if it complies with the Contract Standards. Notwithstanding if any defect or problem arises that constitutes a potential safety hazard, the defect or problem shall be rectified immediately upon instruction by the Engineer or the Employer.

The acceptable threshold measures/ values are given in the ensuing paragraphs and in service level criteria; exceeding these values will amount to non-conformance. The Contractor must not regard these as intervention levels because, at these levels, it will not be possible for the Contractor to undertake sufficient corrective works to avoid incurring payment deductions. To manage the Contract's assets within acceptable performance standards, the Contractor must therefore intervene in advance of reaching these threshold values.

The following Road User Service and Comfort Performance Measures (RUS&CPM's) apply to this contract:

S. No.	Acronym	Road User Service & Comfort Measures (RUS&CPM)
A	RUS&CPM -1	Pavement and Paved Shoulder Related Service Levels
B	RUS&CPM -2	Hard Shoulders Related Service Level
C	RUS&CPM -3	Structures and Cross Drainage Works Related Service Levels
D	RUS&CPM -4	Roadside Slopes and Road Side Drains maintenance and Upkeep
E	RUS&CPM -5	Road Safety Related Service Levels
F	RUS&CPM -6	Upkeep of Road Furniture, Road side amenities and Miscellaneous Works Related Service Levels
G	RUS&CPM -7	Incident Responses & Emergency Works Response

15.2 Conformance management system

The Contractor must establish and operate a conformance management system based on a monthly audit cycle for these Road User Service and Comfort Performance Measures. Requirements of the conformance management system are:

The Contractor shall establish a Conformance Management Unit (CMU) which should be independent of the Contractor's operational team, and which shall be headed by the Conformance Management (Quality Assurance) Unit leader. The organization structure and

names of the individuals who will comprise the Contractor's Conformance Management Unit shall be mentioned in the Contract Quality Assurance Management Plan (CQAMP).

i. The CQAMP must also clearly describe the systems, procedures and methods that will be used to deliver and monitor conformance with the specified performance measures in this contract.
ii. Conformance audit sections will comprise of 100% length of the network roads. The recording of non-conformances will be made on the full conformance audit sections.
iii. Contractor will self-audit the conformance audit sections each month on 27th day (the following day if it happens to be a Sunday or a holiday) of the month for the total Contract road length and will submit the report to the Engineer on 1st working day of the succeeding month.
iv. If the contractor receives 100% of his Performance Achievement Payments for each of three (3) consecutive months, the percentage of the contract road length to be audited may, at the Employer's discretion, be reduced by 10%, i.e. to 90% for the next subsequent month; however, the lowest reduction of audit length could be 20% i.e. in no case audit length shall be less than 80% of the total contract road length
v. The conformance management system must be fully readied in three (3) months of the contract start date.
vi. All non-complying items must be clearly identified in the monthly Network Performance Report. The RUS & CPM list is not exhaustive and the Contractor shall identify and rectify the defects which may directly or indirectly make any length of road non-compliant.

15.3 Different Service Level Criteria/Indicators: Construction and Post Construction Period

Service Level Criteria (SLC)/ indicators specified for Construction Period is reasonably relaxed from practical considerations compared to SLC/ indicators specified for Post Construction Period as many SLC/indicators have been dropped for the construction period. Hence there are two different sets of SLC/ indicators one each for Construction Period and Post Construction Period. SLC/indicators for construction period and post construction period are presented in Chapter 17 as separate tables under heading – Network Performance Payment Management which may be referred for further understanding. To make the SLC/indicators less cumbersome, many SLC/indicators (defects) have been grouped together.

Notwithstanding the above, the Contractor shall maintain an acceptable level of safety for road users at all times during the contract period as per good industry practice, no matter whether it is adequately covered in SLC/indicators or not.

In the following sections, the service level conformance criteria are explained in details for **post construction period.** The service level conformance criteria for during construction period can be construed from the tables given in Chapter 17.

Service Level Conformance Criteria post construction period:

15.4 A. Pavement and Paved Shoulder Related Service Levels (RUS&CPM-1)

Pavement Maintenance is the normal care and attention of the roadway to maintain its structural integrity and serviceability.

Following indicators (defects) are covered under this service level. Each and every kilometer of 100% length of the project network roads are required to be audited on monthly cycle basis for these defects:

1. Potholes
2. Rutting

3. Settlement
4. Surface defects (Bleeding, Ravelling/ disintegration, Streaking, Slippage, Cracking >3mm, etc.)
5. Edge break / Edge crack
6. Surface cleanliness (including dead animal removal)
7. Pavement surface drainage (water stagnation)

The conformance requirements for the above defects are:

1. Potholes

i. There shall be no pothole of diameter greater than 15 cm
ii. There shall not be more than 3 potholes in any continuous 1km centerline length (length between any two consecutive Km stones) of the road
iii. Any 1 Km length having any pothole of diameter greater than 15cm shall be recorded as a non-compliant Km
iv. Any 1 Km length having more than three (3) number of potholes shall be counted as a non-compliant Km
v. Response time of **7 days** is permitted for repairing the potholes. If anyone Km length is recorded as non-compliant on account of potholes during monthly audit and the potholes are **not repaired** within the permitted response time then the non-compliant length due to continuance of non-compliance beyond permitted response time shall be worked out as given in Network Performance Payment Management Table given in Chapter 17
vi. If any 1 Km length is recorded as non-compliant on account of potholes during monthly audit and the potholes are **repaired** within the permitted response time then the non-compliant length due to continuance of non-compliance beyond permitted response time shall be **zero** as illustrated in Network Performance Payment Management Table given in Chapter 17
vii. The Contractor shall intimate the Engineer promptly in writing with dated photograph as evidence of having rectified the defect(s) which made the particular Km length non-compliant. The Engineer shall take a note of this and may like to verify the rectification carried out at site.

Response Time: *The following meaning of "Response Time" shall be implied for the use of the term "Response Time" in the Chapter 15 Road User Service and Comfort Performance Measures:*

Response time as explained above is the time duration given to the contractor for correcting the non-compliance observed in the monthly audit of a service level indicator. The implications with regards to response time for the purpose of non-compliant length calculation due to continuance of non-compliance beyond permitted response time:

1. If the non-compliances are **corrected** within the response time, then the non-compliant length due to continuance of non-compliance beyond permitted response time shall be **zero** as illustrated in Network Performance Payment Management Table given in Chapter 17.
2. If the non-compliances are **not-corrected** within the response time, then the non-compliant length due to continuance of non-compliance beyond permitted response time shall be shall be **worked out** as given in Network Performance Payment Management Table given in Chapter 17

The Contractor shall intimate the Engineer promptly in writing with dated photograph as evidence of having rectified the defect(s) which made the particular

Km length non-compliant. The Engineer shall take a note of this and may like to verify the rectification carried out at site.

2. Rutting

i. A depression/ groove on pavement surface of more than 10 mm depth, caused from wheels shall be considered as rutting.
ii. Rutting shall be measured for linear length of each lane within one Km.
iii. In any 1 km length, the aggregate length having rut measuring in between 10mm and 20mm shall be less than 100m.
iv. Any 1 km length having more than 100m aggregate length of ruts (>10mm and <20mm), shall be counted as a non-compliant Km.**Response Time:** 28 days.

3. Settlement:

i. Any isolated depression on pavement or paved shoulder surface due to any reason, whereby the surface has undergone lowering by 25mm or above shall be considered as settlement.
ii. Any 1 km length having **settlement in area exceeding 1 square meter** shall be recorded as a non-compliant km.
iii. Any one km length having **more than 2 locations having settlements** shall also be recorded as a non-compliant km.
iv. **Response Time:** 14 days

4. Surface Defect

i. Any significant flushing, bleeding, scabbing, stripping, cracking (greater than 3mm) or ravelling of the repaired surface visually evident shall be considered as a surfaced defect.
ii. Any 1 km length having **surface defect in area exceeding 35 square meter** shall be recorded as a non-compliant km.
iii. Any 1 km length having **more than 4 locations having surface defects** shall also be recorded as a non-compliant km
iv. **Response Time:** 28 days

5. Edge Break

i. Edge Break shall be measured for linear length for each Km.
ii. In any 1 km length, there shall not be more than 10m aggregate longitudinal edge line length of deficient sealed length, having maximum width of 200 mm of edge break.
Any 1 km lengths having aggregate length of edge break **greater than 10m** shall be recorded as a non-compliant km.
iii. Any 1 km length having more than **2 locations having edge break** shall also be recorded as a non-compliant km
iv. Any 1 km length having **edge break of width greater than 200mm** shall also be recorded as a non-compliant km
v. **Response Time:** 21 days

6. Surface Cleanliness.

The cleanliness has to be done and maintained for entire road section throughout the contract period. Following activities should be observed for cleaning:

i. In any 1 kilometre length, there shall be no loose bitumen surface material visually observed on the sealed pavement or reported to be dispersing onto shoulders or adjoining properties.
ii. Any dead animals on the road shall be removed and disposed to suitable distance far from urban area within same day, so as to avoid risk of further accident and health hazards due to its contaminations
iii. Clearing and cleaning of any loose materials deposit (of any kind of material) which interrupts road traffic and passage shall be done at all times
iv. Fallen trees, shrubs or any materials which have fallen (from moving traffic while transporting like sand, soil, aggregates, etc.), shall have to be removed.
v. The above listed activities are mandatory at all times in any continuous 1 km section and **non-adherence** to these shall be counted as a non-compliant km
vi. **Response time**: 1 day

7. Pavement Surface Drainage

i. It is important to drain water which is accumulated on the pavement surface as it deteriorates the pavement surface. Pavement surface drainage is mostly required during rainy season, also due to water spillage from neighbouring water bodies like canal etc.
ii. In any 1 kilometre length, there **shall not be more than 1 location (maximum longitudinal length of 20m) where there is 5cm deep stagnation of water** of the road for a period of maximum 1 hour.
In any continuous 1 km section, **stagnation of water more than 5cm deep** on the pavement surface shall be considered as non-compliant km.
iii. **Response Time:** 1 day

15.5 B. Hard Shoulder Related Service Level (RUS&CPM-2)

1. Edge Drop/ Settlement

i. Any 1 km length having edge drop/settlement in the shoulders **exceeding 50 mm depth in maximum aggregated length of 25 m on either side of the road** when measured from the edge of the sealed surface with a 3 m straight edge, shall be recorded as non-compliant km.
ii. Any 1 km length having edge drop in **more than 4 locations** shall also be recorded as non-compliant km.
iii. Any 1 km length having settlement in **more than 2 locations** shall also be recorded as non-compliant km.
iv. **Response Time:** 14 days

2. Rain cuts/Erosion

i. Any 1 km length having edge drop/settlement or low shoulder **in maximum aggregated length of 50 m on either side of the road** shall be recorded as non-compliant km.
ii. Any 1 km length having rain cuts/erosion in **more than 4 locations shall also** be recorded as non-compliant km.
iii. **Response Time:** 10 days

3. Vegetation Clearing

i. There shall be no vegetation allowed on pavement surface and hard shoulders.

ii. In any 1 kilometre, height of the vegetation shall not exceed 200 mm in maximum **aggregated length of 50 m on either side of the shoulder**. If exceeded, that particular 1 km section shall be recorded as non-compliant km
iii. In any 1 kilometre, if the height of the **vegetation exceeds 200 mm** at any 1 location, that particular 1 km section shall be recorded as non-compliant km
iv. **Response Time**: 14 days

4. Maintaining Standard Width of Hard Shoulders

i. In any 1 kilometre, there should not be more than aggregate 50m length of hard shoulder where width of hard shoulders is lesser by 150 mm. If exceeded, that particular 1 km section shall be recorded as non-compliant km
ii. Also, in any 1 kilometre length, there **should not be more than 4 locations** where width of hard shoulders is lesser by 150 mm. If exceeded, that particular 1 km section shall be recorded as non-compliant km
iii. **Response Period:** 28 days

15.7 C. Structures and Cross Drainage related Service Levels (RUS&CPM-3)

1. Cleaning and Clearing of waterway of bridges and all drainage works:

i. Deck, footways, expansion joints and bearings shall be cleaned for any earth or debris that has been build-up.
ii. All the scuppers and down pipes shall be cleaned and shall not contain any debris ensuring free drainage.
iii. Debris build-up on superstructure or substructure shall be removed.
iv. No vegetation shall be allowed in/ or around any bridge.
v. The **above listed activities are mandatory** at all times in any continuous 1 km section and **non-adherence** to these shall be counted as a non-compliant km
vi. **Response Time:** 7 days

2. Maintenance and upkeep of Bridges and Cross Drainage Structures

i. Maintenance and upkeep of bridge includes maintenance of wearing coat, bearings, joints, railing, drainage spouts, head-walls, Parapets, Crash Barriers, railings, wing walls, scour protection in stream bed, any other protections works, maintenance repairs /patch repairs, painting , hazard painting, markings of segments etc.
ii. In any 1 km length, there **shall not be more than 3 instances** where there is non-conformance against the above listed activities.
iii. **Response Time:** 21 days

15.8 D. Roadside Slopes and Road Side Drainage Maintenance and upkeep (RUS&CPM-4)

1. Stability and dressing of slope (along and across)

i. The side slope of road embankment within road prism must be exactly as per typical section of road along and across of road length on both sides of road.
ii. It must be well compacted trimmed for grass/shrubs so as to avoid any interference to sight distance.
iii. This activity needs routine check throughout the Network Performance period.
iv. In any 1 km length, the maximum aggregate length of road where the above conditions of slope and dressing are not met **shall not exceed 25m** (along and across)

v. Also, if any 1 km length having deficiency in stability and dressing of slopes at **more than 2 locations**, then that 1 km sections shall be recorded as non-compliant km.
vi. **Response time:** 14 days

2. Cleaning and up keeping of Road side drains

i. Drain is considered blocked if water is observed visually to pond and/or water doesn't readily flow to the outlet points due to accumulated debris in the channel.
ii. In any 1 km section, there **should not be more than 2 locations** where road side drains are blocked
iii. **Response Time:** 14 days

15.9 E. Road Safety related Service Levels (RUS&CPM-5)

Following activities are covered under this section (The detailed defect are to be audited each Km length basis along center line of road.

1. **Maintenance and Upkeep of Traffic and Road Signs**

i. This pertains to maintenance and upkeep of all kinds of traffic and road signs - Mandatory, Regulatory, Informatory and Cautionary
ii. In any 1 km section, there **shall not be more than 2 signs** which are non-compliant
iii. **Response Time:** 14 days

2. **Pavement Marking and Raised Pavement Markers**

i. This pertains to maintenance and upkeep of all pavement markings and raised pavement markers
ii. In any 1 km section, there **shall not be more than 100 m of aggregate length where** road pavement marking and raised pavement markers are deficient.
iii. Also, in any 1 km section, there **shall not be more than 2 locations** where road pavement marking and raised pavement markers are deficient.
iv. **Response Time:** 14 days

3. **Metal beam crash barriers and Guard Rails**

i. This pertains to maintenance and upkeep of metal beam crash barriers and guard rails
ii. In any 1 km section, there **shall not be more than 10 m of aggregate length where** crash barriers and guard rails are deficient.
iii. Also, in any 1 km section, there **shall not be more than 2 locations where** crash barriers and guard rails are deficient.
iv. **Response Time:** 14 days

4. Maintenance and upkeep of speed breakers/ speed hump/ bar marking rumble strips

i. All road elements like speed breakers, speed hump, rumble strips etc must be maintained for its shape, size and as per standard drawings and specifications.
ii. In any 1 km section, there **shall not be more than 1 location** where speed breakers/ speed hump/ bar marking rumble strips are deficient.
iii. **Response Time:** 14 days

15.10 F. Upkeep of Road Furnitures, Road side amenities & Miscellaneous Work (RUS&CPM-6)

1. Maintenance of Marker-posts

i. All marker posts (kilometres/hectometres/ fifth-kilometre), guard stone, boundary stone, indicators, delineators, geru-painting of trees shall comply with the IRC specifications for materials, visibility and spacing, including the maintenance of all painted surfaces. [Relevant Specifications – MoRT&H 5th Revision]

ii. In any 1 km section, there **shall not be more than 2 deficient** marker posts/posts/ stones/ indicator/ delineator/ geru painting, etc.

iii. **Response Time:** 14 days.

2. Upkeep of Bus-Shelters

i. All the elements of bus-shelters shall be maintained intact and suitably painted. Any missing element shall be replaced to the satisfaction of the Engineer.

ii. In any 1 km section, there shall not be **any deficient bus bays/ lay byes/ Bus Shelters**

iii. **Response Time:** 14 days

3. A. Upkeep of Solar Street Lights

i. The maintenance and upkeep of solar street lights shall conform to the relevant specifications given in Section VIC – General and additional technical specifications.

ii. New lights to be provided as necessary and detailed in alignment and utility plan and to be maintained for its purpose and services including painting, marking, functioning in liaison with local bodies. Solar lights functioning must be ensured through contract period after installation. Any repair /maintenance must be done by contractor using required resources including portable cranes.

iii. In any 1 km section, there shall not be **more than 2 dysfunctional solar street lights**

iv. **Response Time:** 14 days

3. B. Upkeep of Solar Light Mast

i. In any 1 km section, there shall not be **any dysfunctional solar light mast**

ii. **Response Time:** 14 days

4. Upkeep of Footpath/ Pedestrian Path/ Junctions/ Traffic Island

i. Wherever pedestrian footpath is provided using paver blocks, its repair/maintenance including replacement of paver blocks in line and level must be done by Contractor throughout the Contract period. Likewise, junctions and islands maintenance shall be kept in order and in as-built conditions.

ii. Marking, painting and upkeep of marked areas, Foot paths, Pedestrian crossings shall be maintained properly at all times

iii. Maintenance of traffic island and junctions shall be done to keep these in proper shape and size, marking and painting etc.

iv. In any 1km section, the maximum aggregate length of deficient footpaths/pedestrian paths/ junctions/ traffic islands **shall not exceed 20m length**

v. In any 1km section, the maximum number of location having deficient footpaths/pedestrian paths/ junctions/ traffic islands **shall not be more than 1**

vi. **Response Time:** 14 days

5. Maintenance of Safe and Smooth Access to/from Access Roads/ Approach Roads

i. Maintenance of access roads and approach roads shall be done properly. A smooth riding quality shall be ensured on the access/ approach roads at all times.

ii. In any 1km section, there shall not be **more than 1 location** which lacks deficiency in ensuring a smooth and safe access to/from the Project Road

iii. **Response Time:** 14 days

15.11 G. Incident Response (RUS & CPM-7)

Incident response is defined as:

(a) The response to all storm damage, weather related incidents and vandalism

(b) Providing patrols in advance of and during:
- Storm
- Major public events and in particular, to monitor the impact on the availability and the level of service of the Contract's roads such that there are no surprises during these events

(c) Responding to accidents and other events that may affect:
- Road user safety and/or
- Contract road integrity and/or
- Contract road safety

1. **Action for contact**

i. In case of any accident or emergency, action shall be taken to contact local administration (*Police, Panchayat bodies*) within 3 hours of incident to facilitate clearing of road traffic, ensure road safety and assist people who have suffered injury or fatality.

ii. This is mandatory at all times in any continuous 1 km section and non-adherence to these in any 1km shall be counted as a non-compliant km

iii. **Response Time:** Three hours

2. **Restoration of all damaged road infrastructure**

i. The contractor shall assist police and other emergency service providers at accident sites with traffic management, detours and site clean-up or the accident debris including oil, fuel or other spillages sufficient to maintain the safe passage of vehicles and pedestrians

ii. The contractor shall repair site damage so that it is safe (such as surfacing repairs, pavement bleeding, guard rail and Accident damage)

iii. The Contractor shall attend any incident that may affect road user safety. This includes activities such as removing obstructions to the free flow of traffic (such as unauthorized construction materials and abandoned vehicles)

iv. During wet weather (e.g. monsoon), the Contractor shall pay particular attention to sections of road which are likely to be damaged or inundated by water. The Contractor shall provide signs on inundated sections of road, clear waterways, pit

entrances and culverts of obstructions, and divert water from the roadway when necessary

v. The Contractor shall remove all blockages from bridges and culverts immediately. In case of flood, the highest level reached by the water on both sides of the road shall be recorded and the Engineer informed within seven (7) days.

vi. The above mentioned items are mandatory at all times in any 1 km section and non-adherence to these shall be counted as a non-compliant km

vii. **Response Time:** 7 days

15.12 Weightages for Service Level Criteria (SLC) during Construction Period & Post Construction Period

Service Level Criteria (SLC) specified for Construction Period has been reasonably relaxed from practical considerations compared to SLC specified for Post Construction Period as many SLC have been dropped for the construction period. Hence there are two different sets of SLC one each for Construction Period and Post Construction Period. SLC and weightages for construction period and post construction period are presented in table below:

Table: Service Level Criteria during Construction Period

Nomenclature	Service Level Criteria	Item	Conformance Requirements	Weightage
RUS&CPM - 1	Pavement and Paved Shoulder Related Service levels	Potholes	Maximum Dia = 15cm Maximum = 3 Nos.	85%
		Settlement	Maximum area = 1 Sqm. Maximum Nos = 2	80%
		Surface Cleanliness including dead animal removal, etc.	Maximum allowed - Nil	15%
		Pavement surface drainage	Water stagnation of maximum 5cm depth Maximum 20m length for 1 hr Maximum location = 1	15%
RUS&CPM - 2	**Hard Shoulders Related Service Level**	Edge Drop/ Settlement	50 mm drop/depth Maximum aggregate length = 25m Maximum locations = 2	10%
		Rain Cuts/Erosion	Maximum Agg Length = 50m Maximum Numbers = 4	30%
		Vegetation Clearing	Maximum 200mm high Maximum aggregate length = 50m Maximum locations = 4	10%
RUS&CPM - 3	**Structures and Cross Drain related Service**	Cleaning and clearing of waterway of all drainage works:	Maximum locations = 0	20%

Nomenclature	Service Level Criteria	Item	Conformance Requirements	Weightage
	Levels	Maintenance and upkeep of bridges and cross drainage structures' headwalls, parapets, crash barriers, railings, joints, drainage spouts, bearings, wing walls, other protection works, floor protection works - maintenance, repair, painting, hazard painting, numbering, etc.	Maximum locations =3	30%
RUS&CPM - 4	**Roadside Slopes and Road Side Drains maintenance and Upkeep**	Stability and dressing of slope (along and across)	Along 25m aggregate length maximum, Maximum = 2 locations	10%
		Cleaning and upkeep of functionality of road side drain	Maximum locations = 2	10%
RUS&CPM - 5	**Road Safety related Service Levels**	Traffic Signs-Maintenance and upkeep of all kind of road signs and traffic signs.	Maximum locations =2	30%
RUS&CPM - 6	**Upkeep of Road Furniture, Road side amenities and Miscellaneous Works related Service Levels**	Maintenance of safe and smooth access to/from Access Roads/ Approach Roads	Maximum location = 1	20%
RUS&CPM - 7	**Incident Response and Emergency Works Response**	Actions for contact and site clearance as per stipulated response time on occurrence of any incidents.	Maximum happening= 0	25%
		Restoration of all damaged road infrastructure (Roadway, Structures, Road furniture, etc.) due to vandalism.	Maximum happening =0	25%

Table: Service Level Criteria Post Construction Period

Nomenclature	Service Level Criteria	Item	Conformance Requirements	Weightage
RUS&CPM - 1	**Pavement and Paved Shoulder Related Service levels**	Potholes	Maximum dia = 15cm Maximum = 3 nos	85%
		Rutting	>10mm & < 20mm in a maximum aggregate length of 100m	85%
		Settlement	Maximum area = 1 Sqm. Maximum Nos = 2	80%
		Any Surface Defects like Bleeding, Ravelling/ disintegration, Streaking, Slippage, cracking etc	Cracking >3mm Maximum area for ravelling 35 Sqm, Maximum Nos = 4	85%

Nomenclature	Service Level Criteria	Item	Conformance Requirements	Weightage
		Edge Break / Edge crack	Maximum agg length 10 m in upto 200mm width. Maximum nos = 2	35%
		Surface Cleanliness including dead animal removal, etc.	Maximum allowed- nil	15%
		Pavement surface drainage	Water stagnation of maximum 5cm depth Maximum 20m length for 1 hr Maximum location = 1	15%
RUS&CPM - 2	**Hard Shoulders Related Service Level**	Edge Drop/ Settlement	50 mm drop/depth, Maximum agg length 25m, Maximum locations= 2.	10%
		Rain Cuts/Erosion	Maximum Agg Length - 50m Maximum Numbers = 4.	30%
		Vegetation Clearing	Maximum 200mm high, Maximum agg length 50m, Maximum locations = 4	10%
		Maintaining standard width	Maximum agg length 50m with shortfall upto 150mm, Maximum = 4 locations	10%
RUS&CPM - 3	**Structures and Cross Drain related Service Levels**	Cleaning and clearing of waterway of all drainage works:	Maximum locations = 0	20%
		Maintenance and upkeep of bridges and cross drainage structures' headwalls, parapets, crash barriers, railings, joints, drainage spouts, bearings, wing walls, other protection works, floor protection works - maintenance, repair, painting, hazard painting, numbering, etc.	Maximum locations =3	30%
RUS&CPM - 4	**Roadside Slopes and Road Side Drains maintenance and Upkeep**	Stability and dressing of slope (along and across)	Along 25m agg length maximum, Maximum =2 locations	10%
		Cleaning and upkeep of functionality of road side drain	Maximum locations = 2	10%
RUS&CPM - 5	**Road Safety related Service Levels**	Traffic Signs-Maintenance and upkeep of all kind of road signs and traffic signs.	Maximum locations =2	30%
		Pavement Marking and Raised Pavement Markers	Maximum agg length =100m Maximum locations = 2	30%
		Metal Beam Crash Barriers, Guard Rails (Safety/Pedestrian)	Maximum agg length = 10m, Maximum locations = 2	90%

Nomenclature	Service Level Criteria	Item	Conformance Requirements	Weightage
		Maintenance and upkeep of Speed Breakers/Speed Hump, Bar marking Rumble strips	As per IRC Maximum locations= 1	25%
RUS&CPM - 6	**Upkeep of Road Furniture, Road side amenities and Miscellaneous Works related Service Levels**	Any posts / stones / markers (Kilometer / hectometer /fifth kilometer /guard /boundary / indicator / delineator / others including geru painting on road side trees)	Maximum locations = 2	25%
		Upkeep of Bus shelters	Maximum locations = 0	20%
		Upkeep Solar Street Lights	Maximum numbers = 2	25%
		Upkeep of Solar light mast	Maximum numbers = 0	25%
		Upkeep of Foot Paths/Pedestrian Paths/Junctions / Islands	Maxm agg length - 20m, Maximum locations= 1	25%
		Maintenance of safe and smooth access to/from Access Roads/ Approach Roads	Maximum location = 1	20%
RUS&CPM - 7	**Incident Response and Emergency Works Response**	Actions for contact and site clearance as per stipulated response time on occurrence of any incidents.	Maximum happening= 0	25%
		Restoration of all damaged road infrastructure (Roadway, Structures, Road furniture, etc.) due to vandalism.	Maximum happening =0	25%

- Contractor shall conduct self-auditing of 100% length of the network roads.
- Engineer shall also conduct audit on 100% length of the networks roads after receiving and studying Contractor's audit report.
- In any 1 km length, if a service level criteria exceeds the threshold value, will make that km non-compliant (for e.g. in any km, either of the two conditions will make that km non-complaint if size of potholes exceeds 15 cm diameter and/or number of potholes exceeding 3 numbers). Any non-compliance in any km will make that kilometre fall in the category of non-compliant length.
- During monthly audit, payment reduction length (NC Length) is calculated by multiplying non-compliant length by corresponding weightage. For all defects observed during the audit, a response time is allocated to repair the defect.
- In case of more than one type of non-compliance is observed in any 1 km, only the non-compliance having the highest weightage shall be considered for calculating payment reduction length.
- Lump sum payment reduction amount is "Monthly payment for Network Performance per km". As SLC is relatively relaxed during construction period hence during construction period the lump sum payment reduction amount is also reduced to 50% of the Monthly Payment for Network Performance per km.

- Amount to be deducted from performance-linked monthly payment is calculated by multiplying Payment reduction length (Km) and Stipulated Monthly Payment for Network Performance per km.

  Payment Reduction = Payment reduction length (Km) x Stipulated Monthly Payment per km

  (Illustrated in Chapter 17 in the example)
- In case of continuance of multiple non-compliances in any one kilometre beyond their stipulated response times an additional penalty shall be applied. Payment reduction length for continuance of non-compliance beyond response time shall be worked out by multiplying NC Length (continued after response time) and ratio of Days exceeding response time to permitted response time. **(Illustrated in Chapter 17 in the example)**
- Additional penalty shall be calculated by multiplying Payment Reduction Length by Monthly payment for Network Performance per km as the case may be (i.e. during or post construction) **(Illustrated in Chapter 17 in the example)**

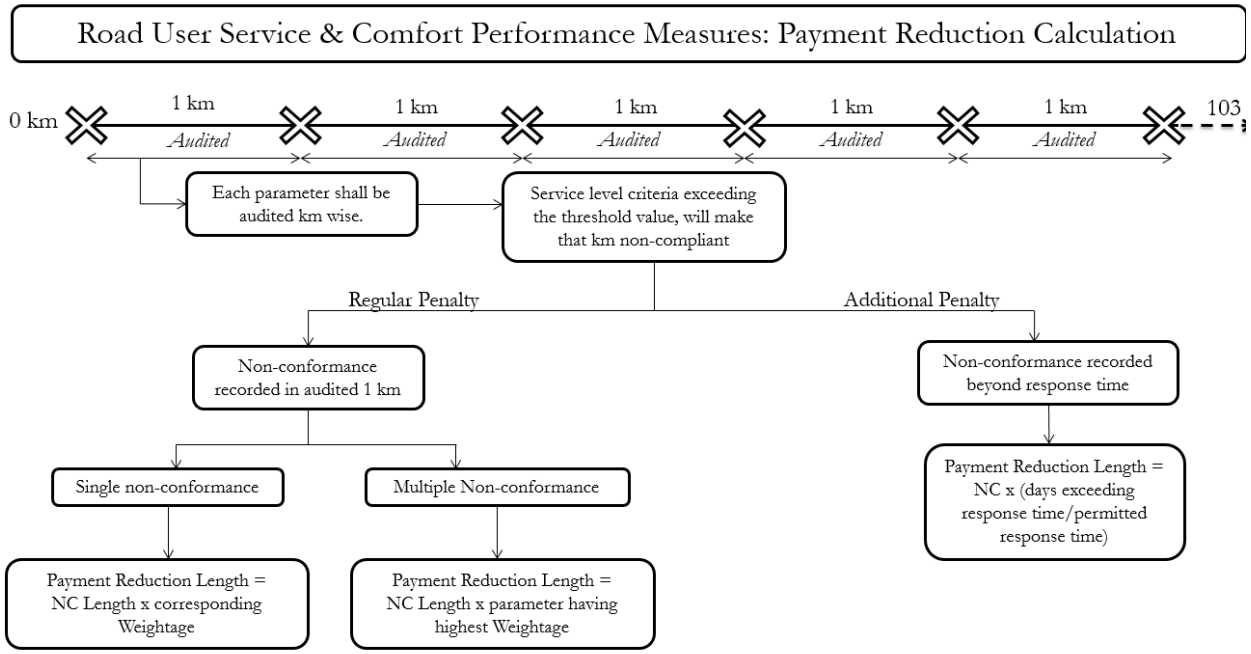


Figure 2 RUS&CPM: Illustration of payment reduction mechanism

16. ROAD DURABILITY PERFORMANCE MEASURES

Road Durability Performance Measures (RDPM's) are the measures undertaken by the Contractor to protect the pavement & surfacing assets, and check the consumption of these assets over the duration of the contract. The Contractor should take full ownership of the intent of these measures and manage their performance proactively throughout the year.

Although the frequenci**es** of road durability performance measurement**s** by the **Contractor and Engineer are i**ndicated for each of the durability performance measures, but this shall not limit the Employer's right to carry out **such** measurements any time during **the contract period**.

The following Road Durability Performance Measures (RDPM's) apply to this contract:

Nomenclature	Road Durability Performance Measures (RDPM's)	Action in Case of Non-Conformance
RDPM-1	Pavement Roughness	Deduction in payment shall be in accordance to Service Level management criteria as detail in NWPPM (Post Construction)
RDPM-2	Pavement deflection	Deduction in payment shall be in accordance to Service Level management criteria as detail in NWPPM (Post Construction)

16.1. Measurement and Non-Conformance of RDPM's

Measurement of Road Durability Performance Measures is detailed in Chapter 8: Measurement and Completion of Works (Clause 8.2) along with the actions in case of Non-Conformance of these RDPM's.

1. Pavement Roughness (RDPM-1)

i. In any 1 km section, the maximum roughness value recorded **shall not exceed 2500mm at any time** post Improvement and Rehabilitation Works**.** If exceeded, that km will be recorded as **non-compliant km**
ii. **Response Time:** 90 days

(Refer Chapter 8 - Clause 8.2.1 for measurement, frequency, conformance, etc.)

2. Pavement Deflection (RDPM-2)

i. The deflection check must be done every year post monsoon preferably in the month of October/November with due consent of the Engineer. Deflection information including data analyses and residual life shall be reported for each road separately. FWD test including test intervals shall be done as per IRC 115-2014.
ii. In any section, the pavement deflection by FWD test shall be such that the residual life of the pavement covers the contract period adequately. For any homogeneous section if the deflection measured is such that the residual life does not cover the contract period adequately then all the kilometers coming under the homogeneous section(s) shall be recorded as non-compliant kilometers and payment reduction shall be effected accordingly.
iii. **Response Time:** 90 days

(Refer Chapter 8 - Clause 8.2.2)

16.2. Payment Reduction on account of Non-Conformance of RDPM's

Any non-conformance recorded for non-compliant km, a lump sum payment shall be **withheld** from the monthly network performance payment as given in table below.

	Service Level Criteria	Lump sum Payment Withheld for NC (Rs)
RDPM – 1	Pavement Roughness	15,00,000
RDPM – 2	Pavement Deflection	50,00,000

- Contractor shall conduct self-audit of 100% length of the network roads.
- Engineer shall also conduct audit on 100% length of the networks roads after receiving and studying Contractor's audit report.
- In any 1 km length, if service level criteria exceed the threshold value, will make that km non-compliant (for e.g. in any 1 km section, the pavement deflection by FWD test shall not exceed 1.2mm, if exceeded, that section will be recorded as non-compliant km). Any non-compliance in any km will make that kilometre fall in the category of non-compliant length.
- In the audit cycle (Roughness – Every 6 months, Pavement deflection – Once in a year), if any non-compliance is recorded, lump sum payment reduction amount per km shall be withheld until complied.
- If the identified defect is rectified under given response time, the amount withheld shall be released and penalty imposed shall be zero.
- If the defect identified is not rectified under given response time, then non-compliant length due to continuance of non-compliance beyond the response time is calculated by multiplying non-compliant Length (continued after response time) and ratio of Days exceeding response time to permitted response time (illustrated in example given in Chapter 17)
- Subsequently payment reduction amount is calculated by multiplying non-compliant length beyond response time by lump sum payment reduction amount.

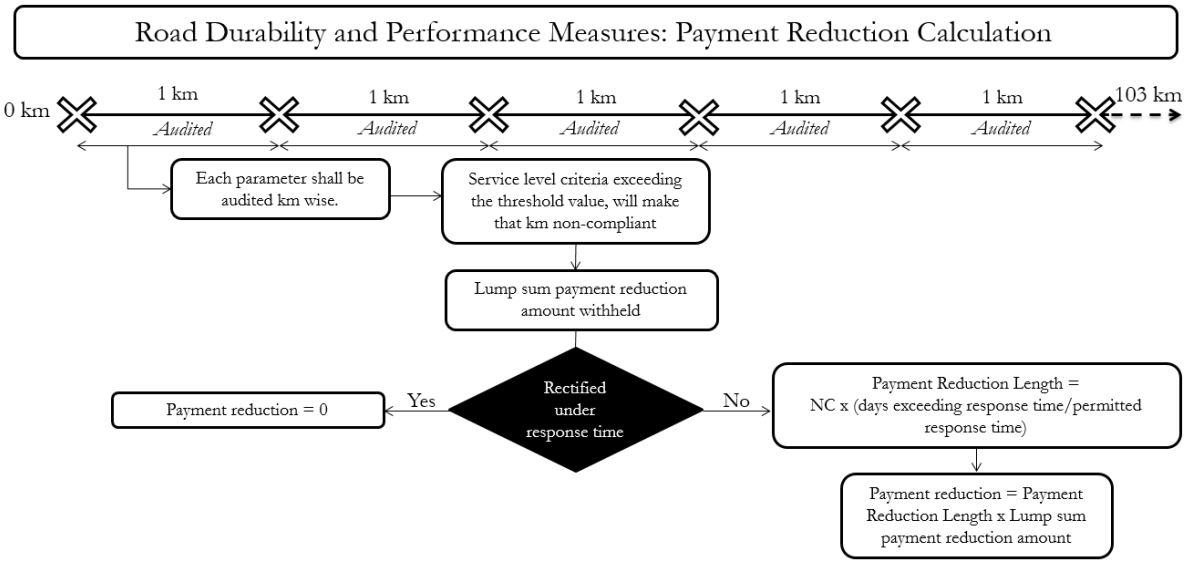


Figure 3 RDPM: Illustration of Payment Reduction

17. PAYMENTS

This is a Lump Sum price Contract, further apportioned in fixed proportion for each of the four components (Improvement, Rehabilitation, Resurfacing and Network Performance) of the Contract. The payments for the Works component executed as per the Contract to the satisfaction of the Engineer i.e. for the Improvement Works, Rehabilitation Works and Resurfacing Works shall be made on the basis of completed linear centreline lengths and for Network Performance the payment shall be a fixed periodic amount (quarterly/monthly) after completion of the construction (Improvement and Rehabilitation) Works provided that the roads are maintained at specified service level.

Emergency Works, if done following work order, to this effect shall be paid as approved by the Engineer as provided for in the Contract.

The method of measurement of completed work for payment shall be in accordance with the measurement and payment provisions of the relevant Chapter of the Specifications.

During the execution of the contract the Contractor shall not be entitled to any payments to execute any additional Improvement Works, Rehabilitation Works or Resurfacing Works in excess of the quantity in the Accepted Programme for that year unless any additional quantity is approved in advance by the Employer.

17.1. Payments for Improvement Works

a) The Payment Schedule for Improvement Works lists a set of identified interventions to be carried out by the Contractor for each year of the contract that add new characteristics to the Road in response to existing or new traffic, safety or other conditions, including EMP & Enhancement works and routine maintenance during construction period, as defined in the Bid Data Sheet and the Specifications.

b) 90% Payment for Improvement Works shall be made based upon the assessed centreline kilometers substantially completed and claimed by the Contractor and verified by the Engineer. Verification includes all required post construction testing.

c) The derived unit rate for payment purposes shall be based upon the amounts of currencies apportioned for Improvement works mentioned in the Letter of Bid, Appendix to Bid, Table C divided by the total kilometers scheduled in the Payment Schedule for Improvement Works to be completed during the Construction Period of the Contract.

Derived Unit Rate (₹ /km) for **Improvement Works (in local currency):**

$$\frac{\text{Amount of local currency for Improvement Works}}{\text{Total Length (km) of } \textbf{Improvement Works}}$$

Where, amount of local currency for Improvement Works shall come from Appendix to Bid, Table C- Summary of Payment Currencies, Column A1

Derived Unit Rate (FC#1 /km) for **Improvement Works (in foreign currency, say FC#1)**

$$\frac{\text{Amount of foreign currency (\#FC1) for Improvement Works}}{\text{Total Length (km) of } \textbf{Improvement Works}}$$

Where, amount of foreign currency (FC#1) for Improvement Works shall come from Appendix to Bid, Table C-Summary of Payment Currencies, Column A1

Similarly, unit rates corresponding to other foreign currencies shall be worked out and applied for payments.

d) Except for the final Periodic Statement for the respective year of the Contract, the Contractor shall be entitled to request 90% payment only when substantially completed (but previously unclaimed). Improvement works equals or exceeds a minimum of five (5) kilometers of aggregated centre line length comprising each of a minimum of 1 km of continuous length except for the last payment request which may comprise of shorter lengths.

e) Failure to achieve the required annual quantity of Improvement Works shall result in imposition of Liquidated Damages pursuant to GC clause 39.3.

f) The Employer reserves the right to increase or decrease the quantity of Improvement Works within ± 20% of the total contract quantity. Where the Employer increases or decreases the total contract quantity of Improvement Works, the value of the Output Category shall be adjusted up or down by the respective weighted unit rate.

g) The Employer shall only pay once for all completed improvement works i.e. total payment for the improvement works shall be restricted to the quantities scheduled in the Payment Schedule A. Improvement Works). Where any section of pavement constructed is deemed by the Employer to have failed before the completion of the contract duration then the required re-construction will be undertaken by the Contractor at no cost to the Employer.

17.2. Payments For Rehabilitation Works

a) 90% payment for Rehabilitation Works shall be made based upon the assessed centreline kilometers substantially completed as defined under and claimed by the Contractor and verified by the Engineer, including Enhancement works and Routine maintenance works during Construction period. Verification includes all required post construction testing. Final payment shall be made after full compliance of item of work. Substantially verified work must be completed as final work within next payment cycle in the same financial year. Payment of Rehabilitation works includes cost of EMP and Enhancement cost duly instructed, accepted and approved by Engineer.

b) The derived unit rate for payment purposes shall be based upon the amounts of currencies apportioned for Rehabilitation works mentioned in the Letter of Bid, Appendix to Bid, Table C divided by the total kilometres scheduled in the Payment Schedule for Rehabilitation Works to be completed during the Construction Period of the Contract.

Derived Unit Rate (₹ /km) for **Rehabilitation Works (in local currency):**

$$\frac{\text{Amount of local currency for Rehabiliation Works}}{\text{Total Length (km) of } \textbf{Rehabilitation Works}}$$

Where, amount of local currency for Rehabilitation Works shall come from Appendix to Bid, Table C- Summary of Payment Currencies, Column A2

Derived Unit Rate (FC#1 /km) for **Rehabilitation Works (in foreign currency, say FC#1)**

$$\frac{\text{Amount of foreign currency (\#FC1) for Rehabilitation Works}}{\text{Total Length (km) of } \textbf{Rehabilitation Works}}$$

Where, amount of foreign currency (FC#1) for Rehabilitation Works shall come from Appendix to Bid, Table C-Summary of Payment Currencies, Column A2

Similarly, unit rates corresponding to other foreign currencies shall be worked out and applied for payments.

c) Except for the final Periodic Statement for the respective year of the contract the Contractor shall be entitled to make a payment request of 90% payment, only when substantially completed (but previously unclaimed). Rehabilitation works, equals or exceeds a minimum of five (5) kilometers of aggregated centre line length comprising each of a minimum of 1 km of continuous length except for the last payment request which may comprise of shorter lengths. Final payment shall be made after full compliance of item of work.

d) Failure to achieve the required annual quantity (as planned - Refer Specifications Section) of Improvement Works shall result in imposition of Liquidated Damages pursuant to GC clause 39.3.

e) The Employer reserves the right to increase or decrease the quantity of Rehabilitation works within ± 20% of the total contract quantity. Where the Employer increases or decreases the total contract quantity of Rehabilitation Works, the value of the Output Category shall be adjusted up or down by the respective weighted unit rate.

f) The Employer shall only pay once for all completed Rehabilitation works of the existing pavement i.e. total payment for the Rehabilitation works shall be restricted to the quantities scheduled in the Payment Schedule: B. Rehabilitation Works. Where any section of rehabilitated pavement is deemed by the Engineer to have failed before the completion of the contract duration then the required re-construction will be undertaken by the Contractor at no cost to the Employer.

17.3. Payments for Resurfacing Works

a) The Payment Schedule for Mandatory Resurfacing Works sets out in Rehabilitation section in 9th and 10th year in improvement and Rehabilitation Sections respectively.

b) 95% of the Payment for Resurfacing Works shall be made based upon the assessed centerline kilometers substantially completed and claimed by the Contractor and verified by the Engineer. Verification includes all required post construction testing. Final payment shall be made after full compliance of item of work including execution of EMP and Enhancement works as directed and verified by Engineer.

c) The derived unit rate for payment purposes shall be based upon the amounts of currencies apportioned for Resurfacing works mentioned in the Letter of Bid, Appendix to Bid, Table C divided by the total kilometers scheduled in the Payment Schedule for Resurfacing Works to be completed.

Derived Unit Rate (₹ /km) for **Resurfacing Works (in local currency):**

$$\frac{\text{Amount of local currency for Resurfacing Works}}{\text{Total Length (km) of } \textbf{Resurfacing Works}}$$

Where, amount of local currency for Resurfacing Works shall come from Appendix to Bid, Table C- Summary of Payment Currencies, Column A3

Derived Unit Rate (FC#1 /km) for **Resurfacing Works (in foreign currency, say FC#1)**

$$\frac{\text{Amount of foreign currency (\#FC1) for Resurfacing Works}}{\text{Total Length (km) of } \textbf{Resurfacing Works}}$$

Where, amount of foreign currency (FC#1) for Resurfacing Works shall come from Appendix to Bid, Table C-Summary of Payment Currencies, Column A3

Similarly, unit rates corresponding to other foreign currencies shall be worked out and applied for payments.

d) Except for the final Periodic Statement for the respective year, the Contractor shall be entitled to make a 95% payment request when substantially completed but previously unclaimed, resurfacing works equals or exceeds a minimum of Five (5) kilometers of aggregated centre line length comprising each of a minimum of 1 km of continuous length except for the last payment request which may comprise of shorter lengths.

e) The Employer shall only pay once for all completed resurfacing works i.e. total payment for the resurfacing works shall be restricted to the quantities scheduled in the Payment Schedule: C. Resurfacing Works). Where any section of resurfacing is deemed by the Engineer to have failed before the completion of the contract duration then the required re-construction will be undertaken by the Contractor at no cost to the Employer.

f) Failure to achieve the required quantity (as planned - Refer Specifications Section) of Resurfacing Works shall result in imposition of Liquidated Damages pursuant to GC clause 39.3.

g) The Employer reserves the right to increase or decrease the quantity of Rehabilitation works within ± 20% of the total contract quantity. Where the Employer increases or decreases the total contract quantity of Rehabilitation Works, the value of the Output Category shall be adjusted up or down by the respective weighted unit rate.

17.4. Payments For Network Performance

a) Out of set 100% Network Performance payments, 30% upfront Payment shall be made to the Contractor every month (provided the Contractor doesn't neglect network performance grossly –as detailed in service level criteria.(Table in Chapter 17) and remaining 70% payment shall be performance linked ; this payment shall be made quarterly based on service level achievement by the contractor in accordance with the actual performance of the Contractor against the Service Level criteria given in the Specifications. Failure to meet the Service Levels will result in payment reductions in accordance with Clause 47 of the General Conditions and the relevant Performance Specifications.

b) For the purpose of payment to Contractor, against the apportioned amount against Network Performance Component , the equal monthly/quarterly amount shall be worked out as below

A. In local currency,

Monthly Network Performance Payment (Upfront) =

$$\frac{(0.30 * \text{Amount of local currency for Network Performance})}{96}$$

Quarterly Network Performance Payment =

$$\frac{(0.70 * \text{Amount of local currency for Network Performance})}{32}$$

Where, amount of local currency for Network Performance shall come from Appendix to Bid, Table C- Summary of Payment Currencies, Column A4

B. In foreign currency,

Monthly Network Performance Payment (Upfront) =

$$\frac{(0.30 * \text{Amount of foreign currency (say FC\#1)for Network Performance})}{96}$$

Quarterly Network Performance Payment =

$$\frac{(0.70 * \text{Amount of foreign currency (say FC\#1)for Network Performance})}{32}$$

Where, amount of foreign currency (say FC#1) for Network Performance shall come from Appendix to Bid, Table C- Summary of Payment Currencies, Column A4

c) Network performance during the Construction Period (stipulated or extended) shall be deemed to be incidental to the Improvement and Rehabilitation Works**.** Failure to meet the Service Levels laid down for Construction Period will result in payment reductions in accordance with Clause 47 of the General Conditions and the relevant Performance Specifications.

d) The payment against Network Performance works during Post Construction period shall be in consideration of fulfillment of Service Level Criteria stipulated as per the Network Performance Payment Management table given in this chapter. The Employer reserves the right to increase or decrease the quantity of Rehabilitation works within ± 20% of the total contract quantity. Where the Employer increases or decreases the total contract quantity of Rehabilitation Works, the value of the Output Category shall be adjusted up or down by the respective weighted unit rate.

17.5. Remuneration of Emergency Works

a) Payment shall be made for the Actual quantities for Emergency Works executed and specified in Work Orders, issued by the Engineer with Employer's concurrence, in accordance with the General Conditions and the Particular Conditions (PC Clause 29 and Clause 63).
b) For the Emergency Works, payments will be made for each emergency on a case-to-case basis as provided in the Contract, based on the actual work quantities approved by the Engineer after obtaining Employer's approval in terms of provisions of Clause 63 of GC.
c) The Contractor's Periodic Statement for ordered Emergency Works shall be based upon Work Order rates and in accordance with the relevant clauses of the GC.
d) The Contractor's Periodic Statement for any ordered Emergency Works shall be sufficiently detailed to enable the Engineer to readily determine and verify the quantity of work completed and the basis of the rates that have been applied. Where the Contractor fails to provide sufficient detail to enable this assessment to be easily and efficiently undertaken then the Engineer may reject the Periodic Statement until such time as the Contractor supplies the required level of detail and supporting information.

17.6. Price Adjustments

Price Adjustments are allowed under the Contract. The lump sums for Improvement works, Rehabilitation Works, Resurfacing Works, Network Performance Works and Emergency works are subjected to Price Adjustment. Refer to Particular Conditions: Clause 48.1.

Sample case for Network Performance Payment Management and Cost implication of Non-Conformance (During Construction Period)

Abstract of Network Performance Payment Deduction Management (During Construction)					
Road Name:	**Dhandhuka-Dholera**	**Dhandhuka-Paliyad**	**Limdi-Dhandhuka**	**Overall**	**Remarks**
Total Length in km	27.000	46.246	29.967	103.213	
Total Audit Length in km	27.000	46.246	29.967	103.213	
Monthly Payment for Network Performance for deduction purpose only **(@ 50% of post-construction payment)**				18,06,228	
Monthly Payment for Network Performance Per Km for deduction purpose only				17,500	
Deduction-1 (D1) - MPM	**Dhandhuka-Dholera**	**Dhandhuka-Paliyad**	**Limdi-Dhandhuka**	**Overall**	**Amount**
Management Performance Measure				1,00,000	**1,00,000**
Deduction-2 (D2) - RUS & CPM	**Dhandhuka-Dholera**	**Dhandhuka-Paliyad**	**Limdi-Dhandhuka**	**Overall**	**Amount**
Total Payment Deduction Length (km) - Regular				14.10	2,46,750
Total Payment deduction length due to continuance of non-compliance beyond response time (km) - Penalty				5.79	1,01,250
Total Payment withheld / Reduction (₹)	-	-	-	**19.89**	**3,48,000**
Grand Total Deduction in Payment (D1+D2) (₹)					**4,48,000**

Sample case for Network Performance Payment Management and Cost implication of Non-Conformance (During Construction Period)

Network Performance Payment Management Deduction - During Construction Period													
Road Name: All Network roads													
Road Length in km =		**103.213**											
Audit Length in km =		**103.213**	**100%**										
Nature of Work: Improvement/ Widening and Strengthening /Rehabilitation													
I	**Management Performance Measure (MPM) [Ref. - Chapter 14]**												
Service Level Indicators / Permitted Non-conformance Levels per km		**Target Compliance** **No.**		**Non Compliant (No.)**	**Lump-sum Payment Reduction (₹)**								**Total Payment Reduction (₹)**
		A		**B**	**C**								**D=BXC**
1	Quality Assurance System / QAP including it's Implementation - MPM-1	100%		0	1,00,000								-
2	Contractor's work programme - MPM-2	100%		0	1,00,000								-
3	Contractors Report submission - MPM-3	100%		1	50,000								50,000

Network Performance Payment Management Deduction - During Construction Period													
4	Traffic Management Plan & Implementation - MPM-4	100%		0	1,50,000								-
5	Inventory Database Management - MPM-5	100%		1	50,000								50,000
6	Detailed Design and Construction Methodology - MPM-6	100%		0	1,50,000								-
				Total	**6,00,000**							**Total**	**1,00,000**
II	**Road User Service & Comfort Performance Measures [Ref. - Chapter 15]**												
Service Level Indicators / Permitted Non-conformance Levels per km		**Target Compliance**		**Actual Compliance (km)**	**Non Compliant (km)**	**Weightage % (Regular) to non-compliant length**	**Payment Reduction Length (Regular) in km**	**Non-compliant length (km) continuing beyond response time**	**Permitted Response time (days)**	**Days taken for compliance**	**No. of days of non-compliance exceeding the response time**	**Non-compliant length due to continuance of non-compliance beyond response time (km)***	**Non-compliant length for payment reduction (km)**
		% of Audit Length	**km**										
				1	**2**	**3**	**4=2X3**	**5**	**6**	**7**	**8=7-6**	**9=5X(8/6)**	**10=(4+9)**
	A. Pavement and Paved Shoulder Related Service												

Network Performance Payment Management Deduction - During Construction Period													
	levels												
1	Potholes - Maximum size 15cm dia -3 Nos maxm	100%	103.0	97	6.0	85%	5.10	1.00	7	14	7.00	1.00	6.10
2	Settlement - Maximum area 1 Sqm. Maximum Nos = 2	100%	103.0	100	3.0	80%	2.40	1.00	14	21	7.00	0.50	2.90
3	Surface Cleanliness including dead animal removal, etc.- maximum allowed- nil)	100%	103.0	100	3.0	15%	0.45	1.00	1	1	0.00	0.00	0.45
4	Pavement surface drainage (water stagnation - maxm 5cm depth, maxm 20m length for 1 hr- maximum 1 no.)	100%	103.0	100	3.0	15%	0.45	1.00	1	3	2.00	2.00	2.45
	B. Hard Shoulder Related Service levels												
1	Edge Drop/ Settlement - 50 mm drop/depth, Maximum agg length 25m, Maximum locations= 4/2.	100%	103.0	100	3.0	10%	0.30	1.00	14	21	7.00	0.50	0.80
2	Rain Cuts/Erosion - Maximum Agg Length - 50m, Maximum Numbers = 4.	100%	103.0	100	3.0	30%	0.90	1.00	10	10	0	0.00	1.33
3	Vegetation Clearing - Maximum 200mm high, Maximum agg length 50m, Maximum locations -4	100%	103.0	100	3.0	10%	0.30	1.00	14	21	7.00	0.50	0.80
	C. Structures and Cross Drain related Service												

Network Performance Payment Management Deduction - During Construction Period													
	Levels												
1	Cleaning and clearing of waterway of all drainage works: Maximum locations = 0	100%	103.0	100	3.0	20%	0.60	0.00	7	7	0.00	0.00	0.60
2	Necessary Safety Provisions at bridges and cross drainage structures' headwalls, parapets, crash barriers, railings; Maximum locations =3	100%	103.0	100	3.0	30%	0.90	0.00	21	21	0.00	0.00	0.90
	D. Road side slopes and road side drains maintenance and upkeep												
1	Stability and dressing of slope (along and across) - Along 25m agg length maxm, across - Full width, Maximum =2 locations	100%	103.0	100	3.0	10%	0.30	0.00	14	14	0.00	0.00	0.30
2	Cleaning and upkeep of functionality of road side drain - Maximum locations = 2	100%	103.0	100	3.0	10%	0.30	1.00	14	19	5.00	0.36	0.66
	E. Road Safety related Service Levels												
1	Traffic Signs-Maintenance and upkeep of all kind of road signs and traffic signs. Maximum locations =2	100%	103.0	100	0.0	30%	0.00	0.00	14	14	0.00	0.00	0.00

Network Performance Payment Management Deduction - During Construction Period													
	F. Upkeep of Road Furniture, Road side amenities and Miscellaneous Works related Service Levels												
1	Maintenance of safe and smooth access to/from Access Roads/ Approach Roads - Maximum location = 1	100%	103.0	100	3.0	20%	0.60	1.00	14	21	7.00	0.50	1.10
	G. Incident Response and Emergency Works Response												
1	Actions for contact and site clearance as per stipulated response time on occurrence of any incidents. Maximum happening= 0	100%	103.0	100	3.0	25%	0.75	0.00	0.13	0.13	0.00	0.00	0.75
2	Restoration of all damaged road infrastructure (Roadway, Structures, Road furniture, etc.) due to vandalism. Maximum happening =0	100%	103.0	100	3.0	25%	0.75	0.00	7	7	0.00	0.00	0.75
						Total	**14.10**					**5.36**	**19.46**
Steps:													
1	Contractor to conduct self audit of 100% length of the network roads.												
2	Engineer to conduct audit on 100% length of the networks roads after receiving and studying Contractor's audit report.												

Network Performance Payment Management Deduction - During Construction Period	
3	In "permitted non-conformance levels" column, exceeding of any of the threshold criteria will make that km non-compliant. (e.g. In any km, either of the two conditions will make that km non-complaint: 1) size of potholes exceeding 15 cm diameter 2) Numbers of potholes exceeding 3 numbers.)
4	Any non-compliance in any km will make that kilometer fall in the category of non-compliant length.
5	In case of more than one types of non-compliance in any one kilometer, only the non-compliance having the highest weightage % (regular) shall be considered for payment reduction length.
6	In case of continuance of multiple non-compliances in any one kilometer beyond their stipulated response times, payment reduction length for continuance of non-compliance beyond response time shall be worked out for each non-compliance individually considering their respective response times.
7	Total non-compliant length of all the network roads shall be multiplied by specified network performance payment per km to work out amount to be deducted from the performance-linked monthly payment specified for network performance.
8	Rutting more than 20mm shall be rectified by the Contractor at his own cost.
Note:	
1	Feed data only in columns 1,5,7 for RUS & CPM
2	Payment Reduction = Payment reduction length (Km) **X** Stipulated Monthly Payment per Km

Sample case for Network Performance Payment Management Service Level Management and Cost implication of Non-Conformance (Post Construction Period)

Abstract of Network Performance Payment Management (Post Construction)					
Road Name:	**Dhandhuka-Dholera**	**Dhandhuka-Paliyad**	**Limdi-Dhandhuka**	**Overall**	**Remarks**
Total Length in km	27.000	46.246	29.967	103.213	
Total Audit Length in km	27.000	46.246	29.967	103.213	
Monthly Payment for Network Performance (₹)				36,12,455	
Monthly Payment for Network Performance Per Km (₹)				35,000.00	
Deduction-1 (D1) – MPM	**Dhandhuka-Dholera**	**Dhandhuka-Paliyad**	**Limdi-Dhandhuka**	**Overall**	**Amount**
Management Performance Measure					**50,000**
Deduction-2 (D2) - RUS & CPM	**Dhandhuka-Dholera**	**Dhandhuka-Paliyad**	**Limdi-Dhandhuka**	**Overall**	**Amount**
Total Payment Reduction Length (km) - Regular				56.75	19,86,250
Total Payment reduction length due to continuance of non-compliance beyond response time (km) - Penalty				11.29	3,95,000
Total Payment Reduction (₹)	**-**	**-**	**-**	**68.04**	**23,81,250**
Withheld / Deduction-3 (D3) - RDPM	**Dhandhuka-Dholera**	**Dhandhuka-Paliyad**	**Limdi-Dhandhuka**	**Overall**	**Amount**
Total Payment withheld / Reduction Length (km) - Regular				-	-
Total Payment reduction length due to continuance of non-compliance beyond response time (km) - Penalty				2.00	**3,61,111**

Total Payment withheld / Reduction (₹)	**-**	**-**	**-**	**2.00**	**3,61,111**
Grand Total Reduction in Payment (D1+D2+D3) (₹)					**27,92,361**

Sample case for Network Performance Payment Management and Cost implication of Non-Conformance (Post Construction Period)

Detailed Service Level work Sheet –Post Construction

Network Performance Payment Management - Post Construction Period													
Road Name: All Network Roads													
Road Length in km =		**103.213**											
Audit Length in km =		**103.213**	**100%**										
Nature of Work: Improvement/ Widening and Strengthening													
I	**Management Performance Measure (MPM) [Ref. - Chapter 14]**												
Service Level Indicators / Permitted Non-conformance Levels per km		**Target Compliance**		**Non Complaint (No.)**	**Lump-sum Payment Reduction (₹)**								**Total Payment Reduction (₹)**
		No.											
		A		**B**	**C**								**D=BXC**
1	Quality Assurance System / QAP including it's Implementation - MPM-1	100%		0	1,00,000								-
2	Contractor's work programme - MPM-2	100%		0	1,00,000								-
3	Contractors Report submission - MPM-3	100%		1	50,000								50,000
4	Traffic Management Plan & Implementation - MPM-4	100%		0	1,50,000								-
5	Inventory Database Management - MPM-5	100%		0	50,000								-
6	Detailed Design and Construction Methodology - MPM-6	100%		0	1,50,000								-
				Total	**6,00,000**							**Total**	**50,000**

II	**Road User Service & Comfort Performance Measures [Ref. - Chapter 15]**												
Service Level Indicators / Permitted Non-conformance Levels per km		**Target Compliance**		**Actual Compliance (km)**	**Non Compliant (km)**	**Weightage % (Regular) to non-compliant length**	**Payment Reduction Length (Regular) in km**	**Non-complaint length (km) continuing beyond response time**	**Permitted Response time (days)**	**Days taken for compliance**	**No. of days of non-compliance exceeding the response time**	**Non-compliant length due to continuance of non-compliance beyond response time (km)***	**Non-compliant length for payment reduction (km)**
		% of Audit Length	**km**										
				1	**2**	**3**	**4=2X3**	**5**	**6**	**7**	**8=7-6**	**9=5X(8/6)**	**10=(4+9)**
	A. Pavement and Paved Shoulder Related Service levels												
1	Potholes - Maximum size 15cm dia -3 Nos max[m]	100%	103.0	94	9	85%	7.65	2.00	7.00	14.00	7.00	2.00	9.65
2	Rutting >10mm & < 20mm in a maximum aggregate length of 100m	100%	103.0	97	6.0	85%	5.10	3.00	28.00	28.00	0.00	0.00	5.10
3	Settlement - Maximum area 1 Sqm. Maximum Nos = 2	100%	103.0	95	8.0	80%	6.40	3.00	14.00	15.00	1.00	0.21	6.61
4	Any Surface Defects like Bleeding, Raveling/ disintegration, Streaking, Slippage, cracking >3mm, etc. - Maximum area 35 Sqm, Maximum Nos = 4	100%	103.0	94	9.0	85%	7.65	3.00	28.00	28.00	0.00	0.00	7.65
5	Edge Break / Edge crack - Maximum agg length 10 m in upto 200mm width. Maximum nos = 2	100%	103.0	94	9.0	35%	3.15	3.00	21.00	28.00	7.00	1.00	4.15
6	Surface Cleanliness including dead animal removal, etc.- maximum allowed- nil)	100%	103.0	100	3.0	15%	0.45	1.00	1.00	1.00	0.00	0.00	0.45

7	Pavement surface drainage (water stagnation - max^{m} 5cm depth, max^{m} 20m length for 1 hr- maximum 1 no.)	100%	103.0	97	6.0	15%	0.90	2.00	1.00	1.00	0.00	0.00	0.90
	B. Hard Shoulder Related Service levels												
1	Edge Drop/ Settlement - 50 mm drop/depth, Maximum agg length 25m, Maximum locations= 4/2.	100%	103.0	91	12.0	10%	1.20	3.00	14.00	15.00	1.00	0.21	1.41
2	Rain Cuts/Erosion - Maximum Agg Length - 50m, Maximum Numbers = 4.	100%	103.0	91	12.0	30%	3.60	3.00	10.00	15.00	5.00	1.50	5.10
3	Vegetation Clearing - Maximum 200mm high, Maximum agg length 50m, Maximum locations -4	100%	103.0	100	3.0	10%	0.30	2.00	14.00	15.00	1.00	0.14	0.44
4	Maintaining standard width - Maximum agg length 50m with shortfall upto 150mm, Maximum = 4 locations	100%	103.0	100	3.0	10%	0.30	1.00	28.00	15.00	0.00	0.00	0.30
	C. Structures and Cross Drain related Service Levels												
1	Cleaning and clearing of waterway of all drainage works: Maximum locations = 0	100%	103.0	97	6.0	20%	1.20	3.00	7.00	15.00	8.00	3.43	4.63
2	Maintenance and upkeep of bridges and cross drainage structures' headwalls, parapets, crash barriers, railings, joints, drainage spouts, bearings, wing walls, other protection works, floor protection works - maintenance, repair, painting, hazard painting, numbering, etc. Maximum locations =3	100%	103.0	97	6.0	30%	1.80	3.00	21.00	15.00	0.00	0.00	1.80
	D. Road side slopes and road side drains maintenance and upkeep												
1	Stability and dressing of slope (along and across) - Along 25m agg length maxm, across - Full width, Maximum =2 locations	100%	103.0	100	3.0	10%	0.30	2.00	14.00	15.00	1.00	0.14	0.44

2	Cleaning and upkeep of functionality of road side drain - Maximum locations = 2	100%	103.0	100	3.0	10%	0.30	1.00	14.00	15.00	1.00	0.07	0.37
	E. Road Safety related Service Levels												
1	Traffic Signs-Maintenance and upkeep of all kind of road signs and traffic signs. Maximum locations =2	100%	103.0	97	6.0	30%	1.80	3.00	14.00	15.00	1.00	0.21	2.01
2	Pavement Marking and Raised Pavement Markers - Maximum agg length =100m, Maximum locations = 2	100%	103.0	97	6.0	30%	1.80	0.00	14.00	15.00	1.00	0.00	1.80
3	Metal Beam Crash Barriers, Guard Rails (Safety/Pedestrian) - Maximum agg length = 10m, Maximum locations = 2	100%	103.0	97	6.0	90%	5.40	1.00	14.00	15.00	1.00	0.07	5.47
4	Maintenance and upkeep of Speed Breakers/Speed Hump, Bar marking Rumble strips - As per IRC . Maximum locations= 1	100%	103.0	97	6.0	25%	1.50	0.00	14.00	15.00	1.00	0.00	1.50
	F. Upkeep of Road Furniture, Road side amenities and Miscellaneous Works related Service Levels												
1	Any posts / stones / markers (Kilometer / hectometer /fifth kilometer /guard /boundary / indicator / delineator / others including geru painting on road side trees), Maximum locations - 2	100%	103.0	102	1.0	25%	0.25	0.00	14.00	14.00	0.00	0.00	0.25
2	Upkeep of Bus shelters - Maximum locations = 0	100%	103.0	100	3.0	20%	0.60	0.00	14.00	15.00	1.00	0.00	0.60
3-a	Upkeep Solar Street Lights - Maximum numbers - 2	100%	103.0	97	6.0	25%	1.50	2.00	14.00	15.00	1.00	0.14	1.64
3-b	Upkeep of Solar light mast - Maximum numbers - 0	100%	103.0	100	3.0	25%	0.75	0.00	14.00	15.00	1.00	0.00	0.75
4	Upkeep of Foot Paths/Pedestrian Paths/Junctions / Islands - Maximum agg length - 20m, Maximum locations= 1	100%	103.0	100	3.0	25%	0.75	1.00	14.00	15.00	1.00	0.07	0.82

5	Maintenance of safe and smooth access to/from Access Roads/ Approach Roads - Maximum location = 1	100%	103.0	100	3.0	20%	0.60	2.00	14.00	15.00	1.00	0.14	0.74
	G. Incident Response and Emergency Works Response												
1	Actions for contact and site clearance as per stipulated response time on occurrence of any incidents. Maximum happening= 0	100%	103.0	100	3.0	25%	0.75	0.00	0.13	0.13	0.00	0.00	0.75
2	Restoration of all damaged road infrastructure (Roadway, Structures, Road furniture, etc.) due to vandalism. Maximum happening =0	100%	103.0	100	3.0	25%	0.75	0.00	7.00	7.00	0.00	0.00	0.75
						Total	**56.75**					**9.36**	**66.11**

III	Road Durability Performance Measures (to be measured for full length) - RDPM [Ref. - Chapter 16]												
Service Level Indicators / Permitted Non-conformance Levels per km		Target Compliance No.		Actual Compliance (km)	Non Complaint (No.)		Lump-sum Payment Reduction per Km (₹)	Non-complaint length (km) continuing beyond response time	Permitted Response time (days)	Days taken for compliance	No. of days of non-compliance exceeding the response time	Non-compliant length due to continuance of non-compliance beyond response time (km)*	Total Payment Reduction (₹)
				1	2	3	4	5	6	7	8=7-6	9=5X(8/6)	10=(9)*4
1	Pavement Roughness - **≤2500 mm/km**	100%	103.0	102	1.0	**To be withheld until complied**	15,00,000	1.00	90	95	5.00	0.06	83,333
2	Pavement Deflection (FWD) - To cover the residual life of the pavement for the contract period	100%	103.0	102	1.0		50,00,000	1.00	90	95	5.00	0.06	2,77,778
						Total	**65,00,000**	**2.00**				**Total**	**3,61,111**
Steps:													
1	Contractor to conduct self audit of 100% length of the network roads.												
2	Engineer to conduct audit on 100% length of the networks roads after receiving and studying Contractor's audit report.												
3	In "permitted non-conformance levels" column, exceeding of any of the threshold criteria will make that km non-compliant. (e.g. In any km, either of the two conditions will make that km non-complaint: 1) size of potholes exceeding 15 cm diameter 2) Numbers of potholes exceeding 3 numbers .)												
4	Any non-compliance in any km will make that kilometer fall in the category of non-compliant length.												
5	In case of more than one types of non-compliance in any one kilometer, only the non-compliance having the highest weightage % (regular) shall be considered for payment reduction length.												
6	In case of continuance of multiple non-compliances in any one kilometer beyond their stipulated response times, payment reduction length for continuance of non-compliance beyond response time shall be worked out for each non-compliance individually considering their respective response times.												
7	Total non-compliant length of all the network roads shall be multiplied by specified network performance payment per km to work out amount to be deducted from the performance-linked monthly payment specified for network performance.												
8	Rutting more than 20mm shall be considered as "failed" and the affected section shall need to be re-constructed as per investigation findings at Contractor's own cost.												
Note:													
1	Feed data only in columns 1,5,7 for RUS & CPM												
2	Payment Reduction = Payment reduction length (Km) **X** Stipulated Monthly Payment per Km												

18. NETWORK PERFORMANCE APPRAISAL

18.1. Network Performance Appraisal

The Network Performance Appraisal is an assessment of the Non-Conformances recorded during the audit cycle. This exercise shall be completed monthly (unless specified otherwise for certain Performance measures).

NETWORK PERFORMANCE		
Management Performance Measures	**Road User Service and Comfort Performance Measures**	**Road Durability and Performance Measures**
MPM is linked to contractor's reporting mechanism to achieve contract outputs. The information the Employer requires both to govern the asset during the term of the contract.	RUS&CPM reflect the road user's expectation about the day to day serviceability and riding quality of the project roads.	RDPM's are the measures undertaken by the Contractor to protect the pavement & surfacing assets, and check the consumption of these assets over the duration of the contract.

The monthly Network Performance Appraisal shall involve working out the total number of non-compliant kilometre road lengths; any km of road length not meeting any of the service criteria specified in chapter 17 shall make that km non-compliant. In case of more than one types of non-compliance in any one kilometer, only the non-compliance having the highest weightage % (regular) shall be considered for payment reduction length.

18.2. Performance Achievement Payment

Monthly Network Performance audits by the Contractor shall commence from the first calendar month of the contract and the audit report shall be shared with the engineer; NO payment reduction shall be effected in "Phase-in Period" (Refer Clause 18.3) for non-achievement of service level criteria stipulated in Chapter 17 for construction period. Through the Phase-in period audit, the contractor will familiarise itself of the various aspects of monthly audit and shall get reasonable time to bring the project network roads to the required level of service in consideration of service level criteria stipulated in Chapter 17 for the construction period.

After the expiry of phase-in period, number of non-compliant km lengths shall be worked out by the Engineer based on its monthly audits which shall be undertaken after submission of contractors monthly audit reports as per schedule specified in the contract. Service level criteria for working out whether a particular km length of the road is compliant or non-compliant are given in tabular form in Chapter 17 for the construction period and post construction period separately. Service level criteria for the construction period are comparatively relaxed for practical reasons. The procedures of working out total number of non-compliant kms and payment deductions to be effected in consideration of the total number of non-complaint kms are also given below the table in Chapter 17

Network Performance achievement payment per km per month shall be worked out as total network performance payment quoted by the bidder divided by (96 x total length of the project network roads in kms), as also detailed in Chapter 17; reduction in payment for network performance achievement shall be based on network performance achievement payment per km per month worked out this way which shall apply for the construction period as well as for the post construction period.

As detailed in Chapter 17, monthly network performance achievement payment is divided into two parts – (1) Upfront payment of 30% which shall be paid monthly and (2) Performance linked

payment of 70% which shall be paid quarterly after adjusting non-compliant kms. Except for the phase-in period, in case the service level non-performance results in 100% reduction in performance linked payment for two consecutive months, then upfront payment of 30% of the monthly network performance payment shall not be paid for the third month. If service level non-performance continues to result in 100% deduction in performance linked payment for the 3 consecutive months, then the Engineer shall recommendation to the Employer for termination of the Contract and the Employer shall have the liberty to action on the Contractor as per the provision of the Clause 18.5

Where there are any changes, (i.e. addition or subtraction) to the project network road sections at any time during the contract period, then the apportioned value of the lump-sum price of the network performance payment shall be adjusted by the engineer after seeking such consent from the employer taking into consideration the following:

- The total apportioned value of the lump-sum price of network performance payment shall be adjusted up or down as the case may be on a pro-rata basis taking into consideration the extra or reduced cost needed to be incurred due to change in the Contract Road Length and the period for which the additional or deleted road sections are required to be maintained as per network performance service level criteria
- Once the changes (change in the total contract road length and the apportioned lump-sum price for network performance) are agreed by the parties to the agreement, the Contractor shall develop a plan for their implementation as soon as practicable with approval of the Engineer

18.3. Phase-in Period

This is a defined period during the initial stage of the Contract that will provide the Contractor a period of time to bring components of the Contract Area up to the required Level of Service and to assess the impacts of the performance measures that are applied. For this Contract, the Phase-in Period is the first three calendar months of the Contract Period. During the Phase-in Period, there will be a stepped reduction in the non-compliant length of the project network roads, which shall ideally be brought to 'Zero' on expiry of the phase-in period

18.4. Adjustment of the Network Performance Payment Due To Non-Conformance

Except for the phase-in period wherein no reduction in network performance payment shall be made, reduction in performance linked Network Performance Payment shall be made for the total number of kilometre lengths found non-compliant as per service level criteria given in Chapter 17.

18.5. Contract Termination based Upon Contractor's Performance

Further to Clauses 58 and 59 under the General Conditions of Contract, if the Contractor has failed to meet the performance requirements as outlined above regardless of when historical non-conformances were closed out, by such an extent that the Contractor gets zero performance achievement payment for three (3) consecutive months (after the phase-in period), the Employer may at its sole discretion either:

a) Terminate the contract or
b) Without prejudicing the Employers rights under a) above and on written performance assurance from the Contractor, grant a further period of three (3) months for further performance assessment. This option shall be explored only once in the lifetime of the Contract.

Appendix to Section VIA – Forms, Formats, Reports and Annexures

(These forms, formats, reporting formats, etc. are tentative and shall be finalised with the Engineer)

This Section contains all draft Forms, Formats and Reports to be prepared by contractor. The content of the enclosed documents can be modified with due permission and approval of Engineer.

List of Forms, Formats, Reports and Annexures –

Forms

- Form – 1: Accident Reporting
- Form – 2: Road Assets Damages Reporting
- Form – 3: Network Performance inspection
- Form – 4: Hazard/Emergency Works/Incident Report
- Form – 5: Road Signs Report
- Form – 6: Bridge and other Structures inspection

Formats

- Format – 1: Network Performance Payment
- Format – 2: Management Performance Measures (MPM)
- Format – 3: Road User Services & Comfort Measure (RUS&CPM)
- Format – 4: Road Durability Performance Measures (RDPM)
- Format – 5: Improvement Works Payment
- Format – 6: Rehabilitation Works Payment
- Format – 7: Resurfacing Payment
- Format – 8: Emergency works and Agreed Variations Payment

Reports

- Report – 1: Road Safety and Traffic ManagementReport – 2: Illustration of Performance Measure

Annexure

- Annexure -1: Stakeholder Relationships

Form 1: Accident Reporting

Note: All Forms / Templates are indicative only. Engineer shall have the final authority to add or remove forms, and to change the contents of the form.

1. Accident Reporting Form

<table>
<tr><th>Accident Reporting Form</th><th>FORM RM01</th></tr>
<tr><td><u>Location</u>

Section No./Road Category: ……..

Road Name: ……

Place: At/or ……. m/km N/S/E/W of

……

…… (Side Road/feature)</td><td><u>Injury</u>

Worst Injury

Fatal / Grievously / Slightly / Minor / None / Unknown

<u>When Crash Occurred/Observed</u>

Date: ……../……/……..

Time: …….. am / pm

Day: Su / Mo / Tu / We / Th / Fr / Sa</td></tr>
<tr><td colspan="2"><u>What Happened</u> e.g. Van heading west on State Highway 12A lost control on right hand bend.

……
……
……</td></tr>
<tr><td><u>Conditions</u> (Please enter / circle)

Speed Limit (km/h) .....

Curve Advisory Speed ..... / NA

Road Type: 1 way / 2 way

Curvature: Straight / Easy / Moderate / Severe

Surface: Sealed / Unsealed

Wet / Dry</td><td>Paint Markings: Pedestrian Xing / Raised Island / Painted Island / No Passing Line / Centre Line / Nil

Road Features: Road Bridge/Motorway/Rail Xing

Flat / Hill

Junction: Driveway / Roundabout / Cross / Tee / Y / More than 4 legs</td></tr>
</table>

Accident Reporting Form	**FORM RM01**
Light: Bright sun / Overcast / Twilight / Dark Lighting: On / Off / None / Unknown Number of lanes	Control: Traffic Signals / Stop / Give Way / Uncontrolled / School Patrol Weather: Fine / Mist / Light Rain / Heavy rain/ Frost / Strong Wind
Diagram	**N** 
<u>Was this a Worksite Crash</u> Yes / No. If yes please provide details	
<u>Damage</u> Was any damage sustained by guardrails, signs, bridges etc? Please identify ……..	
<u>Driver and Vehicle details</u> (if known) Name ……. M/F Age….. Vehicle Reg #…….. Vehicle Reg #..... Address …….	

Accident Reporting Form	**FORM RM01**
Truck Crashes :- Please provide the following information:- • Type of vehicle (Truck, Truck and trailer, etc) …….. • Company, owner and type of load …….. • Hard side, Curtain side , container, etc ……	
Police Attendance Did a Police Officer attend the crash? Yes / No	
Notified by (May be left anonymous) Name ..... Contact Phone/Address	

The Contractor shall use this form to accurately record the location and details of all vehicle crashes on the network. It is expected that in some instances the details of the crash may have to be obtained from the Police, members of the public or the vehicle owners and that the Contractor will be proactive in seeking this information. This information will be used by the Employer and the Contractor to identify potential Black Spots or other areas of road safety concern that may need to be addressed in the future.

Form 2: Road Assets Damages Reporting

Road Asset Damage Form **FORM RM02** **Part A: General Site Details**
A.1 Location: Section No. _____Road Name _____
A.2 Locality: _____
A.3 Date and Time of Contractor's Inspection:
Part B: Damage Details
B.1 Extent of Damage
Part C: Photographs of Site (Attached))
Part D: Damage Caused By: (If Known**)**
D.1 Details
D.2 Details of Person(s) involved:
Part E: General Comments
Report Detail Completed? Yes/No, If "no" why not? _____ **Signed:_____**(Contractor) **Date ____/___/____** **Name (Printed) :_____**

The Contractor will use this form to record the details of damage to assets within the RoW that need to be repaired or replaced. This information will be of value to the Employer and Contractor in identifying trends and where possible recover costs from those responsible.

Form 3: Network Performance inspection

Network Performance Inspection Form				**FORM RM03**
Inspector's Name: ……………………………………………………………………………				
Contract No …………………………………			Contract Title ………………………….	
Date of Inspection………/………/…………			Time of Start …………………………. Day/Night	
Road Inspected…………………………..		Km ……………to Km………………		
Location	**Performance Measure Code** (MPM/RUS&CPM/RDPM)	**Description and Photograph Record**	**Conforming/Non-Conforming**	**Planned Corrective Action**

Submitted by Contractor		**Approved**	
Name: …………….	Signature: ………	Name: …………….	Signature: ………
Date…..../……/……	Designation: ……..	Date…..../……/……	Designation:……..

Form 4: Hazard/Emergency Works/Incident Report

Hazard/Emergency Works / Incident Report Form	**FORM RM04**
Contractor's Name: ……Date ……/……/……..	
Contract No ……..	Contract Title ……
Location Chainage: Km from: ……..	Km to: ……...
DESCRIPTION OF EMERGENCY / INCIDENT EVENT …… …… …… …… ……	
TREATMENT (ESTIMATED WORK ITEMS & QUANTITIES) …… …… …… …… …… …… …… …… …… …… …… …… …… …… ……	
Submitted by: Name: ……. Signature: …… Date……/……/…… Designation:……..	**Approved:** Name: ……. Signature: …… Date……/……/…… Designation:……..

The Contractor will use this form to record the details relating to Hazards, Emergency Works or other Incidents that have occurred within the contract area.

Form 5: Road Signs Report

Signs Maintenance Report						**FORM RM05**
Road Section	Road Category		Location		**ADD/DELETE** Circle One	
GPS Coordinates			Road Name			
Sign Type			Direction			
Sign Width			Sign Height			
Side	L	C	R	Offset (from CL)		
Legend / Text						
Reverse Side						
Indicating Direction	L	R	Unknown	Neither	(the direction indicated by the sign, e.g. LH curve)	
Support Type	Steel Pole		Wooden Post	Other	Frangible Base Y/N	
Substrate (Sign Material)	AL	PL	ST	TI	OT	
Date Installed/Removed						
Relocated from:	Road Name		Location		Side	
Comments:						

Number		Date	
Inventory Updated		Checked	

The Contractor will use this form to accurately record the location and details of all existing and new signs within the contract

Form 6: Bridge and other Structures inspection

Bridge, Large Culvert And Other Structures Inspection Report	**FORM RM 06**

Follow instruction for observing and reporting defects

Use a separate form for each bridge or other structure

Road from :……to:……Name of the Road…….

Bridge Name:……Stream/River/Canal crossed……

Inspector Name:……..Position……

Tick items inspected: **Date of Inspection:……/……./…….**

Approaches ☐ Signs ☐ Barrier Stone ☐ Bearing ☐ Ser ☐ s

Road drainage ☐ Deck & footway ☐ Superstructure ☐ Retaining wall ☐ Other (Identif ☐

Roadway ☐ Joints Deck ☐ Paint ☐ Waterway ☐ Guard-rails ☐

Drainage required: ☐ Substructure ☐ Er ☐ n Record Routine Maintenance ☐

Standard work item		**Work Required**	**Comments/Condition**
	Name		
Associated Surface Drains and Verges			
	Surface drains cleaning		
	Unlined drain debris remove		
	Unlined drain re-grade		
	Lined drain debris remove		
	Lined drain repair		
Large Culverts and Catch Pits Cleaning and Storm Water Drain			
	Culvert and catch pits cleaning		
	Culvert entrance debris		
	Culvert barrel debris		
	Drainage pit debris		
Large Culvert and Catch Pits Repair			
	Culvert pit repair		
	Culvert wing wall repair		
	Culvert apron repair		
	Culvert barrel repair		
	Drainage pit repair		

Bridge, Large Culvert And Other Structures Inspection Report			FORM RM 06
	Earthwork repair		
Adjacent Stream Maintenance			

The Contractor will use this form to record the information gathered from his inspections of Bridges and Other Structures within the Contract's roads. This information will be used by the Employer and Contractor to plan future maintenance or structural repair requirements.

Format 1: Network Performance Payment

Summary

NAME OF WORK: Output Performance Based Road Contract (OPRC) for Improvement, Rehabilitation, Resurfacing and Network Performance works of ……..			
Date:			
Period of Payment: Start Date to end date of month			
Summary of Network Performance System of (Month - Year)			
S. No	**Item Description**	**Length**	**Remarks**
1	**Total Management Performance Non-Conformance (MPM`S)**		
2	**Total Road Durability Non-Conformance (RDPM`S)**		
3	**Total Road User Safety & Comfort Non-Conformance (RUS&CPM`S)**		
	Total of Non-Conformance		

Format 2: Management Performance Measures (MPM)

MANAGEMENT PERFORMANCE MEASURES (MPM`S) - REFER TO WEIGHTINGS IN THE SPECIFICATION				
Date:				
Period of Payment: Start Date to end date of month				
Reference to Bidding Document Section VI	**Item Description**	**No. of non-compliances**	**Lump-sum payment deduction for one non-compliance** **(Given in Network performance payment table)**	**Total Payment Deduction**
		A	B	C= A x B
MPM 1	Quality Assurance System			
MPM 2	Contractor`s Work Programs			
MPM 3	Contractor`s Reports			
MPM 4	Traffic Management			
MPM 5	Inventory Database Management			
MPM 6	Detailed Design (A)			
MPM 6	Construction Methodology (B)			
	Total Management Performance Non-Conformance			

Format 3: Road User Services & Comfort Measure (RUS&CPM)

Road User Service & Comfort Performance Measures [Ref. - Chapter 15]													
Service Level Indicators / Permitted Non-conformance Levels per km		**Target Compliance**		**Actual Compliance (km)**	**Non Complaint (km)**	**Weightage % (Regular) to non-compliant length**	**Payment Reduction Length (Regular) in km**	**Non-complaint length (km) continuing beyond response time**	**Permitted Response time (days)**	**Days taken for compliance**	**No. of days of non-compliance exceeding the response time**	**Non-compliant length due to continuance of non-compliance beyond response time (km)***	**Non-compliant length for payment reduction (km)**
		% of Audit Length	**km**										
			A	**B**	**C=A-B**	**D**	**E=C x D**	**F**	**G**	**H**	**I=H-G**	**J=F x (I/G)**	**K=E+J**
A. Pavement and Paved Shoulder Related Service levels													
1	Potholes - Maximum size 15cm dia -3 Nos max[m]	100%	103			85%			7				
2	Rutting >10mm & < 20mm in a maximum aggregate length of 100m	100%	103			85%			28				
3	Settlement - Maximum area 1 Sqm. Maximum Nos = 2	100%	103			80%			14				
4	Any Surface Defects like Bleeding, Raveling/ disintegration, Streaking, Slippage, cracking >3mm, etc. - Maximum area 35 Sqm, Maximum Nos = 4	100%	103			85%			28				
5	Edge Break / Edge crack - Maximum agg length 10 m in upto 200mm width. Maximum nos = 2	100%	103			35%			21				
6	Surface Cleanliness including dead animal removal, etc.- maximum allowed- nil)	100%	103			15%			1				

Road User Service & Comfort Performance Measures [Ref. - Chapter 15]													
Service Level Indicators / Permitted Non-conformance Levels per km		**Target Compliance**		**Actual Compliance (km)**	**Non Complaint (km)**	**Weightage % (Regular) to non-compliant length**	**Payment Reduction Length (Regular) in km**	**Non-complaint length (km) continuing beyond response time**	**Permitted Response time (days)**	**Days taken for compliance**	**No. of days of non-compliance exceeding the response time**	**Non-compliant length due to continuance of non-compliance beyond response time (km)***	**Non-compliant length for payment reduction (km)**
		% of Audit Length	**km**										
			A	**B**	**C=A-B**	**D**	**E=C x D**	**F**	**G**	**H**	**I=H-G**	**J=F x (I/G)**	**K=E+J**
7	Pavement surface drainage (water stagnation - max^{m} 5cm depth, max^{m} 20m length for 1 hr- maximum 1 no.)	100%	103			15%			1				
B. Hard Shoulder Related Service levels													
1	Edge Drop/ Settlement - 50 mm drop/depth, Maximum agg length 25m, Maximum locations= 4/2.	100%	103			10%			14				
2	Rain Cuts/Erosion - Maximum Agg Length - 50m, Maximum Numbers = 4.	100%	103			30%			7				
3	Vegetation Clearing - Maximum 200mm high, Maximum agg length 50m, Maximum locations -4	100%	103			10%			14				
4	Maintaining standard width - Maximum agg length 50m with shortfall upto 150mm, Maximum = 4 locations	100%	103			10%			28				
C. Structures and Cross Drain related Service Levels													

Road User Service & Comfort Performance Measures [Ref. - Chapter 15]													
Service Level Indicators / Permitted Non-conformance Levels per km		**Target Compliance**		**Actual Compliance (km)**	**Non Complaint (km)**	**Weightage % (Regular) to non-compliant length**	**Payment Reduction Length (Regular) in km**	**Non-complaint length (km) continuing beyond response time**	**Permitted Response time (days)**	**Days taken for compliance**	**No. of days of non-compliance exceeding the response time**	**Non-compliant length due to continuance of non-compliance beyond response time (km)***	**Non-compliant length for payment reduction (km)**
		% of Audit Length	**km**										
			A	**B**	**C=A-B**	**D**	**E=C x D**	**F**	**G**	**H**	**I=H-G**	**J=F x (I/G)**	**K=E+J**
1	Cleaning and clearing of waterway of all drainage works: Maximum locations = 0	100%	103			20%			7				
2	Maintenance and upkeep of bridges and cross drainage structures' headwalls, parapets, crash barriers, railings, joints, drainage spouts, bearings, wing walls, other protection works, floor protection works - maintenance, repair, painting, hazard painting, numbering, etc. Maximum locations =3	100%	103			30%			21				
	D. Road side slopes and road side drains maintenance and upkeep												
1	Stability and dressing of slope (along and across) - Along 25m agg length maxm, across - Full width, Maximum =2 locations	100%	103			10%			14				

Road User Service & Comfort Performance Measures [Ref. - Chapter 15]													
Service Level Indicators / Permitted Non-conformance Levels per km		**Target Compliance**		**Actual Compliance (km)**	**Non Complaint (km)**	**Weightage % (Regular) to non-compliant length**	**Payment Reduction Length (Regular) in km**	**Non-complaint length (km) continuing beyond response time**	**Permitted Response time (days)**	**Days taken for compliance**	**No. of days of non-compliance exceeding the response time**	**Non-compliant length due to continuance of non-compliance beyond response time (km)***	**Non-compliant length for payment reduction (km)**
		% of Audit Length	**km**										
			A	**B**	**C=A-B**	**D**	**E=C x D**	**F**	**G**	**H**	**I=H-G**	**J=F x (I/G)**	**K=E+J**
2	Cleaning and upkeep of functionality of road side drain - Maximum locations = 2	100%	103			10%			14				
E. Road Safety related Service Levels													
1	Traffic Signs- Maintenance and upkeep of all kind of road signs and traffic signs. Maximum locations =2	100%	103			30%			14				
2	Pavement Marking and Raised Pavement Markers - Maximum agg length =100m, Maximum locations = 2	100%	103			30%			14				
3	Metal Beam Crash Barriers, Guard Rails (Safety/Pedestrian) - Maximum agg length = 10m, Maximum locations = 2	100%	103			90%			14				
4	Maintenance and upkeep of Speed Breakers/Speed Hump, Bar marking Rumble strips - As per IRC . Maximum locations= 1	100%	103			25%			14				
F. Upkeep of Road Furniture, Road side amenities and Miscellaneous Works related Service Levels													

Road User Service & Comfort Performance Measures [Ref. - Chapter 15]													
Service Level Indicators / Permitted Non-conformance Levels per km		**Target Compliance**		**Actual Compliance (km)**	**Non Complaint (km)**	**Weightage % (Regular) to non-compliant length**	**Payment Reduction Length (Regular) in km**	**Non-complaint length (km) continuing beyond response time**	**Permitted Response time (days)**	**Days taken for compliance**	**No. of days of non-compliance exceeding the response time**	**Non-compliant length due to continuance of non-compliance beyond response time (km)***	**Non-compliant length for payment reduction (km)**
		% of Audit Length	**km**										
			A	**B**	**C=A-B**	**D**	**E=C x D**	**F**	**G**	**H**	**I=H-G**	**J=F x (I/G)**	**K=E+J**
1	Any posts / stones / markers (Kilometer / hectometer /fifth kilometer /guard /boundary / indicator / delineator / others including geru painting on road side trees), Maximum locations - 2	100%	103			25%			14				
2	Upkeep of Bus shelters - Maximum locations = 0	100%	103			20%			14				
3-a	Upkeep Solar Street Lights - Maximum numbers - 2	100%	103			25%			14				
3-b	Upkeep of Solar light mast - Maximum numbers - 0	100%	103			25%			14				
4	Upkeep of Foot Paths/Pedestrian Paths/Junctions / Islands - Maximum agg length - 20m, Maximum locations= 1	100%	103			25%			14				
5	Maintenance of safe and smooth access to/from Access Roads/ Approach Roads - Maximum location = 1	100%	103			20%			14				
G. Incident Response and Emergency Works Response													

Road User Service & Comfort Performance Measures [Ref. - Chapter 15]													
Service Level Indicators / Permitted Non-conformance Levels per km		**Target Compliance**		**Actual Compliance (km)**	**Non Complaint (km)**	**Weightage % (Regular) to non-compliant length**	**Payment Reduction Length (Regular) in km**	**Non-complaint length (km) continuing beyond response time**	**Permitted Response time (days)**	**Days taken for compliance**	**No. of days of non-compliance exceeding the response time**	**Non-compliant length due to continuance of non-compliance beyond response time (km)***	**Non-compliant length for payment reduction (km)**
		% of Audit Length	**km**										
			A	**B**	**C=A-B**	**D**	**E=C x D**	**F**	**G**	**H**	**I=H-G**	**J=F x (I/G)**	**K=E+J**
1	Actions for contact and site clearance as per stipulated response time on occurrence of any incidents. Maximum happening= 0	100%	103			25%			0.13				
2	Restoration of all damaged road infrastructure (Roadway, Structures, Road furniture, etc.) due to vandalism. Maximum happening =0	100%	103			25%			7				
						Total							

Format 4: Road Durability Performance Measures (RDPM)

Road Durability Performance Measures (to be measured every six month for full length) - RDPM [Ref. - Chapter 16]													
Service Level Indicators / Permitted Non-conformance Levels per km		**Target Compliance**		**Actual Compliance (km)**	**Non Complaint (No.)**		**Lump-sum Payment Reduction per Km (₹)**	**Non-complaint length (km) continuing beyond response time**	**Permitted Response time (days)**	**Days taken for compliance**	**No. of days of non-compliance exceeding the response time**	**Non-compliant length due to continuance of non-compliance beyond response time (km)***	**Total Payment Reduction (₹)**
		%	**Kms**										
			A	**B**	**C=A-B**	**D**	**E**	**F**	**G**	**H**	**I=H-G**	**J=F x (I/G)**	**K=H x J**
1	Pavement Roughness - **≤2500 mm/km**	100%	103			**To be withheld until complied**	15,00,000		90				
2	Pavement Deflection (FWD) - Maximum 1.2 mm	100%	103				50,00,000		90				
												Total	

Format 5: Improvement Works Payment

During Construction

S. No.	Particular of Road Section	Chainages		Total Length of Improvement work done	Previously paid length of Improvement	Balance length of improvement work	Unit rate per Km of Improvement (%) as per Project Cost Configuration	Amount In Rs	Penalty (Road Length) of Non-Conformance	Rate per Km as per calculated amount = 0.5 x NWP(70%)/96* 103.213	Penalty amount in Rs	Net payable amount
		From	To									
A	B			C	D	E=C-D	F	G = E x F	H	I	J= H x I	K =G-J
1	Dhandhuka - Dholera											
2	Dhandhuka-Paliyad											
										Total amount (A+B)		Rs---

Format 6: Rehabilitation Works Payment

During Construction

S. No.	Particular of Road Section	Chainages		Total Length of Rehabilitation work done	Previously paid length of Rehabilitation	Balance length of Rehabilitation work	Unit rate per Km of Rehabilitation (%) as per Project Cost Configuration	Amount In Rs	Penalty (Road Length) of Non-Conformance	Rate per Km as per calculated amount = 0.5 x NWP(70%)/96* 103.213	Penalty amount in Rs	Net payable amount
		From	To									
A	B			C	D	E=C-D	F	G = E x F	H	I	J= H x I	K =G-J
1	Limbdi - Dhandhuka											
										Total amount (A+B)		Rs---

Format 7: Resurfacing Works Payment

S. No.	Particular of Road Section	Chainages		Total Length of Resurfacing work done	Previously paid length of Resurfacing	Balance length of Resurfacing work	Unit rate per Km of Resurfacing (%) as per Project Cost Configuration	Amount In Rs
		From	To					
A	B			C	D	E=C-D	F	G = E x F
1	Dhandhuka -Dholera							
2	Dhandhuka-Paliyad							
3	Limbdi -Dhandhuka							
	Total Payable Amount							

Format 8: Emergency Works and Agreed Variations Payment

S. No.	Particular Emergency item	Unit	Quantity	Item rate as per BID Item	Amount in Rs	Remark –Work Order Reference
1	2	3	4	5	6	

REPORT 1: ROAD SAFETY AND TRAFFIC MANAGEMENT

Road section affected by proposed work/ incident	**Name**		**Chainage**	
Description of proposed work and/or incident				
Time: the proposed traffic management plan will be in action	Start: _____ (AM/PM)		Finish: _____ (AM/PM)	
Duration of work	Start date		Finish date	
Will the works?	Require deviation of vehicular traffic into an on-coming traffic lane?			Yes/No
	Be conducted on, partly on or affect a bridge or other structure?			Yes/No
	Cause significant delay (5 minutes or more)?			Yes/No
How long will closure of the road to vehicular traffic be required for?	A continuous period of more than 12 hours?			Yes/No
	More than 24 hours in a 7 day period?			Yes/No
Type of Road closure? (Full, partial, none)				
Final Summary				

Attachments:

- **Approved functional drawings**
- **TMP plan**

REPORT 2 – ILLUSTRATIONS OF PERFORMANCE MEASURES

This report is intended as an illustration for the Contractor to appraise the Employer about Conformance to various Service Level Indicators as stipulated in Chapter 14, 15 and 16 of Section VIA.

Surface Integrity: (RUS & CPM-1)

Figure 4. Surface Ravelling - Non Conformance

Surface Integrity: (RUS & CPM-1)

Figure 5. Surface Cracking (Brick Provided for Scale) – Non Conformance

Pothole (RUS & CPM-1):

Figure 6.Surface Pot Holes – Non Conformance

Unsealed Shoulder Maintenance (RUS & CPM-2):

Figure 7. Shoulder Maintenance & Sign Visibility – Non Conformance

Figure 8. Shoulder Maintenance – Non Conformance (Brick Provided For Scale)

Ponding of Water on the Pavement Surface (RUS & CPM-1):

Figure 9. Ponding and Shoulder Maintenance – Non Conformance

Maintenance of Culverts and Associated Structures (RUS & CPM-3):

Figure 10. Drainage Culverts –Non Conformance (Vegetation & Silt)

Bridge and Other Structure Cleaning (RUS & CPM-3):

Figure 11. Bridges & Other Structures Specific Maintenance

Maintenance and upkeep of bridges (RUS & CPM-3):

Figure 12. Bridges & Other Structures Cleaning but Non-Conforming Under Specific Maintenance (Sand & Debris on the Deck)

Surface cleanliness (RUS & CPM-1)

Figure 13. Obstructions on the Pavement and Shoulder Non-Conforming (Debris Accumulated on the Shoulder Spilling on to the Pavement)

Vegetation Control – General (RUS & CPM-2):

Figure 14. Conforming Vegetation Control (General)

Figure 15. Vegetation Control (General) Non Conformance (Sign Obscured) & Shoulder Maintenance Non Conformance (Edge of Seal Drop Off)

Sign Maintenance – General (RUS & CPM-5):

Figure 16. Sign Maintenance - Non Conformance

Sign Maintenance – Regulatory, Warning, Advisory, Speed Signs and Chevron Marking (RUS & CPM-5)

Figure 17. Sign Maintenance - Non Conformance

Sign Maintenance – Information Signs (RUS & CPM-5):

Figure 18. Conforming Sign Maintenance

Pavement Marking (Lines, Text, Symbols, etc.) (RUS & CPM-5):

Figure 19. Pavement Marking Non Conformance (Edgeline marked only on one side)

Figure 20. Conforming Pavement Marking - Intersection – Pedestrian Crossing

Marker Posts (Kilometre Stones, 200 Meter Stones, Boundary Pillars, Edge Markers, Culvert Markers, Distance Markers, Hazard Markers, Road Delineators etc.) (RUS & CPM-6):

Figure 21. Conforming Edge Markers

Figure 22. Conforming Delineators and Signage

ANNEXURE I – STAKEHOLDER RELATIONSHIPS

1. **Key Stakeholders**

Apart from the Employer, the Contractor and the Monitoring Consultant, other key stakeholders in the Contract are:

(a) Local Relationship Committee (LRC)

The Employer shall be responsible for identifying representatives and establishing a Local Relationship Committee (LRC) to assist the Contractor in resolving those local community issues that cannot be effectively resolved directly between the Contractor and the individuals involved. The Employer shall confirm the constitution of the LRC within 2 months from the date of contract acceptance. This committee may comprise the:

a) Superintending Engineer (SE) of R&B

b) Block Development and Panchayat Officer (BDPO) of the concerned Section.

c) Naib Tehsildar of the concerned section

(b) Employer's Independent Auditor

The Employer may engage an Independent (separate from any of the other contract parties) Auditor external to the contracted parties, to audit the performance of the Contract and all the entities listed above.

1.1. Roles and Responsibilities of Key Stakeholders

In general, the major roles and responsibilities of the Key Stakeholders are listed below. However, actual performance of these entities would be governed by the terms and conditions of this contract.

(a) Employer

i. Provide a governance role in setting standards and procedures that will protect the long term integrity of the network and the Right of Way (RoW)

ii. Administer the contract including the issuance of necessary instructions and certificates in an efficient and timely manner including the confirmation of any time extensions granted.

iii. Confirm the name of the Engineer

iv. Make payment to the Contractor on all certified claims within the required time frames

v. Minimize barriers to effective communication with the Contractor

vi. Communicate all contractual matters and decisions to the Contractor in writing as quickly and efficiently as possible.

vii. Empower the Contractor to fulfil the objectives of the OPRC model and encourage its development and experience with performance based road maintenance over the duration of the contract

viii. Facilitate a cooperative and trusting contractual environment with the Contractor and facilitate the Contractor's interaction and liaison with other line departments of Government of Gujarat.

ix. Confirm the evaluation of the Contractor's performance at the required frequencies.

(b) Contractor

i. All detailed Engineering surveys and investigations necessary to deliver the contract works including the required Environmental and Social baseline surveys and mapping.

ii. The preparation of all required detailed engineering designs and working drawings for all of the required improvement and rehabilitation components of the contract including associated

iii. Environment, Health, Safety and Social Management Plans and drainage studies as necessary.

iv. All the Works necessary to bring the road to the required service levels and the performance of all Services required for keeping the Road in accordance with the Service Levels defined in the Specifications, while at the same time respecting the relevant plans, procedures, specifications, drawings, codes and any other documents as specified in the Specifications.

v. Develop, implement, and manage systems and procedures that:

1. Ensures all performance criteria are met including the establishment of a Conformance Management Unit.
2. Demonstrate physical works conformance including the achievement of minimum design standards post construction and the implementation of appropriate corrective actions required.

vi. Complete all work, including the rework of any defects or failures resulting from material, construction, workmanship or quality issues under the control of the Contractor, required to maintain the condition of the Contracts assets within the lump sum price for the duration of this contract.

vii. Identify and report to the Engineer any additional improvement works or other capital improvements while carrying out his other network performance (routine maintenance works), Rehabilitation, and resurfacing or improvement work obligations. Such additional improvement works would include, but are not limited to, drainage improvements, safety improvements, bus stops (including shelters) and works to protect the RoW. Subject to the agreement of the Employer and the availability of funding, this additional work would be undertaken as a variation to the contract.

(c) Monitoring Consultant

i) Review the Contractor‘s Quality Plans.
ii) When requested by the Employer, nominate the Engineer. Audit the systems, procedures and records to ensure sufficient inspections, maintenance work, etc. are being completed to enable the achievement of the Performance Requirements, (refer Specification, Chapter 14 – Management Performance Measures, Chapter 15 – Road User Services and Comfort Performance Measures and Chapter 16 – Road Durability Performance Measures).
iii) Review the quality of completed works before recommending payment by the Employer
iv) Where appropriate issue instructions to the Contractor on behalf of the Employer
v) On instruction by the Employer, accompany the Contractor during his on-site audit inspections.
vi) Conduct independent audits of sections of the Contract‘s roads to assess the validity of road user and Employer feedback.

(d) Local Relationship Committee (LRC)

Once established the Employer and Contractor will meet with the LRC's at agreed intervals to discuss, and where possible seek to resolve, relevant community issues impacting upon the management of the Contract.

(e) Employer's Independent Auditor

The Independent Auditor will undertake auditing functions assigned by the Employer to verify conformance with both contract and legislative requirements. All parties shall cooperate with the Independent Auditor and will comply with all reasonable requests for information relating to this contract as quickly as possible.

1.2. Other Contracts/Contractors

The Employer shall notify the Contractor of the location and details of other contract works (if any) underway on the Roads within the Contract Area at the commencement of the contract. This may include the timing of the expiry of any associated defects liability which will require the Contractor to then take over responsibility for the maintenance of these sections under this contract.

1.3. Other Departments/Agencies

In certain cases other departments / agencies may construct or repair their works or utilities within the Contract Area. In case these activities are obstructing the Contractor in performing his services, the Contractor shall notify the Employer, through Engineer, of such activities with all the available details.

In case, other departments / agencies indicate their intention to construct or repair any works associated with their functionality but related to road works, the Contractor shall notify the Employer, through Engineer, of such activities with all the available details. The Employer can request the Contractor to repair / maintain such works within this Contract after issuing a variation.

In no case, the Contractor shall obstruct the concerned department/ agency in performing their duties.

1.4. Communication

Contractor's Contacts

The Contractor must maintain an effective communication system including providing the names of all contact personnel and their phone numbers. The Contractor's communication system must provide adequate coverage over the full extent of the Contract area. The Contractor shall be contactable 24 hours a day, 7 days a week, and shall establish a toll free mobile phone number for emergency contact purposes. This number shall be shown in the Contractor's Emergency procedures and incident response plan and will be provided to the Police, Emergency Services and heads of Local Relationship Committee's.

Communication Records

The Contractor must establish a system for receiving and logging communications relating to the management of the Contract. The log must record the substance of the communication, the time received and the details of any actions that the Contractor is required to take. The log shall also clearly indicate the status of all actions along with the date and time required actions by the Contractor have been completed. This log must also register all grievances from the local stakeholders,

and the responses and actions taken to resolve such grievances. Copies of this log shall be provided to the Engineer on request.

1.5. Publicity

The Contractor:

a) Must not communicate with the media on any issues relating to the maintenance or operation of the Contract without specific approval from the Employer.
b) Must not publish or provide to any third party information pertaining to any Contract Works without the Employer‘s prior approval. This requirement includes conference papers, presentations, workshop discussions, etc.
c) May display non-illuminated signs attached to their site office location and following approval by the Engineer other identified locations for the benefit of the neighbouring communities giving the name of their firm and contact numbers. No other promotional publicity is permitted unless otherwise agreed with the Employer.
d) May display working or inspection vehicle markings and logo‘s specific to this OPRC following approval from the Engineer.