

Tender No. NEPPL/FY25-26/RFP/Bridge Rehabilitation & Repair – Assam

**Request for Proposal (“RFP”) issued by NHIT Eastern Projects Private Limited (NEPPL) for Engagement of Agency/Firm for Bridge Rehabilitation & Repair works for Kachugaon to Kaljhar and Kalijhar to Patacharkuchi Projects in the state of Assam.**

<b>BID SUMMARY</b>		
(i)	Last date and time for receipt of Bidding Documents	02 June 2025 up to 17:00 Hour
(ii)	Date and Time of Opening of Bids	02 June 2025 up to 18:00 Hour
(iii)	Place of Opening of Bids	Unit No.: 324, 3rd Floor, D21 – Corporate Park, Sector21, Dwarka-110077, New Delhi.

Note: – Bids will be opened in the presence of bidders who choose to attend as above.

**NHIT Eastern Projects Private Limited**

Unit No.: 324, 3rd Floor, D21 – Corporate Park,  
Sector-21, Dwarka –110077, Delhi  
Email: tender@nhit.co.in  
Date: 16.05.2025

# National Highways Infra Trust



## Request for Proposal for Bridge Rehabilitation & Repair works

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Bridge Rehabilitation &  
Repair works

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## Disclaimer

The information contained in this Request for Proposal ("RFP") or subsequently provided to Bidder(s), in documentary or any other form, by or on behalf of **NHIT**, or by any authorized person(s), is provided to the interested parties on the terms and conditions set out in this RFP and any other terms and conditions under which such information is provided.

This RFP is not an agreement, offer, or invitation by **NHIT** to any interested parties. Its purpose is solely to provide Bidders with relevant information to assist them in preparing and submitting their proposals ("Proposal" or "Bid") for selection as a vendor for **NHIT** under the specified norms.

**NHIT** makes no representation or warranty and shall not be liable to any Bidder or other person to the fullest extent permissible under applicable laws for any loss, damage, cost, or expense arising from reliance on this RFP or any related process. This includes any inaccuracies, omissions, assumptions, or assessments made based on the information provided.

Each Bidder warrants that the information it provides to **NHIT** in its Proposal and during the bidding process is accurate and complete to the best of its knowledge and belief. The Bidder further indemnifies and holds **NHIT** harmless from any claims, liabilities, or expenses arising from errors, defaults, or non-compliance with applicable laws by the Bidder, including the submission of inaccurate statutory forms or documents.

The issuance of this RFP does not commit **NHIT** to accept any Proposal, award any contract, or enter into any agreement. **NHIT** reserves the right to amend, modify, or annul the bidding process at any time prior to the issuance of a Letter of Award/Work Order, without incurring any liability or obligation to any Bidder.

**NHIT** reserves the right to withdraw, cancel, or terminate this RFP process at any stage, including after the receipt of Proposals, without assigning any reason and without any obligation to proceed with the tender. In the event that no contract is awarded, **NHIT** shall not be liable for any claims, expenses, or losses incurred by any Bidder in connection with the preparation and submission of their Proposal. Bidders shall have no right to seek any form of relief, compensation, or damages from **NHIT**, whether in contract, tort, or otherwise, in relation to the cancellation or non-award of this RFP.

All costs associated with the preparation and submission of Proposals, including any demonstrations, presentations, or related expenses, shall be borne solely by the Bidder. Under no circumstances shall **NHIT** be liable for such costs, regardless of the conduct or outcome of this RFP process.

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## 1. Invitation for Bids (IFB)

### 1.1. Brief Overview of the Work under Consideration

*The scope and details of the work under consideration are provided in the Contract Data Sheet. Bidders are advised to refer to it for further information.*

### 1.2. Key Dates

The key dates related to this RFP, including submission deadlines and evaluation timelines, and their respective locations and modes, are provided in the Contract Data Sheet. Bidders are advised to refer to it for further information.

Event Description	Date & Time	Location / Mode
Invitation of RFP		
Last date of Receiving Queries / Clarifications		
Pre-Bid Meeting date		
Pre-Bid meeting Venue		
Client's response to queries / Clarifications		
Last date of Bid Submission		
Physical Submission of Bid Security / POA etc.		
Opening of Technical Bid		
Declaration of Eligible / Qualified bidders		
Opening of Financial Bid		
Letter of Award		
Validity of bids		
Signing of Agreement		

### 1.3. Eligibility Criteria (Summary)

The eligibility criteria for this bid are specified in Clause 3 (Eligibility and Qualification Criteria) of this RFP. Bidders are required to meet all the technical, financial, and legal requirements outlined therein.

For complete details, bidders must refer to Clause 3.

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### 1.4. Contact Information

Contact Person	Designation	Contact Number	Email Address

In case of any change in the Contractor's contact details, constitution, or organizational hierarchy, they shall immediately notify the Client.

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## 2. Instructions to Bidders (ITB)

### 2.1. Definitions and Interpretations

The following terms, unless repugnant to the context, shall have the meanings assigned hereunder. All definitions are listed alphabetically:

Term	Definition
<b>Addendum</b>	shall mean any <b>written clarification, revision, amendment, or modification</b> issued by the Client to the RFP <b>before the bid submission deadline</b> , which forms an <b>integral part of the RFP document</b> . An Addendum is intended to address queries, provide additional information, or make necessary changes to the bidding requirements, and all Bidders shall be required to consider it in their Bid submissions.
<b>Agreement</b>	Shall mean the legally binding contract executed between the Client and the Contractor for providing services related to road construction and maintenance projects. It includes the General Conditions of Contract (GCC), Special Conditions of Contract (SCC), Annexures, Letter of Award (LoA), schedules, and any mutually agreed amendments or modifications. The Agreement defines the roles, responsibilities, deliverables, timelines, and performance standards expected of the Contractor and governs the contractual relationship between the parties in accordance with applicable laws, regulations, and standards, including those specified by the Ministry of Road Transport and Highways (MoRTH) and other relevant authorities.
<b>Annexures</b>	shall mean the documents, schedules, drawings, specifications, and any other supplementary material attached to or referenced in this RFP. These Annexures form an integral part of the RFP and, once the Contract is awarded, shall be binding on the Contractor.
<b>Authority</b>	Shall mean the National Highways Authority of India (NHAI) or its authorized representative.
<b>Bank Guarantee</b>	Shall mean a written guarantee issued by a bank, on behalf of the Contractor, to secure the performance or payment obligations under the contract, ensuring that the bank will fulfil the financial commitments in the event of the Contractor's failure to perform as per the terms and conditions of the contract.
<b>Bid</b>	shall mean the formal offer submitted by a Bidder in response to the Request for Proposal (RFP), comprising all required documents, technical and financial proposals, declarations, and any other information stipulated in the bidding documents. A Bid represents the Bidder's commitment to execute the works or services as per the

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Term	Definition
	terms, conditions, and specifications outlined in the Contract, subject to acceptance by NHIT.
<b>Bid Due Date</b>	Shall mean the last date and time specified for submission of Bids in the RFP.
<b>Bid Security</b>	shall mean the financial guarantee furnished by a Bidder in the form of a <b>Bank Guarantee, Demand Draft, or any other approved instrument</b> , as specified in the RFP, to secure the Bidder’s commitment to the bidding process. It ensures that the Bid remains valid and that the Bidder complies with all requirements outlined in the bidding documents. The terms governing the submission, validity, and forfeiture of the Bid Security shall be as stipulated in the RFP and Contract.
<b>Bidder</b>	shall mean any individual, firm, company, joint venture (JV), or consortium that submits a Bid in response to the Request for Proposal (RFP). The Bidder must meet the eligibility criteria specified in the RFP and shall be responsible for complying with all terms, conditions, and obligations outlined in the bidding documents.
<b>Bidding Process</b>	shall mean the entire sequence of activities undertaken by NHIT for the selection of a Contractor, Supplier, or Service Provider, starting from the issuance of the Request for Proposal (RFP) until the final award of the Contract. This includes, but is not limited to, the issuance of bidding documents, pre-bid meetings, submission and evaluation of bids, clarifications, negotiations (if applicable), selection of the successful bidder, and issuance of the Letter of Award (LOA).
<b>Client / Employer</b>	Shall refer to NHIT and its subsidiaries, incorporated under the Companies Act, along with their legal successors, assignees, and authorized officers, who are entitled to the rights and remedies as outlined in the Contract.
<b>Confidential Confidentiality</b>	<p>/ shall mean any information, document, data, or communication, whether disclosed in writing, verbally, electronically, or by any other means, that is designated as confidential or that, by its nature, should reasonably be considered confidential. This includes, but is not limited to, <b>technical data, trade secrets, financial information, proprietary methodologies, business strategies, project details, and any information shared during the bidding or contract execution process.</b></p> <p>Confidentiality requires that such information <b>shall not be disclosed, reproduced, shared, or used for any purpose other than its intended use under the Contract</b>, except with the prior written consent of the Client or as required by law. The obligation of confidentiality shall</p>

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Term	Definition
<b>Construction Works</b>	<p>remain in effect <b>throughout the bidding process, contract duration, and for a specified period thereafter, as defined in the Contract.</b></p> <p>shall mean all activities covered under this Contract, including <b>Road Construction, Periodic Maintenance, Routine Maintenance, Electrical Works, and Electrical Maintenance.</b> It encompasses the development, widening, strengthening, and new construction of highways, bridges, culverts, embankments, and associated infrastructure. It also includes periodic maintenance activities such as resurfacing, overlays, rejuvenation treatments, and structural rehabilitation to ensure the longevity of road assets. Routine maintenance obligations, including pothole patching, crack sealing, drainage cleaning, shoulder repairs, and signage upkeep, form an integral part of Construction Works to maintain operational efficiency and road safety.</p> <p>Additionally, Construction Works extend to electrical infrastructure, covering the installation, testing, commissioning, servicing, and maintenance of street lighting systems, transformers, power supply networks, and associated electrical components to ensure continuous functionality. For the purposes of this RFP, <b>Construction Works shall exclude ATMS (Advanced Traffic Management System) and TMS (Traffic Management System), which shall be governed under a separate contractual framework.</b></p>
<b>Contract</b>	<p>shall mean the legally binding agreement executed between NHIT and the selected Contractor for the execution of works, supply of goods, or provision of services as specified in the bidding documents. The Contract shall include the <b>Letter of Award (LOA), General Conditions of Contract (GCC), Special Conditions of Contract (SCC), Contract Data, Scope of Work, Technical Specifications, Bill of Quantities (BoQ), and any other documents forming part of the agreement,</b> along with all amendments, addendums, and modifications issued thereafter.</p>
<b>Contract Price</b>	<p>shall mean the total amount payable to the Contractor by NHIT for the execution of the works, supply of goods, or provision of services as specified in the Contract. The Contract Price shall be as stated in the Letter of Award (LOA) and shall be subject to adjustments, variations, deductions, or additions in accordance with the terms and conditions of the Contract, including approved change orders, price variations, and applicable taxes as per the governing law.</p>
<b>Contractor</b>	<p>shall mean the <b>Successful Bidder</b> to whom the Contract has been awarded by NHIT for the execution of the works, supply of goods, or provision of services as per the terms and conditions of the Contract. The term shall include the Contractor’s <b>legal successors, permitted</b></p>

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Term	Definition
	<b>assigns, subcontractors, or agents</b> engaged in the performance of the Contract, subject to the approval of NHIT where required.
<b>Day</b>	Shall mean a calendar day unless otherwise specified.
<b>Default</b>	shall mean any failure, omission, or non-performance by the Contractor in fulfilling its contractual obligations, whether due to negligence, wilful misconduct, or inability to comply with the terms and conditions of the Contract. This includes, but is not limited to, failure to execute the works as per agreed specifications and timelines, non-compliance with statutory and regulatory requirements, defective or substandard work, breach of financial obligations, or any act that compromises the safety, quality, or serviceability of the road construction and maintenance works.
<b>Defect Liability Period</b>	shall mean the specified period commencing from the date of completion and acceptance of the works by NHIT, during which the Contractor is responsible for <b>rectifying any defects, deficiencies, or faults</b> arising due to defective materials, workmanship, or non-compliance with the Contract specifications. The Contractor shall carry out all necessary repairs, replacements, or corrections at no additional cost to NHIT within the timeframe stipulated in the Contract. The Defect Liability Period shall be as specified in the Contract Data and may be extended in case of delayed rectification or repeated defects.
<b>Dispute</b>	Dispute" shall mean any disagreement, conflict, claim, controversy, or difference of opinion arising between the Contractor and NHIT in connection with the interpretation, execution, performance, or enforcement of the Contract. This includes, but is not limited to, disputes related to scope of work, quality of execution, contractual obligations, payment issues, delays, penalties, variations, termination, or any other matter affecting the rights and obligations of the parties under the Contract.
<b>Draft Contract Agreement</b>	shall mean the preliminary version of the contractual document included in the RFP, which outlines the terms, conditions, obligations, rights, and responsibilities of both the Client and the Successful Bidder. The Draft Contract Agreement serves as the base document for finalizing the formal contract, subject to modifications, negotiations (if applicable), and execution upon award of the Contract.
<b>Eligible Bidder</b>	shall mean an individual, firm, company, joint venture (JV), or consortium that meets the <b>eligibility criteria</b> specified in the RFP, including but not limited to technical qualifications, financial capacity, legal compliance, and past experience. The Bidder must not be

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Term	Definition
	<b>debarred, blacklisted, or disqualified</b> by any government authority, regulatory body, NHAI, NHIT, or its subsidiaries. An Eligible Bidder shall comply with all requirements outlined in the bidding documents and shall be legally capable of entering into a contract with NHIT.
<b>Letter of Acceptance (LoA)</b>	shall mean the formal written communication issued by NHIT to the <b>Successful Bidder</b> , confirming the acceptance of their bid and awarding the Contract, subject to the fulfilment of any preconditions specified therein. The LOA shall constitute a binding commitment between NHIT and the Successful Bidder, requiring the execution of the formal Contract Agreement within the stipulated time. The issuance of the LOA does not, by itself, create a right to commence work unless expressly stated in the document.
<b>Lowest Responsive Bid</b>	shall mean the bid that offers the <b>lowest price</b> among those determined to be <b>Responsive Bids</b> , meeting all <b>eligibility, technical, and financial criteria</b> outlined in the RFP. The bid must also fulfil the <b>qualification requirements specified in Clause 3</b> , ensuring that the bidder has the necessary technical capability, resources, and financial strength to execute the contract successfully. The determination of the Lowest Responsive Bid shall be made based on both <b>price competitiveness and compliance with the overall workability and feasibility requirements</b> set forth in the RFP.
<b>Material Litigation</b>	shall mean any legal dispute, claim, arbitration, or proceeding—whether pending, resolved, or threatened—that has or may have a <b>significant impact on the Bidder’s financial stability, technical capability, or ability to perform contractual obligations</b> . Material Litigation includes cases where the claimed or potential liability exceeds a specified threshold (e.g., <b>10% of the Bidder’s net worth or turnover</b> , as defined in the RFP) or where the outcome could materially affect the Bidder’s credibility, resources, or legal standing in contract execution.
<b>NHIT</b>	"National Highways Infra Trust (NHIT)" shall mean an <b>irrevocable infrastructure trust</b> set up by the <b>National Highways Authority of India (NHAI)</b> under the provisions of the <b>Indian Trusts Act, 1882</b> , and registered as an <b>Infrastructure Investment Trust (InvIT)</b> under the <b>Securities and Exchange Board of India (Infrastructure Investment Trusts) Regulations, 2014 (SEBI InvIT Regulations)</b> with registration number <b>IN/InvIT/20-21/0014</b> .  NHIT, along with its <b>Special Purpose Vehicles (SPVs) and subsidiaries</b> , acts as the <b>Client/Employer</b> in this RFP and subsequent Contract. It is responsible for the <b>development, operation, maintenance, and</b>

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Term	Definition
	<p><b>management of highway infrastructure projects</b> and shall exercise all rights, obligations, and authority as specified in the bidding documents and the Contract.</p> <p><b>Wherever "NHIT" is mentioned in this RFP or the Contract, it shall be deemed to include NHIT, its SPVs, and its subsidiaries, all of whom shall act as the Client/Employer for the purposes of this agreement.</b></p>
<b>Notice to Proceed</b>	shall mean the formal written instruction issued by the Client to the Contractor, authorizing the commencement of work in accordance with the terms, conditions, and timelines specified in the Contract. The issuance of the Notice to Proceed marks the official start of the Contractor’s obligations under the Contract.
<b>Overlapping Constituents</b>	shall mean any situation where two or more Bidders share common ownership, management, key personnel, shareholders, parent companies, subsidiaries, affiliates, or any other controlling interests that may compromise the fairness, competitiveness, or integrity of the bidding process. This includes but is not limited to instances where entities have direct or indirect influence over each other’s bidding decisions, access to each other’s confidential information, or any arrangement that creates a conflict of interest.
<b>Procuring Authority</b>	shall mean the designated department, division, or official(s) within NHIT responsible for overseeing the procurement process, issuing the RFP, evaluating bids, and awarding contracts. This may include, but is not limited to, NHIT’s Procurement Department, Project Department, or any other authorized entity delegated with such responsibilities under this RFP.
<b>RFP</b>	shall mean the official bidding document issued by the Client to invite proposals from eligible Bidders for the execution of specified works or services. The RFP includes <b>all amendments, Addendum, Annexures, appendices, clarifications, and any other documents</b> provided by the Client during the bidding process. It outlines the <b>scope of work, eligibility criteria, bidding procedures, evaluation parameters, and contractual terms</b> , serving as the foundation for bid preparation and contract formation.
<b>Scope of Work</b>	shall mean the <b>comprehensive description</b> of all activities, tasks, responsibilities, and deliverables that the Contractor is required to perform under the Contract. It includes, but is not limited to, the <b>technical specifications, performance requirements, quality standards, timelines, and compliance obligations</b> as defined in the RFP and its associated documents. The Scope of Work establishes the

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Term	Definition
	<b>contractual expectations, execution methodology, and measurable outcomes</b> for the successful completion of the project.
<b>Statutory Auditor</b>	shall mean a <b>Chartered Accountant (CA) who is legally authorized and appointed</b> under applicable laws and regulations to conduct <b>statutory audits, financial verifications, and compliance assessments</b> as required by governing authorities. A Statutory Chartered Accountant is responsible for <b>certifying financial statements, ensuring regulatory compliance, and providing independent assurance</b> on the financial health and operations of an entity. Their appointment, role, and responsibilities shall be in accordance with the applicable statutory provisions, including but not limited to the Companies Act, Income Tax Act, or any other relevant financial regulations.
<b>Statutory Chartered Accountant</b>	shall mean a <b>Chartered Accountant (CA) who is legally authorized and appointed</b> under applicable laws and regulations to conduct <b>statutory audits, financial verifications, and compliance assessments</b> as required by governing authorities. A Statutory Chartered Accountant is responsible for <b>certifying financial statements, ensuring regulatory compliance, and providing independent assurance</b> on the financial health and operations of an entity. Their appointment, role, and responsibilities shall be in accordance with the applicable statutory provisions, including but not limited to the Companies Act, Income Tax Act, or any other relevant financial regulations.
<b>Responsive Bid</b>	shall mean a bid that complies in all material aspects with the eligibility criteria, technical requirements, specifications, terms, and conditions of the Request for Proposal (RFP). A Responsive Bid must meet the submission requirements, including the correct form and format, and must not contain any material deviations or omissions.
<b>Successful Bidder</b>	shall mean the <b>Bidder whose proposal has been evaluated as the most responsive and compliant</b> with the requirements set forth in the RFP and has been <b>formally accepted by the Client</b> for the award of the Contract. The Successful Bidder is the entity that has met all <b>technical, financial, and eligibility criteria</b> and has been issued the <b>Letter of Acceptance (LOA)</b> or any other official communication confirming the contract award.
<b>Technical Proposal</b>	Shall mean the section of the Bid submitted by a Bidder that provides a detailed description of their technical approach, methodology, and plan for executing the Work. It includes but not limited to the information on the resources, timeline, and technical expertise to be applied in the project.

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<b>Term</b>	<b>Definition</b>
<b>Terms of Reference (ToR)</b>	shall mean the comprehensive framework outlining the objectives, scope, methodology, deliverables, performance standards, and reporting requirements that the Contractor must adhere to under the Contract. It defines the roles, responsibilities, and expectations of all stakeholders, ensuring alignment with technical, quality, compliance, and regulatory requirements as specified in the RFP and associated documents.
<b>Work</b>	Shall mean all activities, services, and deliverables to be performed by the Contractor as specified in the RFP. This includes, but is not limited to, the execution of tasks, provision of resources, and fulfilment of requirements outlined in the Scope of Work, regardless of the specific nature of the project.
<b>Written Communication</b>	Shall mean any correspondence exchanged in writing, which includes, but is not limited to, letters, emails, notices, memos, and any other forms of written documentation used for communication between the Client and the Contractor or among parties involved in the project.

## 2.2. Instructions to Bidders - General Instructions

### 2.2.1. Submission of Bids – Individual, Joint Venture or Consortium (Refer clause 5.3 of CDS)

#### 2.2.1.1. Prohibition on Multiple Bid Submissions

A bidder shall submit only one bid for the same project, either as an individual entity or as part of a Joint Venture (JV) or Consortium, but not in both capacities.

A bidder participating as a member of a JV or Consortium shall not submit a separate bid as an individual entity or as a member of another JV/Consortium for the same project.

Any violation of this provision shall lead to immediate disqualification of all bids submitted by the bidder in any form.

#### 2.2.1.2. Joint Venture and Consortium Participation

Bidders may form **Joint Ventures (JVs) or Consortiums** to submit bids, provided that:

- i. The JV/Consortium **appoints a Lead Member**, who shall be responsible for contractual obligations.
- ii. The members of the JV/Consortium **jointly and severally undertake** to fulfil the contract.
- iii. The composition of the JV/Consortium **shall not be altered** without prior approval from NHIT.

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### 2.2.1.3. Declaration of Agreements and Responsibilities

- i. All members of the JV/Consortium **must submit a legally binding agreement**, defining their roles, responsibilities, and financial commitments.
- ii. NHIT **reserves the right to request additional documentation** or conduct due diligence to verify the independence and capability of the bidding entities.

### 2.2.1.4. Restrictions on Subcontracting

- i. While JVs and Consortiums are permitted, **subcontracting key project obligations** to external entities **without prior approval** from NHIT shall not be allowed.
- ii. NHIT reserves the right to reject bids where subcontracting arrangements **undermine the bidder's core responsibilities**.

### 2.2.1.5. Disqualification for Non-Compliance

- i. Any bid **violating these provisions**—such as multiple submissions from the same entity under different capacities—**shall be rejected**.
- ii. Any false or misleading information regarding the JV/Consortium structure shall lead to **disqualification and possible legal action** by NHIT.

## 2.2.2. Power of Attorney (PoA) for Bidders

### 2.2.2.1. Requirement for PoA Submission

All bidders, whether **domestic (national) or international**, and whether **submitting bids individually, as part of a Joint Venture (JV), or as a Consortium**, must provide a **valid Power of Attorney (PoA)** authorizing the signatory to represent the bidder in all matters related to the submission of the bid and the execution of the contract if awarded.

### 2.2.2.2. Compliance with Local and Indian Laws

- i. The PoA should **adhere to the legal formalities and requirements of both the bidder's home country and India** to ensure its **validity and enforceability in legal proceedings**.
- ii. It must be prepared and validated in a manner that aligns with the **legal framework and authorities of the bidder's home country** and must be **duly recognized under Indian law** to be considered valid for the bidding process.

### 2.2.2.3. Attestation & Notarization Requirements

- i. If issued outside India, the PoA must be **duly notarized and attested by the appropriate authority**, including **consular authentication** where required, to ensure enforceability in India.
- ii. If issued within India, the PoA must be **executed on a non-judicial stamp paper of appropriate value** and duly notarized.

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## 2.2.2.4. Reference for Other Clauses

Any requirement related to the authorization of the bidder's representative, legal authority, or signature verification in other sub-clauses shall **refer to this clause (2.2.2)** instead of repeating PoA requirements.

## 2.2.2.5. Non-Compliance & Disqualification

Failure to submit a valid PoA **as per the above requirements** shall result in **disqualification of the bidder or consortium** from the bidding process.

**2.2.3.** Notwithstanding anything to the contrary contained in this RFP, the detailed terms and conditions specified in the agreement, including but not limited to the General Conditions of Contract (GCC), Special Conditions of Contract (SCC), Contract Data, Terms of Reference, Particular Conditions of Contract, Bill of Quantities (BoQ), and any other contract-related documents, shall have an overriding effect. In the event of any conflict or inconsistency between the terms in the RFP and those in the agreement, the provisions of the agreement shall prevail, unless specifically mentioned in the LOA. Any amendments or modifications to these terms shall be mutually agreed upon by the Client and the Contractor in writing.

## 2.2.4. Conflict of Interest

**2.2.4.1.** Bidders shall at all times provide professional, objective, and impartial advice, prioritizing the interests of the NHIT Entities above all else. Bidders must avoid conflicts with other assignments or their own corporate interests, ensuring their actions are free from any considerations of future work opportunities. Under no circumstances shall two Bidders have **overlapping constituents**, nor shall any arrangement exist whereby a third-party gains access to the confidential information of another Bidder.

**2.2.4.2.** Bidders must sign a Non-Disclosure Agreement (NDA) with NHIT post issuance of the Letter of Award (LOA), should NHIT deem it necessary.

**2.2.4.3.** Bidders are required to disclose any existing relationships or engagements with NHIT, its affiliates, or other stakeholders that could potentially lead to a conflict of interest. Such disclosures must be made in writing at the time of bid submission and updated promptly if any changes occur during the bidding process or execution of the contract.

**2.2.4.4.** Any conflict of interest discovered during the execution of the contract must be immediately reported to NHIT. Failure to disclose such conflicts may result in penalties, including termination of the contract and disqualification from future bidding processes.

**2.2.4.5.** Bidders must implement robust internal controls to ensure compliance with this clause, including measures to prevent unauthorized access to confidential information and to maintain the integrity of the bidding process.

**2.2.4.6.** NHIT reserves the right to audit the Bidders' practices and processes to verify compliance with the conflict-of-interest provisions outlined in this clause. Non-compliance identified during such audits may attract sanctions as deemed appropriate by NHIT.

## 2.2.5. Fraud & Corruption

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**2.2.5.1.** Bidders shall observe the highest standard of ethics during the selection process and throughout the execution of the work. For the purposes of this clause, **NHIT** defines:

**2.2.5.1.1. Corrupt Practice:** The offering, giving, receiving, or soliciting of anything of value to influence the action of a public official in the selection process or during contract execution.

**2.2.5.1.2. Fraudulent Practice:** Any act of misrepresentation or false declaration of facts intended to influence the selection process or execution of a contract to the detriment of **NHIT**. This includes collusive practices among bidders, whether prior to or after submission of proposals, aimed at depriving **NHIT** of the benefits of fair and open competition.

**2.2.5.2.** **NHIT** reserves the right to reject any proposal if it determines that the bidder recommended for selection has engaged in corrupt or fraudulent practices during the bidding process.

**2.2.5.3.** **NHIT** may declare a bidder ineligible to participate in any future procurement processes, either indefinitely or for a specified duration, if it determines at any time that the bidder has engaged in corrupt or fraudulent practices.

**2.2.5.4.** Bidders declared ineligible for corrupt or fraudulent practices under this clause shall be prohibited from participating in the selection process for any work or services tendered by **NHIT** during the specified period of ineligibility.

**2.2.5.5.** Any instances of corrupt or fraudulent practices discovered during contract execution shall result in immediate termination of the contract, forfeiture of any performance guarantees, and potential legal action as deemed appropriate by **NHIT**.

**2.2.5.6.** **NHIT** reserves the right to conduct audits or investigations to ensure compliance with this clause. Bidders must cooperate fully with such audits or investigations, providing access to all relevant records, documents, and personnel.

**2.2.5.7.** Bidders are required to include a written declaration as part of their proposal, confirming that they have not engaged in and will not engage in any corrupt or fraudulent practices as defined in this clause. Non-compliance with this declaration may result in disqualification.

**2.2.5.8.** **NHIT** reserves the right to share information regarding ineligible bidders with other public entities or organizations to promote transparency and accountability.

**2.2.5.9.** Any breach of this clause shall entitle **NHIT** to recover any damages incurred due to the corrupt or fraudulent practices, in addition to other remedies available under applicable law.

## **2.2.6. Termination of RFP Process**

**2.2.6.1.** The Procuring Authority reserves the right to terminate the RFP process at any stage without assigning any reason and without incurring any liability to the bidders, including but not limited to costs or expenses incurred in the preparation or submission of proposals.

**2.2.6.2.** Such termination may occur under, but is not limited to, the following circumstances:

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- a) Significant changes in the scope, objectives, or requirements of the project that necessitate re-evaluation of the procurement approach.
- b) Non-compliance with applicable laws, regulations, or internal policies during the RFP process.
- c) Insufficient or inadequate responses received that do not meet the minimum qualification criteria or technical specifications outlined in the RFP.
- d) Detection of fraudulent practices, misrepresentation, or conflict of interest among any participating bidders.
- e) Budgetary constraints or unavailability of funds.
- f) Force Majeure events or other unforeseen circumstances that make the continuation of the RFP process impracticable.

**2.2.6.3.** In the event of termination, the Procuring Authority shall publish a notification regarding such termination on the official NHIT website. It shall be the sole responsibility of the bidders to stay informed of any updates or changes. The Procuring Authority shall not be liable for any claims arising due to a bidder's failure to take note of such publication. The Procuring Authority may, at its discretion, issue a new RFP for the same or substantially similar scope of work.

**2.2.6.4.** The Procuring Authority shall not be obligated to provide reasons for the termination of the RFP process or to disclose any internal evaluations, decisions, or deliberations related to the termination.

**2.2.6.5.** The termination of the RFP process shall not confer any rights upon any bidder or entity, nor shall it result in any claim or cause of action against the Procuring Authority or its representatives.

**2.2.6.6.** This clause is independent of any termination provisions applicable to the subsequent contract, which shall be governed by the terms of the General Conditions of Contract (GCC) or Special Conditions of Contract (SCC).

### 2.2.7. Bid Capacity

#### 2.2.7.1. Qualification Based on Bid Capacity:

Bidders meeting the minimum qualification criteria outlined in this RFP shall qualify only if their assessed available bid capacity exceeds the estimated bid value of INR 40 crores (for calculation purposes only; this figure does not reflect the actual bid value). The available bid capacity shall be determined as follows:

$$\text{Assessed Available Bid Capacity} = (A \times N \times 2.5) - B + C$$

#### Where:

**A** = Maximum value of civil engineering works excluding the amount of bonus received, if any, in respect of EPC Projects executed in any one year during the last three years (updated to the price level of the year indicated in table at Note-3 below) taking into account the completed as well as works in progress. The EPC projects include turnkey projects/ Item rate contract/ Construction works.

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**N** = Duration (in years) specified for completion of the works under this RFP.

**B** = Value (updated to the price level of the year indicated in table at **Notes for Calculation** below) of existing commitments, works for which the bidder has emerged as the winner of the bids or on-going work to be completed during the period of completion of the works for which BID is invited. For the sake of clarification, it is mentioned that works for which bidder has emerged as the winner of the bids, but LOA has not been issued as on the day before opening the financial bids shall also be considered while calculating value of B.

**C**= The amount of bonus received, if any, in EPC Projects during the last 3 years (updated to the price level of the year indicated in table at Notes for Calculation below).

**2.2.7.2. Notes for Calculation:**

**2.2.7.2.1. Price Level Adjustment Factors:**

The following factors shall be used to update the annual turnover and commitments to the current price level:

Year	Year-1 (Current Financial Year)	Year-2 (Previous Year)	Year-3 (Two Years Prior)
<b>Updation Factor</b>	<b>1.00</b>	<b>1.05</b>	<b>1.10</b>

Year-1: Refers to the current financial year or, if the bid due date falls within three months of the close of the last financial year, the preceding financial year.

Year-2 and Year-3: Refer to the financial years immediately preceding Year-1.

**2.2.7.3. Verification of Commitments:**

The bidder must submit a statement detailing all current commitments, including ongoing works and works for which the bidder has been declared the winner but not yet issued an LOA. This statement must include the following details for each work:

- i. Name of work.
- ii. Value of the contract (updated to current price levels as per Note 1).
- iii. Stipulated completion period and remaining completion timeline.

**The statement must be:**

- i. Countersigned by the Engineer-in-Charge (not below the rank of Executive Engineer) for EPC projects or by the Concessionaire/Authorized Signatory of the SPV for BOT projects.
- ii. Verified and certified by the bidder’s Statutory Auditor.

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Failure to submit the required statement or submission of an incomplete or unverified statement shall result in disqualification of the bid as per Clause 3 (Eligibility and Qualification Criteria).

## 2.2.7.4. General Provisions:

- i. Bidders shall submit the required details for the calculation of 'A' and 'C' in the prescribed format as provided in the Annexure of this document. Failure to furnish these details in the specified format shall render the bid non-compliant and subject to disqualification.
- ii. Bidders must ensure accurate and complete disclosure of commitments and turnover figures. Any misrepresentation or omission may result in disqualification.
- iii. NHIT reserves the right to seek additional clarifications or conduct independent verification of the submitted data.
- iv. This bid capacity assessment is non-negotiable and binding for all bidders participating in this RFP process.
- v. The amount of bonus received, if any, in EPC Projects should be countersigned by the Client or its Engineer-in-charge not below the rank of Executive Engineer or equivalent in respect of EPC Projects.

## 2.2.8. Earnest Money Deposit (EMD)

The Bidder is required to submit an Earnest Money Deposit (EMD) as part of the bid security. **All provisions related to EMD, including its amount, mode of submission, validity, refund conditions, and forfeiture, are specified under Clause 2.4 (Bid Security Details).** Bidders are required to comply with the provisions mentioned therein.

## 2.2.9. Key Terms and Conditions of Appointment/Engagement

**2.2.9.1. Right to Modify Validity Period:** NHIT reserves the absolute right to either curtail or extend the validity period of the engagement/appointment of the appointed Agency/Firm, at its sole discretion, as deemed necessary for the successful execution of the project or in the best interest of **NHIT**. Any extension or reduction in the validity period will be communicated to the Agency/Firm in writing.

**2.2.9.2. Notification of Changes:** In case of any modification to the validity period, **NHIT** will provide written notice specifying the new terms and conditions, including the extended or shortened period, and any associated adjustments, if applicable.

**2.2.9.3. Obligations During Extension or Curtailment:** The appointed Agency/Firm shall continue to fulfil all obligations under this engagement, including performance deliverables, timelines, and other agreed-upon terms, during the entire extended or curtailed period, unless otherwise notified by **NHIT**.

### 2.2.9.4. Contractor's Obligations Upon Termination

- i. In the event of termination under the provisions of the **Termination of Contract clause in the GCC**, the Contractor shall continue to perform all contractual

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obligations diligently until the effective date of termination, as specified in the termination notice. The Contractor shall not:

- a) unilaterally cease work before the termination date.
  - b) obstruct or interfere with other agencies executing parallel works; or
  - c) damage, disrupt, or delay any ongoing or completed work.
- ii. The Contractor shall ensure a smooth handover of the site, including all relevant documents, materials, and work records, in coordination with the Client and any succeeding agency. Failure to comply with these obligations shall be treated as a **breach of contract**, entitling the Client to impose penalties, recover damages, forfeit performance security, or take any other legal action deemed necessary.
- iii. The Client reserves the right to blacklist the Contractor from future projects for a specified period in the event of non-compliance with this clause.

**2.2.9.5. No Claims for Extension or Curtailment:** The appointed Agency/Firm acknowledges and agrees that there shall be no entitlement to any claim or compensation in connection with any extension or reduction in the engagement period, unless explicitly agreed upon by both parties in writing.

## 2.2.10. MSME Status of Agency/Firm

**2.2.10.1. Confirmation of MSME Status:** The Bidder shall confirm whether it is registered as a **Micro Enterprise, Small Enterprise, or Medium Enterprise** under the relevant laws and regulations governing MSMEs. The Bidder shall submit their **Registration Number** along with a copy of the **Registration Certificate** issued by the appropriate authority.

**2.2.10.2. Notification of Change in Status:** The Bidder agrees to notify **NHIT** promptly in writing of any change in the status of their organization with respect to the classification under the **Micro, Small, and Medium Enterprises (MSME) Development Act** or any other relevant legislation. This includes, but is not limited to, any changes that may affect their eligibility for MSME benefits or status.

**2.2.10.3. Responsibility for Non-Notification:** The Bidder acknowledges that it shall be solely responsible for any failure to inform **NHIT** of any change in its MSME status. **NHIT** will not be held liable for any consequences arising from the Bidder's failure to update its status in a timely and accurate manner.

**2.2.10.4. Obligation to Provide Updated Documentation:** In the event of any change in the Bidder's MSME status, the Bidder shall promptly submit the updated **Registration Certificate** or any other relevant documentation to **NHIT** for verification.

**2.2.10.5. Impact on Contractual Obligations:** The Bidder understands that failure to comply with the above requirements may result in the disqualification of their bid or termination of any contract awarded, as determined by **NHIT** in its sole discretion.

## 2.2.11. Indemnification

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The Agency shall indemnify, defend, and hold **NHIT** harmless, including its affiliates, directors, officers, employees, agents, and representatives, from and against any and all claims, demands, penalties, fines, losses, damages, costs, expenses, or proceedings (whether actual or threatened), including but not limited to legal fees and expenses, arising directly or indirectly from:

- 2.2.11.1. Breach of Laws or Regulations:** Any breach or contravention of any applicable laws, statutes, regulations, or governmental directives, whether local, national, or international, by the Agency or its personnel during the performance of services under this agreement.
- 2.2.11.2. Non-compliance:** Any failure by the Agency to comply with the terms, conditions, or provisions outlined in this order or agreement.
- 2.2.11.3. Third-Party Claims:** Any claims or actions initiated by third parties, including employees or agents of the Agency, arising from the Agency's negligence, misconduct, or breach of its contractual obligations.
- 2.2.11.4. Intellectual Property Infringement:** Any claims, losses, or damages arising out of infringement or alleged infringement of third-party intellectual property rights, including patents, trademarks, copyrights, or trade secrets, caused by the Agency's actions or omissions.
- 2.2.11.5. Environmental or Safety Violations:** Any penalties, fines, or legal actions arising from violations of environmental laws or safety regulations directly attributable to the Agency's activities.

The indemnity obligations under this clause shall apply irrespective of the negligence, whether active or passive, of **NHIT** or any of its affiliates, and shall survive the termination or expiration of this agreement.

The Agency agrees to assume full responsibility for its actions, or those of its employees, subcontractors, or agents, that result in any of the above-mentioned claims.

**2.2.11.6. Indemnification Procedures:**

**2.2.11.6.1. Notice of Claim:** In the event that **NHIT** is subject to a claim or proceeding that is subject to indemnification, **NHIT** shall promptly notify the Agency in writing. The Agency shall have the right to assume and control the defense of any such claim or proceeding, at its own expense, provided that **NHIT** may participate in such defense at its own cost and discretion.

**2.2.11.6.2. Cooperation:** **NHIT** agrees to cooperate fully with the Agency in defending or settling any claim subject to indemnification. However, the Agency shall not settle, admit liability, or enter into any agreement or compromise concerning such claims without the prior written consent of **NHIT's** authorized representative, as per **NHIT's** internal approval framework, which may include final approval from the CEO of **NHIT**.

Any settlement that imposes financial obligations, penalties, restrictions, or liabilities on **NHIT** shall be void and unenforceable unless expressly approved in writing by **NHIT**. **NHIT** reserves the right to review, participate in, or assume control of the defense and settlement process at its sole discretion, should it determine that the proposed resolution may adversely impact **NHIT's** legal, financial, or reputational interests.

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## 2.2.11.6.3. Blacklisting Disclosure & Indemnification

At any stage of the RFP process, upon award of the contract, during its execution, or at any time before or after completion of contractual obligations, if the Contractor is blacklisted, debarred, or otherwise disqualified from bidding or executing contracts **Central Public Sector Undertaking (CPSU), State Public Sector Undertaking (SPSU), government companies, government organizations, or regulatory authorities, NHAI, NHIT and NHIT's subsidiaries**, the Contractor shall immediately notify NHIT in writing, providing a detailed explanation of the reasons and circumstances leading to such blacklisting.

Failure to disclose such blacklisting shall be considered a material breach of contract, entitling NHIT to take appropriate action, including but not limited to:

- a) Contract termination without liability to NHIT,
- b) Forfeiture of performance security,
- c) Recovery of damages resulting from reputational harm, project delays, or financial loss,
- d) Blacklisting the Contractor from future NHIT projects, and
- e) Triggering indemnification provisions to recover any costs incurred due to the Contractor's blacklisting.

NHIT reserves the right to assess the impact of the blacklisting on ongoing contractual obligations and may, at its sole discretion, impose additional safeguards, request alternative arrangements, or initiate necessary legal proceedings to protect its interests

## 2.2.12. Eligible Bidders

Bidders must meet the eligibility and qualification requirements specified under **Clause 3 (Eligibility & Qualification Criteria)** to participate in the bidding process. The detailed technical, financial, and legal criteria, including the necessary supporting documents, are outlined therein.

## 2.2.13. Disqualification Criteria

The disqualification conditions applicable to bidders are set forth under **Clause 3.8 (Disqualification Criteria)**. Bidders failing to meet the specified requirements, providing false information, or engaging in prohibited practices shall be disqualified.

## 2.2.14. Payment Terms

The payment terms for this project are governed by the provisions set forth in the General Conditions of Contract (GCC), Special Conditions of Contract (SCC), and the Contract Data.

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Bidders are advised to refer to these documents for detailed information regarding the payment schedule, invoicing requirements, and any associated terms.

### Key Points:

#### 2.2.14.1. Invoice Submission:

- i. All payments shall be made in accordance with the terms outlined in the Contract, based on the successful submission and approval of invoices by **NHIT**. The required supporting documentation must be provided with each invoice. In case the required documents are not submitted along with the invoice, the payment shall not be disbursed, nor shall the invoice be considered as submitted. An invoice shall only be deemed submitted if it is accompanied by all necessary details and documents required for the verification of its authenticity.

#### 2.2.14.2. Payment Milestones:

- i. Payment will be made in accordance with the approved payment schedule, subject to the successful completion and acceptance of the corresponding milestones, as specified in the Contract Data.

#### 2.2.14.3. Currency and Method of Payment:

- i. Payments will be made in the currency specified in the Contract, through the payment method outlined therein. All payment-related banking charges, if any, shall be borne by the Bidder.

#### 2.2.14.4. Delay in Payment:

- i. In the event of delays in payments due to issues on **NHIT's** part, no interest shall be payable on any overdue payments. The payment will be processed as per the terms outlined in the **General Conditions of Contract (GCC)** and **Special Conditions of Contract (SCC)**.
- ii. Bidders are advised to review the GCC and SCC for the relevant provisions regarding payment timelines and procedures.
- iii. Bidders are advised to review the relevant sections of the GCC, SCC, and Contract Data for a comprehensive understanding of the payment procedures, including any penalties, deductions, or conditions related to payment processing.

#### 2.2.15. Documents to be Submitted Along with the Bid

- i. Bidders are required to submit the following documents as part of their Bid. Failure to provide these documents in the required format may result in disqualification of the Bid:

##### 2.2.15.1. Authorization Documents:

##### 2.2.15.2. Power of Attorney – Refer clause 2.2.2 **Bid Form**:

- i. The Bid in the form provided in the RFP, duly completed and signed by the authorized representative of the Bidder on all pages.

##### 2.2.15.3. Bidder Profile:

A detailed profile of the Bidder, certified by the Authorized Signatory, including organizational structure, key personnel, and areas of expertise.

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### 2.2.15.4. Eligibility and Experience Documentation:

- i. Documents supporting the Bidder's claims regarding eligibility and experience, duly signed by the authorized representative on all pages.
- ii. Copies of work orders, purchase orders, completion certificates, and performance certificates must be included. **NHIT** reserves the right to request third-party certifications at a later stage.

### 2.2.15.5. Undertaking:

- i. A declaration or undertaking in the format provided in the RFP, duly signed by the authorized representative on all pages, affirming compliance with the terms and conditions of the RFP.

### 2.2.15.6. Company Registration and Compliance Certificates:

- i. Copy of the Company Registration Certificate, GST Registration Certificate, and MSME Certificate (if applicable).
- ii. Copies of PAN and TAN registrations (as applicable).
- iii. Any other statutory registration certificates required by law.

### 2.2.15.7. Experience Credentials:

- i. Experience certificates self-attested by the Authorized Signatory, along with copies of supporting documents such as Work Orders/Purchase Orders and Completion Certificates.

### 2.2.15.8. Financial Documentation:

- i. Audited financial statements for the last three financial years, including Balance Sheets, Profit and Loss Statements, and Auditor's Reports.
- ii. A Certificate from a Statutory Chartered Accountant specifying the annual turnover of the Bidder for the last three financial years.
- iii. The Bidder shall not have been involved in material litigation that, in aggregate, exceeds 10% of their net worth or annual turnover over the last [5] years. For the purposes of this clause, 'material litigation' refers to any legal dispute, arbitration, or claim that may adversely affect the Bidder's ability to execute the project. The Bidder must provide a declaration of all ongoing and past material litigation, along with supporting documents, if any, for verification by NHIT.

### 2.2.15.9. Bid Security:

- i. Earnest Money Deposit (EMD) in the form and value specified in the RFP, along with proof of submission.

### 2.2.15.10. Technical Proposal (if applicable):

- i. A detailed technical proposal (if required by the RFP) demonstrating the Bidder's approach, methodology, and understanding of the scope of work.

### 2.2.15.11. Other Relevant Documents:

- i. Any additional information or documentation specified in the RFP or deemed necessary to substantiate the Bidder's eligibility and compliance.

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## 2.2.16. Anti-Bribery & Corruption (ABC) Policy

NHIT is committed to conducting all its business activities with honesty, integrity, and the highest ethical standards. We maintain a zero-tolerance approach to bribery and corruption in all forms and are dedicated to acting professionally and fairly in all our business dealings and relationships, regardless of location.

To ensure compliance, we implement and enforce robust systems and controls designed to prevent and detect bribery and corruption. We expect all employees, contractors, suppliers, and stakeholders to adhere strictly to these principles.

If you encounter or are subject to any improper demands, including bribery or corrupt practices involving NHIT employees, you are encouraged to report such incidents immediately. Reports can be made **confidentially by sending an email to [whistleblow@nhit.co.in](mailto:whistleblow@nhit.co.in)**.

NHIT ensures that all whistleblowers will be protected from retaliation and that their reports will be handled with the utmost confidentiality, in line with applicable laws and organizational policies.

## 2.2.17. Ethics & Integrity

The selected Agency/Firm is expected to uphold the highest standards of professional ethics, integrity, and accountability in all its dealings, operations, and interactions associated with NHIT. The Agency/Firm shall:

- a) **Act in NHIT's Best Interests:** Ensure that all actions, decisions, and conduct are aligned with NHIT's objectives and do not, in any manner, harm or compromise NHIT's reputation, business interests, or operational effectiveness.
- b) **Avoid Conflicts of Interest:** Proactively disclose any actual, potential, or perceived conflicts of interest that may arise during the execution of duties. The Agency/Firm must take appropriate measures to mitigate any such conflicts to ensure impartiality and transparency in all dealings.
- c) **Adhere to Laws and Regulations:** Comply with all applicable laws, rules, and regulations governing professional conduct, anti-corruption, anti-bribery, and fair business practices.
- d) **Confidentiality:** Safeguard all proprietary, confidential, or sensitive information entrusted by NHIT and ensure that such information is not used for personal gain or disclosed to any unauthorized party.
- e) **Fair Practices:** Engage in fair business practices, avoiding any acts of dishonesty, fraud, misrepresentation, or unethical conduct.
- f) **Non-Maleficence:** Refrain from any behaviour, directly or indirectly, that may be detrimental to NHIT's interests, reputation, or relationships with its stakeholders, clients, or partners.

NHIT reserves the right to terminate the contract and take appropriate legal action if the Agency/Firm is found to be in violation of any aspect of this clause. Compliance with these principles is a mandatory requirement, and failure to adhere may result in disqualification, penalties, or other remedial measures as deemed necessary by NHIT.

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## 2.2.18. Confidentiality Obligations under the RFP

The Agency/Firm acknowledges that **Clause 32** (Confidentiality and Non-Disclosure) and **Clause 36.3** (Confidentiality and Intellectual Property Rights) of the General Conditions of Contract (GCC) comprehensively govern the obligations of confidentiality and the treatment of intellectual property rights under the contract. In addition to those provisions, the following confidentiality obligations apply specifically to the RFP stage:

### 2.2.18.1. Scope of Confidentiality During the RFP Process:

All information, documents, or data shared by **NHIT** as part of the Request for Proposal (RFP) process, including but not limited to RFP documents, evaluation criteria, communication, and other proprietary information, shall be treated as confidential by the Agency/Firm.

### 2.2.18.2. Prohibited Actions:

- a) The Agency/Firm shall not disclose, reproduce, or use any RFP-related information for any purpose other than preparing and submitting a proposal in response to this RFP.
- b) The Agency/Firm shall not share any RFP-related information with third parties, except with employees or advisors directly involved in the proposal preparation, who must also comply with these confidentiality obligations.

### 2.2.18.3. Reference to GCC Obligations:

The obligations under Clause 32 and Clause 36.3 of the GCC shall apply to all information disclosed during the RFP process, including the preservation of confidentiality for intellectual property, trade secrets, and proprietary data of **NHIT**.

### 2.2.18.4. Exclusions from Confidentiality:

- a) Confidentiality obligations under this clause shall not apply to information that:  
Is publicly available at the time of disclosure or subsequently becomes publicly available through no fault of the Agency/Firm.
- b) Was lawfully in the Agency/Firm's possession before disclosure by **NHIT**.
- c) Is required to be disclosed by law, regulation, or court order, provided that the Agency/Firm gives prior written notice to **NHIT**, where permissible, and takes reasonable measures to limit the extent of such disclosure.

### 2.2.18.5. Survival of Obligations:

The confidentiality obligations outlined herein shall remain binding on the Agency/Firm regardless of the outcome of the RFP process and shall survive the conclusion or cancellation of this RFP for a period of at least five (5) years or as specified in Clause 32 and Clause 36.3 of the GCC, whichever is longer, **or until the information becomes public by lawful disclosure.**

### 2.2.18.6. Breach and Remedies:

Any breach of this confidentiality clause may result in disqualification of the Agency/Firm from the RFP process, forfeiture of the Earnest Money Deposit (EMD), or other legal or contractual remedies as deemed appropriate by **NHIT**.

### 2.2.18.7. Acknowledgment of Obligations:

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By participating in this RFP, the Agency/Firm explicitly agrees to abide by the confidentiality obligations stated herein and acknowledges the applicability of Clause 32 and Clause 36.3 of the GCC to the RFP process.

## 2.2.19. Right of Removal

**NHIT** reserves the sole and absolute right to remove any selected Agency/Firm from the selection list at its discretion, without the obligation to provide any justification or to bear any costs, liabilities, or compensation arising from such removal. Furthermore, **NHIT** retains the right, at any stage, to replace, remove, or appoint a new Agency/Firm to fulfil ongoing or future requirements as it deems necessary to ensure the efficient execution of its projects or operations.

The exercise of this right by **NHIT** shall not be construed as a breach of any contractual obligations under the Request for Proposal (RFP) process or subsequent agreements, and no claims for damages, loss of opportunity, or compensation shall be entertained from the removed Agency/Firm.

## 2.2.20. Right to descope part of full

### 2.2.20.1. Right to Descope Due to Contractor's Failure or Other Conditions

"Notwithstanding anything contained in the Contract, NHIT reserves the right to partially or fully descope the Contractor's scope of work under the following circumstances:

- a. **Failure to Perform:** If the Contractor fails to meet performance standards, timelines, or quality requirements as per the Contract, despite being given reasonable opportunity to rectify the deficiencies.
- b. **Persistent Non-Compliance:** If the Contractor fails to adhere to contractual obligations, including but not limited to safety regulations, statutory compliance, or approved work methodologies.
- c. **Material Breach of Contract:** If the Contractor commits a material breach that does not warrant immediate termination but requires NHIT to take corrective action.
- d. **Financial or Technical Inability:** If NHIT determines that the Contractor is financially unstable or lacks the technical resources to execute the project efficiently.
- e. **Regulatory or Statutory Directives:** If NHIT is required to modify the scope due to legal, environmental, or regulatory changes affecting the project.
- f. **Project Restructuring or Budgetary Constraints:** If NHIT decides to restructure, reschedule, or optimize the project scope for administrative or financial reasons.

### 2.2.20.2. Consequences of Descope

In case of partial descope, the Contractor shall continue with the remaining scope as per the Contract, and the Contract Price shall be adjusted proportionately based on agreed unit rates.

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NHIT shall have the right to re-allocate the descoped portion to another agency or execute it through its own resources without any claims or objections from the Contractor.

If the descoping is due to Contractor's failure, non-performance, or breach, NHIT reserves the right to recover additional costs incurred in getting the work executed from another party.

Performance Security shall not be released until all adjustments, claims, and recoveries (if any) are settled to NHIT's satisfaction.

## **2.2.20.3. Linkage with GCC Termination Clause**

If the failure or non-performance leading to descoping is severe and beyond rectification, NHIT reserves the right to initiate termination as per the provisions of the Termination Clause under the GCC.

## **2.2.21. General Information**

### **2.2.21.1. Vendor Profile:**

The Vendor shall provide a comprehensive profile detailing the constitution, ownership structure, and core business activities of their organization. This information must be submitted as part of the Bid/Proposal to enable **NHIT** to assess the Vendor's qualifications and suitability for the assignment.

### **2.2.21.2. Analysis of Rates:**

The Bidder is required to include a detailed Analysis of Rates as part of their Financial Proposal. The Analysis should clearly outline the basis of cost estimates, ensuring transparency and facilitating an informed evaluation by **NHIT**.

### **2.2.21.3. Conflict of Interest and Commitments (refer clause 2.2.4 of RFP):**

The Bidder shall disclose any existing commitments, obligations, or circumstances that may either act as a constraint or result in a conflict of interest concerning the proposed assignment. Such disclosures must accompany the Bid/Proposal to ensure full transparency.

### **2.2.21.4. Site Visit Requirement:**

It is mandatory for the Bidder to conduct a site visit prior to the submission of the Bid/Proposal. The purpose of the site visit is to enable the Bidder to assess all relevant conditions and requirements necessary for the preparation of an informed and accurate proposal. By submitting their Bid/Proposal, the Bidder acknowledges that they have accounted for all site-related considerations.

## **2.3. Bid Process Overview**

### **2.3.1. Two-Envelope System (Technical & Financial)**

The selection of the Successful Bidder shall follow a Two-Envelope System, comprising the **Technical Proposal** and the **Financial Proposal**, submitted in separate sealed envelopes:

#### **(a) Technical Proposal**

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- i. Shall mean the part of the Bid containing the Bidder's qualifications, experience, methodology, and proposed approach for executing the Work as specified in the RFP.
- ii. The Technical Proposal shall be evaluated based on the criteria outlined in the RFP, including, but not limited to, experience in similar projects, equipment ownership, and personnel capabilities.
- iii. Only those Bidders whose Technical Proposals meet or exceed the prescribed minimum score shall proceed to the Financial Proposal evaluation.
- iv. Details of evaluation of technical proposal is given in the **Section 3 – Eligibility and Qualification Criteria**.

### (b) Financial Proposal

- i. Shall mean the part of the Bid containing the financial offer, including the total Contract Price for executing the Work in accordance with the terms of the RFP.
- ii. The Financial Proposal shall be opened only for Bidders whose Technical Proposals are qualified, and the evaluation shall be conducted as per the methodology defined in the RFP.

### (c) Evaluation Process

- i. The Authority shall open and evaluate the Technical Proposals first.
- ii. Financial Proposals of only technically qualified Bidders shall be opened.
- iii. The selection of the Successful Bidder shall be based on the evaluation methodology outlined in Clause 3 – Eligibility and Qualification Criteria, following the Quality and Cost Based Selection (QCBS) system as per NHIT's practices. The final ranking of bidders shall be determined based on their combined Technical Score (TS) and Financial Score (FS), as described in the RFP.

## 2.3.2. Bid Submission Procedures

### 2.3.2.1. General Requirements

- i. Bids shall be prepared and submitted in strict accordance with the instructions specified in the Request for Proposal (RFP).
- ii. The Bidder shall ensure that all documents and forms are complete, accurate, and duly signed by an authorized representative.
- iii. Late, incomplete, or non-compliant Bids shall not be considered and will be summarily rejected.

### 2.3.2.2. Submission Format

- i. The Bid shall be submitted in two separate sealed envelopes, clearly marked as follows:

**Envelope 1: "Technical Proposal for [Project Name]"**

**Envelope 2: "Financial Proposal for [Project Name]"**

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- ii. Both envelopes shall be placed in an outer sealed envelope marked as:  
**“Bid Submission for [Project Name] – Do Not Open Before [Bid Opening Date]”**

### 2.3.2.3. Mode of Submission

- i. Bids must be submitted either in person or via registered post/courier to the address specified in the RFP, ensuring that they are received before the Bid Due Date and time.
- ii. The Employer/Authority shall not be responsible for any delays in submission due to postal, courier services, or other external factors. The Bidder is solely responsible for ensuring timely submission.
- iii. If electronic submission is permitted as per Clause 2.3.2.8, Bidders may also submit their Bids through the designated online platform, subject to compliance with the RFP requirements.

### 2.3.2.4. Bid Validity

- i. The Bid shall remain valid for a period of **[120 days]** from the Bid Due Date, unless extended by mutual written agreement between the Employer and the Bidder.
- ii. The Employer may request an extension of Bid validity if required during the evaluation period. The Bidder shall respond promptly to such requests.

### 2.3.2.5. Modification or Withdrawal of Bids

- i. The Bidder may modify or withdraw its Bid before the Bid Due Date by submitting a written notice to the Employer/Authority.
- ii. No Bid shall be modified or withdrawn after the Bid Due Date. Any attempt to do so will result in the disqualification of the Bidder.

### 2.3.2.6. Bid Opening

- i. The Technical Proposals shall be opened on the date and time specified in the RFP, in the presence of Bidder representatives who choose to attend.
- ii. The Financial Proposals shall only be opened for those Bidders who are found technically qualified. The date and time for the opening of Financial Proposals shall be communicated separately to the qualified Bidders.

### 2.3.2.7. Late Bids

Any Bid received after the Bid Due Date and time, as stipulated in the RFP, shall be considered late and shall not be evaluated. Such Bids will be returned unopened to the Bidder, unless the delay was caused by force majeure or other exceptional circumstances, as determined by the Employer.

### 2.3.2.8. Electronic Submission (if applicable)

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- i. If electronic submission of Bids is permitted, the Bidder shall submit the Bid via the designated online platform, ensuring that the required digital signatures are affixed.
- ii. The Bidder must ensure that the submission complies with the technical specifications and format requirements as outlined in the RFP.
- iii. In case both electronic and physical submissions are permitted, the physically submitted Bid shall prevail in the event of any discrepancies.
- iv. If the Contract Data Sheet (CDS) mandates only electronic submission, then physical submission will not be required.

## 2.3.2.9. Bid Clarifications

- i. The Employer reserves the right to request clarifications or additional information from the Bidders during the evaluation process.
- ii. All clarifications shall be requested in writing, and Bidders shall respond in a timely manner.
- iii. Any response or clarification provided by the Bidder will be considered part of the Bid and may be evaluated accordingly.

## 2.3.2.10. Rejection of Non-Compliant Bids

- i. Any Bid that does not comply with the Bid submission procedures as outlined in this Sub-**Clause 2.3** shall be rejected by the Employer.
- ii. Bidders shall ensure that their Bids are fully compliant with the submission requirements, including format, documents, and signatures, to avoid rejection.

## 2.4. Bid Security Details

The Bidder shall furnish Bid Security (Earnest Money Deposit, or "EMD") as a guarantee to ensure the Bidder's bona fide intention to participate in the bidding process and to safeguard the Employer from the risk of Bidder's withdrawal or failure to comply with the terms of the RFP or any other conditions specified in the Contract. The EMD shall be submitted as per the details set forth below.

### 2.4.1. Earnest Money Deposit (EMD)

The Earnest Money Deposit (EMD) amount shall be either a fixed sum or a percentage of the estimated project cost, as specified hereinbelow. The EMD must be submitted by the Bidder in the prescribed form and shall be in accordance with the instructions provided in this **Clause** Failure to submit the EMD in the specified format shall result in the disqualification of the Bid.

- i. **Amount/Percentage:** *[As specified in Contract Data Sheet]*
- ii. **Mode of Submission:** The EMD shall be submitted in the form of a Demand Draft (DD), Banker's Cheque, or a Bank Guarantee issued by a Scheduled Commercial Bank in India, payable in favour of [Employer Name]. The validity of the EMD shall be for a period of **[90]** days.
- iii. **Retention & Refund:**

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- a) The EMD of the successful Bidder shall be retained until the execution of the Contract Agreement or the submission of the Performance Security, whichever occurs earlier.
- b) The EMD of unsuccessful Bidders will be refunded promptly upon finalization of the contract award process.
- c) No interest shall be payable on the EMD amount under any circumstances.

**iv. Forfeiture of EMD:**

- a) The EMD may be forfeited under the following conditions:
- b) If the Bidder withdraws or modifies its bid during the bid validity period.
- c) If the Bidder refuses to accept the Letter of Award (LOA) after being selected as the successful Bidder.
- d) If the successful Bidder fails to sign the Contract Agreement within the stipulated time.
- e) If the Bidder fails to furnish the required Performance Security within the prescribed period.
- f) If any fraudulent or misleading information is found in the bid documents.

## 2.4.2. Bank Guarantee Template for Bid Security

A Bank Guarantee, in lieu of the Earnest Money Deposit (EMD), may be submitted as an alternative mode of Bid Security. In such cases, the Bank Guarantee must comply with the prescribed format and requirements specified in **Annexure [B1]** of this RFP.

The Bank Guarantee shall:

- Be issued by a Scheduled Commercial Bank in India.
- Be irrevocable and unconditional.
- Be valid for a period of **[180] days** from the final date for submission of the bid (including any extension period).
- Contain a clear and specific statement of the guarantee amount and a reference to the **Invocation Clause**, as detailed in the Bank Guarantee template provided in the Annexure.

A template of the Bank Guarantee format is provided in **Annexure [B1]**, which must be strictly adhered to while submitting the Bank Guarantee.

## 2.5. Clarifications and Addendum

### 2.5.1. Pre-Bid Queries and Responses

- (a) **Submission of Queries:** Bidders may submit queries or seek clarifications regarding the bid documents within the timeline specified in the Key Dates section of this RFP. All queries shall be submitted in writing via email or through the official communication channel specified in Section 1.4.
- (b) **Format for Queries:** Queries must be submitted in the prescribed format, mentioning the relevant section, Clause No., or provision of the RFP for which clarification is sought.

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- (c) **Response to Queries:** The Client shall provide responses to all queries received within the stipulated timeline. These responses shall be made available to all bidders via email or uploaded on the official tender portal.
- (d) **No Individual Clarifications:** No bidder shall communicate directly with any Authority representative for clarification outside the specified channels.

## 2.5.2. Issuance of Corrigendum/Addendum

- (a) **Client's Right to Amend:** The Client reserves the right to modify, amend, or issue Corrigendum to the RFP documents before the bid submission deadline.
- (b) **Communication of Changes:** All Corrigendum/Addendum shall be communicated via the official tender portal. If deemed necessary, the Authority may also notify bidders via the email address provided during registration. No other form of communication shall be deemed valid.
- (c) **Binding Nature:** All Corrigendum/Addendum issued by the Authority shall be considered an integral part of the RFP documents and binding upon all bidders.
- (d) **Deadline Extensions:** If necessary, the Authority may, at its discretion, extend the bid submission deadline to provide adequate time for bidders to incorporate changes communicated through Corrigendum/Addendum.
- (e) **Responsibility of Bidders:** All Corrigendum/Addendum uploaded on the official tender portal shall be deemed to have been duly communicated to all bidders. It shall be the sole responsibility of bidders to regularly check the official portal for updates. If a corrigendum/addendum is also communicated via email, bidders shall acknowledge receipt within the specified timeframe. Failure to acknowledge shall not absolve the bidder from complying with the issued modifications.

## 2.6. Bid Validity Period

The Bid shall remain valid for a period of **120 days** from the **last date of submission of the Financial Bid**. The Bidder agrees to keep the offer open and unaltered for acceptance by the Employer during this period, without modification or withdrawal.

The following terms and conditions shall apply with respect to the Bid Validity Period:

- **Commencement of Validity:**

The 120-day validity period shall commence from the last date of submission of the Financial Bid, and shall expire on the 120th day thereafter, unless extended by mutual consent of the Employer and the Bidder.
- **Extension of Validity:**

If, in the opinion of the Employer, the bid evaluation process cannot be concluded within the validity period, the Employer may request an extension of the validity period. The Bidder shall, at the sole discretion of the Employer, extend the validity of the Bid for the requested period, on the same terms and conditions, including the pricing. Such an extension shall be formalized through a written agreement between the Employer and the Bidder.
- **Bidder's Obligation During Bid Validity:**

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During the Bid Validity Period, the Bidder shall not revoke or withdraw their Bid. The Bidder shall keep their Bid open for acceptance without any unilateral alteration to the terms, conditions, or prices specified in their submission.

However, in the following circumstances, a Bidder may be allowed to revise and resubmit their Bid:

- a. **Changes or Addendums by NHIT:** If NHIT issues any corrigendum, addendum, or modification to the RFP documents after Bid submission, Bidders shall have the right to revise and resubmit their Bids in accordance with the revised terms, within the prescribed timeframe.
- b. **Correction of Genuine Errors Prior to Bid Opening:** A Bidder (only once) may request a revision of their submitted Bid before the scheduled bid opening date if they provide a written request along with a detailed justification and analysis of the error, demonstrating that the revision is necessary due to an inadvertent mistake and not due to any malpractice or unfair advantage.
- c. **Ensuring Fair Competition:** Any request for Bid revision shall be subject to NHIT's approval, ensuring that no unfair advantage is given to any Bidder. NHIT reserves the right to reject any revision request if it finds that the change could compromise the integrity of the bidding process or create an imbalance among competing Bidders.

Once the Bids are opened, no revisions, modifications, or withdrawals shall be permitted under any circumstances.

- **Failure to Extend Validity:**

If the Bidder refuses or fails to extend the Bid Validity Period when requested by the Employer, the Bid shall be considered non-responsive, and the Bidder shall be disqualified from further consideration.

- **Force Majeure:**

In the event of Force Majeure or other circumstances beyond the control of the Employer, the Bid Validity Period may be extended, subject to mutual agreement between the Employer and the Bidder.

## 2.7. Evaluation Process

The evaluation of Bids shall be conducted in accordance with the eligibility, technical, and financial criteria detailed in **Clause 3 (Eligibility and Qualification Criteria) of this RFP**. The process shall be fair, transparent, and objective, based on the information provided by the Bidders.

### 2.7.1. Technical Bid Evaluation (for details refer clause no. 3.4 – Technical evaluation Criteria)

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The Technical Bid shall be evaluated based on key parameters, including but not limited to **bidder's experience, technical approach, methodology, key personnel, equipment, financial capacity, and past performance**. For detailed evaluation criteria and scoring methodology, refer to **Clause 3.4 – Technical Evaluation Criteria**.

The **Technical Bid** will be evaluated on a **pass/fail** basis. Any Bid that does not meet the minimum technical requirements specified in the RFP will be deemed non-responsive and disqualified from further evaluation.

## **2.7.2. Financial Bid Evaluation**

The Financial Bids of only the **technically qualified Bidders** shall be opened and evaluated to determine the **most advantageous offer**, considering the bid price, conformance to payment terms, and completeness of the financial proposal. The Financial Bid evaluation shall be conducted in accordance with the criteria specified in **Clause 3.6 – Financial Criteria**.

The **Financial Bid** will be scored based on the lowest responsive bid, considering both the total cost and the value offered in terms of quality, safety, and time. In the event of a tie, the Employer may decide to engage in negotiations or apply additional criteria to determine the final award.

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## 3. Eligibility and Qualification Criteria

This section outlines the eligibility and qualification criteria for bidders to ensure that only qualified and capable entities participate in the bidding process. The bidder must meet the specified technical, financial, and legal requirements to be considered eligible for the award of the contract.

**The detailed technical and financial eligibility requirements specific to this project are provided in the Contract Data Sheet (CDS).** Bidders are advised to **carefully refer to the Contract Data Sheet and all associated annexures** for project-specific qualification parameters, thresholds, formats, and documentary requirements before preparing their bid.

### 3.1. General Eligibility Criteria

**3.1.1.** To be eligible for bidding, the Bidder must fulfil the following general eligibility requirements:

#### 3.1.2. Legally Established Entity:

The Bidder must be a legally registered entity in India or an eligible international entity, including a consortium, joint venture (JV) if allowed for this RFP (refer CDS clause 5.3), or partnership. Valid proof such as a certificate of incorporation, partnership deed, or joint venture agreement must be provided.

#### 3.1.3. Notification of Changes in Firm's Name, Structure, or Merger

At any stage during the RFP process or after contract award, the Bidder must immediately notify NHIT in writing in the event of:

- i. A change in the name of the firm or its legal identity.
- ii. Any restructuring, reorganization, or change in the ownership or controlling interest of the firm.
- iii. Merger, acquisition, or amalgamation with any other entity, whether domestic or international.

NHIT reserves the right to assess the impact of such changes on the Bidder's eligibility and performance obligations. If NHIT determines that such changes adversely affect the Bidder's qualifications, financial stability, or conflict-of-interest status, NHIT may:

- a. Disqualify the Bidder from the RFP process.
- b. Terminate the contract without liability to NHIT.
- c. Invoke performance security and recover damages for any financial or reputational impact.

Failure to disclose any such change shall be treated as a material breach of contract and may result in immediate disqualification or contract termination.

**3.1.4. Experience & Capability:** The Bidder must demonstrate experience in executing infrastructure projects of a similar nature and scale. The total value of work completed should reflect the Bidder's financial and technical ability to handle the project. Supporting

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documents such as completion certificates, project references, and contract details must be provided.

- 3.1.5. Statutory Compliance:** The Bidder must have valid GST registration, PAN, and other applicable statutory registrations. Documentary proof must be submitted.
- 3.1.6. No Blacklisting:** The Bidder should not have been blacklisted or debarred by **Central Public Sector Undertaking (CPSU), State Public Sector Undertaking (SPSU), government companies, government organizations, or regulatory authorities, NHAI, NHIT and NHIT's subsidiaries**. A self-declaration certificate confirming the non-blacklisting status must be provided.
- 3.1.7. Financial Soundness:** The Bidder must meet the minimum financial criteria specified under Clause 3.4 (Financial Criteria) to demonstrate its ability to execute the contract successfully.
- 3.1.8.** As part of the eligibility assessment, bidders must comply with the requirements specified in **Clause 2.2.7.3 (Verification of Commitments)**. Failure to submit the required statement of commitments, or submission of an incomplete or unverified statement, may result in disqualification of the bid.
- 3.1.9.** Failure to meet these general eligibility criteria shall result in automatic disqualification from the bidding process.

## **3.2. Technical Criteria (Similar Project Experience) refer cl. 5.2 of CDS**

The Bidder must demonstrate relevant experience in executing projects of similar nature, scope, and complexity. The technical qualifications shall be based on the Bidder's proven capability in handling projects that are comparable in scale and scope to the one proposed herein. The technical criteria for eligibility shall be as follows:

### **3.2.1. Similar Project Experience:**

- i. ***Minimum 10 years of experience in Repair & Rehabilitation works out of which at least 5 years should be in Repair & Rehabilitation of All/any of major structural components of a Bridge.***
- ii. ***Minimum 5 years of experience in replacement of bearings (motion type of Bearing) of Bridges with span not less than 50 meters.***
- iii. Minimum 3 years of experience in undertaking structural strengthening of piers/Girders/Pedestals using Jacketing/Carbon fibre wrapping with minimum 3 nos. completed projects.

### **3.2.2. Nature of Work:**

- i. The projects should have involved activities such as Bridge Rehabilitation and Repair of similar scale, complexity, and technology as outlined in this RFP.

### **3.2.3. Value of Works Executed:**

- i. The Bidder must have executed works with a minimum total contract value of **[as specified in Contract Data Sheet]**, either individually or collectively across similar projects.
- ii. The value of such works should have been completed in the past **[5] years**.

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**3.2.4. Supporting Documentation:** The Bidder shall submit the following documents to substantiate their technical experience:

- i. Completion certificates from the Employer or the client for each project undertaken.
- ii. Detailed description of the project scope, including the Bidder's role and responsibilities.
- iii. Contract value and duration of the project.

Failure to provide the required documentation or evidence of similar project experience may result in the disqualification of the Bidder.

### 3.3. Specific Eligibility Criteria – refer Cl. 5.2 of CDS

Bidders must meet the following project-specific eligibility requirements based on the type of work they are bidding for:

#### 3.3.1. Road Maintenance Works

- i. The Bidder must have successfully completed at least **three (3)** road maintenance projects on national or state highways within the **past five (5) years**.
- ii. The total value of these completed projects must be at least **for the amount as specified in Contract Data Sheet**, demonstrating financial capacity.
- iii. The scope of work should include periodic maintenance, overlays, and routine upkeep of road infrastructure.
- iv. The Bidder must own or have access to essential equipment such as milling machines, pavers, compactors, and hot-mix plants.
- v. Supporting documents: Project completion certificates, scope of work, and proof of equipment ownership/access.

#### 3.3.2. Toll Management Works

- i. The Bidder must have a **minimum of two (2) years** of experience in toll plaza operation and management.
- ii. The total value of toll management contracts handled should reflect the Bidder's ability to manage toll revenue and operations.
- iii. Experience should include operation of electronic toll collection systems, manual toll collection, and revenue reconciliation.
- iv. Supporting documents: Performance certificates, reference letters, and toll operations reports.

#### 3.3.3. Civil Works

- i. The Bidder must have completed civil engineering projects related to highway construction, bridge repairs, or related infrastructure.
- ii. The scope should include road construction, bituminous macadam, reinforced concrete structures, grading, and drainage systems.
- iii. The total value of such projects must be at least **[as specified in Contract Data Sheet]** amount within the **last five [5] years**.

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- iv. The Bidder must own or have access to batching plants, transit mixers, bitumen sprayers, and crushers.
- v. Supporting documents: Project details, completion certificates, proof of equipment ownership/access.

### 3.3.4. Electrical Works

- i. The Bidder must have experience in installation, operation, and maintenance of electrical systems for highways or toll plazas.
- ii. Experience should cover highway lighting, traffic signals, and high-mast lighting installations.
- iii. The total value of executed electrical works should be at least [as specified in Contract Data Sheet] amount.
- iv. The Bidder must own or have access to cranes, hydraulic platforms, and certified testing devices.
- v. Supporting documents: Project completion certificates, safety compliance reports, and equipment access proof.

### 3.4. Technical Evaluation Criteria

The technical evaluation of the bids will be carried out based on the criteria outlined in the table below. Each bidder will be evaluated on the basis of the following parameters, and the maximum marks that can be awarded under each criterion are specified.

**Minimum Qualifying Score** - The bidder must achieve a minimum of **70 marks (out of 100)** in the technical evaluation to qualify for the financial bid opening. Bidders who score below the minimum qualifying score will not be considered further in the evaluation process.

#### 3.4.1. Technical Evaluation Matrix

Sr. No.	Evaluation criteria & scoring guidance	Maximum Points
1	<b>Minimum 10 Years' Experience in Rehabilitation and Repair works:</b>	25
	10 Years to 12 Years: 15 Marks	
	> 12 Years to 15 Years: 20 Marks	
	> 15 Years: 25 Marks	
2	<b>Annual Turnover for Last Three years:</b>	25
	10 Crore to 20 Crore: 15 Marks	
	>20 Crore to 30 Crore: 20 Marks	
	> 30 Crore: 25 Marks	
3	<b>Experience and Capabilities in replacement of bearings</b>	25
	a) Less than 05 Years – Not Eligible	
	b) 05 Years to less than 07 Years – 15 Marks	
	c) 07 Years to 10 Years – 20 Marks	
	D) More than 10 Years – 25 Marks	
<b>Documents Required:</b> <i>WOs copies issued by client.</i>		
4	<b>Experience in undertaking structural strengthening of piers/Girders/Pedestals using Jacketing/Carbon fibre wrapping</b>	25
	Less than 03 Completed projects – Not eligible	

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a) 03 to 05 Projects – 15 Marks	
b) 06 to 08 Projects – 20 Marks	
c) More than 08 Projects – 25 Marks	
<b>Total Technical Score</b>	<b>100</b>

## 3.5. Documents to be Furnished

Bidders must provide the following documents to support their technical proposals. Failure to provide the required documents will result in disqualification:

### 3.5.1. General Eligibility Documents:

- Registration certificate of the bidder entity (including consortium or joint venture, if applicable).
- GST certificate.
- PAN card.
- A self-declaration stating that the bidder is not blacklisted by any government authority in India.

### 3.5.2. Technical Proposal Documents:

- A detailed technical approach and methodology document outlining the steps and processes to be followed.
- CVs and qualifications of key personnel, demonstrating their expertise in managing similar projects.
- List and description of the equipment and technology that will be used during the project.
- Equipment ownership or lease agreements.

### 3.5.3. Financial Documents:

- Audited financial statements for the last three financial years.
- Bank statements showing financial capacity.
- Proof of tax compliance.

### 3.5.4. Experience Documents:

- Completion certificates for at least three projects of a similar nature and scale, along with client references.
- Details of completed projects (including scope, value, and timelines) to substantiate the bidder's experience.

### 3.5.5. Safety and Environmental Management Documents:

- A safety management plan.
- Environmental compliance certificates or reports from previous projects.
- Details of any relevant certifications related to quality or safety management systems (e.g., ISO).

### 3.5.6. Previous Performance on NHAI/Highway Projects:

- Reference letters or performance certificates from clients for projects similar in scope or value.

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b) Evidence of the bidder's past performance on NHAI or highway projects.

### 3.5.7. Evaluation Methodology

The evaluation will be conducted in the following manner:

- i. **Step 1: Preliminary Scrutiny** – Checking completeness of documents.
- ii. **Step 2: Technical Evaluation** – Assessing bidder experience, project execution capability, equipment, and personnel based on the above matrix and document submitted.  
Bidders must secure a minimum of 70 marks in the technical evaluation to move to the next stage.
- iii. **Step 3: Financial Qualification** – Evaluating financial soundness based on audited statements and turnover. Financial proposals of only those bidders who have qualified in the technical evaluation will be opened and evaluated.
- iv. **Step 4: Final Scoring & Selection** – Assigning weighted scores and finalizing technically qualified bidders.

The Client reserves the right to reject any technical proposal that does not meet the minimum requirements or fails to submit the requisite documents.

### 3.6. Financial Criteria (Net Worth, Turnover, etc.)

The Bidder must satisfy the **financial eligibility criteria** to ensure their financial stability and capacity to undertake and complete the project. Additionally, the evaluation of the **Financial Bids** shall consider compliance with cost structure, payment terms, and bid completeness. The criteria for financial evaluation are as follows:

#### 3.6.1. Financial Eligibility Criteria:

The Bidder must meet the following financial requirements to qualify for bid evaluation:

- i. **Net Worth:** The Bidder must have a minimum net worth of **[as specified in Contract Data Sheet]** as of the most recent financial year. The net worth should be certified by a Chartered Accountant or an equivalent financial expert, and the certificate must be included with the bid.
- ii. **Annual Turnover:** The Bidder must have an average annual turnover of at least **[as specified in Contract Data sheet]** over the last **[3] financial years**. This turnover must be derived from core business activities related to infrastructure development and project management.
- iii. **Solvency and Credit Rating:** The Bidder should provide a letter from a recognized financial institution stating their current solvency and creditworthiness, which shall demonstrate their ability to mobilize funds for the project.
- iv. **Financial Documents:** The Bidder must submit the following:
  - a) Audited financial statements for the last **[3] years**, including profit and loss statements, balance sheets, and cash flow statements.
  - b) A certificate from a Chartered Accountant stating the average annual turnover and the net worth for the relevant period.

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- c) Any other documents that demonstrate the Bidder's financial strength, including letters of credit, bank statements, or solvency certificates, if applicable. Failure to meet the financial criteria or provide the required supporting documents may lead to the rejection of the bid.

### 3.6.2. Financial Bid Evaluation:

The Financial Bids of only the **technically qualified Bidders** shall be opened and evaluated to determine the **most advantageous offer**, considering the following:

- i. **Bid Price:** The overall price quoted by the Bidder shall be evaluated to ensure compliance with the cost structure and pricing details specified in the RFP. The Employer reserves the right to **reject any bid** if the pricing is deemed **excessively high or unreasonably low**.
- ii. **Conformance to Payment Terms:** The financial proposal must align with the **payment schedule and terms** defined in the RFP.
- iii. **Completeness of Financial Proposal:** The financial bid shall be assessed for **completeness**, ensuring that **all required items, works, and deliverables** under the Contract are properly priced.

The Financial Bid shall be evaluated based on the **Lowest Responsive Bid**, considering both the total cost and the value offered in terms of quality, safety, and timely execution. In case of a **tie**, the Employer may opt for **negotiations** or apply additional criteria to determine the final award.

### 3.7. Legal and Regulatory Requirements

The Bidder must comply with all applicable laws, regulations, and statutory obligations under Indian law, as well as the regulatory requirements set by the Employer, including but not limited to the following:

- 3.7.1. Incorporation and Legal Status:** The Bidder must be a legally constituted entity under Indian law, registered as a corporation, partnership, or joint venture. The Bidder must provide a copy of the certificate of incorporation, articles of association, and other relevant documents proving their legal status.
- 3.7.2. Tax Compliance:** The Bidder must submit a valid Goods and Services Tax (GST) registration certificate, along with evidence of good standing in compliance with all applicable tax obligations. In addition, the Bidder must have filed tax returns for the last **[5] years**.
- 3.7.3. No Litigation or Legal Disputes:** The Bidder must declare that they are not involved in any litigation or legal disputes that may affect their ability to perform the contract. The Bidder must submit a self-certification regarding the absence of any ongoing or past legal disputes, particularly those that may affect the project's execution.
- 3.7.4. Debarment or Blacklisting:** The Bidder must not be debarred, blacklisted, or otherwise disqualified from bidding on projects by NHIT and its subsidiaries, any government agency, department, or public authority. A declaration confirming this must be provided by the Bidder.
- 3.7.5. Other Regulatory Compliance:** The Bidder must comply with all relevant local, state, and central government laws and regulations, including but not limited to labor laws, environmental regulations, and safety standards. The Bidder must submit necessary documentation to demonstrate compliance with these regulatory requirements.

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Failure to meet these legal and regulatory requirements, or to provide the necessary documentation, may result in the rejection of the Bidder's proposal.

### 3.8. Disqualification Criteria

NHIT reserves the right to disqualify any bidder or Respondent, at its sole discretion, at any stage during the evaluation of proposals, in the event that the Respondent:

#### 3.8.1. Late Submission:

Submits the proposal documents after the specified bid due date and time, regardless of the reason for delay.

#### 3.8.2. Misrepresentation or False Information:

Makes any misleading or false representations, or provides false, inaccurate, or incomplete information in the forms, statements, or supporting documents submitted to demonstrate eligibility or compliance with the requirements.

#### 3.8.3. Failure to Provide Clarifications:

Fails to provide relevant clarifications or additional information, as requested by NHIT, within the stipulated time frame.

#### 3.8.4. Ineligibility Due to Debarment or Blacklisting:

The Respondent, or any of its directors, shall be deemed ineligible if they have been declared ineligible or debarred by any Central Public Sector Undertaking (CPSU), State Public Sector Undertaking (SPSU), government companies, government organizations, regulatory authorities, NHAI, NHIT, or NHIT's subsidiaries for involvement in corrupt practices, fraudulent conduct, or any other criminal activity. Additionally, any bidder found to be blacklisted by such entities will be disqualified from participation in this RFP process.

#### 3.8.5. Mandatory Disclosure & Consequences of Non-Disclosure

The Bidder shall submit a self-declaration affidavit stating that neither the Bidder nor any of its directors or key personnel have been debarred or blacklisted by any entity mentioned in Clause 3.8.1.4. This affidavit shall be provided along with the bid submission.

In the event that NHIT discovers, at any stage of the bidding process or contract execution, that the Bidder was blacklisted or debarred at the time of submission and failed to disclose such information:

- i. The bid shall be summarily rejected, or the contract shall be terminated immediately.
- ii. NHIT shall forfeit any performance security or earnest money deposit (EMD) submitted by the Bidder.
- iii. NHIT reserves the right to recover damages for any financial, reputational, or operational loss incurred due to the misrepresentation.
- iv. The Bidder shall be permanently blacklisted from future NHIT projects.

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NHIT may also conduct background verification checks at its sole discretion to confirm the authenticity of the Bidder's disclosures. Any false statement, concealment, or misrepresentation shall be treated as fraudulent practice, and NHIT shall be entitled to take appropriate legal action.

**3.8.6. Joint Venture (JV) Eligibility:** Bidders submitting their proposal as a Joint Venture (JV) must strictly adhere to the eligibility criteria as specified in this RFP. Any JV submitted in a form other than that prescribed in this document will be deemed non-compliant. Such JV bidders shall be considered ineligible, and their bids will be summarily rejected without further consideration.

**3.8.7. Disputes with NHIT Entities:** Bidders who have an unresolved dispute with any NHIT entities or have previously defaulted in the provision of services or execution of works for NHIT shall be deemed ineligible to participate in this RFP. The Bidder's past performance with NHIT Entities will be thoroughly reviewed, and any history of defaults or contractual disputes may result in disqualification from the bidding process.

### **3.8.8. Non-Workable & Unjustified Bids**

A Bidder shall be liable for disqualification from the RFP process or contract termination if the bid submitted is deemed non-workable, irrationally low, or lacking proper justification. The following conditions shall apply:

- i. **Unrealistic Pricing:** If NHIT determines that the Bidder has submitted an abnormally low bid that appears non-workable, with the potential to compromise project quality, financial viability, or timely completion.
- ii. **Failure to Justify Quoted Rates:** If the Bidder fails to submit a detailed rate analysis, cost breakdown, or backup documentation demonstrating the viability of the quoted rates within the stipulated time upon NHIT's request.
- iii. **Inability to Provide Work Methodology:** If the Bidder is unable to furnish a credible work methodology, resource allocation plan, or execution strategy ensuring compliance with project deliverables as outlined in the scope document.
- iv. **Malafide Intentions or Price Disruption:** If it is reasonably established that the Bidder has deliberately submitted an abnormally low bid with mala-fide intent to manipulate prices, disrupt fair competition, or create a non-competitive market scenario.
- v. **Non-Compliance with Deliverables:** If the quoted rates, work methodology, or resource commitments fail to meet the scope and quality requirements, thereby affecting project execution, NHIT reserves the right to disqualify the Bidder at any stage of the bidding or execution process.

NHIT, at its sole discretion, may seek additional clarifications, rate justifications, or performance commitments from the Bidder. If the Bidder fails to provide satisfactory explanations or evidence of feasibility, NHIT reserves the right to:

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- a) Disqualify the Bidder from the tender process.
- b) Terminate the contract if already awarded.
- c) Invoke performance security and recover damages for project risks caused due to the non-workable bid.
- d) Blacklisting the Bidder from future NHIT projects.

NHIT's decision in assessing the workability of the bid shall be final and binding, and no claims or disputes regarding disqualification under this clause shall be entertained.

### General Provisions:

- **NHIT** reserves the right to evaluate the responsiveness, eligibility, and qualification of Bidders based on the information provided in the proposal and any clarifications sought by **NHIT**.

The decision to disqualify a Bidder under the above criteria shall be final and binding, and no claims for compensation or reconsideration shall be entertained.

### 3.8.9. Disqualification for Duplicate Bids or Collusion

A bidder shall be disqualified from the RFP process, and their bid shall be summarily rejected, if at any stage NHIT determines that:

- i. **Duplicate or Multiple Bids** – The Bidder has submitted more than one bid for the same project, either directly or indirectly, through different entities, Joint Ventures, Consortiums, or affiliated companies, in violation of Clause 2.2.1.5.
- ii. **Collusion with NHIT Employees** – The Bidder is found to have engaged in direct or indirect collusion with any NHIT employee, representative, or consultant to gain an unfair advantage in the bidding process.
- iii. **Prohibition on Collusion Among Bidders**

"Collusion Among Bidders: If NHIT determines that two or more Bidders have engaged in any form of collusion, cartelization, price-fixing, bid rotation, or any other anti-competitive practice to manipulate the bidding process or restrict fair competition, all such Bidders shall be immediately disqualified from the RFP process.

In addition, NHIT reserves the right to:

- a. Forfeit the Earnest Money Deposit (EMD) or Performance Security of the colluding Bidders.
- b. Blacklist the involved Bidders from future NHIT tenders for a specified period.
- c. Report the collusion to relevant regulatory authorities for further legal action.

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The determination of collusion shall be at NHIT's sole discretion and may be based on direct evidence, circumstantial findings, or independent investigation. Any such decision shall be final and binding, with no claims entertained from the affected Bidders.

- iv. Fraudulent or Manipulative Practices – The Bidder has attempted to influence the RFP process by unethical means, including bribery, coercion, or unauthorized communication with NHIT officials regarding bid evaluation.

If any of the above violations are detected at any stage of the RFP process or contract execution, NHIT reserves the right to:

- a) Reject the bid immediately without further evaluation.
- b) Terminate the contract if already awarded.
- c) Forfeit the Earnest Money Deposit (EMD) or Performance Security.
- d) Blacklist the Bidder from participating in future NHIT projects.
- e) Initiate legal proceedings as per applicable laws.

NHIT shall not be liable for any claims, damages, or expenses incurred by the Bidder due to disqualification under this clause.

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## 4. Project Information

As provided in the Contract Data Sheet

### 4.1. Scope of Work

The Scope of Work under this Request for Proposal (RFP) is outlined in detail in **Annexure [C2]**, which constitutes an integral and binding part of this document. The works to be undertaken by the successful bidder shall align with the objectives of this RFP and encompass activities associated with the maintenance, management, procurement, or consultancy of road infrastructure and allied systems.

The successful bidder shall assume full responsibility for the planning, execution, and completion of the assigned works in strict accordance with the terms and conditions set forth in the contract agreement. This includes unwavering adherence to all applicable technical standards, specifications, and industry best practices, ensuring compliance with quality, safety, environmental, and statutory requirements at all stages of the project.

All works shall be executed with the highest standards of professionalism, diligence, and efficiency, ensuring the timely delivery of services while minimizing disruptions to ongoing operations. The bidder shall deploy appropriate and adequate resources, including skilled personnel, equipment, and materials, to achieve the objectives outlined in the detailed Scope of Work.

The specific obligations, deliverables, timelines, and performance metrics are comprehensively detailed in **Annexure [C2]**, which forms an integral and binding part of this RFP. Bidders are required to thoroughly review, comprehend, and unconditionally acknowledge the provisions set forth in **Annexure [C2]** as a mandatory prerequisite for submitting their proposals. Non-compliance with this requirement may result in the rejection of the proposal.

Furthermore, the bidder shall proactively address any challenges or deviations encountered during the execution of the works, ensuring prompt communication with the contracting authority and effective resolution of issues in alignment with the contract terms.

The Bidder is required to carefully review the entire Scope of Work to ensure they understand all the activities and responsibilities entailed in the project execution.

### 4.2. Site Details and Location Maps

This section provides essential information about the project site, including site conditions, access, and any specific challenges that may affect the execution of the works. The Bidder must thoroughly review these details to assess the feasibility and plan for project implementation.

**4.2.1. Site Location:** The project is located at **Annexure [C4]**. The exact coordinates of the site can be found in the attached site location maps. The site is accessible via [insert access roads]

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and is situated in proximity to key transport hubs, making transportation of materials and equipment relatively easy.

**4.2.2. Topographical and Site Conditions:** The site consists of [refer Annexure [C4]]. The existing road network requires maintenance and repair works, including resurfacing, drainage improvements, and signages.

**4.2.3. Site Restrictions:** The Bidder must consider the following site-specific factors:

- i. **Right of Way:** Ensure access to the site without any encumbrances.
- ii. **Traffic Management:** Special consideration must be given to managing traffic during working hours, including diversions and road closures as necessary.
- iii. **Space Availability:** The available area for material storage, equipment placement, and construction camps is limited and needs careful planning.

**4.2.4. Location Maps:**

- i. Detailed location maps, site layouts, and access points are provided in the **Annexure [C4]** for the Bidder's reference. These maps should be reviewed thoroughly to understand site boundaries, existing infrastructure, and areas of work.

**4.2.5. Pre-Construction Surveys:** The Contractor is required to carry out their own survey to verify the existing conditions of the site, including sub-soil investigations, topographic surveys, and geotechnical assessments. These surveys will form the baseline for the execution of the works.

The Bidder must submit a plan for the logistics and execution of works, considering the site-specific challenges and requirements outlined above.

## 4.3. Environmental and Statutory Clearances

The Contractor is responsible for ensuring that all necessary environmental and statutory clearances are obtained prior to commencing any works on the project site. This section provides an overview of the clearances required and the expectations for compliance with environmental and statutory regulations.

**4.3.1. Environmental Clearances:** The project must adhere to the environmental regulations set forth by the Ministry of Environment, Forest and Climate Change (MoEFCC) and other relevant authorities. The Contractor must ensure compliance with the following:

- i. **Environmental Impact Assessment (EIA):** The Contractor must obtain an EIA approval if required for the nature and scope of the work.
- ii. **Air, Water, and Noise Pollution Control:** The Contractor must implement measures to mitigate air, water, and noise pollution during the construction phase in accordance with the prescribed limits and guidelines.
- iii. **Waste Management:** The Contractor must implement a waste management plan, including the disposal of construction debris, hazardous materials, and non-hazardous waste, ensuring compliance with local regulations.

**4.3.2. Statutory Clearances:** The following statutory clearances must be obtained by the Contractor before work commences:

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- i. **Permits for Excavation and Groundwork:** Approvals from local authorities for any excavation and groundwork activities.
  - ii. **Clearance for Traffic Diversion:** Approval from relevant traffic authorities for any required road closures or diversions during the work.
  - iii. **Land Use and Building Approvals:** Any necessary approvals from local authorities regarding land use or construction work.
- 4.3.3. Compliance and Documentation:** The Contractor shall submit copies of all clearance certificates, permits, and approvals obtained from the relevant authorities. These documents must be provided as part of the pre-construction documentation before the commencement of the work.
- 4.3.4. Environmental Management Plan (EMP):** The Contractor shall prepare an Environmental Management Plan (EMP) that outlines the measures to be implemented to protect the environment throughout the project lifecycle. The EMP shall include details on waste management, pollution control, and mitigation measures for any environmental impacts identified during the pre-construction surveys. **Detailed Format for Environmental Management Plan (EMP) is given in Section 16.**

The Contractor shall be responsible for the timely acquisition of all necessary clearances and ensuring that the work is carried out in full compliance with environmental and statutory requirements.

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## 5. Terms and Conditions of Contract

### 5.1. General Conditions of Contract (GCC)

The General Conditions of Contract (GCC) shall govern the contractual relationship between the Employer and the Contractor, detailing the rights, obligations, and responsibilities of both parties. The GCC provides comprehensive terms covering scope, performance standards, payment terms, safety measures, dispute resolution mechanisms, and termination conditions, among other relevant provisions.

The GCC forms an integral part of this RFP and is appended as **Annexure [A1]** for reference. Bidders are advised to carefully review the GCC to ensure complete understanding and compliance. By submitting their Proposal, Bidders confirm their acceptance of the terms outlined in the GCC, except for any deviations explicitly stated and agreed upon during the bid evaluation process.

In case of any inconsistency between the provisions of this RFP and the GCC, the provisions of the GCC shall prevail unless explicitly stated otherwise in the Special Conditions of Contract (SCC) or other contractual documents.

### 5.2. Special Conditions of Contract (SCC)

The Special Conditions of Contract (SCC) shall supplement the General Conditions of Contract (GCC) and shall specify project-specific requirements, terms, and obligations applicable to the execution of the contract.

The SCC is designed to address particular aspects of the project, including but not limited to scope variations, additional responsibilities, payment milestones, performance security, warranties, and project timelines. In case of any conflict between the GCC and SCC, the provisions of the SCC shall prevail to the extent of such conflict.

The detailed Special Conditions of Contract are provided as an **Annexure [A2]** to this RFP document. Bidders are advised to thoroughly review the SCC and incorporate its provisions into their bids. The SCC forms an integral part of the contract and shall be binding on all parties upon the signing of the agreement.

### 5.3. Contract Data (Project-Specific Details)

The Contract Data provides essential project-specific details that supplement the General and Special Conditions of the Contract. These details are integral to understanding the scope, execution, and management of the contract. The Contract Data shall be referenced by all Bidders during the preparation and submission of their Bids and by the successful Bidder during project execution.

All relevant project-specific information, including but not limited to, the following, shall be included in the Contract Data and annexed to this RFP:

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- a) **Project Title and Location:** A brief description of the project and its geographical location.
- b) **Scope of Work:** Outline of key deliverables, milestones, and specific requirements.
- c) **Key Dates and Timeframes:** Including Bid submission deadlines, contract commencement date, and project completion timelines.
- d) **Payment Terms:** Details regarding billing cycles, interim payments, and final settlement.
- e) **Performance Requirements:** Any specific performance indicators or metrics applicable to the project.
- f) **List of Minimum Equipment:** Required machinery and tools to be owned or deployed by the contractor, as applicable.
- g) **Quality Standards and Testing Protocols:** Reference to applicable standards and frequency of testing, if any.
- h) **Safety and Environmental Compliance:** Specific safety and environmental guidelines for the project.
- i) **Contact Points:** Designated representatives for communication and coordination, including their roles and responsibilities.

The detailed **Contract Data** is provided as **Annexure [C1]** of this RFP and forms an integral part of the bidding documents. Bidders are advised to review the Annexure thoroughly to ensure their Bids are compliant with the project-specific requirements. Any clarifications regarding the Contract Data must be sought in accordance with the procedure outlined in **Clause No. [2.5 – Clarifications and Addendum]** of this RFP.

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## 6. Design and Construction Requirements

### 6.1. Design Requirements

The Contractor shall ensure that all designs conform to:

- i. MoRTH Specifications for Road and Bridge Works (5th Revision) published by IRC.
- ii. Relevant IRC codes and guidelines.
- iii. Relevant IS codes and standards.

Design submissions must align with the project's functional and safety requirements, incorporating:

- i. Detailed design reports, calculations, and drawings for structural and non-structural components.
- ii. Safety provisions, environmental sustainability, and traffic management plans.

All design requirements are detailed in **Annexure [C5]**, which includes specific parameters and submission protocols.

### 6.2. Construction Requirements

All construction activities shall comply with:

- i. MoRTH Specifications for Road and Bridge Works (5th Revision).
- ii. Approved project schedules and methodologies.
- iii. Standards for material quality, workmanship, and safety.

The Contractor must ensure testing, quality assurance, and the use of appropriate equipment. Non-compliance shall be subject to penalties as specified in the contract. For further details, refer to **Annexure [C6]**.

### 6.3. Technical Specifications

All technical specifications shall strictly follow:

- i. MoRTH Specifications for Road and Bridge Works (5th Revision).
- ii. Relevant IRC codes for design, materials, and construction.
- iii. Relevant IS codes for materials, testing, and compliance.

The detailed technical specifications for the project are provided in **Annexure [C7]**. Any deviations require prior approval from **NHIT**.

### 6.4. Approved Drawings (Plans, Layouts, Sections, etc.)

The project shall be executed in strict accordance with the approved drawings, which include:

- i. General Arrangement Drawings (GAD), detailed layouts, and sections.
- ii. Structural reinforcement details and material specifications.
- iii. Utility layouts and drainage systems.

The approved drawings are appended as **Annexure [C8]**. Any revisions or updates shall be issued formally by **NHIT**.

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### 6.5. Utility Shifting Guidelines (if applicable)

If utility shifting is part of the project scope, the Contractor shall:

- i. Follow the protocols outlined in MoRTH Specifications for Road and Bridge Works (5th Revision) and relevant IRC/IS codes.
- ii. Liaise with utility owners to minimize disruptions.
- iii. Ensure proper safety, environmental compliance, and timely execution.

Detailed guidelines for utility shifting, including coordination protocols and safety measures, are provided in **Annexure [A4]**.

#### Note

All technical specifications, drawings, and guidelines shall adhere to the latest editions of MoRTH Specifications for Road and Bridge Works (5th Revision), relevant IRC codes, and IS codes. Annexures referenced in this section are integral to the RFP document.

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## 7. Quality Assurance and Control Requirements

### 7.1. Standards to be Adhered to (MoRTH, IRC, IS, etc.)

#### Standards to be Adhered to

The Contractor shall strictly follow the latest versions of the following standards for all aspects of quality assurance and control:

1. **MoRTH Specifications for Road and Bridge Works (5th Revision):**
  - i. **Clause No. 900**, which comprehensively addresses quality management and control measures for road and bridge works.
2. **Relevant IRC Codes:**
  - i. For design, materials, and construction practices.
3. **Relevant IS Codes:**
  - i. For testing methods, material standards, and compliance procedures.

All testing, inspections, and certifications shall conform to the guidelines outlined in these codes. Where discrepancies arise, the most stringent requirement shall prevail.

### 7.2. Contractor's QA/QC Obligations

The Contractor is required to implement a robust QA/QC plan as per **Clause No. 900** of the **MoRTH Specifications for Road and Bridge Works (5th Revision)**, which includes but is not limited to:

1. **Establishment of a QA/QC System:**
  - i. Develop and submit a comprehensive QA/QC plan for approval prior to the commencement of works.
  - ii. Designate a dedicated QA/QC manager and support team responsible for quality management.
2. **Material Testing and Certification:**
  - i. Conduct all material testing in accordance with the relevant IRC and IS codes.
  - ii. Submit test results and certifications from approved laboratories as per project requirements.
3. **Inspection and Approval:**
  - i. Facilitate inspections by the Engineer or authorized representatives at all stages of work.
  - ii. Obtain prior approval for materials, equipment, and methodologies before use or implementation.
4. **Documentation and Reporting:**
  - i. Maintain detailed records of all QA/QC activities, including test reports, inspection logs, and certifications.
  - ii. Submit periodic quality reports to the Engineer for review and verification.
5. **Rectification of Defects:**
  - i. Address any defects or non-compliance issues promptly as identified during inspections or audits.

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- ii. Ensure that rectification measures conform to the approved standards and specifications.

**6. Site Laboratory and Testing Facilities:**

- i. Establish a fully equipped site laboratory to conduct routine tests.
- ii. Ensure availability of trained personnel to perform and validate tests as required.

Failure to comply with QA/QC obligations may lead to penalties, suspension of work, or termination of the contract, as deemed appropriate by the Employer.

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### 8. Health, Safety, and Environmental (HSE) Guidelines

This section establishes the mandatory Health, Safety, and Environmental (HSE) guidelines that the Contractor must adhere to during the execution of the project. The Contractor is obligated to implement appropriate measures to ensure the safety of workers, the protection of the environment, and compliance with statutory regulations.

#### 8.1. HSE Requirements

The Contractor shall be responsible for ensuring the health, safety, and welfare of all persons employed or engaged in the performance of the work. Additionally, the Contractor must take all necessary precautions to protect the environment, ensure the safety of the general public, and minimize disruptions to traffic and nearby properties. Strict adherence to traffic management protocols, construction best practices, and all applicable health, safety, and environmental (HSE) regulations is mandatory. The Contractor shall comply with NHIT's HSE Policy & Requirements as detailed in **Annexure [A5]** of this RFP throughout the project duration.

The following HSE guidelines must be strictly adhered to throughout the project duration:

##### 1. General HSE Obligations:

- i. The Contractor shall implement all necessary measures to safeguard the health and safety of workers, visitors, and any other persons who may be affected by the project activities.
- ii. The Contractor shall provide and maintain a safe working environment, free from recognized hazards that could cause injury or illness. The working conditions shall comply with all applicable national and international standards, including but not limited to the **Factories Act, 1948, The Environment Protection Act, 1986, The Occupational Safety, Health and Working Conditions Code, 2020, and International Labour Organization (ILO) standards.**
- iii. The Contractor shall conduct risk assessments regularly and take proactive steps to mitigate any identified risks. All work practices shall be reviewed periodically to ensure compliance with the latest safety regulations and standards.

##### 2. Health and Safety Procedures:

- i. The Contractor shall establish a **Health and Safety Management Plan (HSMP)** before commencing work, detailing the procedures and controls to be implemented. The HSMP shall include procedures for emergency response, first aid, medical services, and accident reporting.
- ii. The Contractor shall provide personal protective equipment (PPE) to all workers and ensure its proper use. PPE includes, but is not limited to, helmets, safety boots, gloves, goggles, ear protection, and high-visibility clothing.
- iii. The Contractor shall ensure that all workers are adequately trained on health and safety protocols, emergency procedures, and the proper use of equipment. Regular safety drills and training sessions must be conducted and documented.
- iv. A **Health and Safety Officer** shall be appointed to oversee the implementation of the HSMP and ensure compliance with all safety regulations. The Health and Safety

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Officer will be responsible for reporting safety violations and making recommendations for corrective actions.

### 3. Emergency Preparedness:

- i. The Contractor shall establish emergency response procedures for various contingencies, including fire, medical emergencies, natural disasters, and accidents. These procedures must be communicated to all personnel, and emergency response drills shall be conducted periodically.
- ii. A **first-aid kit** and emergency medical services shall be readily available at the worksite. The Contractor must ensure that all workers are familiar with the location of the emergency facilities and the procedures for requesting emergency assistance.

### 4. Reporting and Record-Keeping:

- i. The Contractor shall maintain comprehensive records of all health and safety incidents, including accidents, injuries, near-misses, and corrective actions taken. These records must be submitted regularly to the Employer for review.
- ii. In case of any significant accident or incident, the Contractor shall provide an immediate report to the Employer and the relevant authorities, along with a detailed investigation into the cause and corrective measures.

### 5. Subcontractor Compliance:

- i. The Contractor shall ensure that all subcontractors engaged in the project adhere to the same high standards of health and safety. The Contractor shall be responsible for ensuring that subcontractors comply with the HSE requirements and shall monitor their performance accordingly.

### 6. Non-Compliance Penalties:

- i. Failure to comply with the HSE guidelines may result in penalties, work stoppages, or contract termination. The Employer reserves the right to take corrective action in case of persistent non-compliance.

## 8.2. Environmental Management Plan (EMP)

The Contractor shall prepare and implement an **Environmental Management Plan (EMP)** to ensure the project is executed in a manner that minimizes environmental impact. The EMP shall detail the specific actions to be taken to mitigate adverse environmental effects arising from the project and ensure compliance with environmental regulations. **Detailed Format for Environmental Management Plan (EMP) is given in Section 16.**

### 1. General Environmental Obligations:

- i. The Contractor shall comply with all relevant environmental laws, regulations, and guidelines, including those set by the **Ministry of Environment, Forest and Climate Change (MoEFCC)**, the **Environmental Protection Act, 1986**, and **State Pollution Control Boards**. The EMP must be designed in accordance with these regulations to minimize pollution and protect natural resources.

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- ii. The EMP must include provisions for environmental monitoring and compliance audits to assess the project's adherence to environmental standards and regulations.
2. **Mitigation of Environmental Impacts:** The EMP shall address the following environmental impacts, among others:
- i. **Air Quality:** Measures to control dust, emissions from vehicles, and other pollutants during construction activities. Dust suppression techniques, such as water spraying and the use of dust barriers, shall be implemented.
  - ii. **Water Quality:** The Contractor shall ensure that water bodies in and around the project area are protected from contamination due to construction activities. Measures shall be taken to manage runoff, prevent spillage of hazardous materials, and treat wastewater as per legal requirements.
  - iii. **Waste Management:** The Contractor shall implement a waste management strategy that includes the collection, segregation, recycling, and disposal of waste materials. Hazardous and non-hazardous wastes must be handled separately, with proper disposal methods to avoid environmental harm.
  - iv. **Noise and Vibration:** The Contractor shall take necessary precautions to limit noise and vibration levels at the site. The use of noise barriers, the maintenance of machinery, and compliance with permissible noise limits shall be part of the mitigation measures.
  - v. **Ecological Impact:** If the project site affects flora and fauna, the EMP shall include a detailed plan for the conservation of biodiversity, including the protection of existing vegetation, wildlife, and endangered species.
3. **Monitoring and Compliance:**
- i. The Contractor shall conduct regular environmental monitoring to assess the effectiveness of the mitigation measures and identify any unforeseen environmental impacts.
  - ii. Environmental audits shall be conducted at regular intervals, and the Contractor shall submit the results of these audits to the Employer.
  - iii. The Contractor shall cooperate with the authorities and provide access to the site for inspection of environmental compliance.
4. **Waste Disposal and Resource Management:**
- i. The Contractor shall ensure the proper disposal of construction debris and hazardous materials in compliance with relevant environmental guidelines.
  - ii. The EMP shall include measures for resource conservation, such as energy-efficient construction methods, use of sustainable materials, and water conservation during the execution of the project.
5. **Emergency Response for Environmental Incidents:**
- i. In the event of an environmental accident, such as a chemical spill or fuel leak, the Contractor shall have a response plan in place, including immediate containment measures, notification procedures, and mitigation actions. The Employer shall be

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notified immediately, and corrective actions must be taken to prevent further damage.

### 6. Environmental Training:

- i. The Contractor shall provide environmental awareness training to all workers and subcontractors involved in the project. This training shall focus on the importance of environmental protection, waste management, and the proper use of equipment to minimize environmental impacts.

### 7. Reporting and Documentation:

- i. The Contractor shall maintain detailed records of all environmental activities, including waste management, emissions control, and monitoring results. These records shall be made available to the Employer and relevant authorities upon request.

### 8. Compliance Audits:

- i. The Employer reserves the right to conduct independent environmental compliance audits, at their discretion, to assess the Contractor's adherence to the EMP. If the Contractor is found to be non-compliant, corrective measures shall be required within a specified time frame.

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### 9. Financial Proposal

#### 9.1. Format for Financial Bid Submission

On the Letterhead of the Bidder

Financial Proposal

**From:**

<Name and Address of the Bidder>

**To:**

Mr. [name & designation shall be as specified in Contract Data Sheet]

NHIT Eastern Projects Private Limited

Unit No.: 324, 3rd Floor, D21 - Corporate Park

Sector-21, Dwarka, Delhi - 110077

**Subject: Financial Proposal for RFP Issued by NEPPL for Engagement of Agency/Firm for Bridge Rehabilitation & Repair works for Kachugaon to Kaljhar and Kalijhar to Patacharkuchi Projects in the state of Assam**

#### Financial Offer

The financial offer, inclusive of all costs except GST, is presented below:

Sr. No.	Particulars	Amount (INR)
1	Refer Annexure [C3]	

**Note:** A detailed cost breakup is provided in the attached Bill of Quantities (BoQ).

**Name & Signature of Bidder's Authorized Signatory**

**Date:**

#### Instructions for Bidders

1. The financial offer must be quoted in Indian Rupees, limited to two decimal places, and shall remain firm throughout the contract period.
2. The quoted fee must be inclusive of all charges except GST, which will be paid as applicable. Taxes should be shown separately while submitting invoices for payment.
3. Withholding taxes, as applicable, will be deducted at the time of payment.
4. A detailed BoQ with cost breakup should accompany this proposal.

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## 9.2. Payment Schedule

The payment schedule for the works shall be governed by the provisions outlined in the **Contract Data Sheet** and shall conform to the terms specified in the General Conditions of Contract (GCC) and Special Conditions of Contract (SCC). Payments may be structured as either **Milestone-Based** or **BoQ-Based**, as defined in the Contract Data.

- **Milestone-Based Payments:** Payments shall correspond to the measurable and certified completion of specific activities or project milestones, as defined in the approved Scope of Work and the agreed construction program. The certification of milestones by the Engineer/Authority's Representative shall be mandatory for processing payment claims.
- **BoQ-Based Payments:** Payments shall be made against the actual quantities of work executed, measured, and certified as per the mode of measurement specified in the Contract Data and BoQ. The contractor shall submit Interim Payment Certificates (IPCs) based on quantities executed, supported by appropriate documentation, including detailed measurement sheets and verification reports. Payment shall be made at the agreed unit rates for the items specified in the BoQ, subject to the terms of the Contract.

For both methods, advance payments, if applicable, shall be disbursed upon submission of an acceptable Advance Payment Bank Guarantee. Deductions for retention money, performance securities, liquidated damages, and any other amounts stipulated in the Contract shall apply uniformly.

The final payment shall be released upon successful completion of all contractual obligations, including rectification of defects during the Defects Liability Period (DLP), submission of "As-Built Drawings," and certification of the Final Payment Certificate by the Engineer/Authority's Representative. Payments shall be processed within the timelines specified in the Contract and shall be subject to compliance with all contractual conditions.

## 9.3. Bill of Quantities

The Bill of Quantities (BoQ) provided in the **Annexure [C3]** forms an integral part of the Contract and specifies the estimated quantities, unit rates, and total cost for each item of work. The contractor is required to execute the works strictly in accordance with the BoQ, the drawings, and the technical specifications outlined in the Contract.

The quantities mentioned in the BoQ are indicative and subject to variations as per the provisions of the GCC. The contractor shall not execute quantities beyond the variation limits stipulated in the Contract Data without prior written approval from the Authority.

The Engineer/Authority's Representative shall certify all measurements and variations in accordance with the specified mode of measurement. Payment for items shall be made at the agreed unit rates for the actual work done, as certified.

The contractor shall ensure proper documentation and submission of records, including daily progress reports, to support all claims under the BoQ. Any disputes related to measurements or

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quantities shall be resolved as per the provisions of the Dispute Resolution Mechanism in the Contract.

## 9.4. Right to Renegotiate or Re-Tender

The Client reserves the right to renegotiate the prices or initiate a separate tendering process if the total contract value or the executed quantities exceed the limits specified in the Contract Data Sheet. In the event that no such limits are provided in the Contract Data Sheet, the limit shall be **125% of the total contract value and 125% for any specific item.**

The Contractor shall not claim any automatic entitlement to execute additional quantities beyond the agreed contractual limits. Any renegotiation or additional award shall be subject to mutual agreement and approval by the Client.

## 9.5. Taxation Details

The Contractor shall be solely responsible for the payment of all applicable taxes, duties, levies, and other statutory charges, whether existing or arising during the Contract period, except for Goods and Services Tax (GST), which shall be paid separately by the Authority at the prevailing rates.

The Contractor shall issue GST-compliant tax invoices for every claim, incorporating their valid GST Registration Number and the applicable GST rates. Any input tax credits availed by the Authority shall be adjusted against payments due to the Contractor. Failure to comply with GST regulations, including timely submission of invoices and returns, shall result in penalties as provided under the governing laws and the Contract.

The Contractor shall indemnify the Authority against any liabilities, losses, or penalties arising out of non-compliance with applicable tax laws. If there is any change in applicable tax laws or the introduction of new taxes during the Contract period, such changes shall be dealt with in accordance with the GCC.

It shall be the Contractor's obligation to ensure compliance with all statutory requirements and provide evidence of tax deposits upon request by the Authority. Any tax-related disputes shall be handled in accordance with the provisions of the Contract and the applicable laws of the jurisdiction.

## 10. Performance and Security Documents

### 10.1. Performance Security Template (Annexure [B2])

The Contractor shall furnish a Performance Security in the form of an unconditional and irrevocable Bank Guarantee issued by a Scheduled Commercial Bank in India or any other bank acceptable to the Authority, in the format provided in the Contract Data. The Performance Security shall be submitted within the timeline stipulated in the Letter of Acceptance (LOA) and prior to the signing of the Contract Agreement.

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The amount of the Performance Security shall be equivalent to the percentage of the Accepted Contract Amount as specified in the Contract Data and shall remain valid until the expiry of the Defects Liability Period (DLP) or any extension thereof, including an additional claim period of 60 (sixty) days.

In the event of the Contractor's failure to perform any of its obligations under the Contract, the Authority shall have the right to invoke the Performance Security, either in part or in full, without prior notice to the Contractor. Such invocation shall not absolve the Contractor from its contractual obligations or liabilities.

The Contractor shall ensure that the Performance Security is renewed or replaced as and when required, to maintain its validity as per the Contract terms. Failure to maintain valid Performance Security shall be treated as a material breach, entitling the Authority to take appropriate action, including termination of the Contract.

## **10.2. Bank Guarantee Template (for Advance Payment) (Annexure [B3])**

If an advance payment is agreed upon, the Contractor shall furnish an Advance Payment Bank Guarantee (APBG) in the prescribed format provided in the Contract Data. The APBG shall be issued by a Scheduled Commercial Bank in India or any other bank acceptable to the Authority, and it shall be equivalent to the amount of the advance payment sanctioned under the Contract.

The APBG shall be unconditional and irrevocable, ensuring repayment of the advance payment in the event of default by the Contractor. The guarantee shall remain valid until the advance payment is fully adjusted against interim payments or until the date specified in the Contract Data, whichever is earlier.

The Authority shall have the right to invoke the APBG, either partially or fully, if the Contractor fails to utilize the advance payment for the intended purpose, defaults in executing the Works, or breaches any terms of the Contract.

The advance payment shall be recovered progressively from the Contractor's Interim Payment Certificates (IPCs) as per the recovery schedule specified in the Contract Data. The recovery of the advance payment shall commence from the first IPC and shall be completed before the value of work executed reaches 80% of the Accepted Contract Amount.

The Contractor shall ensure timely renewal or extension of the APBG to maintain its validity as required under the Contract. Any failure to provide or maintain a valid APBG shall result in suspension of payments to the Contractor and may lead to termination of the Contract.

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## 11. Supplementary Information for Bidders

### 11.1. Draft Contract Agreement

The Draft Contract Agreement forms an integral part of this Request for Proposal (RFP) document. It outlines the comprehensive terms and conditions governing the execution of the project, including but not limited to, the obligations of the parties, payment terms, scope of work, timelines, quality assurance requirements, performance security, and provisions for dispute resolution.

The Draft Contract Agreement is attached as **Annexure [C9]** for reference and must be carefully reviewed by all bidders to ensure full understanding and compliance. Any deviations or modifications to the terms of the Draft Contract Agreement will not be entertained post-award unless expressly agreed upon by the Authority.

By submitting their bids, bidders confirm their unconditional acceptance of the terms and conditions stipulated in the Draft Contract Agreement. The successful bidder will be required to execute this agreement in its present form, subject to any project-specific amendments as notified by the Authority.

### 11.2. List of Approved Vendors (wherever applicable)

The List of Approved Vendors, as specified by the NHIT, **comprises manufacturers, suppliers, and service providers approved for the procurement of materials, equipment, and services required for the project.** This list ensures compliance with prescribed quality standards, enhances reliability, and promotes efficiency in project execution.

The successful bidder shall procure materials and services exclusively from the vendors listed in **Annexure [A3]**, unless prior written approval is obtained from the Authority for alternate vendors. Any deviation from this requirement without authorization may result in penalties or other remedial actions as deemed appropriate by the Authority.

The bidders are advised to review the List of Approved Vendors in **Annexure [A3]** to assess the availability and suitability of vendors for the project's specific requirements. This list is subject to periodic revisions, and the Authority reserves the right to amend or update the list during the execution of the contract, as necessary.

### 11.3. Dispute Resolution Mechanism (Clause No. 18 of GCC)

#### Dispute Notification and Procedure

The Contractor shall notify the Client in writing within 7 days of the occurrence of any dispute, difference, or claim that requires resolution. The notice should clearly detail the nature of the dispute, relevant facts, and the legal or factual basis for the claim. Upon receipt of the dispute notice, the Client and Contractor shall engage in discussions for a period not exceeding 30 days to attempt an amicable settlement.

#### 11.3.1. Amicable Settlement

In the event of any dispute, difference, or claim arising between the Client and the Contractor in connection with or related to the Contract, the parties shall first attempt to

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resolve such dispute amicably through mutual consultation and negotiation. The party initiating the dispute (the "Notifying Party") shall notify the other party in writing, clearly outlining the nature and scope of the dispute. Both parties shall make all reasonable efforts to settle the dispute, amicably, within 30 days from the date of notification.

If the dispute remains unresolved after this period, the decision of the Client's CEO shall be final and binding on both parties. Should the decision of the Client's CEO not be acceptable, and the dispute persists, the matter shall proceed to the Dispute Resolution process as outlined below.

### 11.3.2. Dispute Resolution Board (DRB)

If the dispute remains unresolved after the amicable settlement period, the dispute shall be referred to a Dispute Resolution Board (DRB).

- a) The DRB will be constituted solely from the senior management team of the Client at its Head Office (HO). No external person or third party will be involved in this process.
- b) The DRB shall be tasked with reviewing the dispute and providing a recommendation or resolution within 45 days from the date the dispute is referred to it. The decision of the DRB shall be binding on both parties unless challenged under the Arbitration **Clause No. 11.3.4** below.
- c) In the event the DRB fails to resolve the dispute within the prescribed time, or if either party is dissatisfied with the DRB's decision, the dispute will proceed to arbitration.

### 11.3.3. Arbitration

If the dispute remains unresolved after mediation, the dispute shall be referred to and resolved through arbitration in accordance with the provisions of the Arbitration and Conciliation Act, 1996, as amended from time to time.

- a) **In cases where the disputed amount is up to INR 1.5 Crore**, the arbitration shall be conducted by a sole arbitrator appointed by the Client.
- b) **In cases where the disputed amount exceeds INR 1.5 Crore**, three arbitrators shall be appointed. One arbitrator shall be appointed by the Client, one by the Contractor, and the third arbitrator shall be appointed by the two previously appointed arbitrators. In case the two arbitrators fail to agree on the appointment of the third arbitrator, the third arbitrator shall be appointed by the relevant arbitration institution in New Delhi.
- c) The arbitration proceedings shall be held in New Delhi, India, and the language of arbitration shall be English. The arbitrator's decision shall be final and binding on both parties. The cost of arbitration, including the arbitrator's fees, shall be borne equally by the parties unless otherwise awarded by the arbitrator.

### 11.3.4. Jurisdiction and Venue

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The courts at Delhi, India, shall have exclusive jurisdiction over all disputes and legal proceedings arising from or relating to the Contract. Both parties expressly consent to the jurisdiction of the courts at Delhi for the purpose of enforcement of any judgment or award.

### 11.3.5. Interim Relief

Notwithstanding the above, either party may seek interim relief from a court of competent jurisdiction at any time before or during the dispute resolution process, in order to preserve its rights or prevent any irreparable damage or harm.

### 11.3.6. No Suspension of Work

The Contractor shall continue with the performance of its obligations under the Contract, including the Works, during the dispute resolution process unless the Client has issued a formal suspension order. Non-payment of money or non-performance of obligations by the Client shall not relieve the Contractor of its responsibilities to continue the work.

## 11.4. List of Applicable Laws and Standards

The execution of this project, including all associated works, obligations, and deliverables, shall conform to the following applicable laws, regulations, and standards. The list provided herein is exhaustive but not limited to the mentioned items. It shall be the contractor's responsibility to ensure compliance with all applicable statutory and technical requirements, whether explicitly mentioned or not:

### 11.4.1. Applicable Laws:

#### 11.4.1.1. General and Contractual Laws:

- The Indian Contract Act, 1872
- The Arbitration and Conciliation Act, 1996

#### 11.4.1.2. Labour and Employment Laws:

- The Minimum Wages Act, 1948
- The Payment of Wages Act, 1936
- The Employees' Provident Funds and Miscellaneous Provisions Act, 1952
- The Workmen's Compensation Act, 1923
- The Contract Labour (Regulation and Abolition) Act, 1970
- The Building and Other Construction Workers' Welfare Cess Act, 1996.

#### 11.4.1.3. Taxation Laws:

- The Goods and Services Tax (GST) Act, 2017
- The Income Tax Act, 1961

#### 11.4.1.4. Environmental Protection Laws:

- The Environment (Protection) Act, 1986
- The Water (Prevention and Control of Pollution) Act, 1974
- The Air (Prevention and Control of Pollution) Act, 1981

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### 11.4.1.5. Transport and Safety Laws:

- The Motor Vehicles Act, 1988
- The Factories Act, 1948

### 11.4.1.6. Any other laws, regulations, or rules:

Any additional laws, rules, or guidelines enacted by the Government of India, State Governments, or relevant statutory bodies that are applicable to this project.

### 11.4.2. Standards and Technical Specifications:

#### 11.4.2.1. National Standards:

- Specifications for Road and Bridge Works (Latest Revision), Ministry of Road Transport and Highways (MoRTH)
- Indian Roads Congress (IRC) Standards and Guidelines
- Bureau of Indian Standards (BIS) relevant to construction, material specifications, and safety

#### 11.4.2.2. International Standards (if specified):

- ISO standards for quality, safety, and management systems
- ASTM or EN standards for material testing and equipment where applicable

#### 11.4.2.3. Project-Specific Standards:

- Any additional standards explicitly mentioned in the RFP, contract documents, or technical schedules.

### 11.4.3. Contractor's Responsibility:

It is the contractor's responsibility to ensure strict compliance with all applicable laws, standards, and guidelines, whether listed above or otherwise applicable by the nature of the project.

### 11.4.4. Jurisdiction and Dispute Resolution (Clause No. 17 of GCC):

This Agreement shall be governed by, and construed in accordance with, the laws of India. The parties hereby agree that any disputes, claims, or controversies arising out of or in connection with this Agreement, including its validity, interpretation, enforcement, or performance, shall be subject to the exclusive jurisdiction of the courts in New Delhi, India.

The parties consent to the jurisdiction of the courts of New Delhi and waive any objections based on venue or forum non convenience. All legal proceedings under this Agreement shall be conducted in the English language.

### 11.5. Pre-Bid Meeting Minutes (if issued as an addendum)

The Procuring Authority shall convene a Pre-Bid Meeting as specified in the **Contract Data Sheet** to address any queries or clarifications raised by the prospective Bidders regarding the RFP documents. The minutes of the Pre-Bid Meeting, including responses to the queries and any amendments to the RFP, if applicable, shall be recorded and circulated to all Bidders who have downloaded or purchased the RFP.

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The Pre-Bid Meeting Minutes shall form an integral part of the RFP documents and shall be binding on all Bidders. Bidders are advised to review the minutes and ensure that their proposals are in conformity with the clarifications and amendments issued. No separate communication shall be entertained on matters addressed in the Pre-Bid Meeting Minutes.

Any updates to the RFP pursuant to the Pre-Bid Meeting shall be issued through an Addendum and published as per the procedure outlined in **Clause No. 2.5 for Amendments/Communications**.

### 11.6. Corrigendum/Addendum to RFP (if issued)

The Procuring Authority reserves the right to amend, modify, or supplement the RFP documents at any stage prior to the submission deadline. Such amendments, modifications, or supplements shall be issued in the form of a Corrigendum or Addendum.

The Corrigendum/Addendum to the RFP shall be uploaded on the official website as specified in the Data Sheet and/or communicated to all Bidders who have purchased or downloaded the RFP. Bidders are advised to regularly visit the official website and review all issued Corrigendum/Addendum to stay updated.

The procedure for issuing Corrigendum/Addendum shall be as follows:

- a) Any clarifications, modifications, or changes to the RFP shall be recorded in writing and approved by the competent authority of the Procuring Authority.
- b) A formal notification of the Corrigendum/Addendum, along with the updated sections of the RFP, shall be published on the official website and circulated to registered Bidders.
- c) The Corrigendum/Addendum shall form an integral part of the RFP and be binding on all Bidders.
- d) The timeline for submission of bids may be extended if the nature of the Corrigendum/Addendum necessitates additional preparation time for Bidders, at the sole discretion of the Procuring Authority.

No further communication on issued Corrigendum/Addendum shall be entertained. It is the sole responsibility of the Bidders to ensure compliance with the updated RFP requirements.

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## 12. Information Required to Evaluate the Bid Capacity

### 12.1. Calculation of “A” and “C”

To determine the value of “A” and “C” for Bid Capacity evaluation under **Clause 2.2.7 (Bid Capacity Calculation)**, the bidder must provide details of Civil Engineering Works undertaken in respect of EPC Projects (Turnkey Projects / Item Rate Contracts / Construction Works) during the last three financial years. The amount of bonus received, if any, shall be indicated separately.

The **Net Value Excluding Bonus** shall be derived as **(3) = (1) - (2)**.

Sl. No.	Financial Year	Value of Civil Engineering Works in EPC Projects (₹ Crores) (1)	Amount of Bonus (₹ Crores) (2)	Net Value Excluding Bonus (₹ Crores) (3) = (1) - (2)
1	2023-24/2023			
2	2022-23/2022			
3	2021-22/2021			

The maximum value of projects undertaken in a single financial year from the last three years, excluding any bonus amount, is ₹\_\_\_\_\_ Crores (Rupees \_\_\_\_\_). This value, updated to the price level of the year indicated in Appendix, is calculated as follows:

₹ \_\_\_\_\_ Crores × \_\_\_\_\_ (Updation Factor as per Appendix) = ₹ \_\_\_\_\_ Crores (Rupees \_\_\_\_\_).

The total amount of bonus received, if any, in EPC Projects during the last three years (updated to the price level of the year indicated in Appendix) is as follows:

Sl. No.	Financial Year / Calendar Year	Amount of Bonus (₹ Crores) (1)	Updation Factor (2)	Updated Amount of Bonus (₹ Crores) (3) = (1) × (2)
1	2023-24/2023		1.00	
2	2022-23/2022		1.05	
3	2021-22/2021		1.10	
	<b>Total (C)</b>			

### 12.2. Calculation of “B”

The bidder must provide details of all existing commitments and ongoing works to be completed in the next **9 months**.

Sl. No.	Name of Project / Work	% Participation of Bidder in Project	Date of Issue of LOA / Date of Opening of	Construction Period as per Agreement / LOA	Contract Value as per Agreement /	Value of Work Completed (₹ Crores)	Balance Value of Work to be Completed (₹)	Anticipated Date of Completion	Balance Value of Work at 2023-24/2023 Price

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			Financial Bid / Date of Start / Appointed Date		LOA (₹ Crores)		Crores (1)		Level (₹ Crores) (2) = (1) × Updation Factor
1									
2									
3									
	<b>Total</b>								

The **Updation Factor** to be applied is as follows:

Sl. No.	Financial Year / Calendar Year	Updation Factor
1	2023-24/2023	1.00
2	2022-23/2022	1.05
3	2021-22/2021	1.10

The bidder must provide a **verified statement** of all existing commitments, awarded works, and anticipated value of work to be completed during the construction period of the project for which the bid is invited. This statement must be **countersigned by the Client or its Engineer-in-Charge (not below the rank of Executive Engineer) for EPC Projects or by the Concessionaire / Authorized Signatory of SPV for BOT Projects.**

No awarded or ongoing work has been excluded from this statement for M/s \_\_\_\_\_, either individually or in a Joint Venture with M/s \_\_\_\_\_ and M/s \_\_\_\_\_, as on the bid due date of this RFP.

**Note:**

- i. If the balance period of construction is **less than** the construction period of the project for which the bid is invited, the **full contract value** as per Agreement/LOA shall be mentioned.
- ii. If the balance period of construction is **more than** the construction period of the project for which the bid is invited, only the **anticipated value of work to be completed** shall be mentioned.
- iii. If the anticipated value of work to be completed is not provided, the **proportionate value** shall be considered while evaluating the **Assessed Available Bid Capacity**.

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

**Place:** \_\_\_\_\_

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## 13. Miscellaneous Provisions

### 13.1. Force Majeure Clause No. (Clause No. 19 of GCC)

#### Definition

Force Majeure shall mean any extraordinary event or circumstance beyond the reasonable control of the affected party that prevents or delays the performance of its contractual obligations. These events may include, but are not limited to, acts of God, natural disasters (such as floods, earthquakes, or storms), acts of war, terrorism, riots, civil commotion, government orders, pandemics, or any other unforeseen event that cannot be mitigated through reasonable diligence.

#### Notification

The party affected by a Force Majeure event shall notify the other party in writing within seven (7) days of the occurrence of such an event, providing reasonable details of its nature, likely duration, and impact on performance. Failure to notify within this period may result in the loss of the right to claim Force Majeure relief.

#### 13.1.1. Consequences of Force Majeure

- (a) The obligations of the affected party shall be suspended for the duration of the Force Majeure event, to the extent that they are directly impacted by it.
- (b) Both parties shall use all reasonable efforts to mitigate the effect of the Force Majeure event and resume performance of their obligations as soon as practicable.
- (c) If the Force Majeure event continues for a period exceeding ninety (90) days, either party may terminate the contract upon written notice to the other party.

#### 13.1.2. Exclusions

Force Majeure shall not include:

- (a) Any event caused by the negligence or intentional act of the affected party.
- (b) Economic hardship, changes in market conditions, or lack of funds.

#### 13.1.3. Extension of Time

If the Contractor's performance is delayed due to a Force Majeure event, the Contractor shall be entitled to an extension of time equivalent to the period of delay, subject to approval by the Client.

#### 13.1.4. Payments During Force Majeure

The Contractor shall not be entitled to claim compensation or additional payments due to Force Majeure events unless explicitly agreed upon in the contract or otherwise required under applicable law.

#### 13.1.5. Final Determination

Any disputes regarding the application of this **Clause No.** shall be resolved in accordance with **Clause No. 18 of GCC** (Dispute Resolution).

### 13.2. Termination Conditions (Clause No. 20 of GCC)

#### 13.2.1. Termination by the Client

The Client may terminate the Contract, in whole or in part, with immediate effect or after a specified notice period, in the following circumstances:

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- 13.2.2. Non-Performance:** If the Contractor fails to meet contractual obligations, including delays or substandard performance, after receiving a written notice to cure the breach within a period specified in the Contract.
- 13.2.3. Breach of Terms:** In case of material violation of any terms or conditions of the Contract, including but not limited to safety standards, statutory compliance, or quality assurance requirements.
- 13.2.4. Insolvency:** If the Contractor becomes insolvent, enters into bankruptcy proceedings, or undergoes dissolution, liquidation, or similar financial distress events.
- 13.2.5. Force Majeure:** If Force Majeure conditions continue for more than ninety (90) days, making further performance impracticable.
- 13.2.6. Convenience of the Client:** **The Client reserves the right to terminate the Contract for convenience, provided reasonable compensation for work performed up to the date of termination is made.**

**13.2.7. Termination for Default:**

In case of default by the Contractor, the Client reserves the right to terminate the Contract, either in whole or in part, by giving written notice. Default includes the following:

- a) **Non-Performance:** Failure to meet key contractual obligations, including delays in execution or substandard work, despite receiving a notice to cure within a period specified in the Contract.
- b) **Breach of Terms:** Failure to comply with any material provisions of the Contract, including statutory, safety, or quality assurance requirements.
- c) **Insolvency or Financial Distress:** If the Contractor enters into insolvency, bankruptcy, liquidation, or similar financial distress, or any situation that materially impacts its ability to fulfil its obligations under this Contract.

**13.2.8. Upon such termination, the following shall apply:**

- a) **Notice to Cure:** A written notice shall be issued to the Contractor, specifying the nature of the default. The Contractor will be granted a cure period of 15 days (or as specified in the Special Conditions of Contract) to remedy the default. Failure to rectify the default within the cure period will lead to immediate termination.
- b) **Penalties and Compensation:** The Client may impose penalties of up to **10% of the Contract value** for non-performance or failure to meet standards. The Contractor shall be liable to compensate the Client for any costs incurred due to the default, including but not limited to the cost of procuring alternate contractors to complete the work.
- c) **Withholding of Payments:** The Client has the right to withhold payments corresponding to incomplete, defective, or unsatisfactory work performed prior to termination.

Termination under this **Clause No.** is without prejudice to any other legal or contractual rights available to the Client, including claims for damages and performance guarantees.

**13.2.9. Termination by the Contractor**

The Contractor may terminate the Contract by providing a written notice, subject to fulfilling its obligations until the termination date, in the following circumstances:

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**Non-Payment:** If the Client fails to pay undisputed invoices for a period exceeding One Hundred & Eighty (180) days after they become due, despite receiving written notice.

**Client Hindrance:** If the Client repeatedly obstructs the Contractor's performance by failing to provide access, approvals, or other essential resources as specified in the Contract.

**Force Majeure:** If Force Majeure conditions persist beyond Ninety (90) days, rendering performance impossible.

### 13.2.10. Procedure for Termination

**Notice of Intent:** A party initiating termination shall issue a formal written notice detailing the grounds for termination and the intended termination date, allowing a minimum of thirty (30) days for remedial action unless otherwise specified.

**Efforts to Resolve:** The parties shall engage in good-faith discussions during the notice period to address and resolve the stated issues.

**Confirmation of Termination:** If the issues remain unresolved by the end of the notice period, the initiating party shall issue a final termination notice, effectively ending the Contract.

### 13.2.11. Post-Termination Obligations

**Cease Work:** The Contractor shall cease all work immediately except for activities required to protect the works already executed or to comply with statutory obligations.

**Return of Assets:** All equipment, materials, designs, and other assets belonging to the Client shall be returned or securely handed over within seven (7) days of termination.

**Payments:** The Client shall settle payments for verified work performed up to the termination date, subject to deductions for any damages, penalties, or liabilities.

### 13.2.12. Liabilities Upon Termination

**Contractor's Liabilities:** The Contractor shall bear the cost of demobilization, removal of equipment, and site clearance unless otherwise agreed.

**Client's Liabilities:** In cases of termination for convenience, the Client shall pay reasonable compensation for expenses directly attributable to the termination. Reasonable compensation is limited to:

Costs for completed works and verified quantities based on contract rates.

Documented and substantiated costs for materials procured specifically for the project, provided these materials are handed over to the Client.

Actual and reasonable costs incurred for demobilization and site clearance.

Compensation shall exclude anticipated profits on unexecuted work, costs due to the Contractor's default, and any claims not supported by documentary evidence. Total compensation shall not exceed 10% of the original contract value. Claims for compensation must be submitted within 30 days of termination with all supporting documents, subject to verification by the Client.

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## **13.2.13. Survival of Provisions**

The provisions relating to confidentiality, indemnities, dispute resolution, warranties, and any other obligations expressly stated to survive termination or expiration of this Agreement shall remain in full force and effect.

## **13.2.14. Dispute Arising from Termination**

Any disputes related to or arising from termination shall be resolved as per **Clause No. 18** of GCC (Dispute Resolution).

## **13.3. Governing Law and Jurisdiction**

This Agreement shall be governed by, and construed in accordance with, the laws of India. The parties hereby agree that any disputes, claims, or controversies arising out of or in connection with this Agreement, including its validity, interpretation, enforcement, or performance, shall be subject to the exclusive jurisdiction of the courts in New Delhi, India. The parties consent to the jurisdiction of the courts of New Delhi and waive any objections based on venue or forum non convenience. All legal proceedings under this Agreement shall be conducted in the English language.

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### 14. Undertaking

#### Undertaking

*(On the Letterhead of the Bidder)*

*To be submitted with the Technical Bid*

#### We undertake that:

**1. Validity of Proposal:**

The proposal submitted by us shall remain valid for a period of at least 120 (one hundred and twenty) days from the last date for submission of the proposal as specified in the RFP.

**2. Fees and Charges:**

No additional fees, costs, expenses, taxes, or levies shall be payable by National Highways Infra Trust (NHIT) or any entities under the National Highways Infra Trust (NHIT) for the services rendered, except as explicitly mentioned in the Financial Proposal.

**3. Non-Blacklisting/Debarment:**

We certify that we have not been banned, blacklisted, delisted, disqualified, or debarred by NHIT, NHIT, SPVs under NHIT, or any government agency, quasi-government agency, or PSU from participating in tenders or contracts. Additionally, no investigation is pending against us, our Managing Director (MD), Chief Executive Officer (CEO), or Directors, nor has any action been initiated against us/our Directors by the CVC, RBI, or any other government/statutory agency concerning financial irregularities.

**4. Conflict of Interest:**

We declare that we do not have any conflict of interest that may prejudice the scope of work under this RFP. We further confirm that we will not engage in any business or professional activities during the engagement period that may adversely affect the interests of NHIT, NHIT, or SPVs under NHIT.

**5. Adequate Resources and Capability:**

We confirm that we possess the necessary infrastructure, personnel, equipment, and resources (whether technical, financial, or operational) to perform the services or works as per the scope outlined in the RFP. We affirm that we have fully understood the scope of work and shall comply with the terms of engagement. This includes fulfilling requirements related to consultancy, civil works, road maintenance, or supply-related services, as applicable.

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### 6. **Bankruptcy/Litigation:**

We certify that no bankruptcy, liquidation, or similar proceedings have been initiated against us by any entity, government agency, quasi-government agency, or PSU. Furthermore, there are no material cases or proceedings pending against us or our Directors that may affect our ability to execute the contract or significantly impact our deliverables under this RFP.

### 7. **Accuracy of Information:**

All information provided in our Bid is true, correct, and complete to the best of our knowledge. This includes details regarding our capabilities, resources, and any other information relevant to the execution of the services or works for which the bid is submitted.

### **Acceptance of Terms:**

We accept all the terms and conditions as mentioned in the RFP. In the event of any contradiction between the terms and conditions outlined in the RFP and our proposal/offer, the decision of **NHIT** shall prevail.

**Signature(s) and Name(s) of the Authorized Signatory with Seal**

Date:

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## 15. NON-DISCLOSURE AGREEMENT

### NON-DISCLOSURE AGREEMENT

(Specimen)

This confidentiality and non-disclosure agreement (“Agreement”) is made on [●], 2025 (“Effective Date”) between National Highways Infra Investment Managers Private Limited, a company incorporated under the Companies Act, 2013, and having its registered office at G 5 & 6, Sector 10, Dwarka, New Delhi, 110075, acting on behalf of the National Highways Infra Trust (“**NHIT**”) and entities under **NHIT** AND [●] [Note: Name of the recipient to be included], a [company/entity/body] [incorporated/constituted] under the provisions of the laws of India, with its office at [●] [Note: To be included by the recipient] (“Recipient”). In consideration of the premises and of the mutual promises of each party to the other herein contained, it is hereby mutually agreed as follows:

#### WHEREAS:

- A. National Highways Authority of India (NHAI) is responsible for development and maintenance of sections of national highways in India, which are entrusted to it by the Ministry of Road Transport and Highways.
- B. NHAI has settled the National Highways Infra Trust (“Trust”) as a contributory irrevocable trust, in accordance with the provisions of the Indian Trusts Act, 1882.
- C. **NHIIMPL** has been appointed as the investment manager to the Trust and is responsible for, among other things, the management and administration of the Trust, and rendering investment management services to the Trust.
- D. The Trust is contemplating to mobilize funds by way of either debt raise or offer of units (“Transaction”).
- E. The Recipient is a company/entity engaged in works contracts, services, consultancy, manpower supply, or road maintenance works, as applicable, and is contemplating entering into a business relationship with **NHIT** or its entities.
- F. In order to explore a potential business relationship that might entail the Recipient receiving confidential information related to works contracts, services, consultancy, manpower supply, road maintenance, or other projects undertaken by **NHIT**, the Recipient acknowledges the sensitive nature of the Confidential Information and agrees that all Confidential Information received by it from **NHIT/entities** under **NHIT** shall be kept confidential and governed by the following terms and conditions;

#### I. DEFINITIONS

Term	Definition
“Discloser”	means the party providing Confidential Information for the Permitted Purpose, including, without limitation, the National Highways Infra Trust ( <b>NHIT</b> ), its associated entities, or the

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Term	Definition
<b>“Permitted Purpose”</b>	<p>National Highways Infra Investment Managers Private Limited (<b>NHIT</b>) acting in its capacity as the manager on behalf of the Trust.</p> <p>means the engagement of the Recipient in works contracts, services, consultancy, manpower supply, road maintenance works, or any other related activities undertaken as part of any ongoing or future projects involving the National Highways Infra Trust (<b>NHIT</b>) or its associated entities.</p>
<b>“Confidential Information”</b>	<p>means all information, data, and ideas, whether in tangible or intangible form, disclosed by the National Highways Infra Investment Managers Private Limited (<b>NHIIMPL</b>) in connection with the Trust, the proposed Transaction, or its business and operations, including but not limited to:</p> <p>(a) any commercial, technical, operational, or other information, data, or interpretations provided for the Permitted Purpose, expressly identified as “Confidential” in writing;</p> <p>(b) information relating to costs, profits, markets, sales, and financial performance;</p> <p>(c) plans for future developments, road construction or maintenance strategies, engineering designs, and specifications; and</p> <p>(d) all documents, records, designs, models, sketches, electronic data, and other materials of any nature supplied by <b>NHIT</b> to the Recipient.</p>

## II. CONFIDENTIALITY OBLIGATIONS

- a) **Restricted Use:** The Recipient shall use the Confidential Information solely for the Permitted Purpose and for no other purpose whatsoever.
- b) **Controlled Disclosure:** The Recipient may disclose the Confidential Information only to its employees, contractors, consultants, or advisors who require access on a strict need-to-know basis for the Permitted Purpose. Each such individual shall be informed of the confidential nature of the information and the terms of this Agreement and shall be bound by equivalent confidentiality obligations to the extent relevant and applicable.
- c) **Protection from Unauthorized Access:** The Recipient shall ensure that the Confidential Information is not disseminated to or accessible by any third party without proper authorization and shall implement appropriate security measures to safeguard the Confidential Information, consistent with its own protocols for managing proprietary and confidential information.
- d) **Legal and Regulatory Compliance:** The Recipient shall comply with all applicable laws, including but not limited to laws governing trade secrets, data privacy, and securities regulations, such as

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the Securities and Exchange Board of India (Prohibition of Insider Trading) Regulations, 2015, as amended.

e) **Restrictions on Trading and Transactions:** For a period of six months from the date of return of the Confidential Information or termination of this Agreement, or for a period of ninety (90) days from the date of completion of the Transaction, whichever is later, the Recipient shall not, directly or indirectly, trade, acquire, or sell, or agree, propose, seek, or offer to acquire or sell, or facilitate the acquisition, ownership, or sale of any securities or business (or any part thereof) of the Discloser, including the Trust.

### III. EXCEPTIONS

The obligations under **Clause No. II** shall not apply to any Confidential Information that:

- a) **Prior Possession:** Was in the lawful possession of the Recipient prior to its disclosure by the Discloser and without any restriction on its use or disclosure;
- b) **Independent Development:** Was independently developed by the Recipient without reference to or use of the Confidential Information;
- c) **Public Domain:** Was in the public domain at the time of disclosure under this Agreement or subsequently becomes publicly available, except as a result of a breach of this Agreement by the Recipient;
- d) **Third-Party Disclosure:** Is disclosed to the Recipient by a third party who, to the best of the Recipient's knowledge, is not bound by any confidentiality obligation to the Discloser;
- e) **Authorized Disclosure:** Is expressly authorized for release by the Discloser in writing;
- f) **Mandatory Disclosure:** Is required to be disclosed under applicable law or regulation, or by an order of a governmental, judicial, or quasi-judicial authority, or:
  - i) Is disclosed to the Recipient's lenders or insurers in connection with any loan or insurance arrangement, provided that the Recipient:
    - Notifies the Discloser in writing, to the extent permissible under law, to allow the Discloser to contest or seek protective measures against such disclosure; and
    - Limits such disclosure strictly to the extent required under the circumstances.

### IV. NO GRANT OF PROPRIETARY RIGHTS OR LICENSE

The Confidential Information shall remain the exclusive property of the Discloser at all times. Nothing in this Agreement shall be construed as granting, by implication, estoppel, or otherwise, any license, right, title, or interest in or to the Confidential Information to the Recipient for any purpose. The Discloser retains all proprietary rights in and to the Confidential Information, including but not limited to any intellectual property rights, and the Recipient acknowledges that it acquires no such rights through the disclosure of Confidential Information under this Agreement.

### V. TERM AND TERMINATION

This Agreement, along with the Confidentiality Obligations contained herein, shall come into force on the date of issuance of the Letter of Engagement or Letter of Appointment and shall remain

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effective until the completion of the specified term or as otherwise agreed in writing. Notwithstanding the foregoing, the Discloser reserves the right to terminate this Agreement at any time by providing written notice to the Recipient. Termination shall not affect the Recipient's continuing obligations with respect to the protection and non-disclosure of Confidential Information, which shall survive termination for a period of [insert specific period, e.g., two years], or as required by applicable law.

## VI. INJUNCTION

The Parties acknowledge and agree that the Confidential Information is valuable, unique, and integral to the interests of the Discloser. Any unauthorized use, disclosure, or breach of the Confidentiality Obligations by the Recipient may cause irreparable harm to the Discloser for which monetary damages may be inadequate. Accordingly, the Discloser shall be entitled to seek injunctive relief, including temporary, preliminary, or permanent injunctions, from a competent court to prevent or restrain any such breach or threatened breach. Such relief shall be in addition to, and not in substitution for, any other legal or equitable remedies available, including claims for monetary damages.

## VII. RETURN OF MATERIALS

Upon the Discloser's written request, the Recipient shall promptly, and in any event within five (5) days or such later period as specified by the Discloser, return all copies of the Confidential Information in any form or medium, or, if so, directed by the Discloser, destroy such copies. Any destruction shall be carried out in such a manner that the Confidential Information cannot be retrieved or reconstructed. The Recipient shall certify in writing to the Discloser that all such Confidential Information has been returned or destroyed, as applicable, and that no copies thereof remain in the Recipient's possession.

## VIII. ACKNOWLEDGEMENT

The Recipient acknowledges and agrees that:

- a) This Agreement does not, and shall not be construed to, constitute a solicitation or offer for the sale or transfer of any securities of the Discloser, or any affiliate of the Discloser, or any entity sponsored by the Discloser.
- b) This Agreement does not impose any obligation or commitment on the Discloser to issue, sell, or transfer any securities of the Discloser or any other person or entity.
- c) Any subscription or purchase of securities of the Discloser, any affiliate of the Discloser, or any entity sponsored by the Discloser by the Recipient shall be conducted in full compliance with applicable laws and regulations, and shall be solely on the basis of offer document(s) or prospectus related to such securities, which shall be prepared and issued in accordance with such applicable laws.

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## IX. MISCELLANEOUS:

a) No waiver by the Discloser of any breach or default by the Recipient under this Agreement shall be deemed a waiver of any subsequent or continuing breach or default thereof. This Agreement constitutes the entire understanding and agreement between the parties with respect to the subject matter hereof, and supersedes all prior negotiations, discussions, representations, and agreements, whether oral or written, relating to the same, except that nothing herein shall prejudice the statutory or common law rights of either party in relation to Confidential Information. This Agreement may only be amended or modified in writing, executed by duly authorized representatives of both parties. If any provision of this Agreement is held to be invalid, illegal, or unenforceable, the remaining provisions shall continue in full force and effect. This Agreement is executed in two (2) originals, each of which shall be deemed an original for all purposes. This Agreement shall become effective as of the date first written above, upon execution by both parties.

### **b) For the avoidance of doubt, the parties further agree as follows:**

- (i) The terms and provisions of this Agreement are confidential.
- (ii) In the event that the parties enter into any further agreements related to the Investment Opportunity or in connection with the evaluation or facilitation of the Investment Opportunity, this Agreement shall continue to be binding on the parties with respect to any Confidential Information exchanged in such subsequent agreements.
- (iii) The recitals set forth above shall be deemed an integral part of this Agreement;
- (iv) The Recipient acknowledges that the Discloser makes no representation or warranty, express or implied, as to the accuracy or completeness of the Confidential Information or any other information provided; and
- (v) This Agreement shall be binding upon and inure to the benefit of the parties hereto, their respective successors, and permitted assigns.

## X. GOVERNING LAWS

This Agreement shall be governed by, and construed in accordance with, the laws of India, without regard to its conflicts of law principles. The parties expressly agree that any dispute, controversy, or claim arising out of or in connection with this Agreement, or the breach, termination, or validity thereof, shall be subject to the exclusive jurisdiction of the courts located in New Delhi, India. The parties hereby irrevocably consent to the jurisdiction of such courts and waive any objection to the venue of such courts, including any objection based on forum non convenienc or similar grounds. Notwithstanding the above, the parties agree that either party may seek interim or urgent relief in any other competent court or tribunal, including but not limited to injunctions or orders for specific performance, without prejudice to the exclusive jurisdiction of the courts of New Delhi, India, for all other matters.

## XI. SURVIVAL

Notwithstanding the termination or expiration of this Agreement, the provisions set forth in **Clause No's II(d), VIII, and X** of this Agreement shall survive in full force and effect. These **Clause No's** shall

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remain binding on the parties and shall continue to be enforceable to the extent necessary to give effect to the rights and obligations contained therein.

The survival of these provisions shall be governed by the nature and intent of the respective **Clause No's**, and the parties agree that any obligations, rights, or duties arising from these provisions will remain operative even after the termination or expiration of this Agreement, for such period as is necessary to complete or resolve any obligations or claims arising thereunder.

In particular, **Clause No. II (d)** (which addresses the confidentiality obligations), **Clause No. VIII** (which pertains to dispute resolution and jurisdiction), and **Clause No. X** (which addresses any post-termination rights or duties) shall remain in effect for a period, where applicable, in accordance with the applicable statutory laws or as otherwise expressly stated in this Agreement.

**IN WITNESS WHEREOF**, the parties hereto have caused this Agreement to be executed by their duly authorized representatives on the day and date mentioned hereinabove.

Signed and delivered by **NHIT** by the hand of

## Authorised Signatory

**Name:**

**Designation:**

Signed and delivered by [●] [Note: Name of the Recipient to be inserted], by the hand of

**Authorised**

**Name:**

**Designation:**

**Signatory**

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## 16. Power of Attorney

### POWER OF ATTORNEY

#### (Specimen)

KNOW ALL MEN BY THIS POWER OF ATTORNEY:

WHEREAS \_\_\_\_\_, a firm registered under the provisions of the P \_\_\_\_\_, having registration number \_\_\_\_\_ and having its office at \_\_\_\_\_ (hereinafter called the 'Firm').

AND WHEREAS the Firm intends to submit its bid in respect of "[●]".

WHEREAS it is considered necessary and expedient to execute a general Power of Attorney in favour of [●], [●] of the Firm, on behalf of the Firm, to authorises him to submit the bid on behalf of the Firm.

NOW THIS POWER OF ATTORNEY WITNESSES AS FOLLOWS:

The Firm hereby appoints [●], designated as [●] of the Firm, as its Attorney (hereinafter collectively called "the Attorney") to do the following acts, deeds and things in the name and on behalf of the Firm for successful submission of the bid in respect of abovementioned RFP:

1. To sign and submit technical & financial proposal, on behalf of Firm, in respect of the proposal for [●].
2. To upload the documents on e-tender portal and attach the digital signature of the Firm to document, enrol the digital signature with the e-tender portal of the, and to do any other activity.
3. To sign all applications, affidavits, agreements, amendments, clarifications and all such other documents, as may be necessary for submission of the bid for engagement of legal advisers for proposed assignment and to do all other activity as may be required for successful bid submission.
4. This authority letter shall be valid from the date of issue and shall remain in force till completion of the bidding process in accordance with the Tender Notice No: [●], as amended.

IN WITNESS WHEREOF this deed has been signed by Shri [●] of the Firm.

<b>Accepted by:</b>  Accepted By _____	<b>For [●]</b>  Granted _____ by
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Witness.

- 1. \_\_\_\_\_
- 2. \_\_\_\_\_

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### 17. Environmental Management Plan (EMP)

A structured and detailed format for contractors to ensure comprehensive environmental protection and compliance throughout the project lifecycle.

#### 1. Executive Summary

*A snapshot of the project's objectives, key environmental measures, and expected outcomes.*

- i. Overview of the project scope and objectives.
- ii. Key environmental measures and anticipated outcomes.
- iii. Highlights of the contractor's commitment to sustainability.

#### 2. Introduction

*This section outlines the EMP's purpose, project scope, and applicable environmental regulations.*

- i. Purpose and objectives of the EMP.
- ii. Project description, including location, scale, and scope of work.
- iii. Applicable environmental regulations, guidelines, and standards.

#### 3. Environmental Baseline Conditions

*Provides a summary of the current environmental features and potential risks identified before construction.*

- i. Summary of pre-construction environmental surveys and studies.
- ii. Description of environmental features:
  - o Sensitive areas (e.g., water bodies, wetlands).
  - o Flora and fauna, including endangered species.
  - o Soil, water, and air quality conditions.
- iii. Identification of key environmental risks.

#### 4. Environmental Management Objectives

*Defines the overarching and specific goals for safeguarding the environment throughout the project.*

- i. Overall goals for environmental protection.
- ii. Specific objectives:
  - o Pollution prevention.
  - o Biodiversity conservation.
  - o Efficient resource use and waste minimization.

#### 5. Roles and Responsibilities

*Clearly delineates the roles of the contractor, Environmental Officer, and other stakeholders in implementing the EMP.*

- i. Defined responsibilities of:

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- Contractor and subcontractors.
- Environmental Officer or Site Supervisor.
- ii. Coordination protocols with local authorities, stakeholders, and regulatory agencies.

### 6. Environmental Impact Assessment (EIA)

*Summarizes identified environmental impacts, including their short-term and long-term implications.*

- i. Summary of the environmental impact study.
- ii. Identification of:
  - Short-term and long-term impacts.
  - Cumulative impacts and mitigation hierarchy.

### 7. Mitigation Measures

*Lists detailed actions to minimize negative environmental impacts, categorized by type.*

- i. Category-wise measures to mitigate impacts:
  - a) **Air Quality:** Dust suppression, vehicle emission controls.
  - b) **Water Quality:** Sedimentation control, preventing contamination.
  - c) **Soil Conservation:** Erosion prevention, topsoil preservation.
  - d) **Waste Management:** Segregation, recycling, safe disposal.
  - e) **Noise Management:** Noise barriers, equipment soundproofing.
  - f) **Biodiversity:** Protection of species and habitats.

### 8. Pollution Control Plan

*Specific measures to prevent and control air, water, and noise pollution during the project.*

- i. Measures to address air, water, and noise pollution.
- ii. Use of eco-friendly machinery and construction practices.
- iii. Spill containment and response procedures.

### 9. Waste Management Plan

*Details procedures for handling, storing, and disposing of hazardous and non-hazardous waste.*

- i. Waste categorization (hazardous, non-hazardous, recyclable).
- ii. Methods for collection, storage, transport, and disposal.
- iii. Procedures for compliance with local waste regulations.

### 10. Monitoring Plan

*Outlines the parameters, frequency, and methodology for monitoring environmental compliance.*

- i. Parameters for monitoring (e.g., air, water, and noise quality).
- ii. Monitoring frequency, tools, and techniques.

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- iii. Reporting mechanism and corrective actions for deviations.

### 11. Emergency Preparedness and Response

*Describes the procedures and training to handle environmental emergencies effectively.*

- i. Response plan for environmental emergencies (e.g., spills, leaks).
- ii. Emergency contact list for stakeholders and authorities.
- iii. Staff training for emergency handling and response readiness.

### 12. Training and Awareness

*Explains plans for workforce training and awareness programs on environmental practices.*

- i. Training schedules for workforce on EMP requirements.
- ii. Awareness programs for:
  - a) Pollution prevention.
  - b) Efficient resource use.
  - c) Incident reporting and management.

### 13. Reporting and Documentation

*Defines the format and frequency for compliance reports and record-keeping requirements.*

- i. Reporting schedule and formats (daily, weekly, monthly).
- ii. Documentation requirements for:
  - a) Monitoring results.
  - b) Waste handling and disposal records.
  - c) Incident logs.

### 14. Budget and Resource Allocation

*Provides an estimate of financial and resource requirements for EMP implementation.*

- i. Detailed budget for implementing the EMP.
- ii. Resource allocation for environmental equipment, training, and compliance activities.

### 15. Appendices

*Contains supporting documents such as maps, permits, and contact lists for stakeholders.*

- i. Maps of sensitive ecological areas and project layout.
- ii. Permits, approvals, and regulatory compliance documentation.
- iii. Contact details of stakeholders, authorities, and emergency response personnel.

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## 18. List of Annexures

Annexure no.	Section No.	Clause No. No.	Annexure details
<b>Contract Conditions</b>			
Annexure-A1	Section 5	5.1	General Conditions of Contract (GCC) covering rights, obligations, payment terms, and dispute resolution.
Annexure-A2	Section 5	5.2	Special Conditions of Contract (SCC) outlining project-specific terms and conditions.
Annexure-A3	Section 11	11.2	List of Approved Makes
<b>Standard HSE &amp; Safety Compliance</b>			
Annexure-A4	Section 6	6.5	Utility shifting guidelines for safety, compliance, and timely execution.
Annexure-A5	Section 8	8	NHIT's EHS Policy
<b>Standard Formats</b>			
Annexure-B1	Section 2	2.3.2	Bank Guarantee Template for Bid Security
Annexure-B2	Section 10	10.1	Performance Security Template
Annexure-B3	Section 10	10.2	Bank Guarantee Template
<b>Project-Specific Annexures</b>			
Annexure-C1	Section 5	5.3	Contract Data Sheet detailing project-specific information like milestones, equipment, and safety guidelines.
Annexure-C2	Section 4	4.2.1	Scope of Work
Annexure-C3	Section 9	9.3	Bill of Quantities
Annexure-C4	Section 4	4.2.4	Detailed location maps, site layouts, and access points are provided in the Annexure for the Bidder's reference.
Annexure-C5	Section 6	6.1	Design requirements including parameters for structural and safety submissions.
Annexure-C6	Section 6	6.2	Construction requirements covering quality, workmanship, and testing standards.
Annexure-C7	Section 6	6.3	Technical specifications based on MoRTH, IRC, and IS codes.
Annexure-C8	Section 6	6.4	Approved drawings including layouts, GADs, and structural details.
Annexure-C9	Section 11	11.1	Draft Contract Agreement

# General Conditions of Contract

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## General Conditions of Contract

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## General Conditions of Contract

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### Purpose of this General Conditions of Contract

The purpose of this General Conditions of Contract (GCC) is to provide a structured and comprehensive framework governing the rights, obligations, and responsibilities of the Employer and the Contractor in executing road maintenance works. This GCC establishes clear guidelines to ensure compliance with applicable standards, including **MoRTH specifications, IRC guidelines**, and relevant statutory requirements. It addresses key aspects such as the scope of work, performance standards, risk allocation, payment terms, and dispute resolution, while mandating adherence to safety, environmental, and quality control measures. Additionally, this GCC incorporates provisions for insurance, indemnities, and warranties to safeguard both parties and maintain infrastructure quality. By aligning with **Best Practices for Contractual Governance**, the GCC ensures transparency, efficiency, and accountability in managing the contract, fostering collaboration to achieve the timely and effective maintenance of road infrastructure.

### 1. Definitions and Interpretations

For the purpose of this Agreement, the following terms shall have the meanings ascribed to them, unless the context clearly requires otherwise. These definitions are provided to ensure a clear and consistent interpretation of the terms used throughout the Agreement.

Term	Definition
<b>Acceptance</b>	Shall mean the formal acknowledgment by the Client, upon verification that the works have been completed in accordance with the agreed scope, specifications, and standards prescribed under the Contract, including compliance with MoRTH, IRC, IS Codes, and other applicable regulations.
<b>Alternative Dispute Resolution (ADR)</b>	Shall mean a mechanism for resolving disputes between the parties, including but not limited to mediation, conciliation, or arbitration, as an alternative to formal litigation. The procedures for ADR shall be governed as per the provisions outlined under the <b>Dispute Resolution Clause 18</b> of this GCC.
<b>Alternative Works</b>	Shall mean any works or services undertaken to replace, modify, or supplement the original scope of works due to unforeseen circumstances, changes in site conditions, or as directed by the Client, ensuring compliance with the Contract's terms and specifications.
<b>Annual Performance Review</b>	Shall mean the periodic evaluation conducted by the Client to assess the Contractor's performance in accordance with the terms, obligations, and key performance indicators stipulated in the Contract Agreement during its term.

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Term	Definition
<b>Arbitration</b>	Shall mean the process by which a dispute arising under the contract is resolved by an independent third-party arbitrator, whose decision is final and binding on the parties, in accordance with the provisions of the <i>Arbitration and Conciliation Act, 1996</i> (as amended), and as outlined in <b>Clause 18</b> of this GCC.
<b>Agreement</b>	Shall mean the legally binding contract executed between the Client and the Contractor for providing services related to road construction and maintenance projects. It includes the General Conditions of Contract (GCC), Special Conditions of Contract (SCC), Annexures, Letter of Award (LoA), schedules, and any mutually agreed amendments or modifications. The Agreement defines the roles, responsibilities, deliverables, timelines, and performance standards expected of the Contractor and governs the contractual relationship between the parties in accordance with applicable laws, regulations, and standards, including those specified by the Ministry of Road Transport and Highways (MoRTH) and other relevant authorities.
<b>Bank Guarantee</b>	Shall mean a written guarantee issued by a bank, on behalf of the Contractor, to secure the performance or payment obligations under the contract, ensuring that the bank will fulfil the financial commitments in the event of the Contractor's failure to perform as per the terms and conditions of the contract.
<b>Base Date</b>	Shall mean the date up to which the conditions of the site, works, and environment are considered for the purpose of contract price adjustments.
<b>Bid Price</b>	Shall mean the total price submitted by the Contractor in response to the Client's invitation for tenders, which encompasses all costs, including labor, materials, equipment, overheads, and other expenses necessary for the completion of the works in accordance with the contract requirements.
<b>Bill of Quantities (BoQ)</b>	Shall mean a document prepared by the Client or their representative, detailing the quantities and specifications of all works to be executed under the contract. It serves as a basis for pricing and tender evaluation, including the measurement of work items, their unit rates, and estimated costs to aid in the preparation of the Contractor's bid. The BoQ forms an integral part of the contract and is used for determining the contract value and assessing any variations in the work.
<b>Boundary Line</b>	Shall mean the line demarcating the boundary of the site or the area of the concession.

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Term	Definition
<b>Bridge</b>	Shall mean a structure designed and constructed to carry traffic or other loads across a watercourse, depression, road, or other physical obstacle. It typically consists of a deck supported by substructures, such as piers, abutments, or foundations, and is intended to facilitate safe and efficient passage of vehicles, pedestrians, and other loads in accordance with relevant design standards and specifications.
<b>Certificate of Completion</b>	Shall mean a formal certificate issued by the Engineer to the Contractor upon the satisfactory completion of the works, confirming that the works have been completed in accordance with the contract documents, specifications, and other applicable requirements. The certificate signifies that the works have met the required standards and are deemed ready for handover to the Client, subject to any outstanding issues or defects identified during the final inspection.
<b>Claim</b>	Shall mean a formal written request by the Contractor for an adjustment to the contract terms, including but not limited to changes in time, cost, or scope, arising from unforeseen circumstances, variations, or other causes beyond the Contractor's control that affect the performance of the contract.
<b>Client / Employer</b>	Shall refer to NHIT and its subsidiaries, incorporated under the Companies Act, along with their legal successors, assignees, and authorized officers, who are entitled to the rights and remedies as outlined in the Contract.
<b>Commencement Date</b>	Shall mean the date specified in the contract from which the Contractor is required to begin the execution of the works.
<b>Compensation Event</b>	Shall mean an event or circumstance as defined in the contract that entitles the Contractor to claim an extension of time or additional payment for costs incurred due to the occurrence of such event, which was beyond the Contractor's control and not attributable to the Contractor's actions or omissions.
<b>Completion Date</b>	Shall mean the date by which the Contractor is required to complete the works, as agreed in the contract.
<b>Completion Certificate</b>	Shall mean the certificate issued by the Client or Engineer confirming that the works have been completed in accordance with the contract specifications, and all requirements have been met to the satisfaction of the Client or Engineer.
<b>Confidential Information</b>	Shall mean any data or information, whether written, oral, or in any other form, relating to the works, the contract, or any other aspect of the project, which is confidential in nature and is not to be disclosed to third parties without the prior written consent of the disclosing party.

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Term	Definition
	<p>This shall include, but not be limited to, business plans, technical data, financial information, and proprietary information.</p> <p>The disclosure and protection of Confidential Information may also be governed by applicable laws, including the <b>Indian Contract Act, 1872</b> and the <b>Information Technology Act, 2000</b>, along with any confidentiality or non-disclosure agreements between the parties.</p>
<b>Contract Price</b>	<p>Shall mean the total amount agreed upon between the Client and the Contractor for the execution of the works, as specified in the contract, including any adjustments made due to changes, variations, or modifications in the scope of work, in accordance with the terms and conditions of the contract. This may include taxes, duties, and other financial obligations as specified under the contract.</p>
<b>Contractor</b>	<p>Shall mean the individual, firm, or company engaged by the Client to execute the works as per the terms and conditions of the contract, including any subcontractors or agents employed by the Contractor for the performance of the works.</p>
<b>Contractor's Equipment</b>	<p>Shall mean all equipment, machinery, tools, vehicles, and other resources provided by the Contractor to execute the works, including any temporary or permanent items necessary for the performance of the contract. This includes all items used for construction, maintenance, and testing as required to fulfill the contractual obligations.</p>
<b>Contractor's Personnel</b>	<p>Shall mean all employees, workers, subcontractors, agents, and any other individuals or entities engaged by the Contractor to perform the works under the contract, including those working at the construction site or any location necessary for the execution of the project.</p>
<b>Contractor's Proposal</b>	<p>Shall mean the detailed submission made by the Contractor in response to the Client's invitation or request, outlining the proposed methodology, work plan, schedule, and cost estimates for executing the works, including any technical or financial terms as required under the contract.</p>
<b>Concessionaire</b>	<p>Shall mean the Contractor under the NHAJ Concession Agreement, responsible for the operation and maintenance of the project after construction.</p>
<b>Construction Works</b>	<p>Shall mean all activities and tasks undertaken by the Contractor to fulfil the requirements of the contract, including both permanent works (such as buildings, structures, and infrastructure) and temporary works (such as scaffolding, formwork, and site facilities), in accordance with the contract specifications, drawings, and applicable standards.</p>

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Term	Definition
<b>Consultant</b>	Shall mean the professional service provider appointed by the Client to assist in the supervision, design, management, or other project-related activities, providing expert advice, technical expertise, and support in accordance with the terms of the contract.
<b>Date of Handover</b>	Shall mean the date on which the Contractor completes the works in accordance with the contract and formally hands over the completed project to the Client, signifying the transfer of responsibility from the Contractor to the Client.
<b>Delay</b>	Shall mean the failure to complete the works within the agreed completion date, resulting from the Contractor's fault, the Client's actions or omissions, or unforeseen circumstances beyond the control of either party, as defined in the contract.
<b>Design Documents</b>	Shall mean all drawings, specifications, calculations, reports, and other related documents provided by the Contractor, detailing the design of the works, in accordance with the contract requirements.
<b>Dispute</b>	Shall mean any disagreement or conflict arising between the parties regarding the interpretation, application, or breach of the contract terms, which may require resolution as per the procedures outlined in <b>Clause 18</b> of this GCC.
<b>Dispute Resolution Procedure</b>	Shall mean the process described in <b>Clause 18</b> of this GCC for addressing disputes, differences, or claims arising under the Contract. It encompasses procedures such as amicable settlement, referral to a Dispute Resolution Board (DRB), and arbitration in accordance with the Arbitration and Conciliation Act, 1996 (as amended). The resolution framework also includes jurisdictional provisions, interim relief, and continuity of work obligations to ensure minimal disruption. Wherever the term "Arbitration" appears in this Agreement, it shall refer to <b>Clause 18</b> , detailing its application and procedure.
<b>Duties and Responsibilities</b>	Shall mean the obligations and tasks assigned to each party under the contract, encompassing the specific roles, functions, and responsibilities of both the Client and the Contractor as outlined in the contract.
<b>Engineer-in-charge</b>	Shall means the person appointed by the Employer or its authorized representative to oversee, administer, and certify the execution of work under the Contract. The Engineer-in-Charge shall be responsible for supervising construction, maintenance, material quality, and contract compliance as per the specifications. For consultancy and equipment hiring contracts, the Engineer-in-Charge shall ensure services or hired equipment meet contract terms. The Engineer-in-

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Term	Definition
	Charge shall have the authority to issue instructions, approve work, and certify completion, subject to the Employer’s final approval. All instructions and approvals given by the Engineer-in-Charge shall be binding on the Contractor unless otherwise directed by the Employer.
<b>Engineer’s Representative</b>	Shall mean the individual appointed by the Engineer to act on their behalf, responsible for overseeing the works, ensuring compliance with the contract, and making decisions related to the construction process.
<b>Employer’s Representative</b>	Shall mean the individual appointed and authorized by the Client to oversee, administer, and manage the contract on behalf of the Client, ensuring compliance with the terms and conditions of the contract.
<b>Emergency Works</b>	Shall mean works required to rectify, mitigate, or respond to situations arising from natural disasters, accidents, or other unforeseen events that demand immediate action to restore safety, functionality, or compliance with the contract.
<b>Employer’s Risk</b>	Shall mean the risks for which the Employer is responsible under the contract, including but not limited to unforeseen site conditions, force majeure events, or any other risks that are outside the Contractor’s control and which may impact the progress or execution of the works.
<b>Escalation Clause</b>	Shall mean the provision in the contract that allows for adjustments to the contract price or rates based on changes in inflation, material costs, labor rates, or other relevant indices, to account for unforeseen increases in costs during the course of the project.
<b>Force Majeure</b>	Shall mean any unforeseeable event or circumstance beyond the control of either party, including but not limited to natural disasters, war, terrorism, floods, strikes, or government actions, which prevents or delays the performance of contractual obligations.
<b>Final Payment</b>	Shall mean the last payment made by the Client to the Contractor upon the successful completion of the contract, including all adjustments for variations, deductions, or any other contractual obligations, after the issuance of the Completion Certificate.
<b>Final Settlement</b>	Shall mean the final agreement between the Contractor and the Client, which marks the conclusion of the contract, including any outstanding payments, claims, or adjustments, and reflects the completion of all contractual obligations by both parties.
<b>Gross Income</b>	Shall mean the total income earned by the Concessionaire from the operation of the project, including all tolls, fees, charges, and other revenues generated from the project, before any deductions or expenses.

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Term	Definition
<b>Indemnity</b>	Shall mean the obligation of the Contractor to hold harmless and protect the Client from any losses, damages, liabilities, claims, or expenses arising from the Contractor’s actions, negligence, or failure to perform obligations under the contract, including but not limited to any third-party claims.
<b>Insurance</b>	Shall mean the coverage required under the contract to protect the Contractor, Client, and third parties from risks and liabilities during the execution of the works. This includes coverage for damage to works, injury, accidents, loss, theft, and public liability. The Contractor must obtain insurance from a reputable insurer and provide proof of such coverage to the Client. The insurance must meet the legal and contractual requirements, ensuring adequate protection against potential risks during the project’s duration.
<b>Interim Payment</b>	Shall mean a payment made to the Contractor at regular intervals for work completed up to a certain stage, as specified in the contract, based on progress or milestones achieved, subject to the approval of the Client or Engineer.
<b>Insurance Certificate</b>	shall mean a document issued by an insurance company confirming that the Contractor has obtained and maintained the required insurance coverage as specified in the contract, covering risks such as damage to the works, liability, or other relevant insurable events during the course of the project.
<b>Key Personnel</b>	Shall mean the individuals designated in the contract as essential to the execution of the works, whose expertise, roles, and responsibilities are critical to the successful completion of the project, and whose substitution or replacement requires prior approval from the Client.
<b>Liquidated Damages</b>	Shall mean a predetermined amount specified in the contract, which the Contractor agrees to pay as compensation to the Client for delays or failure to complete the works within the agreed completion date, as a result of the Contractor's default.
<b>Letter of Acceptance</b>	Shall mean the formal document issued by the Client to the Contractor, signifying the Client's acceptance of the Contractor's bid or proposal, thereby forming a binding contract between the parties.
<b>Letter of Intent</b>	Shall mean a written statement from the Employer indicating the Employer's intention to proceed with the execution of the works or part thereof, prior to the formal signing of the contract, without creating any contractual obligations on the part of the Employer except for those specifically agreed in the letter.

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Term	Definition
<b>Mobilization</b>	Shall mean the activities required to prepare the site, deploy resources, and establish necessary facilities for the commencement of the works. This includes setting up temporary site offices, mobilizing labor, equipment, and materials, and ensuring the availability of utilities and services, as well as fulfilling regulatory and safety requirements, in accordance with the terms of the contract.
<b>Notice of Delay</b>	Shall mean a formal notification issued by the Contractor to the Client or Engineer, informing them of delays or potential delays in the completion of the works. The notice shall detail the cause of the delay, the expected duration, and any actions being taken to mitigate the delay, in accordance with the terms of the contract. The notice must be submitted within the specified time frame as outlined in the contract to ensure proper documentation and potential adjustments to the project schedule.
<b>Notice to Proceed</b>	Shall mean a formal written notice issued by the Client to the Contractor, authorizing the commencement of the works specified in the contract, typically following the contract signing. It marks the official start date for the project and confirms that the Contractor may begin work in accordance with the agreed terms and conditions.
<b>Payment Certificate</b>	Shall mean a document issued by the Engineer or Client, certifying the amount due to the Contractor for the work completed up to a specific date, based on the progress of the work, as per the terms of the contract. The certificate includes details of the work completed, measurements, and any applicable adjustments, deductions, or additions, and serves as the basis for the Contractor's payment claim.
<b>Performance Bond</b>	Shall mean a financial guarantee, typically issued by a bank or insurance company, ensuring the Contractor's fulfilment of the terms and conditions of the contract. The bond serves as security for the Client, covering the cost of completing the work or remedying any defects in case the Contractor fails to perform in accordance with the contract. The bond amount is usually a percentage of the contract value and is released upon successful completion of the contract obligations.
<b>Price Adjustment</b>	Shall mean modifications to the contract price due to fluctuations in material costs, labour, or other factors such as inflation or changes in the scope of work, as defined and agreed upon in the contract.
<b>Progress Payment</b>	Shall mean a periodic payment made to the Contractor based on the measured and certified completion of work, whether calculated as a percentage of the total contract value, as per completed items of work,

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Term	Definition
	<p>or as otherwise defined in the contract. Such payments are certified by the Engineer in accordance with the agreed terms.</p>
<b>Request for Proposal</b>	<p>shall mean a formal solicitation document issued by the Client to invite bids for a specified scope of work. It defines project requirements, technical specifications, eligibility criteria, evaluation methodology, and contractual terms governing the bidding process. The RFP ensures transparency, compliance, and fair competition while outlining bid submission, evaluation, and contract award conditions.</p>
<b>Retention</b>	<p>Shall mean a predetermined percentage of the payment due to the Contractor that is withheld by the Client as security to ensure the satisfactory performance and completion of the works, including rectification of any defects during the defect liability period, as specified in the contract.</p>
<b>Site Safety</b>	<p>Shall mean the comprehensive set of measures, practices, and protocols implemented to safeguard the health and safety of all personnel, workers, and the general public during the execution of the works, in compliance with applicable laws, regulations, and contract provisions, including adherence to IRC guidelines and relevant safety standards.</p>
<b>Substantial Completion</b>	<p>Shall mean the stage in the execution of the works where all major components and contractual obligations have been completed to a degree that allows the project to be used or occupied for its intended purpose, notwithstanding the presence of minor defects or incomplete works that do not materially affect functionality, safety, or operability, as determined by the Engineer in accordance with the terms of the contract.</p>
<b>Subcontractor</b>	<p>Shall mean any individual, firm, partnership, or corporation engaged by the Contractor to execute a specified portion of the works or services under the contract, in accordance with the approved terms and conditions, and subject to the Contractor's overall responsibility for the completion and performance of the project as per the contract.</p>
<b>Takeover Certificate</b>	<p>Shall mean the formal document issued by the Client, or the Engineer on behalf of the Client, certifying the satisfactory completion of the works or a specified portion thereof in accordance with the contract terms, signifying the Client's acceptance and assumption of responsibility for the works.</p>
<b>Terms of Reference (ToR)</b>	<p>Shall mean a document that defines the scope, objectives, responsibilities, and deliverables for the road construction and maintenance project. It specifies the tasks, such as design,</p>

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Term	Definition
	<p>construction, quality control, material specifications, timelines, and resource allocation, to be carried out by the contractor. The ToR operates in conjunction with the <b>General Conditions of Contract (GCC)</b>, <b>Special Conditions of Contract (SCC)</b>, and <b>Contract Data (CD)</b>, which provide the contractual, legal, and procedural guidelines for the project. It ensures that all parties understand their roles, obligations, and expectations while adhering to the project’s technical specifications and standards. The ToR serves as a reference for the execution and monitoring of the project, ensuring compliance with the overarching contract documents and applicable standards.</p>
<b>Time Extension</b>	<p>Shall mean an adjustment to the original contract completion date, granted by the Client based on justifiable reasons, such as delays caused by unforeseen circumstances, variations in work scope, or other factors beyond the Contractor’s control, in accordance with the provisions of the contract.</p>
<b>Worksite</b>	<p>Shall mean the designated area where the works specified in the contract are to be executed, including all associated locations such as access roads, storage areas, and temporary facilities or structures established by the Contractor for the purpose of completing the works, as defined in the contract documents.</p>
<b>Warranty Period</b>	<p>Shall mean the specified duration following the issuance of the Completion Certificate or Takeover Certificate during which the Contractor is obligated to rectify any defects, deficiencies, or failures in the works, materials, or equipment, ensuring compliance with the contract requirements. This period is defined in the contract and commences upon the formal acceptance of the works by the Client.</p>

## 2. Scope of Work

### 2.1 General Scope

The Contractor shall provide all services necessary to carry out road maintenance activities, as outlined in this Agreement. These services shall include routine, preventive, and emergency maintenance, repair, and rehabilitation of the road network, associated structures, and facilities, ensuring their safe and functional condition as specified by the Client. The Contractor shall also be responsible for coordinating with the Client and maintaining records of all work performed.

### 2.2 Detailed Scope of Works / Services

The Contractor's responsibilities under this Agreement shall include, but are not limited to, the following tasks:

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## General Conditions of Contract

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- 2.2.1 Routine and Preventive Maintenance:** Perform regular inspections, cleaning, and minor repairs of the road, pavements, shoulders, road signs, road markings, drainage systems, guardrails, and other roadside infrastructure, ensuring compliance with the Client's standards.
- 2.2.2 Emergency Repairs and Restoration:** Respond promptly to unexpected events, such as accidents or weather-related damages, ensuring the road is restored to safe and usable conditions with minimal disruption to traffic.
- 2.2.3 Pavement and Surface Treatment:** Maintain, repair, and rehabilitate the road pavement, including surface treatments, patching of damaged areas, and the replacement of severely damaged sections.
- 2.2.4 Drainage and Stormwater Management:** Ensure the proper functioning of the road's drainage systems, including culverts, drains, and ditches, to prevent water accumulation and maintain road stability.
- 2.2.5 Traffic Signs and Road Markings:** Maintain and replace damaged or faded traffic signs, signals, and road markings in accordance with relevant traffic regulations and standards.
- 2.2.6 Roadside Structures and Bridges:** Maintain the structural integrity of all roadside structures, including bridges, overpasses, underpasses, retaining walls, and other infrastructure, ensuring safe operational conditions.
- 2.2.7 Traffic Management and Safety:** Implement safety measures during road maintenance activities, such as proper traffic management, signages, barriers, and other devices, to ensure safety for road users and workers.
- 2.2.8 Environmental Protection:** Conduct all maintenance activities in a manner that complies with environmental regulations, including proper disposal of waste, pollution control, and minimizing disruption to the surrounding environment.
- 2.3 Contractor's Obligations**
- 2.3.1** The Contractor shall supply all labor, equipment, tools, materials, and expertise required to perform the work under this Agreement.
- 2.3.2** The Contractor shall comply with all relevant local, national, and international laws, regulations, and industry standards related to road maintenance, health and safety, and environmental protection.
- 2.3.3** The Contractor shall ensure that all maintenance work is completed within the prescribed timelines and quality standards specified in this Agreement.
- 2.4 Coordination and Reporting**
- 2.4.1** The Contractor shall coordinate all maintenance activities with the Client and provide timely updates regarding the progress of work, issues identified, emergency responses, and completion status.
- 2.4.2** The Contractor shall submit regular reports detailing all maintenance activities carried out, including a summary of work completed, ongoing tasks, and any emergency interventions.

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### 2.5 Exclusions

This Agreement excludes any major reconstruction, upgrading, or new construction of roads, bridges, or structures unless explicitly specified in a separate written agreement between the Client and the Contractor.

## 3. Contract Period and Validity

### 3.1 Contract Period

The Contract shall commence on the **Effective Date** as specified in the Agreement and shall remain in force for an initial period of **[as specified in Contract Data Sheet] years/months** (the "Contract Period"), unless terminated earlier in accordance with the provisions of this Agreement. The Contractor shall commence work as specified and shall diligently proceed with the work to ensure that all obligations and deliverables are completed in accordance with the terms and conditions of this Agreement.

### 3.2 Extension of Contract Period

Upon mutual agreement between the Client and the Contractor, the Contract Period may be extended for additional periods, each not exceeding **[as specified in Contract Data Sheet] years/months**, subject to the terms and conditions agreed upon by both parties. Such extension shall be agreed in writing before the expiry of the initial Contract Period or any subsequent extension period. The extension may be due to reasons such as:

- 3.2.1 The need for continued road maintenance works / services beyond the initial Contract Period.
- 3.2.2 Delays in the completion of work that are beyond the Contractor's control and for which an extension is granted in accordance with the provisions of this Agreement.

### 3.3 Validity of Contract

This Agreement shall be valid and binding upon the parties from the **Effective Date [as specified in Contract Data Sheet]** until the completion of all obligations and deliverables, unless terminated earlier as per the provisions of this Agreement. The validity of the Contract shall also depend upon the fulfilment of the following:

- 3.3.1 **Performance Security:** The Contractor shall provide a Performance Security **[amount as specified in Contract Data Sheet]** as per the conditions stipulated in this Agreement, which shall remain valid throughout the Contract Period and any extensions thereof.
- 3.3.2 **Compliance with Regulatory Requirements:** The Contract will remain valid provided the Contractor maintains compliance with all applicable laws, regulations, and standards relevant to the performance of road maintenance works / services.

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### 3.4 Survival of Obligations After Termination

Notwithstanding the termination of the Contract, the Contractor's obligations regarding confidentiality, warranties, and indemnities shall survive beyond the termination and continue in full force until satisfied. Any outstanding payments owed by either party to the other at the time of termination shall also survive termination and remain due for settlement.

### 3.5 Termination and Final Acceptance

In the event of termination of the Contract, the provisions of **Clause 20 (Termination)** shall apply, and in the event of completion of the Contract, the provisions of **Clause 23 (Substantial Completion and Final Acceptance)** shall apply.

## 4. Contractor's Obligations

### 4.1 General Obligations

The Contractor shall perform all obligations and services in accordance with the terms of this Agreement and in a professional and efficient manner, ensuring compliance with the **Contract Specifications**, applicable laws, regulations, and standards, and minimizing disruption to road users and the public.

### 4.2 Obligations Relating to Performance and Quality

The Contractor shall ensure the performance and quality of the road maintenance works / services as per the specifications laid out in the **Scope of Work**. The Contractor shall maintain an efficient **Quality Control (QC) system** and ensure documentation of compliance.

### 4.3 Staffing and Resource Management

The Contractor shall provide sufficient and competent personnel, equipment, and materials to perform the works / services efficiently. The staffing obligations are detailed under **Clause 5 (Contractor's Personnel)**.

### 4.4 Health, Safety, and Environmental Requirements

The Contractor shall comply with health, safety, and environmental regulations, ensuring a safe working environment for all personnel and the public. Obligations in this area are covered in **Clause 11 (Health, Safety, and Environmental Management)**.

### 4.5 Insurance Obligations

The Contractor shall provide and maintain the necessary insurance policies, including public liability, workmen's compensation, and contractor's all-risk insurance, as detailed in **Clause 12 (Insurance)**.

### 4.6 Site Management and Supervision

The Contractor shall be responsible for the management, supervision, and coordination of the work. This is covered under **Clause 25 (Site Management and Supervision)**.

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### 4.7 Subcontracting

The Contractor shall not subcontract any part of the work without the prior written approval of the Client. Subcontracting provisions are in **Clause 6 (Subcontracting and Assignment)**.

### 4.8 Compliance with Laws and Regulations

The Contractor shall comply with all applicable laws and regulations, as outlined in **Clause 17 (Governing Law and Jurisdiction)**.

### 4.9 Indemnity and Liability

The Contractor shall indemnify and hold the Client harmless from any claims, damages, or liabilities. The indemnity and liability clauses are covered under **Clause 26 (Indemnity and Liability)**.

### 4.10 Reporting and Documentation

The Contractor shall maintain records and submit regular reports and documentation as required by the Client. Reporting and documentation are covered in **Clause 27 (Reporting and Documentation)**.

### 4.11 Maintenance and Performance Standards

The Contractor shall adhere to the maintenance and performance standards outlined in the **Contract Specifications** and ensure works / services are rendered to maintain road infrastructure as per **Clause 28 (Maintenance and Performance)**.

### 4.12 Dispute Resolution

In case of disputes, the dispute resolution process as per **Clause 18 (Dispute Resolution)** shall apply.

### 4.13 Termination of Contract

In the event of termination, the provisions of **Clause 20 (Termination of Contract)** shall apply.

### 4.14 The duties of the contractor

This shall include compliance with safety standards, quality, environmental, and health regulations as per MoRTH, IRC, and international norms.

## 5. Contractor's Personnel

### 5.1 Contractor's Responsibility:

The Contractor shall ensure that only qualified, experienced, and competent personnel are deployed for the execution of the Works. All personnel, including management, technical, and support staff, shall be appropriately trained, skilled, and capable of performing the assigned tasks efficiently, in compliance with applicable standards, laws, and regulations.

### 5.2 Key Personnel:

The Contractor shall provide a list of key personnel who will be assigned to the project, along with their qualifications, experience, and roles. These personnel shall include,

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but not be limited to, the Project Manager, Site Engineer, Safety Officer, Quality Control Officer, and other specialized personnel as required by the project. The roles and responsibilities of these key personnel shall be clearly defined and communicated to the Client.

### 5.3 Substitution of Personnel:

In the event of the need to replace or substitute any key personnel, the Contractor must obtain prior written approval from the Client. Any substitution shall be made with personnel of similar or higher qualifications, and the Contractor shall provide adequate justification for such changes. The new personnel must meet the same qualifications and experience criteria as the replaced staff.

### 5.4 Non-Compliance and Disciplinary Action:

In case the Client finds that any personnel deployed by the Contractor fail to meet the required standards, the Client reserves the right to request their removal from the site. The Contractor shall promptly remove such personnel and replace them with suitable alternatives. Continued non-compliance by the Contractor's personnel may lead to penalties as per the contract, including potential delays or suspension of work.

### 5.5 Health, Safety, and Welfare:

The Contractor is responsible for ensuring the health, safety, and welfare of all personnel deployed for the project. All personnel must be provided with the necessary personal protective equipment (PPE) and must comply with the safety protocols defined in the Health, Safety, and Environmental (HSE) plan for the project. The Contractor shall also ensure that all personnel undergo safety training and awareness programs as required.

### 5.6 Workforce Composition:

The Contractor shall provide a balanced workforce for the execution of the Works, including skilled labor, technical staff, and supervisory personnel. The workforce must be adequate to meet the project timeline and ensure continuous work in compliance with the project's quality, safety, and environmental requirements.

### 5.7 Contractor's Supervision:

The Contractor shall provide a sufficient number of supervisors and management personnel to oversee the work, ensuring compliance with the approved methodologies, safety standards, and project schedules. The Contractor shall also ensure that supervisors are responsible for maintaining quality control and reporting to the Client.

### 5.8 Employee Welfare and Benefits:

The Contractor shall comply with all relevant labour laws and provide adequate welfare facilities for its personnel, including but not limited to, sanitation, accommodation, transportation (if required), and other benefits as per statutory requirements.

### 5.9 Exclusivity of Personnel:

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The personnel deployed by the Contractor for the project shall not be transferred to other projects without the prior written consent of the Client. This ensures that the project benefits from dedicated and focused human resources.

### 5.10 Compliance with Local Regulations:

All personnel deployed must adhere to the labour laws, safety standards, and environmental regulations that apply to the locality of the project site, in addition to international standards, where applicable.

## 6. Subcontracting and Assignment

### 6.1 Subcontracting Approval:

The Contractor shall not subcontract any part of the Works without prior written consent from the Client. All subcontractors must meet the same standards required of the Contractor and adhere to the terms of this contract.

### 6.2 Contractor's Responsibility:

The Contractor remains fully responsible for the performance of the contract, even when subcontracting. Subcontractors' acts, omissions, and defaults shall be treated as those of the Contractor.

### 6.3 Assignment and Transfer:

The Contractor shall not assign, transfer, or subcontract the rights or obligations under this contract without the Client's prior written consent. Any unauthorized assignment or transfer shall be void.

### 6.4 Subcontractor Compliance:

The Contractor must ensure that all subcontractors comply with the terms, standards, and requirements of the contract, including quality, safety, and statutory obligations.

### 6.5 Notification of Changes:

Any changes to subcontractors must be approved by the Client. The Contractor shall notify the Client in writing of any proposed changes to the subcontractor team.

### 6.6 Subcontractor's Documentation:

Subcontractors must provide necessary documentation such as progress reports, safety records, and quality assurance certifications as required by the Client. The Contractor is responsible for submitting these on behalf of subcontractors.

### 6.7 Insurance Requirements:

Subcontractors must carry appropriate insurance coverage as required under the contract, including public liability and workers' compensation. The Contractor must provide proof of insurance on behalf of subcontractors when requested.

### 6.8 Subcontractor Performance:

The Contractor shall evaluate subcontractor performance to ensure compliance with the contract, quality standards, and timelines. Any performance issues must be addressed immediately, and the Client should be informed of corrective actions.

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### 6.9 Indemnity:

The Contractor shall indemnify the Client against any claims or damages arising from the actions or failures of subcontractors.

## 7. Risk Allocation

### 7.1 Client's Risks:

**7.1.1** The Client assumes responsibility for risks arising from:

**7.1.1.1 Force Majeure:** Events beyond the control of either party, such as natural disasters, strikes, wars, or other unforeseen events.

**7.1.1.2 Site Conditions:** Delays or issues caused by pre-existing site conditions or environmental factors unknown to the Contractor at the time of bid submission.

**7.1.1.3 Delays by the Client:** Delays caused by late approvals, failure to provide necessary access, or other actions attributable to the Client.

**7.1.1.4 Design Changes:** Modifications or changes to the project's design or scope requested by the Client after contract execution.

### 7.2 Contractor's Risks:

The Contractor assumes responsibility for risks arising from:

**7.2.1 Project Delays:** Delays resulting from the Contractor's failure to perform, inadequate resources, or failure to meet agreed milestones.

**7.2.2 Unforeseen Site Conditions:** Conditions that, although unforeseen, could have been reasonably anticipated by the Contractor at the time of the bid submission.

**7.2.3 Workmanship and Quality:** Ensuring that the works meet the specified standards, with responsibility for correcting any defects or deficiencies during the construction phase and warranty period.

**7.2.4 Compliance with Laws:** The Contractor's responsibility for complying with all statutory requirements, regulations, and permits during the course of work.

### 7.3 Shared Risks:

Certain risks are shared between the Client and Contractor, with allocation based on mutual agreement or contract amendments. These include:

**7.3.1 Changes in Law:** Risk arising from changes in local or national legislation impacting the execution or cost of the project.

**7.3.2 Third-Party Claims:** Risks of third-party claims related to the construction process, which may be jointly managed by both parties depending on the cause.

### 7.4 Risk Cost Purchase (Client's Risk Mitigation Effort):

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**7.4.1 Risk Management Costs:** The Client may incur costs related to purchasing risk management tools or measures, including additional insurance, legal protections, or third-party services to mitigate specific risks identified during the project.

**7.4.2 Additional Resources:** The Client may provide or purchase additional resources, such as alternative designs or technologies, to mitigate risks related to site conditions, environmental challenges, or delays.

**7.4.3 Cost Reimbursement:** If the Client elects to purchase such risk mitigation services, any costs incurred may be passed on to the Contractor, subject to prior written approval or agreement on the cost-sharing method.

### 7.5 Risk Mitigation and Notification:

Both parties are required to actively mitigate risks within their control. Each party must promptly notify the other of any risk factors that could impact the project, including the potential for delay or additional costs. Regular risk assessments must be conducted, and mitigation strategies should be implemented as necessary.

### 7.6 Force Majeure:

In the event of Force Majeure, the affected party must notify the other party as soon as possible. The contract may be extended, or other adjustments may be made to accommodate the impact of such events.

### 7.7 Insurance for Risk Management:

Both the Client and Contractor must maintain appropriate insurance coverage to mitigate the impact of risks under their respective responsibilities. This includes public liability, contractor all-risk insurance, and other relevant policies.

## 8. Quality Control and Assurance

### 8.1 General Obligations

**8.1.1** The Contractor shall ensure that all works comply with the approved Quality Assurance Plan (QAP), MoRTH, IRC, and other relevant specifications.

**8.1.2** All materials, workmanship, and methodologies must adhere to the prescribed standards, with no deviations allowed without prior written approval from the Client.

**8.1.3** The Contractor is fully responsible for the quality of work, including ensuring compliance with technical specifications, design criteria, and project-specific quality benchmarks.

### 8.2 Quality Assurance Plan (QAP)

**8.2.1** The Contractor shall submit a comprehensive QAP for Client approval before commencing work. The QAP must include:

**8.2.1.1** Roles and responsibilities of personnel involved in quality control.

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**8.2.1.2** Inspection points, testing protocols, frequency of tests, corrective actions, and defect rectification timelines.

**8.2.2** The QAP shall also detail mock-ups, trials, and continuous quality monitoring methods.

**8.2.3** The Contractor must diligently implement the approved QAP and address any changes suggested by the Client.

### **8.3 On-Site Testing Laboratory**

**8.3.1** The Contractor must establish and operate an on-site testing laboratory with calibrated equipment as per IS and MoRTH standards.

**8.3.2** Real-time quality tests shall be conducted, and the results documented and shared with the Client.

**8.3.3** The Client reserves the right to verify results through independent testing at NABL-accredited laboratories.

### **8.4 Material Source Approval**

**8.4.1** All material sources shall be pre-approved by the Client. The Contractor must submit samples, test results, and certifications for approval before procurement.

**8.4.2** The Contractor must ensure timely submission of documents to avoid delays.

### **8.5 Inspection and Testing Protocols**

**8.5.1** All materials and workmanship shall undergo regular inspections and testing as per the QAP.

**8.5.2** Test frequencies, sampling methods, and acceptance criteria must adhere to MoRTH and project standards.

**8.5.3** The Client may conduct independent testing or appoint third-party auditors at any stage, with costs borne by the Contractor in case of non-compliance.

### **8.6 Non-Conformance Management**

**8.6.1** The Contractor shall maintain a system to record and rectify non-conforming work.

**8.6.2** Non-conforming materials or works must be removed from the site immediately and rectified at the Contractor's expense.

**8.6.3** Repeated quality issues will result in escalation as follows: written warnings, penalties, and, if unresolved, suspension of work.

### **8.7 Defects Rectification and Timelines**

**8.7.1** Identified defects must be rectified within timelines specified in the QAP or technical documents.

**8.7.2** Failure to comply within these timelines may result in penalties, suspension of work, or termination of the contract.

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### 8.8 Documentation and Reporting

- 8.8.1 The Contractor shall maintain updated records of all quality control activities, including inspection reports, test results, calibration certificates, and supplier certifications.
- 8.8.2 Periodic quality reports (daily, weekly, or monthly as specified) shall be submitted to the Client.
- 8.8.3 Handover documentation, including material certifications, test reports, inspection records, and warranties, must be submitted at project completion for final approval.

### 8.9 Continuous Improvement Measures

- 8.9.1 The Contractor shall adopt continuous improvement practices, including regular reviews of quality outcomes and training personnel on quality standards.
- 8.9.2 Feedback mechanisms must be established to identify recurring quality issues and implement corrective actions.

### 8.10 Penalties for Quality Non-Compliance

- 8.10.1 Failure to meet quality standards or address defects promptly shall result in penalties as per the contract.
- 8.10.2 Substandard quality, delays in defect rectification, or repeated non-conformance may also lead to work suspension or termination.

### 8.11 Client's Oversight and Rights

- 8.11.1 The Client reserves the right to conduct inspections, tests, and reviews at any stage, including surprise checks.
- 8.11.2 Additional testing at NABL-accredited laboratories may be mandated at the Contractor's cost in cases of suspected non-compliance.
- 8.11.3 Third-party audits may be conducted, with any resulting penalties or costs borne by the Contractor for non-compliance.

## 9. Work Execution and Methodology

### 9.1 General Obligations

- 9.1.1 The Contractor shall carry out all **road construction, periodic maintenance, and routine maintenance** works in strict compliance with the approved work methodologies, schedules, and technical specifications as per MoRTH guidelines, IRC standards, and the relevant contract documents.
- 9.1.2 The Contractor is responsible for ensuring that all work is executed in line with the prescribed road maintenance procedures, safety protocols, quality benchmarks, and environmental standards. Any deviations from these shall be subject to prior written approval from the Client.

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**9.1.3** For the purpose of broad guidelines, the following brief methodology is being provided for reference. **The Contractor shall submit a detailed maintenance methodology at least 30 days before execution of the work for the Client's approval.**

### 9.2 Road Construction Methodology

Road construction shall be executed in accordance with MoRTH, IRC, and NHAI Schedule-F specifications, ensuring high-quality, durable pavements capable of sustaining traffic loads as per design life requirements. The methodology shall comprehensively cover earthwork, embankment formation, pavement layers, drainage structures, road safety appurtenances, and associated works. The Contractor shall ensure that all construction activities are planned, executed, and monitored as per approved designs, work methodologies, and safety protocols. All quality control tests shall be conducted as per specified standards, and the work shall be inspected by the Client or its authorized representatives at various stages.

#### 9.2.1 Scope and Requirements

The Contractor shall execute all new road construction and major rehabilitation works in accordance with MoRTH, IRC, and NHAI Schedule-F specifications. The methodology shall cover embankment preparation, pavement layers, drainage, structures, and road safety features.

#### 9.2.2 Subgrade and Pavement Layers

The Contractor shall ensure that subgrade, granular sub-base (GSB), wet mix macadam (WMM), bituminous layers (DBM, BC, etc.), and concrete layers (PQC, DLC, etc.) are laid as per approved designs and quality control norms.

#### 9.2.3 Earthwork and Embankment Preparation

Before pavement construction, all earthwork and embankment preparation shall follow MoRTH specifications, including compaction testing, slope stabilization, and proper drainage provisions.

#### 9.2.4 Drainage and Structural Components

The construction of culverts, drains, bridges, and retaining walls shall be carried out in line with approved drawings and IRC/MoRTH specifications. Proper curing and structural integrity checks shall be conducted before road opening.

#### 9.2.5 Traffic Management during Construction

The Contractor shall implement a temporary traffic diversion plan to ensure smooth traffic flow and road user safety. Temporary roads or bypasses shall be constructed as required.

### 9.3 Bridge and Structural Construction Methodology

The construction of bridges, culverts, ROBs, and other structures shall be carried out in accordance with MoRTH, IRC, and BIS standards, ensuring structural integrity,

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durability, and safety. The Contractor shall follow approved designs and specifications, ensuring strict quality control at every stage, from foundation work to superstructure completion.

The methodology shall cover all aspects of bridge and structural construction, including substructure and superstructure works, material selection, quality control measures, safety procedures, and traffic management during construction. The execution shall comply with MoRTH, IRC, and BIS standards, ensuring durability, stability, and road user safety.

### 9.3.1 Substructure and Foundation Works

- i. The Contractor shall ensure that all excavation, piling, and foundation works are carried out as per the approved design and site conditions.
- ii. Piling (bored cast-in-situ or driven) shall be executed using the appropriate methodology, maintaining verticality and ensuring proper reinforcement cage placement.
- iii. For shallow foundations, the excavation depth and bearing strata shall be verified before concreting.
- iv. Abutments and piers shall be constructed using high-strength concrete, ensuring proper curing and reinforcement cover as per IRC and MoRTH specifications.

### 9.3.2 Superstructure Erection

- i. The erection of girders (precast or cast-in-situ) shall follow an approved lifting and launching scheme, ensuring proper alignment and structural stability.
- ii. Deck slab construction shall ensure adequate formwork support, reinforcement placement, and proper curing.
- iii. Prestressing operations, if applicable, shall be carried out as per IRC:18 and MoRTH standards, ensuring proper tensioning and grouting.

### 9.3.3 Expansion Joints and Bearings

- i. The Contractor shall install expansion joints and bearings as per the approved design, ensuring correct alignment and proper seating.
- ii. Bearing pads (elastomeric, pot, or spherical) shall be placed with precision, and their compressibility shall be verified before final placement.
- iii. Expansion joints shall be sealed properly to prevent water ingress and joint deterioration.

### 9.3.4 Finishing Works and Safety Features

- i. Crash barriers, handrails, and parapets shall be installed as per IRC:5 and MoRTH guidelines.
- ii. The bridge deck shall be waterproofed using approved membranes or asphaltic coatings.
- iii. Approach roads shall be integrated seamlessly, ensuring proper drainage and smooth transition between road and bridge sections.

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### 9.3.5 Traffic and Environmental Management during Construction

- i. The Contractor shall ensure proper diversion routes and barricading during construction, as per the approved traffic management plan.
- ii. Dust suppression measures shall be implemented during excavation and material handling.
- iii. Waste materials shall be disposed off safely in compliance with environmental regulations.

### 9.4 Periodic Maintenance Methodology

Periodic maintenance activities are essential for ensuring the longevity, durability, and functional efficiency of the road infrastructure. These works shall include surface renewal, overlaying, strengthening, milling & resurfacing, crack sealing, and preventive maintenance measures to enhance pavement performance and road safety. The Contractor shall execute all periodic maintenance works in compliance with MoRTH, IRC, and NHAH Schedule-F guidelines. The methodology shall focus on proper surface preparation, material selection, quality assurance, and minimization of disruptions to traffic. Any deviations or modifications in the planned methodology shall require prior approval from the Client.

#### 9.4.1 Scope and Objectives

Periodic maintenance shall include surface renewal, overlaying, strengthening, milling & resurfacing, crack sealing, and other preventive measures to extend pavement life.

#### 9.4.2 Surface Preparation before Resurfacing

The Contractor shall undertake thorough surface cleaning, removal of loose material, and application of prime/tack coats as per MoRTH standards before overlaying new pavement layers.

#### 9.4.3 Milling and Resurfacing

If resurfacing is required, existing asphalt layers shall be milled as per the required depth before new bituminous layers are laid. The Contractor shall ensure proper bonding between layers.

#### 9.4.4 Strengthening of Pavement

For pavement strengthening, the Contractor shall execute overlaying or additional layers (BM, DBM, BC) as per the approved design mix, ensuring compaction and density control.

#### 9.4.5 Inspection and Testing

Core sampling, density tests, and roughness index tests shall be conducted to verify compliance with specified quality standards.

### 9.5 Periodic Maintenance of Bridges and Structures

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Periodic maintenance of bridges, culverts, ROBs, and structures is critical to ensuring their longevity, structural safety, and functionality. The Contractor shall conduct systematic inspections, repairs, and preventive maintenance activities as per MoRTH Schedule-F, IRC, and BIS guidelines.

The methodology shall include inspection protocols, maintenance procedures for bearings and expansion joints, concrete repair techniques, waterproofing measures, and traffic safety arrangements. All maintenance activities shall be performed as per MoRTH Schedule-F, IRC:SP:35, and other relevant standards to ensure the long-term serviceability and structural integrity of bridges, culverts, and ROBs.

### 9.5.1 Inspection and Structural Assessment

- i. The Contractor shall conduct periodic inspections of all bridges, culverts, and ROBs as per IRC:SP:35 and MoRTH Schedule-F.
- ii. Structural integrity checks shall include visual inspections, load testing (if required), and material condition assessment.
- iii. Any signs of distress, such as cracks, spalling, or deflections, shall be documented, and corrective measures shall be proposed.

### 9.5.2 Bearing and Expansion Joint Maintenance

- i. Bearings shall be inspected for signs of displacement, corrosion, or excessive deformation.
- ii. Lubrication and cleaning of bearings shall be performed as per manufacturer recommendations.
- iii. Expansion joints shall be cleaned, re-sealed, or replaced if damaged, ensuring smooth movement of the structure.

### 9.5.3 Concrete Repairs and Strengthening Measures

- i. Deteriorated concrete shall be repaired using polymer-modified mortars or epoxy-based solutions.
- ii. Carbon fibre wrapping or steel plate bonding shall be used for strengthening weak structural elements.
- iii. Proper curing shall be ensured after repairs to achieve the required strength and durability.

### 9.5.4 Waterproofing, Drainage, and Corrosion Protection

- i. Deck waterproofing membranes shall be inspected and repaired if damaged.
- ii. Drainage pipes and scuppers shall be cleaned to prevent water accumulation on the bridge deck.
- iii. Anti-corrosion coatings shall be applied to exposed reinforcement and steel elements to prevent deterioration.

### 9.5.5 Traffic and Public Safety Management during Maintenance

- i. Temporary lane closures shall be planned to minimize disruption to traffic.
- ii. Proper signage, barricading, and flagmen shall be deployed to guide road users safely.

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- iii. The Contractor shall coordinate with local authorities to ensure compliance with safety regulations.

### 9.6 Detailed Maintenance Methodology

**9.6.1** The Contractor shall submit a comprehensive Road Maintenance Methodology Plan for the Client’s approval before commencement. This plan must include detailed processes for each maintenance activity, including surface repair, crack filling, patching, resurfacing, drainage maintenance, and any other works as per the scope.

**9.6.2** The plan should detail the sequence of operations, methods, materials to be used, equipment, and labor deployment. It must also outline the methodology for managing road closures, traffic control, and diversion routes during maintenance work.

**9.6.3** Any changes to the approved methodology must be submitted for Client approval before implementation.

### 9.7 Routine Maintenance Execution

**9.7.1** The Contractor shall ensure that the maintenance works, such as pothole repairs, crack sealing, surface dressing, resurfacing, patch repairs, and drainage cleaning, are carried out as per MoRTH and IRC standards, ensuring road safety and minimal disruption to traffic.

**9.7.2** Specific procedures for each type of work (e.g., resurfacing, pothole filling, crack sealing) shall be outlined in the methodology, and work shall proceed strictly as per the sequence and conditions specified.

**9.7.3** For resurfacing works, the Contractor must ensure that existing road surface preparation is adequate, including milling, cleaning, and priming, as per the IRC and MoRTH specifications.

### 9.8 Emergency Repairs Under Routine Maintenance

While routine maintenance includes activities such as pothole filling, crack sealing, and minor surface repairs, **emergency repair works necessitated by unforeseen events**—such as floods, landslides, major accidents, or structural failures—require a structured response.

In the event of an emergency affecting the highway infrastructure, the contractor shall:

- i. **Immediate Response:** Mobilize resources within **[2] hours** of notification to assess the damage and ensure temporary traffic management measures for public safety.
- ii. **Reporting & Coordination:** Notify the Authority Engineer immediately and submit a preliminary damage assessment report within **[6] hours**, detailing the nature and extent of damage.
- iii. **Temporary & Permanent Restoration:** Execute immediate safety measures, including temporary traffic diversions, barricading, and urgent patchwork. Permanent repairs shall follow within the timeframe stipulated by the Authority Engineer.

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- iv. **Material & Cost Considerations:** The contractor shall maintain a stockpile of essential materials and deploy necessary manpower and equipment for emergency response. The cost of such emergency repairs, if beyond the scope of routine maintenance, shall be addressed as per contractual provisions.
- All emergency repair activities must comply with relevant MoRTH specifications and safety guidelines, ensuring minimal disruption to traffic and structural integrity of the highway.

### 9.9 Approval Process for Deviations

In cases where deviations from the approved maintenance plan, materials, methodology, or schedule are necessary, the contractor shall obtain prior approval from the Client or Authority Engineer. The approval process shall be as follows:

- i. **Standard Approvals:** Any planned deviation must be submitted in writing, including justification, impact assessment, and proposed corrective measures. The Client/Authority Engineer shall review and respond within **[10] working days** from submission.
- ii. **Urgent & Emergency Deviations:** For urgent situations requiring immediate action (e.g., safety hazards, emergency repairs), the contractor may seek **verbal approval** from the Authority Engineer. Such approvals must be recorded in writing within **[24] hours**, followed by formal documentation within **[5] working days**.
- iii. **Record-Keeping & Compliance:** All approved deviations shall be documented for compliance with contractual provisions and MoRTH specifications. Unauthorized deviations may result in penalties or rejection of work.

### 9.10 Material Selection and Handling

**9.10.1** All materials used for road maintenance must meet MoRTH and IRC specifications, with the Contractor required to submit material samples and obtain Client approval prior to procurement.

**9.10.2** Materials must be sourced from approved suppliers, and the Contractor shall maintain documentation for certification of compliance with MoRTH, IRC, and relevant BIS standards.

**9.10.3** Proper handling and storage of materials, such as bitumen, aggregates, and cement, must be ensured to maintain their quality and prevent contamination or deterioration.

### 9.11 Timely Execution and Scheduling

**9.11.1** Maintenance work shall be executed as per the approved work schedule, ensuring that critical road maintenance activities such as resurfacing and patching are completed within the stipulated timeframes to avoid prolonged disruption to road users.

**9.11.2** Any delay in the completion of work must be reported to the Client immediately, along with a revised schedule and reasons for the delay. The Contractor must take immediate corrective actions to mitigate delays.

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### 9.12 Site Mobilization and Readiness

**9.12.1** The Contractor shall mobilize necessary resources, including equipment, skilled labor, and materials, before starting the work to ensure site readiness. This includes setting up of temporary safety barriers, signage, and traffic control systems as per the approved traffic management plan.

**9.12.2** Temporary diversion routes and road closures, if necessary, must be coordinated with the Client and relevant local authorities to ensure smooth traffic flow during the maintenance period.

### 9.13 Quality Control during Execution

**9.13.1** Quality control measures must be strictly adhered to at all stages of work. The Contractor shall conduct in-situ testing, such as core sampling, compaction testing, and bitumen content testing, in accordance with MoRTH specifications.

**9.13.2** For major maintenance works such as resurfacing or surface dressing, the Contractor must verify the compaction, uniformity, and adhesion of the new layer with the underlying surface.

**9.13.3** The Contractor must implement a system of daily inspections and testing to monitor the quality of materials, workmanship, and progress.

### 9.14 Health, Safety, and Environmental Considerations

**9.14.1** The Contractor is responsible for ensuring that all work is carried out in compliance with the health, safety, and environmental standards outlined in the approved Safety Management Plan.

**9.14.2** Measures must be implemented to minimize dust, noise, and other pollutants during work, and the site must be regularly cleaned **to maintain safety and environmental standards.**

#### 9.14.2.1 Environmental Compliance

- i. The contractor shall ensure that all maintenance activities comply with environmental regulations as per **Central Pollution Control Board (CPCB) and State Pollution Control Board (SPCB) guidelines.** The following measures shall be strictly implemented:
- ii. **Dust Suppression:** Regular water sprinkling, use of dust barriers, and other appropriate measures shall be adopted, particularly during sweeping, pothole repairs, and unpaved shoulder maintenance.
- iii. **Waste Management:** Debris, removed vegetation, and other waste materials shall be collected, segregated, and disposed of at designated locations as per SPCB norms. No waste shall be dumped in drains, water bodies, or road shoulders.

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- iv. **Noise & Air Pollution Control:** Construction equipment and vehicles shall comply with prescribed emission and noise limits. Unnecessary idling of machinery shall be avoided.
- v. **Spill Prevention:** Proper handling and disposal of hazardous materials, including bitumen and oil spills, shall be ensured to prevent contamination of soil and water.
- vi. **Compliance & Monitoring:** The contractor shall maintain records of environmental protection measures undertaken and make them available for inspection by the Client/Authority Engineer.
- vii. Non-compliance may result in penalties as per contract provisions.

**9.14.3** The Contractor shall ensure that adequate signage, barriers, and flagmen are deployed to ensure road user safety during work.

### 9.15 Traffic Management and Public Communication

**9.15.1** The Contractor shall submit a detailed traffic management plan as part of the methodology, outlining road closure procedures, detour routes, signages, and safety measures for public protection.

**9.15.2** Any changes to traffic management must be promptly communicated to the Client and local authorities.

**9.15.3** Public notices regarding roadwork schedules, diversions, and alternate routes must be issued by the Contractor to ensure minimum inconvenience to the public.

### 9.16 Inspection and Supervision

**9.16.1** The Contractor shall ensure that qualified supervisory staff are on-site at all times to oversee daily operations, ensuring work quality, safety, and adherence to the methodology.

**9.16.2** The Client or its authorized representative reserves the right to inspect the work at any stage. Any defects or deviations identified shall be corrected by the Contractor at their expense.

### 9.17 Non-Conformance and Corrective Action

**9.17.1** In case of non-conformance to the approved methodology or technical specifications, the Contractor must take immediate corrective actions and notify the Client of the remedial measures.

**9.17.2** Failure to correct defects within the specified timeframe will result in penalties, suspension of work, or other contractual remedies as outlined in the contract.

### 9.18 Reporting and Documentation

**9.18.1** The Contractor shall submit daily and weekly progress reports, highlighting completed activities, quality checks, resource utilization, and any issues encountered during work.

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**9.18.2** The Contractor must maintain all records related to material procurement, testing, inspections, and any approvals from authorities for the duration of the project.

### 9.19 Completion and Handover

**9.19.1** Upon completion of the maintenance work, the Contractor shall ensure that the site is fully cleaned, all temporary structures are removed, and the road is safely reopened for traffic.

**9.19.2** The Contractor shall submit a completion report, including details of all maintenance work carried out, materials used, quality checks performed, and any outstanding issues to the Client for final approval.

## 10. Materials and Equipment

### 10.1 General Requirements

**10.1.1** The Contractor shall supply all materials and equipment required for the execution of new construction, periodic maintenance, and routine maintenance of roadworks and electrification systems. This includes materials necessary for construction, rehabilitation, resurfacing, installation, repair, and maintenance activities, as well as the tools and machinery needed to perform these activities.

**10.1.2** All materials and equipment must conform to the specifications outlined in MoRTH, IRC, relevant IS codes, and the approved Quality Assurance and Quality Control Plan (QA/QC Plan) as per **Clause 8**.

### 10.2 Materials

**10.2.1** All materials required for new construction, periodic maintenance, and routine maintenance of roadworks and electrification systems must be sourced from approved suppliers and meet the prescribed standards. The materials shall conform to MoRTH, IRC, relevant IS codes, and the approved Quality Assurance and Quality Control Plan (QA/QC Plan).

#### 10.2.1.1 Materials include, but are not limited to:

- i. **Roadworks (New Construction & Maintenance):** Bitumen, aggregates, cement, reinforcement steel, geotextiles, concrete admixtures, paint, road signs, reflective materials, thermoplastic road markings, joint sealants, drainage pipes, and ancillary construction materials.
- ii. **Electrification Works:** Poles, transformers, cables, streetlight fixtures, junction boxes, electrical wires, electrical control panels, earthing systems, and accessories.

**10.2.2** The Contractor shall submit **samples, manufacturer test certificates, and third-party laboratory test reports** for all materials before use to ensure compliance with project specifications. If any material fails to meet the prescribed standards, it shall be **immediately**

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rejected, and the Contractor shall replace it with a conforming alternative **at their own expense and without affecting project timelines.**

### 10.3 Equipment for Execution and Maintenance

#### 10.3.1 General Requirements

The Contractor shall deploy suitable, **calibrated, and well-maintained** equipment for **new construction, periodic maintenance, and routine maintenance** of roadworks and electrification systems. Equipment shall conform to the **MoRTH, IRC, relevant IS codes, and the approved QA/QC Plan.**

**Equipment shall include but is not limited to:**

- i. **Roadworks (New Construction & Maintenance):** Graders, pavers, rollers, excavators, milling machines, asphalt plants, bitumen sprayers, chip spreaders, road cutters, hot mix transporters, crack sealing machines, and surface dressing equipment.
- ii. **Electrification Works:** Cranes, hoists, lifting machines, cable pullers, welding machines, pole erection rigs, auger drilling machines, fault detection equipment, and transformer testing kits for streetlight and electrical system installation and maintenance.

#### 10.3.2 Equipment Submission and Maintenance

The Contractor shall submit a **comprehensive list** of all equipment required for the project, including **calibration records and maintenance logs**, ensuring that all equipment is properly maintained and in **good working condition.**

**Equipment must be:**

- i. **Adequate for efficient and safe execution** of all tasks.
- ii. **Regularly serviced and calibrated** to ensure compliance with project requirements.
- iii. **GPS-enabled for tracking** (if applicable) to monitor utilization and ensure operational efficiency.
- iv. **Immediately replaced in case of malfunction**, to avoid project delays.

#### 10.3.3 Equipment Fitness and Preventive Maintenance

**All deployed equipment shall be:**

- i. **Fit for the intended purpose** and capable of performing the assigned tasks.
- ii. **Regularly inspected, tested, and serviced** to minimize breakdowns and downtime.
- iii. **Maintained proactively** as per manufacturer guidelines to avoid unexpected failures.
- iv. **Kept operational and available at all times** to meet project demands efficiently.

### 10.4 Quality Assurance and Testing of Materials

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**10.4.1** The Contractor shall ensure that all materials used in roadworks construction, maintenance and electrification comply with the approved **Quality Assurance and Quality Control (QA/QC) Plan**. The Contractor shall submit **source approvals, manufacturer test certificates (MTC), and on-site test reports** for all materials prior to their use. The quality control and testing of materials shall be conducted in accordance with the applicable provisions of **MORTH, IRC, IS codes, and project-specific technical specifications**. Where required, testing shall be carried out by independent **NABL-accredited** laboratories.

**10.4.2** Any material that fails to meet the specified requirements shall be deemed **non-compliant** and shall be immediately removed from the site at the Contractor's cost. The Contractor shall replace such material with compliant material from an **approved source**, ensuring that no additional cost is incurred by the Client.

**10.4.3** The Contractor shall maintain comprehensive records of all **test results, approvals, and compliance certificates** and shall submit these to the Client upon request. The Client reserves the right to inspect and verify the materials at any stage of procurement, delivery, or installation.

### 10.5 Storage and Handling of Materials and Equipment

**10.5.1** The Contractor shall ensure that all materials and equipment are **stored, handled, and protected** in a manner that prevents **damage, deterioration, contamination, or theft**. Storage facilities shall be designed to maintain materials in their original condition and comply with relevant **safety, environmental, and manufacturer's guidelines**.

**10.5.2** Materials shall be stored in designated areas, with specific provisions as follows:

i. **Roadworks Materials:**

a. **Bitumen and Cement** shall be stored in **covered, dry, and well-ventilated spaces** to prevent contamination and deterioration.

b. **Aggregates** may be stored in **open spaces**, duly protected from contamination and excessive moisture.

ii. **Electrical Components** (e.g., transformers, cables, control panels) shall be stored in **weather-protected, moisture-free environments**, ensuring compliance with the manufacturer's storage guidelines.

**10.5.3** The Contractor shall implement appropriate **handling procedures** to prevent damage during **loading, unloading, and transportation**. All equipment shall be stored and maintained in accordance with the **manufacturer's recommendations** to ensure its proper functionality and longevity.

**10.5.4** The Client reserves the right to **inspect storage and handling procedures** at any time and may direct corrective measures if deficiencies are identified. Any material or equipment found damaged, defective, or improperly stored shall be **immediately replaced or rectified** at the Contractor's cost.

### 10.6 Non-Conformance of Materials and Equipment

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**10.6.1** Any materials or equipment that fail to comply with the approved specifications, quality standards, or contractual requirements shall be deemed non-conforming and shall not be used in the project.

**10.6.2** Upon identification of non-conforming materials or equipment, whether through inspection, testing, or performance evaluation, the Contractor shall:

- i. Immediately remove the defective materials or equipment from the site.
- ii. Rectify or replace the non-conforming items at their own cost, without affecting the project timeline.
- iii. Ensure that all replacements strictly adhere to the approved specifications and quality control requirements.

**10.6.3** If the Contractor fails to remove or replace the defective materials or equipment within the stipulated timeframe, the Client shall have the right to procure conforming replacements at the Contractor's risk and expense, and any associated costs shall be recovered from the Contractor.

**10.6.4** The Client reserves the right to reject any material or equipment at any stage if it is found non-compliant, even after initial approval or installation. The Contractor shall be solely responsible for any delays, damages, or costs arising due to the use of non-conforming materials or equipment.

### **10.7 Client's Rights to Inspect and Test**

**10.7.1** The Client reserves the right to inspect and test all materials, equipment, and systems (roadworks, electrification) at any stage. If any non-compliance or deficiencies are identified, the Client may require corrective actions, including replacement or repair of materials or equipment at the Contractor's expense.

### **10.8 Documentation and Reporting**

**10.8.1** The Contractor must maintain accurate and up-to-date records of all materials supplied, equipment deployed, and testing conducted. This includes certifications, inspection reports, maintenance logs, calibration records, and material test results. The Contractor shall submit regular progress reports to the Client, detailing the status of material procurement, equipment deployment, and any issues related to materials or equipment.

## **11. Health, Safety, and Environmental Requirements**

### **11.1 Compliance**

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The Contractor shall comply with all applicable health, safety, and environmental laws, regulations, and standards, including but not limited to those outlined by local authorities, MoRTH, and IRC. The Contractor is responsible for ensuring the safety of all personnel and for maintaining a safe working environment at all times, including the provision of necessary safety equipment, training, and emergency preparedness measures. All works shall be carried out in accordance with the Health, Safety, and Environmental (HSE) guidelines as detailed in the **Health, Safety, and Environmental Requirements document**. The Contractor shall also ensure compliance with environmental protection measures, including the management of waste, pollution control, and resource conservation.

For detailed HSE protocols, please refer to the **Health, Safety, and Environmental document**.

## 12. Insurance and Liability

### 12.1 Contractor's Insurance Requirements

The Contractor shall maintain, at their own expense, the following insurances throughout the term of the Contract and ensure that they are in full force and effect at all times during the execution of the work:

### 12.2 Workmen's Compensation Insurance

The Contractor shall procure and maintain adequate Workmen's Compensation Insurance to cover all liabilities arising under statutory provisions and at common law for injuries to or death of persons employed under the Contract. Proof of insurance shall be submitted to the Client prior to the commencement of the work.

### 12.3 Contractor All Risk (CAR) Insurance

The Contractor shall obtain and maintain a Contractor All Risk (CAR) Insurance policy covering all risks associated with the execution of the works, including but not limited to physical damage to the works, equipment, and third-party property. This insurance shall remain valid until the issuance of the final completion certificate.

### 12.4 Other Insurances

Additional insurances, if required, such as Public Liability Insurance or Third-Party Liability Insurance, shall be explicitly specified in the **Special Conditions of Contract (SCC)**. In such cases, the Contractor shall ensure compliance as per the SCC's stipulations.

### 12.5 Proof of Insurance

Copies of all required insurance policies and proof of premium payments shall be submitted to the Client within seven days of the contract award and before the commencement of work.

### 12.6 Failure to Insure

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In case the Contractor fails to procure or maintain the required insurance policies, the Client reserves the right to procure such insurances and deduct the cost from payments due to the Contractor, along with applicable penalties.

### 12.7 Indemnity

The Contractor agrees to indemnify and hold harmless the Client against any claims, damages, losses, or liabilities arising from the Contractor's negligence, omissions, or failure to comply with the terms of this contract. This includes claims related to third-party injuries, property damage, or environmental damage due to the Contractor's actions or lack of adequate precautions.

### 12.8 Insurance Documentation and Proof

**12.8.1** The Contractor shall provide the Client with valid certificates of insurance for all required policies prior to the commencement of work. The insurance policies must be maintained for the duration of the contract and for a period of time post-completion as specified in the contract.

**12.8.2** The Client reserves the right to verify and review all insurance coverage at any time. The Contractor shall immediately notify the Client of any cancellation, non-renewal, or change in insurance coverage.

### 12.9 Additional Insurances

The Contractor is responsible for obtaining any additional insurance that may be necessary for the completion of specific works under this contract, including any unforeseen risks that may arise during road maintenance works / services.

### 12.10 Liabilities and Limitations

**12.10.1** The insurance coverage must not limit the Contractor's liabilities or responsibilities under the terms of the contract.

**12.10.2** The Contractor shall remain liable for any risks that fall outside the scope of the insurance coverage.

**12.10.3** The Client shall not be held liable for any damage or loss that is covered under the Contractor's insurance policies, nor for any failure by the Contractor to secure adequate insurance coverage.

### 12.11 Specific Insurance for Road Maintenance Works

In addition to the general types of insurance listed above, **road maintenance works** have additional specific risks, particularly related to safety, traffic management, and environmental impacts. Therefore, the following should be included to cover roadworks effectively:

**12.11.1 Traffic Management Insurance:** To cover incidents or accidents occurring due to changes or disruptions in traffic patterns caused by road maintenance work.

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- 12.11.2 Roadwork Hazards Insurance:** Coverage for accidents occurring due to the nature of roadwork, including risks to workers and the public from construction equipment, excavations, or surface treatments.
- 12.11.3 Hazardous Material Handling Insurance:** Specifically for projects involving the disposal of hazardous materials such as asphalt, chemicals, or other waste generated during roadworks.

## 13. Labor Laws and Statutory Compliance

### 13.1 General Compliance

The Contractor shall comply with all applicable labour laws, regulations, and statutory requirements as per the laws of the land, including but not limited to:

- i. The **Contract Labor (Regulation and Abolition) Act, 1970** and its amendments.
- ii. The **Employees' Provident Funds and Miscellaneous Provisions Act, 1952**.
- iii. The **Employees' State Insurance Act, 1948**.
- iv. The **Minimum Wages Act, 1948**.
- v. The **Payment of Wages Act, 1936**.
- vi. The **Workmen's Compensation Act, 1923** or its amended equivalents.
- vii. The **Factories Act, 1948** (where applicable).
- viii. Any other applicable state or central labor legislation.

### 13.2 Wage Payment and Benefits

The Contractor shall ensure that all workers employed under the contract are paid wages not less than the prescribed minimum wages and are provided with benefits such as Provident Fund, Employee State Insurance, gratuity, and other statutory benefits as mandated by applicable laws.

### 13.3 Labor Licenses and Registrations

The Contractor shall obtain and maintain valid labor licenses, registrations, and permits required under applicable labor laws and provide copies to the Client upon request.

### 13.4 Health, Safety, and Welfare

The Contractor shall ensure the welfare of workers by providing adequate safety measures, sanitary facilities, clean drinking water, first aid, and hygienic working conditions in compliance with statutory requirements. The Contractor shall comply with the provisions of the **Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996** and the rules framed thereunder, including any welfare cess.

### 13.5 Prohibition of Child and Forced Labor

The Contractor shall not employ any person below the age of 18 years and ensure that no forced or bonded labour is engaged. The Contractor shall strictly comply with the provisions of the **Child Labor (Prohibition and Regulation) Act, 1986**.

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### 13.6 Compliance Monitoring and Reporting

The Contractor shall maintain accurate records of all labour engaged on the project, including wages paid, hours worked, and statutory benefits provided. The Contractor shall furnish periodic reports as requested by the Client to demonstrate compliance with labor laws and statutory requirements.

### 13.7 Labor Disputes and Resolution

The Contractor shall be solely responsible for resolving any disputes arising with workers or unions and shall ensure that such disputes do not disrupt project activities or create liabilities for the Client.

### 13.8 Indemnification

The Contractor shall indemnify and hold harmless the Client from and against any liabilities, penalties, claims, or proceedings arising out of any breach of labour laws or statutory requirements by the Contractor or their subcontractors.

### 13.9 Penalty for Non-Compliance

In case of non-compliance with labor laws or statutory requirements, the Client reserves the right to impose penalties, deduct amounts from payments due to the Contractor, or terminate the contract without prejudice to other rights and remedies.

### 13.10 Specific to Road Maintenance

Given the nature of road maintenance work, the Contractor shall:

- i. Provide safety gear such as high-visibility jackets, helmets, gloves, and safety boots to all workers.
- ii. Ensure adequate training for workers handling machinery, hazardous materials, or working in traffic zones.
- iii. Comply with traffic management protocols to ensure worker and public safety during maintenance activities.

## 14. Payment Terms and Conditions

### 14.1 General

The Contractor shall be entitled to receive payments for the works executed, subject to certification by the Client or the Engineer-in-Charge. ***The payment structure, whether percentage-based, lump-sum, or BoQ-based item rate, shall be as per the type of contract and detailed in the Contract Data Sheet.*** This clause provides an indicative framework for various payment scenarios.

### 14.2 Payment on Percentage Basis

In case the contract stipulates percentage-based payments, the Contractor shall receive payments in predefined stages linked to the completion of specific milestones, as outlined in the **Contract Data Sheet**. Each stage payment shall be proportional to the overall contract value and subject to certification of the milestone achievement.

### 14.3 Lump-Sum Payment

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In case of lump-sum contracts, payments shall be made as per the agreed milestones or deliverables, as detailed in the **Contract Data Sheet**. Each payment shall be subject to satisfactory progress and certification by the Client. Any variations in scope shall be addressed through additional work orders or amendments, as applicable.

#### 14.4 BoQ-Based Item Rate Payment

In case the contract follows a Bill of Quantities (BoQ) item rate basis, the Contractor shall be paid based on actual quantities executed and certified at the agreed unit rates as per the BoQ. Measurements for executed works shall conform to the applicable IS and MoRTH standards.

#### 14.5 Retention Money

A retention amount, typically a percentage of each payment, shall be deducted and retained as security until successful completion of the works, including defect liability and final acceptance by the Client. The retention money shall be released along with the final bill upon satisfactory completion of all contractual obligations, including rectification of any defects during the defect liability period.

#### 14.6 Advance Payments

Any advance payments, if applicable, shall be detailed in the SCC and subject to recovery through subsequent payments as per agreed terms.

#### 14.7 Payment Certification and Conditions

Payments shall be subject to:

- i. Submission of detailed invoices along with supporting documents.
- ii. Certification by the Client or the Engineer-in-Charge for works completed.
- iii. Compliance with contractual obligations, including quality, safety, and statutory requirements.

#### 14.8 Taxes and Deductions

All payments shall be subject to statutory deductions such as TDS, GST, or any other applicable taxes as per prevailing laws.

#### 14.9 Final Bill Settlement

The final bill, including the release of retention money, shall be settled after:

- i. Submission of all as-built drawings, test reports, and warranties.
- ii. Clearance of all dues related to subcontractors, suppliers, and workers.
- iii. Certification by the Client of successful completion of works, including the defect liability period.

#### 14.10 Interim Payment Method and Requirements

Interim payments shall be processed periodically, as specified in the contract, to ensure timely reimbursement for the work executed. The Contractor shall submit interim invoices along with the required documentation, including measurement sheets, progress reports, and certifications of work completed. Each interim payment shall be subject to verification and certification by the Engineer-in-Charge, ensuring compliance with the contract specifications, quality standards, and milestones

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achieved. Retention money, as applicable, shall be deducted from each interim payment, and all statutory deductions, such as taxes, shall be applied as per prevailing laws. It is expressly clarified that all interim payments are provisional and shall not be considered final. These payments are subject to final reconciliation, adjustments, or modifications, as required, in the final bill to reflect the actual work performed, material consumed, and compliance with all contract obligations.

### 14.11 Submission of Documentation Along with Invoice

#### 14.11.1 For Interim Payments

To process interim bills, the Contractor must submit the following:

##### A. Work-Related Documentation:

- a) **Measurement Sheets** signed by the Contractor's representative and verified by the Client's representative.
- b) **Inspection Reports** confirming adherence to Quality Assurance and Quality Control Plans (as per **Clause 8**).
- c) **Test Reports and Material Certificates** for all materials utilized during the invoiced period.
- d) **Progress Photographs** showcasing completed works corresponding to the invoice.
- e) **Approved Work Orders and Variations**, if applicable.

##### B. Statutory Compliance Documentation:

- a) **Wage Registers** and attendance records for labor deployed during the period.
- b) **PF and ESI Deposit Receipts** for the period covered by the invoice.
- c) **Labor Licenses** applicable to the workforce engaged in the project.
- d) **Insurance Compliance Certificates** as per contractual requirements.

#### 14.11.2 For Final Bill

In addition to the above, the following must be submitted:

##### A. Work-Related Documentation:

- a) **Final Reconciliation Statement** of materials, quantities, and payments.
- b) **Equipment Utilization Records** for all deployed equipment throughout the project.
- c) **Variation and Extra Work Documentation** including Client-approved change orders.

##### B. Statutory Compliance Documentation:

- a) **Acknowledgment of No Claims** from the Contractor, confirming no outstanding claims.
- b) **Safety Compliance Records** including training records and reports of any incidents.
- c) **Environmental Compliance Reports**, if applicable.
- d) **Retention and Deduction Summary** for retained amounts, advances, and penalties, if any.

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Failure to submit the required documents may delay invoice processing. The Contractor is responsible for the timely submission of accurate and complete documentation.

## 15. Performance Standards and Penalties

### 15.1 Performance Standards

The Contractor shall ensure that all works and services under this contract are executed in strict compliance with:

- i. **MORTH Specifications for Road and Bridge Works (Latest Revision).**
- ii. **Relevant IRC Standards and IS Codes.**
- iii. **Contractual obligations outlined in this Agreement.**
- iv. **Health, Safety, and Environmental (HSE) requirements (Clause 11).**

The scope of performance under this contract includes but is not limited to:

#### 15.1.1 Road Construction and Maintenance

- i. Execution of **road construction, resurfacing, periodic and routine maintenance** in compliance with approved drawings, designs, and specifications.
- ii. Timely and quality completion of **pothole repairs, crack sealing, shoulder maintenance, and pavement rehabilitation.**
- iii. Ensuring **drainage structures (culverts, stormwater drains, etc.) are functional and free of obstructions** throughout the contract period.
- iv. Maintenance of **roadside infrastructure, including crash barriers, guardrails, embankments, and signage.**

#### 15.1.2 Electrical Works

- i. **Installation, maintenance, and operation** of street lighting systems, high-mast lights, transformers, and power supply infrastructure.
- ii. Ensuring that streetlights have **minimum 98% operational uptime**, with faulty units repaired or replaced within the response time.

#### 15.1.3 Safety and Environmental Compliance

- i. Implementation of **proper traffic management, barricading, and warning signs** during work execution.
- ii. Adherence to **CPCB and SPCB environmental regulations**, including **dust suppression, waste disposal, and pollution control measures.**
- iii. Compliance with **statutory safety provisions** to prevent workplace hazards and ensure public safety.

### 15.2 Minimum Performance Requirements

The Contractor shall meet the following **minimum performance standards**, ensuring timely and quality execution of all works:

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## 15.2.1 Road Maintenance Performance Standards

Activity	Maximum Response Time
Pothole repairs	<b>24 hours</b> from identification/reporting
Crack sealing & patchwork	<b>48 hours</b> from reporting
Shoulder maintenance	<b>72 hours</b> after deterioration is reported
Drainage clearing	Before & after monsoon, periodic check every <b>3 months</b>
Road markings & signage	Maintained in reflective condition at all times

## 15.2.2 Electrical System Performance Standards

Activity	Maximum Response Time
Streetlight repair	<b>48 hours</b> from reporting
Transformer/panel fault repair	<b>72 hours</b> from reporting
Operational uptime for lighting systems	<b>Minimum 98% uptime required</b>

Non-compliance with these performance requirements shall attract penalties as per **Clause 15.4**.

## 15.3 Monitoring and Inspection

The Contractor shall conduct **regular inspections and performance evaluations** as per the approved Maintenance Plan, which shall include:

1. **Daily inspections** for routine maintenance (potholes, cracks, road markings, signage, and lighting).
2. **Weekly inspections** for structural elements, including drains, safety barriers, and electrical systems.
3. **Monthly inspections** for periodic maintenance planning, material quality checks, and service life assessments.
4. **Post-completion monitoring of rectified works**, ensuring durability as per Clause 28.4.

All inspections shall be documented as per **Clause 27 (Reporting and Documentation)**, and the Contractor shall rectify any identified deficiencies **within the stipulated response time**, failing which penalties shall apply as per Clause 15.4.

Recurring defects or repeated failures in previously rectified areas shall be closely monitored to ensure compliance with quality standards.

## 15.4 Penalties for Non-Compliance

The following penalties shall be imposed in case of failure to meet the specified performance standards:

### 15.4.1 Delay in Completion of Works

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- i. If the Contractor **fails to complete scheduled construction or maintenance work** within the agreed timeline, a penalty of **[0.5] % of the contract value per day of delay** shall be imposed, up to a maximum of **[10] % of the contract value**.

## 15.4.2 Road Maintenance Non-Compliance

Deficiency	Penalty
Failure to repair potholes within 24 hours	₹[X] per pothole per day
Cracks & patchwork not completed within 48 hours	₹[X] per defect per day
Failure to clear drainage in stipulated time	₹[X] per km per day
Non-maintenance of faded/damaged signage	₹[X] per sign per day

- i. If a defect reappears in the same location within the defect liability period, the Contractor shall extend its performance guarantee for that section as per Clause 24.
- ii. Failure to maintain the rectified section will attract additional penalties, which shall be deducted from the performance security or monthly invoices.

## 15.4.3 Electrical System Failures

Deficiency	Penalty
Non-functional streetlights beyond 48 hours	₹[X] per pole per day
Transformer/panel failures beyond 72 hours	₹[X] per unit per day
Failure to maintain 98% uptime for lighting systems	₹[X] per month as a lump sum deduction

## 15.4.4 Safety Violations

Violation	Penalty
Failure to implement safety measures (barricades, traffic diversion, warning signs, etc.)	₹[X] per location per day
Any incident causing injury/property damage due to safety non-compliance	As per EHS Policy
Repeated safety violations	Escalated penalties + possible work suspension

Penalties shall be **deducted from the Contractor's monthly invoice or performance security**.

## 15.5 Grace Period for Rectification

- i. The Client **may allow a grace period of [7] days** for rectification of **minor defects**, provided they do not impact public safety or overall project timelines.
- ii. No penalty shall be imposed during this period, but the **Contractor shall bear all rectification costs**.

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### 15.6 Cumulative Penalties and Termination

- i. If the cumulative penalties imposed on the Contractor exceed **[5] % of the total contract value**, the Client reserves the right to **terminate the contract under Clause 20 (Termination for Default)**.
- ii. The Client shall have the right to **recover additional costs and damages** for non-performance.

### 15.7 Documentation of Penalties and Appeals

All penalties shall be **formally documented and notified** to the Contractor. The penalty notice shall include:

- i. **Details of the non-compliance.**
- ii. **Applicable performance standard and response time.**
- iii. **Penalty amount and reference clause.**

The Contractor shall have the right to **appeal within [15] days** of receiving the penalty notice, submitting **supporting evidence for reconsideration**. The Client shall review the appeal and decide on **waiving, reducing, or upholding** the penalty. The Client's decision shall be **final and binding** unless an alternate dispute resolution mechanism is specified in the contract.

## 16. Amendments and Variations

### 16.1 Change Management Framework

All Amendments and Variations under this Agreement shall be governed by a structured Change Management framework to ensure transparency, accountability, and compliance with the contractual terms. The framework shall serve as the guiding principle for initiating, processing, and implementing Amendments and Variations. The Change Management process involves:

- a) **Identification of Change:** Both parties shall identify any changes required in the scope, cost, or timelines of the contract.
- b) **Evaluation and Assessment:** Changes shall be evaluated for their technical, financial, and schedule impacts in accordance with the processes outlined in this clause.
- c) **Approval and Implementation:** Changes shall only be implemented upon written approval by the Client, following the procedures detailed in **Clause 16.3**.
- d) **Documentation:** All changes, including approved Variations and Amendments, shall be formally documented and included in the contractual records.

This Change Management Framework establishes the overarching principles under which all Amendments and Variations shall be handled as specified in this clause.

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### 16.2 Definition of Amendments and Variations

For the purpose of this Agreement, the term "Amendment" refers to any change to the terms, conditions, scope, or requirements of this contract that is agreed upon by both parties, whereas "Variation" refers to any alteration, addition, or omission in the work or services required under this contract, as directed by the Client in writing during the performance of the contract.

### 16.3 Initiation of Variations

Variations may be initiated under the following circumstances:

#### 16.3.1 Client-Initiated Variations

The Client may, at any time, request the Contractor to carry out variations to the work through a formal written instruction. These may include, but are not limited to, changes in the scope of work, design modifications, or adjustments to specifications or schedule.

#### 16.3.2 Contractor-Initiated Variations

The Contractor may propose a variation in case of unforeseen circumstances, including technical difficulties, material unavailability, or changes in statutory regulations that require adjustments to the original scope of work. Such proposals must be submitted in writing and subject to the Client's approval.

#### 16.3.3 Force Majeure

In cases where events beyond the control of either party (such as natural disasters, governmental actions, etc.) affect the performance of the contract, a variation may be necessary to accommodate the resulting changes in work or schedule.

### 16.4 Process for Issuing a Variation or Amendment

#### 16.4.1 Written Request

- i. Any proposed variation or amendment must be communicated through a formal written request by the initiating party (Client or Contractor). The request shall include:
  - a. A detailed description of the proposed change.
  - b. Justification for the variation (e.g., technical necessity, statutory compliance, unforeseen circumstances).
  - c. The expected impact on cost, schedule, and scope.

#### 16.4.2 Impact Assessment:

Upon receipt of a variation request:

- i. **If initiated by the Client**, the Contractor shall submit a detailed **Impact Assessment Report** within **[7] days**. This report shall include:

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- a. A **detailed description** of the variation.
  - b. The **impact on the scope of work**, materials, and design.
  - c. A **comprehensive cost estimate**, including:
    - **Breakdown of costs** (labor, materials, and equipment).
    - **Rate analysis** for any new items.
    - **Comparison with the original scope**—if the revised work is cheaper, the Contractor shall indicate the applicable discount.
  - d. **Impact on the project schedule**, including adjustments to milestones.
  - e. Any **other relevant contractual or technical considerations** affecting execution.
- ii. **If initiated by the Contractor**, the request shall include:
- a. **Justification for the variation**, such as technical feasibility, material unavailability, regulatory changes, or unforeseen site conditions.
  - b. **Proposed scope of change**, including any design modifications.
  - c. **Rate analysis and cost impact**, broken down into labor, material, and equipment costs.
  - d. **Impact on the project schedule**, including any required extension of time.
  - e. **Any supporting technical documentation**, such as drawings, calculations, or statutory approvals, if applicable.

The Client shall review the request and seek clarifications within **[15] days**, if necessary. The Contractor shall then submit the **complete impact assessment** within **[15] days** from the Client's request for additional details.

**The Contractor shall not proceed with the variation until formal written approval is granted by the Client.**

### 16.4.3 Approval of Variation:

- i. The **Client** shall review the assessment and either approve, reject, or request modifications within **[30] days**.
- ii. If the variation is **Contractor-initiated**, the Client may either approve or suggest modifications, considering the project's feasibility and budget constraints.
- iii. **No work related to the variation shall commence unless a formal Variation Order (VO) is issued.**

### 16.4.4 Variation Order (VO):

Upon Client approval, the Variation Order shall be issued, specifying:

- a) The scope and nature of the variation.
- b) The agreed-upon adjustments to cost and schedule.
- c) Any necessary changes to other contract terms or conditions.

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The VO shall form an integral part of the contract, and the Contractor shall proceed with the work as per the revised terms.

### 16.4.5 Finalization and Agreement:

Once the Variation Order is issued, both parties shall agree to the revised terms in writing, and the work shall proceed in accordance with the approved changes. Any financial or schedule adjustments will be incorporated into subsequent payments as per the agreed-upon terms in the Variation Order.

### 16.5 Cost and Payment for Variations

All variations shall be priced as follows:

#### 16.5.1 Unit Rates or Lump Sum:

Variations shall be priced based on the existing unit rates or lump-sum rates in the contract. If unit rates are not applicable, the Contractor shall submit a detailed breakdown of costs for labor, materials, and equipment, which shall be subject to Client approval.

#### 16.5.2 Cost Adjustment:

In cases where the original contract price cannot be used as a basis for the variation, the parties shall mutually agree on the appropriate cost adjustment. The Client reserves the right to request supporting documentation for any cost increase.

#### 16.5.3 Retention of Rights:

The approval of a variation does not waive the Client's right to deduct penalties or enforce any contractual obligations related to the original scope of work. Any additional costs due to variations shall be subject to the retention of any agreed retention amounts.

### 16.6 Time Implications of Variations

#### 16.6.1 Extension of Time (EoT):

If a variation impacts the project timeline, the Contractor shall request an extension of time in accordance with the provisions of **Clause 21 (Extension of Time)**. The Client shall consider the justification for the extension based on the impact of the variation.

#### 16.6.2 Delays Due to Variations:

Any delay in approval or execution of variations caused by either party shall not be considered as an excusable delay for the purpose of an extension of time unless the delay is due to reasons beyond control, such as force majeure.

### 16.7 Variation Documentation and Records

Both parties shall maintain detailed records of all variations, including:

- i. Copies of all Variation Orders (VOs).

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- ii. Documentation of cost and time adjustments.
- iii. Correspondence and agreements related to the variation.

The Contractor shall provide a detailed update of the variations in every progress report and billing cycle, ensuring transparency and adherence to the amended scope and timelines.

### 16.8 Dispute Resolution for Variations

In case of any dispute regarding the scope, cost, or impact of a variation, the matter shall be resolved in accordance with the dispute resolution mechanism set forth in **Clause 18 (Dispute Resolution)**. Pending resolution, the Contractor shall continue to perform the work in accordance with the Variation Order.

## 17. Governing Law and Jurisdiction

This Agreement shall be governed by, and construed in accordance with, the laws of India. The parties hereby agree that any disputes, claims, or controversies arising out of or in connection with this Agreement, including its validity, interpretation, enforcement, or performance, shall be subject to the exclusive jurisdiction of the courts in New Delhi, India.

The parties' consent to the jurisdiction of the courts of New Delhi and waive any objections based on venue or forum non convenience. All legal proceedings under this Agreement shall be conducted in the English language.

## 18. Dispute Resolution

### 18.1 Dispute Notification and Procedure

The Contractor shall notify the Client in writing within 7 days of the occurrence of any dispute, difference, or claim that requires resolution. The notice should clearly detail the nature of the dispute, relevant facts, and the legal or factual basis for the claim. Upon receipt of the dispute notice, the Client and Contractor shall engage in discussions for a period not exceeding 30 days to attempt an amicable settlement.

### 18.2 Amicable Settlement

In the event of any dispute, difference, or claim arising between the Client and the Contractor in connection with or related to the Contract, the parties shall first attempt to resolve such dispute amicably through mutual consultation and negotiation. The party initiating the dispute (the "Notifying Party") shall notify the other party in writing, clearly outlining the nature and scope of the dispute. Both parties shall make all reasonable efforts to settle the dispute, amicably, within 30 days from the date of notification.

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If the dispute remains unresolved after this period, the decision of the Client's CEO shall be final and binding on both parties. Should the decision of the Client's CEO not be acceptable, and the dispute persists, the matter shall proceed to the Dispute Resolution process as outlined below.

### 18.3 Dispute Resolution Board (DRB)

If the dispute remains unresolved after the amicable settlement period, the dispute shall be referred to a Dispute Resolution Board (DRB).

- a) The DRB will be constituted solely from the senior management team of the Client at its Head Office (HO). No external person or third party will be involved in this process.
- b) The DRB shall be tasked with reviewing the dispute and providing a recommendation or resolution within 45 days from the date the dispute is referred to it. The decision of the DRB shall be binding on both parties unless challenged under the Arbitration clause below.
- c) In the event the DRB fails to resolve the dispute within the prescribed time, or if either party is dissatisfied with the DRB's decision, the dispute will proceed to arbitration.

### 18.4 Arbitration

If the dispute remains unresolved after mediation, the dispute shall be referred to and resolved through arbitration in accordance with the provisions of the Arbitration and Conciliation Act, 1996, as amended from time to time.

- a) **In cases where the disputed amount is up to INR 1.5 Crore**, the arbitration shall be conducted by a sole arbitrator appointed by the Client.
- b) **In cases where the disputed amount exceeds INR 1.5 Crore**, three arbitrators shall be appointed. One arbitrator shall be appointed by the Client, one by the Contractor, and the third arbitrator shall be appointed by the two previously appointed arbitrators. In case the two arbitrators fail to agree on the appointment of the third arbitrator, the third arbitrator shall be appointed by the relevant arbitration institution in New Delhi.
- c) The arbitration proceedings shall be held in New Delhi, India, and the language of arbitration shall be English. The arbitrator's decision shall be final and binding on both parties. The cost of arbitration, including the arbitrator's fees, shall be borne equally by the parties unless otherwise awarded by the arbitrator.

### 18.5 Jurisdiction and Venue

The courts at Delhi, India, shall have exclusive jurisdiction over all disputes and legal proceedings arising from or relating to the Contract. Both parties expressly consent to the jurisdiction of the courts at Delhi for the purpose of enforcement of any judgment or award.

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### 18.6 Interim Relief

Notwithstanding the above, either party may seek interim relief from a court of competent jurisdiction at any time before or during the dispute resolution process, in order to preserve its rights or prevent any irreparable damage or harm.

### 18.7 No Suspension of Work

The Contractor shall continue with the performance of its obligations under the Contract, including the Works, during the dispute resolution process unless the Client has issued a formal suspension order. Non-payment of money or non-performance of obligations by the Client shall not relieve the Contractor of its responsibilities to continue the work.

## 19. Force Majeure

### 19.1 Definition

Force Majeure shall mean any extraordinary event or circumstance beyond the reasonable control of the affected party that prevents or delays the performance of its contractual obligations. These events may include, but are not limited to, acts of God, natural disasters (such as floods, earthquakes, or storms), acts of war, terrorism, riots, civil commotion, government orders, pandemics, or any other unforeseen event that cannot be mitigated through reasonable diligence.

#### Notification

The party affected by a Force Majeure event shall notify the other party in writing within seven (7) days of the occurrence of such an event, providing reasonable details of its nature, likely duration, and impact on performance. Failure to notify within this period may result in the loss of the right to claim Force Majeure relief.

### 19.2 Consequences of Force Majeure

- a) The obligations of the affected party shall be suspended for the duration of the Force Majeure event, to the extent that they are directly impacted by it.
- b) Both parties shall use all reasonable efforts to mitigate the effect of the Force Majeure event and resume performance of their obligations as soon as practicable.
- c) If the Force Majeure event continues for a period exceeding ninety (90) days, either party may terminate the contract upon written notice to the other party.

### 19.3 Exclusions

Force Majeure shall not include:

- a) Any event caused by the negligence or intentional act of the affected party.
- b) Economic hardship, changes in market conditions, or lack of funds.

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### 19.4 Extension of Time

If the Contractor's performance is delayed due to a Force Majeure event, the Contractor shall be entitled to an extension of time equivalent to the period of delay, subject to approval by the Client.

### 19.5 Payments During Force Majeure

The Contractor shall not be entitled to claim compensation or additional payments due to Force Majeure events unless explicitly agreed upon in the contract or otherwise required under applicable law.

### 19.6 Final Determination

Any disputes regarding the application of this clause shall be resolved in accordance with **Clause 18** (Dispute Resolution).

## 20. Termination of Contract

### 20.1 Termination by the Client

The Client may terminate the Contract, in whole or in part, with immediate effect or after a specified notice period, in the following circumstances:

**20.1.1 Non-Performance:** If the Contractor fails to meet contractual obligations, including delays or substandard performance, after receiving a written notice to cure the breach within a period specified in the Contract.

**20.1.2 Breach of Terms:** In case of material violation of any terms or conditions of the Contract, including but not limited to safety standards, statutory compliance, or quality assurance requirements.

**20.1.3 Insolvency:** If the Contractor becomes insolvent, enters into bankruptcy proceedings, or undergoes dissolution, liquidation, or similar financial distress events.

**20.1.4 Force Majeure:** If Force Majeure conditions continue for more than ninety (90) days, making further performance impracticable.

**20.1.5 Convenience of the Client:** The Client reserves the right to terminate the Contract for convenience, provided reasonable compensation for work performed up to the date of termination is made.

### 20.1.6 Termination for Default:

In case of default by the Contractor, the Client reserves the right to terminate the Contract, either in whole or in part, by giving written notice. Default includes the following:

- a) **Non-Performance:** Failure to meet key contractual obligations, including delays in execution or substandard work, despite receiving a notice to cure within a period specified in the Contract.

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- b) **Breach of Terms:** Failure to comply with any material provisions of the Contract, including statutory, safety, or quality assurance requirements.
- c) **Insolvency or Financial Distress:** If the Contractor enters into insolvency, bankruptcy, liquidation, or similar financial distress, or any situation that materially impacts its ability to fulfil its obligations under this Contract.

### Upon such termination, the following shall apply:

- a) **Notice to Cure:** A written notice shall be issued to the Contractor, specifying the nature of the default. The Contractor will be granted a cure period of 15 days (or as specified in the Special Conditions of Contract) to remedy the default. Failure to rectify the default within the cure period will lead to immediate termination.
- b) **Penalties and Compensation:** The Client may impose penalties of up to **5% of the Contract value** for non-performance or failure to meet standards. The Contractor shall be liable to compensate the Client for any costs incurred due to the default, including but not limited to the cost of procuring alternate contractors to complete the work.
- c) **Withholding of Payments:** The Client has the right to withhold payments corresponding to incomplete, defective, or unsatisfactory work performed prior to termination.

Termination under this clause is without prejudice to any other legal or contractual rights available to the Client, including claims for damages and performance guarantees.

## 20.2 Termination by the Contractor

The Contractor may terminate the Contract by providing a written notice, subject to fulfilling its obligations until the termination date, in the following circumstances:

- 20.2.1 Non-Payment:** If the Client fails to pay undisputed invoices for a period exceeding One Hundred & Eighty (180) days after they become due, despite receiving written notice.
- 20.2.2 Client Hindrance:** If the Client repeatedly obstructs the Contractor's performance by failing to provide access, approvals, or other essential resources as specified in the Contract.
- 20.2.3 Force Majeure:** If Force Majeure conditions persist beyond Ninety (90) days, rendering performance impossible.

## 20.3 Procedure for Termination

- 20.3.1 Notice of Intent:** A party initiating termination shall issue a formal written notice detailing the grounds for termination and the intended termination date, allowing a minimum of thirty (30) days for remedial action unless otherwise specified.
- 20.3.2 Efforts to Resolve:** The parties shall engage in good-faith discussions during the notice period to address and resolve the stated issues.
- 20.3.3 Confirmation of Termination:** If the issues remain unresolved by the end of the notice period, the initiating party shall issue a final termination notice, effectively ending the Contract.

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### 20.4 Post-Termination Obligations

**20.4.1 Cease Work:** The Contractor shall cease all work immediately except for activities required to protect the works already executed or to comply with statutory obligations.

**20.4.2 Return of Assets:** All equipment, materials, designs, and other assets belonging to the Client shall be returned or securely handed over within seven (7) days of termination.

**20.4.3 Payments:** The Client shall settle payments for verified work performed up to the termination date, subject to deductions for any damages, penalties, or liabilities.

### 20.5 Liabilities Upon Termination

**20.5.1 Contractor's Liabilities:** The Contractor shall bear the cost of demobilization, removal of equipment, and site clearance unless otherwise agreed.

**20.5.2 Client's Liabilities:** In cases of termination for convenience, the Client shall pay reasonable compensation for expenses directly attributable to the termination. Reasonable compensation is limited to:

**20.5.2.1** Costs for completed works and verified quantities based on contract rates.

**20.5.2.2** Documented and substantiated costs for materials procured specifically for the project, provided these materials are handed over to the Client.

**20.5.2.3** Actual and reasonable costs incurred for demobilization and site clearance.

**20.5.2.4** Compensation shall exclude anticipated profits on unexecuted work, costs due to the Contractor's default, and any claims not supported by documentary evidence. Total compensation shall not exceed 10% of the original contract value. Claims for compensation must be submitted within 30 days of termination with all supporting documents, subject to verification by the Client.

### 20.6 Survival of Provisions

Provisions relating to confidentiality, indemnities, dispute resolution, warranties, and other obligations explicitly stated to survive termination shall remain enforceable.

### 20.7 Dispute Arising from Termination

Any disputes related to or arising from termination shall be resolved as per **Clause 18** (Dispute Resolution).

## 21. Extension of Time

### 21.1 Request for Extension:

The Contractor shall apply for an extension of time in writing if the completion of work is delayed due to any of the following reasons, which are not attributable to the Contractor's fault:

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- a) Unforeseen Force Majeure events, including but not limited to natural calamities, war, civil disturbances, strikes, etc.
- b) Changes in the scope of work, design modifications, or delays in instructions from the Client.
- c) Delays in the availability of land or necessary permissions from local authorities.
- d) Delays in the supply of materials or equipment by the Client.
- e) Any other circumstances as agreed upon in the Special Conditions of Contract.

### 21.2 Time Extension Request Procedure:

The Contractor must submit a written request for an extension of time, detailing the reasons for the delay, its impact on the project schedule, and any supporting documentation (e.g., reports, correspondence). Such requests must be made within **seven (7) days** from the occurrence of the event causing the delay. The Client shall review the request and provide a written decision within a reasonable period.

### 21.3 Approval and Grant of Extension:

The Client may grant an extension of time if the delay is caused by factors beyond the Contractor's control. Upon approval, the Contractor's completion date shall be extended for the period equal to the delay, subject to the terms of this Clause. No extension of time shall be granted for delays caused by the Contractor's own fault, negligence, or failure to manage the work.

### 21.4 No Financial Compensation:

An extension of time granted under this clause does not entitle the Contractor to any financial compensation or additional costs unless specifically agreed upon in writing by the Client and outlined in the Special Conditions of Contract.

### 21.5 Liquidated Damages during Extension:

In case of delay beyond the extended time granted, the Contractor shall be liable to pay **Liquidated Damages as specified in Clause 30** of this Agreement. The extension of time does not absolve the Contractor of its responsibility to meet the revised completion dates and obligations under the Contract.

### 21.6 Client's Right to Terminate for Prolonged Delay:

If the delay exceeds a period of **[refer contract data sheet] months** or extends beyond a point where the completion of the work is no longer feasible, the Client reserves the right to terminate the Contract under **Clause 20.1.5** (Termination for Convenience) or **Clause 20.1.6** (Termination for Default), as applicable.

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### 22. Price Variation / Escalation

*Price escalation shall be applicable to contracts with a duration exceeding twelve (12) calendar months.*

#### 22.1 Scope of Price Variation

Price variation (Escalation / De-escalation) shall apply to the work under this Contract in the event of changes in the prices of materials, labor, fuel, and equipment during the Contract period, based on the indices and benchmarks specified below. Price variation shall be payable for the work executed within the **original contract period** and shall not apply to work performed beyond the contract period or during any extension of time unless specifically agreed upon by both parties in writing.

#### 22.2 Escalation Calculation Formula

The price variation shall be calculated based on the following formula:

$$P.V. = 0.85RW \times \Sigma ((C_n - B_n) / B_n) \times W_n)$$

Where:

**RW** = Invoice Value i.e. Value of work done & certified for the work completed

**P.V.** = Price Variation (Escalation/De-escalation) as a percentage of the total value of work executed.

**C<sub>n</sub>** = Current price of the relevant component (labor, material, fuel, or equipment) for the nth item.

**B<sub>n</sub>** = Base price (original agreed rate) of the relevant component (labor, material, fuel, or equipment) for the nth item.

**W<sub>n</sub>** = Weight of the nth item, representing the proportion of that component in the total contract value.

#### 22.3 Escalation Components and Basis

##### 22.3.1 Labor Escalation (PL)

Labor price variation shall be based on the **Minimum Wages as issued by the Central Labour Commissioner (CLC), New Delhi**. The escalation will be determined by the percentage change in the minimum wage rates for the relevant labor categories between the base rate and the current rate at the time of execution.

The formula for labor escalation is:

$$P.V(\text{Labor}) = ((\text{Current Minimum Wage} - \text{Base Minimum Wage}) / \text{Base Minimum Wage}) \times (\text{Weight of Labor in Total Cost})$$

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### 22.3.2 Cement Escalation (PC)

Cement price variation will be calculated based on the **Wholesale Price Index (WPI) published by the Reserve Bank of India (RBI) for Ordinary Portland Cement**. The Cement escalation will be determined by the percentage change in the WPI for All commodities used in the project between the base month and the month of execution.

The formula for material escalation is:

$$P.V(\text{Cement}) = ((\text{Current WPI} - \text{Base WPI}) / \text{Base WPI}) \times (\text{Weight of Cement in Total Cost})$$

### 22.3.3 Steel Escalation (PS)

Steel (steel/components (including strands and cables)) price variation will be calculated based on the **Wholesale Price Index (WPI) published by the Reserve Bank of India (RBI) for Mild Steel –Long Products**. The Steel escalation will be determined by the percentage change in the WPI for All commodities used in the project between the base month and the month of execution.

The formula for material escalation is:

$$P.V(\text{Material}) = ((\text{Current WPI} - \text{Base WPI}) / \text{Base WPI}) \times (\text{Weight of Steel in Total Cost})$$

### 22.3.4 Bitumen Escalation (PB)

Bitumen price variation will be calculated based on **the official retail price of bitumen at the nearest refinery of IOCL on the first day of the month**. The Bitumen escalation will be determined by the percentage change in the Bitumen prices as issued by IOCL used in the project between the base month and the month of execution.

The formula for material escalation is:

$$P.V(\text{Material}) = ((\text{Current Bitumen Price} - \text{Base Bitumen Price}) / \text{Base Bitumen Price}) \times (\text{Weight of Bitumen in Total Cost})$$

### 22.3.5 Material Escalation (PM)

Material price variation will be calculated based on the **Wholesale Price Index (WPI) published by the Reserve Bank of India (RBI) for All Commodities**. The material escalation will be determined by the percentage change in the WPI for All commodities used in the project between the base month and the month of execution.

The formula for material escalation is:

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$P.V(\text{Material}) = ((\text{Current WPI} - \text{Base WPI}) / \text{Base WPI}) \times (\text{Weight of Material in Total Cost})$

### 22.3.6 Fuel Escalation (PF)

Fuel price variation shall be based on the **diesel prices at the nearest petrol pump to the project site**, as published by the local authorities or oil companies. The escalation will be determined by the percentage change in the diesel price between the base price at the time of contract signing and the current price during execution.

The formula for fuel escalation is:

$P.V(\text{Fuel}) = ((\text{Current Diesel Price} - \text{Base Diesel Price}) / \text{Base Diesel Price}) \times (\text{Weight of Fuel in Total Cost})$

### 22.3.7 Equipment Escalation (PA)

Equipment price variation shall be based on the **Manufacture of Machinery and Equipment WPI** issued by the Reserve Bank of India (RBI). The escalation will be calculated based on the percentage change in the WPI for machinery and equipment between the base month and the month of execution.

The formula for equipment escalation is:

$P.V(\text{Equipment}) = ((\text{Current Equipment WPI} - \text{Base Equipment WPI}) / \text{Base Equipment WPI}) \times (\text{Weight of Equipment in Total Cost})$

### 22.4 Calculation of Price Variation

The total price variation for the contract will be the sum of the individual price variations for materials, labor, fuel, and equipment, calculated as follows:

$P.V. = [P.V(\text{Labor}) + P.V(\text{Cement}) + P.V(\text{Steel}) + P.V(\text{Bitumen}) + P.V(\text{Material}) + P.V(\text{Fuel}) + P.V(\text{Equipment})]$

Where the individual components are calculated based on the relevant indices and their corresponding weights in the contract value.

### 22.5 Invoice Value for Price Variation

Price variation shall be payable based on the value of work completed and certified during the contract period. The amount of price variation will be calculated on the total invoiced value of the work executed during the contract period (excluding any

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work completed beyond the contract period or during extensions). The formula for the invoiced amount based on price variation is:

$$\text{P.V. Amount} = (\text{P.V.} \times \text{Invoice Value} \times 0.85)$$

Where:

- P.V. = Price variation (as a percentage)
- Invoice Value = Certified value of the work completed during the contract period.

## 22.6 Exclusions for Price Variation

Price variation shall not apply to:

- a) Items for which the rates have been fixed by the Client and are not subject to escalation.
- b) Any variation arising due to changes in taxes, duties, or levies after the contract is signed.
- c) Works executed beyond the contract period, unless extended by mutual agreement.

## 22.7 Component Weightage

Weightage of each component shall be as defined in the table “Price Variation Component Breakdown” below:

**Price Variation Component Breakdown**

Component	Earthwork, Granular work, and other works	Bituminous work	Cement Concrete Pavement	Culverts, minor bridges and other structures	Major Bridges and Structures
Labour (PL)	[20%]	[20%]	[20%]	[15%]	[15%]
Cement (PC)	[5%]	Nil	[20%]	[15%]	[15%]
Steel (PS)	Nil	Nil	Nil	[15%]	[20%]
Bitumen (PB)	Nil	[15%]	Nil	Nil	Nil
Fuel and Lubricants (PF)	[10%]	[10%]	[10%]	[10%]	[10%]
Other Materials (PM)	[50%]	[40%]	[35%]	[30%]	[25%]
Plant, Machinery,	[15%]	[15%]	[15%]	[15%]	[15%]

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Component	Earthwork, Granular work, and other works	Bituminous work	Cement Concrete Pavement	Culverts, minor bridges and other structures	Major Bridges and Structures
and Spares (PA)					
<b>Total</b>	100%	100%	100%	100%	100%

### 22.8 Limitations on Price Variation

The maximum allowable price variation, for any individual item or group of items, shall not exceed **[10%]** of the original contract price. Any variation in excess of this limit shall be subject to mutual agreement between the Client and the Contractor.

### 22.9 Final Adjustment

At the completion of the work, a final adjustment of the Price Variation will be made based on the actual quantities and costs incurred during the contract period. Any discrepancies, overpayments, or underpayments will be corrected in the final settlement.

## 23. Substantial Completion and Final Acceptance

### 23.1 Substantial Completion

#### 23.1.1 Definition

Substantial Completion shall be deemed achieved when all contractual obligations related to **road construction, periodic maintenance, routine maintenance, electrical works, and electrical maintenance** have been completed to a stage where the works:

- i. Are fully **operational and fit for their intended purpose**.
- ii. **Comply with all contractual specifications**, statutory requirements, and safety standards.
- iii. Have only **minor Punch List items** remaining, which do not impair the **functionality, safety, or operability** of the works.

#### 23.1.2 Notice of Substantial Completion

The Contractor shall issue a **written Notice of Substantial Completion** to the Client, accompanied by:

- i. **Punch List** – A detailed list of minor pending works or defects.
- ii. **Compliance Certificates** – Certifying that **all civil and electrical installations** meet the required standards and regulations.

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- iii. **Test and Inspection Reports** – Demonstrating adherence to contractual and statutory requirements.

### 23.1.3 Client's Inspection and Certification

- i. The Client shall inspect the works within the timeframe specified in the **Contract Data Sheet (CDS)** and shall either:
  - a) Issue a **Substantial Completion Certificate**, or
  - b) Provide a **written notice** specifying deficiencies to be rectified by the Contractor within a prescribed period.

### 23.1.4 Contractor's Continuing Obligations

- i. The Contractor remains responsible for completing **all Punch List items** and shall not be relieved of obligations under the **Defect Liability Period (DLP) and Maintenance Provisions** of the contract.

## 23.2 Final Acceptance

### 23.2.1 Conditions for Final Acceptance

Final Acceptance shall be granted when the following conditions are met:

- i. **Completion of all Punch List items** to the satisfaction of the Client.
- ii. **Successful completion of the Defect Liability Period (DLP)** as stipulated in the **Special Conditions of Contract (SCC)**.
- iii. **Submission of Final Documentation**, including:
  - a) **Completion Certificates** for road construction, periodic maintenance, routine maintenance, and electrical works.
  - b) **Compliance Certificates** for safety, environmental, and statutory requirements.
  - c) **Warranties and Guarantees** for materials, equipment, and systems used.
  - d) **Operation and Maintenance (O&M) Manuals** where applicable.
  - e) **Final reconciliation of all quantities, variations, and payments.**

### 23.2.2 Request for Final Acceptance

The Contractor shall formally **request Final Acceptance** in writing, along with supporting documentation proving compliance with all contractual obligations.

### 23.2.3 Client's Final Inspection and Certification

- i. The Client shall conduct a **Final Inspection** within the timeframe specified in the SCC.
- ii. If the Client is satisfied, a **Final Acceptance Certificate (FAC)** shall be issued, confirming that the Contractor has fully discharged its obligations, except for warranties and ongoing maintenance commitments.

### 23.2.4 Release of Retention Money and Final Payment

- i. The **issuance of the Final Acceptance Certificate** shall be a **precondition** for:
  - a) The **release of retention money.**
  - b) The **final settlement of outstanding payments** to the Contractor under the contract.

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### 23.3 Retention of Rights

The issuance of the **Final Acceptance Certificate** shall not:

#### 23.3.1 Waive the Client's rights to claim against the Contractor for:

- i. **Latent defects** discovered after Final Acceptance.
- ii. **Fraud, wilful misconduct, or gross negligence** that may come to light post-acceptance.

#### 23.3.2 Release the Contractor from:

- i. **Warranty and guarantee obligations** under the contract.
- ii. **Statutory liabilities** that extend beyond the contract period.

### 23.4 Disputes Regarding Acceptance

- i. Any dispute regarding **Substantial Completion or Final Acceptance** shall be resolved in accordance with **Clause 18 (Dispute Resolution)** of this contract.

### 23.5 Consequences of Non-Compliance

Failure to achieve **Substantial Completion** or **Final Acceptance** within the stipulated timeframes shall result in:

- i. **Liquidated damages** as specified in the SCC.
- ii. **Applicable penalties** as per the contract.
- iii. **Other contractual remedies**, including the right of the Client to **engage third parties** to complete pending works at the Contractor's cost.

## 24. Warranty and Maintenance Period

### 24.1 Warranty Period:

"**Warranty**" shall mean the Contractor's obligation to ensure that all works executed under this Contract, including **Road Construction, Periodic Maintenance, Routine Maintenance, Electrical Works, and Electrical Maintenance**, comply with the prescribed technical specifications, contractual requirements, and statutory standards for the duration of the **Warranty Period**.

The Contractor shall be responsible for rectifying, at no additional cost to the Client, any defects arising from **faulty materials, poor workmanship, design deficiencies, or non-compliance with contractual obligations**, as identified within the **Warranty Period**.

The Warranty Period shall be independent of and in addition to the Defects Liability Period (DLP). The DLP is a defined post-completion phase during which the Contractor remains obligated to rectify defects notified by the Client before the issuance of the Final Acceptance Certificate. The expiry of the DLP shall not relieve the Contractor from its obligations under the Warranty Period, which shall extend beyond the DLP to ensure the long-term durability, functionality, and compliance of the executed works as per the terms of this Contract.

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### 24.1.1 Scope of Warranty

The Contractor shall provide a warranty for all **new construction works, periodic maintenance, routine maintenance, and electrical works** for a period specified in the **Special Conditions of Contract (SCC)**. The warranty period shall commence from the date of the **Final Acceptance Certificate** issued by the Client.

### 24.1.2 Warranty Obligations for Different Works

The Contractor shall be responsible for **repairing, replacing, or rectifying** any defects arising due to **faulty materials, substandard workmanship, or design deficiencies** within the warranty period. The warranty coverage shall include:

#### i. New Road Construction:

- a. Structural integrity of pavement layers, including subgrade, GSB, WMM, DBM, BC, PQC, and shoulders.
- b. Bridges, culverts, embankments, and retaining structures.
- c. Roadside infrastructure, including crash barriers, pedestrian facilities, and signage.

#### ii. Periodic Maintenance Works:

- a. Overlay works, resurfacing, micro surfacing, and rejuvenation treatments.
- b. Crack sealing and surface treatments.
- c. Drainage system rehabilitation.

#### iii. Routine Maintenance Works:

- a. Pothole patching, crack repairs, and road markings.
- b. Cleaning and upkeep of shoulders, medians, and embankments.

#### iv. Electrical Works:

- a. Street lighting, transformers, feeder panels, and cabling systems.
- b. Power supply infrastructure and associated electrical components.

### 24.1.3 Coverage and Responsibility

- a. The Contractor shall **rectify all defects at no additional cost** to the Client, including labor, materials, and execution.
- b. If a rectified defect reoccurs within the warranty period, the warranty for that section shall be extended.
- c. Any **failure affecting road safety shall be treated as an emergency and rectified immediately.**

## 24.2 Maintenance Period

### 24.2.1 Duration & Scope

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Following the completion of the **Warranty Period**, the Contractor shall undertake maintenance responsibilities for a period specified in the **Contract Data Sheet (referred to as the "Maintenance Period")**.

The Contractor shall be responsible for:

- a. **Ensuring the durability and continued serviceability** of the constructed works.
- b. **Periodic inspections and preventive maintenance** of roads, drainage, and electrical systems.
- c. **Immediate rectification of defects identified during inspections or reported by the Client.**

### 24.2.2 Maintenance Responsibilities

During the Maintenance Period, the Contractor shall:

- i. **Conduct periodic inspections** for early detection of defects.
- ii. **Ensure timely interventions** to prevent deterioration of road surfaces and electrical systems.
- iii. **Maintain an adequate workforce, materials, and equipment** for all maintenance activities.

### 24.3 Defect Rectifications During Warranty and Maintenance Period

#### 24.3.1 Responsibilities During Warranty Period

- i. The Client shall notify the Contractor in writing of any defects. The Contractor shall rectify them **within the response time defined in the SCC**.
- ii. If a **rectified defect reoccurs within the Warranty Period**, the Contractor shall extend the **warranty obligations** for that section at **no additional cost** to the Client.
- iii. **Failure to rectify defects within the stipulated timeline will result in penalties**, as per Clause 15 (**Penalties for Non-Compliance**).
- iv. **Post-completion monitoring of rectified defects shall be undertaken as per Clause 28.4 (Post-Completion Monitoring and Extended Responsibility)**.

#### 24.3.2 Responsibilities During Maintenance Period

- i. Any defects identified during the **Maintenance Period** must be attended to promptly, following the maintenance schedule in the **SCC**.
- ii. **Recurring failures due to substandard repairs will lead to additional penalties**, as per Clause 15 (**Penalties for Non-Compliance**).
- iii. **All defect rectifications shall be performed in accordance with Clause 28.3 (Defect Rectification and Performance Assurance)**.

#### 24.3.3 Liability for Non-Performance of Warranty & Maintenance Obligations

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- i. If the Contractor **fails to rectify defects within the stipulated timeline**, the Client shall have the right to:
  - a) Undertake the necessary rectifications at the Contractor's risk and cost.
  - b) Recover the expenses incurred by deducting the amount from payments due or the performance security.
- ii. The Contractor shall bear **all costs for repairing or replacing defective work** and any **damage caused to third parties due to non-compliance**.

### 24.3.4 Extended Warranty or Maintenance Period

- i. If defects persist beyond the original Warranty or Maintenance Period, an **extension of obligations may be required** under the same terms and conditions.
- ii. The extension shall be **subject to mutual agreement** between the Client and the Contractor.
- iii. **For extended responsibilities related to defect rectifications, Clause 28.3 shall apply.**

### 24.3.5 Performance Testing & Inspections

- i. During the **Warranty and Maintenance Period**, the Contractor shall conduct **performance testing and inspections** to ensure compliance with **MoRTH and IRC standards**.
- ii. The Client may require additional testing based on **statutory requirements** or performance benchmarks.

### 24.3.6 Final Inspection & Completion of Maintenance Period

- i. At the end of the **Maintenance Period**, the Contractor shall formally notify the Client and request a **Final Inspection**.
- ii. The Client shall conduct a **final performance inspection** to verify compliance with all maintenance obligations.
- iii. If all contractual conditions are met, the Client shall issue a **Certificate of Completion for the Maintenance Period**.
- iv. **Any outstanding defect rectifications and post-completion responsibilities shall be handled as per Clause 28.4.**

## 25. Site Management and Supervision

### 25.1 Site Management and Supervision Requirements:

- 25.1.1** The Contractor shall be responsible for the effective management, supervision, and control of the worksite throughout the duration of the Contract, ensuring that all work is carried out in compliance with the approved plans, specifications, and relevant statutory and regulatory requirements.

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**25.1.2** The Contractor shall provide all necessary site management and supervision staff to ensure the timely, efficient, and safe execution of the works. The Contractor's site management team shall include suitably qualified engineers and personnel, each possessing the necessary qualifications, experience, and competence relevant to the specific tasks they are assigned.

### **25.2 Qualification of Engineers and Personnel:**

**25.2.1** The Contractor shall submit the qualifications, certifications, and experience details of all key personnel assigned to the project, including engineers, supervisors, and safety officers, for approval by the Client prior to commencement of work.

**25.2.2** All engineers and supervisors shall hold qualifications and experience that are consistent with industry standards, and the Client reserves the right to reject any personnel deemed unqualified or inadequate for their assigned tasks.

### **25.3 Organization Chart and Manpower Deployment:**

**25.3.1** The Contractor shall submit an updated Organization Chart detailing the project's key personnel and their responsibilities, along with a manpower deployment plan, to the Client for approval.

**25.3.2** The Contractor shall ensure that the necessary number and skill levels of personnel are deployed at the worksite throughout the project. The manpower plan shall include, but not be limited to, civil engineers, electrical engineers, safety officers, supervisors, foremen, and labourers. The Contractor shall update the manpower deployment plan regularly to reflect any changes in staffing or work requirements.

### **25.4 Construction Schedule and Work Monitoring:**

**25.4.1** The Contractor shall submit a detailed construction schedule, including milestones and timelines, for Client approval prior to the commencement of work. This schedule shall outline the planned sequence of work, dependencies, and estimated completion dates for each phase of the project.

**25.4.2** The construction schedule shall be regularly updated and adjusted to reflect actual progress and any changes to the work scope, delays, or other factors affecting the timeline. The Contractor shall notify the Client in writing of any deviations from the approved schedule.

### **25.5 Progress Reporting and Documentation:**

**25.5.1** The Contractor shall provide daily, weekly, and monthly progress reports to the Client. These reports shall detail the progress of all ongoing work, including work completed, work planned for the next reporting period, any issues encountered, and actions taken to address them.

**25.5.2** The reports shall include:

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- a) Daily Progress Reports (to include manpower deployed, equipment used, work accomplished, and any issues encountered).
- b) Weekly Progress Reports (to provide a summary of work completed, pending, and planned tasks, along with any delays or obstacles).
- c) Monthly Progress Reports (including a detailed overview of overall project progress, challenges, and mitigation measures).

**25.5.3** The reports must be submitted in the format approved by the Client, and shall be accompanied by photographs or other relevant documentation as necessary to clearly demonstrate progress.

### **25.6 Supervision and Site Inspections:**

**25.6.1** The Contractor shall ensure that qualified engineers and supervisors are present on-site at all times during the execution of the works, supervising the quality and progress of the work.

**25.6.2** The Contractor shall provide the Client with access to the site at all times for the purpose of inspecting, reviewing, and evaluating the work. The Client may conduct periodic or surprise inspections to ensure compliance with the contract specifications and work quality standards.

### **25.7 Coordination and Collaboration:**

**25.7.1** The Contractor shall coordinate all activities on-site, including subcontractors, suppliers, and any third-party entities involved in the project, to ensure smooth, uninterrupted work flow and adherence to the project schedule.

**25.7.2** The Contractor shall maintain effective communication with the Client's designated project manager and provide all necessary support for coordination and monitoring of work progress.

### **25.8 Site Safety and Compliance:**

**25.8.1** The Contractor shall ensure that all work is performed in compliance with the applicable health, safety, and environmental regulations. A qualified Safety Officer shall be assigned to monitor compliance with safety standards on the site.

**25.8.2** The Contractor shall submit safety plans, emergency procedures, and risk assessments for approval before commencement of any work. Regular safety audits and reviews shall be conducted as part of the project supervision.

### **25.9 Penalties for Non-Compliance:**

**25.9.1** Failure to comply with the site management and supervision requirements, including the submission of the Organization Chart, manpower plan, construction schedule, progress reports, or failure to ensure appropriate supervision, shall result in penalties as outlined in the Special Conditions of Contract (SCC).

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**25.9.2** Non-compliance with safety standards, manpower shortages, or inadequate supervision will be subject to corrective actions, including possible suspension of work until compliance is achieved.

## 26. Indemnity and Liability

### 26.1 Contractor's Liability for Faults and Failures:

The Contractor shall be liable for all costs, losses, or damages incurred by the Client arising from:

**26.1.1 Defective Work:** Any defects in workmanship, materials, or designs that are not in accordance with the agreed specifications or industry standards.

**26.1.2 Non-Compliance:** Any failure by the Contractor to comply with the terms of the contract, including delays, substandard work, or failure to meet performance standards.

**26.1.3 Failure to Meet Milestones:** If the Contractor's fault causes delay or non-performance that affects the overall project timeline, the Contractor shall be liable for additional costs or damages suffered by the Client due to such delays.

### 26.2 Recovery of Costs:

**26.2.1** The Client has the right to recover any costs incurred due to the Contractor's failures or delays, which include but are not limited to:

**26.2.1.1** Costs for rework or rectification of defective work.

**26.2.1.2** Additional costs for resources required to mitigate the impact of the Contractor's failure.

**26.2.1.3** Costs for hiring third-party services, consultants, or experts to address the consequences of the Contractor's shortcomings.

**26.2.2** The Client may deduct these costs from any pending payments due to the Contractor, including retention amounts.

### 26.3 Indemnity:

**26.3.1** The Contractor shall indemnify and hold the Client harmless against all claims, losses, damages, liabilities, or expenses arising from:

**26.3.1.1** Breach of the contract by the Contractor.

**26.3.1.2** Negligence or failure to act in accordance with statutory and regulatory requirements.

**26.3.1.3** Any third-party claims related to defective work or performance under the contract.

### 26.4 Exclusion of Certain Liabilities:

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**26.4.1** This clause shall not apply to liabilities arising from Force Majeure events, or those outside the Contractor's control, unless expressly stated in the contract.

- i. The Contractor's liability is also subject to the terms of the **Force Majeure and Risk Allocation** clauses, where applicable.

### 26.5 Documentation and Notices:

**26.5.1** The Client shall notify the Contractor in writing of any defects or costs incurred due to the Contractor's fault within a specified period after discovery.

**26.5.2** The Contractor shall promptly investigate and take corrective actions at their own cost, or the Client may take remedial measures if the Contractor fails to act within a reasonable timeframe.

## 27. Reporting and Documentation

### 27.1 General Reporting Requirements:

The Contractor shall maintain **accurate, up-to-date, and detailed records** of all activities, progress, and events related to the execution of **Road Construction, Periodic Maintenance, Routine Maintenance, and Electrical Works & Maintenance**. These records shall include, but are not limited to:

- i. **Daily progress reports** covering work completed, material consumption, deployed manpower, and equipment usage.
- ii. **Quality control reports** including test results, material inspections, and compliance with MoRTH, IRC, and IS standards.
- iii. **Maintenance logs** documenting all periodic and routine maintenance activities, including pothole repairs, resurfacing, drainage cleaning, and roadside infrastructure upkeep.
- iv. **Electrical maintenance records** for streetlights, transformers, feeder panels, and high-mast lights, including uptime tracking and fault rectification timelines.
- v. **Safety and environmental compliance reports**, detailing adherence to HSE standards, traffic management measures, and environmental mitigation actions.
- vi. **Emergency repair reports** specifying the nature of the incident, response time, and remedial actions taken.

The Contractor shall also maintain and submit detailed records of defect rectifications, including recurrence tracking, corrective actions taken, and post-completion monitoring reports, as required under Clause 28.5 (Documentation & Record-Keeping)

The Contractor shall ensure that all documentation is **properly organized, legible, and readily available** for inspection by the Client or its authorized representatives at any time. Reports shall be submitted **as per the prescribed formats and timelines** defined in the contract.

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All reports and documentation shall be submitted in accordance with the formats, timelines, and instructions provided by the Client. The Contractor shall ensure the timely and correct submission of the required documentation without delay.

### 27.2 Types of Reports:

#### 27.2.1 Daily Progress Reports:

- i. The Contractor shall submit daily progress reports detailing the work performed, manpower deployed, equipment utilized, and any challenges encountered on-site. These reports shall also include information on material consumption, quality control activities, and safety compliance. The reports should clearly identify any work delays, hindrances, or deviations from the scheduled activities, as well as the corrective actions taken.
- ii. The daily progress report shall be submitted to the Client within [24] hours from the end of each working day.

#### 27.2.2 Weekly Progress Reports:

- i. The Contractor shall provide a weekly progress report summarizing the work accomplished, work planned for the following week, and any ongoing or anticipated challenges or risks. This report shall also include updated details of the work schedule, manpower, equipment, and materials usage, along with key project metrics and any changes to the approved schedule or scope.
- ii. The weekly report shall be submitted to the Client no later than [every Friday] for the preceding week.

#### 27.2.3 Monthly Progress Reports:

- i. A detailed monthly progress report shall be submitted, covering all aspects of the project's progress, including completed milestones, ongoing works, deviations from the schedule, safety performance, and material and equipment status. The report shall highlight any issues impacting project completion and propose corrective actions.
- ii. This report shall be submitted to the Client within [5] working days after the end of each month.

### 27.3 Document Submission Requirements:

#### 27.3.1 Work-Related Documentation:

- i. The Contractor shall submit the following documents along with their respective reports or as required by the Client:
  - a. Updated construction schedule and progress charts.
  - b. Record of materials used, including delivery notes, material certifications, and inspection reports.
  - c. Details of equipment usage and maintenance logs.

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- d. Work inspection reports and any testing or quality control documentation.
- e. Photos or drawings illustrating the progress of key works or any issues encountered.
- f. Correspondence, meeting minutes, and any other relevant documents that affect the progress of the work.

## 27.3.2 Statutory Compliance Documents:

- i. The Contractor shall also submit all statutory compliance documentation in line with legal and regulatory requirements, including:
  - a. Proof of statutory licenses, permits, and approvals.
  - b. Safety inspection and audit reports.
  - c. Workers' compensation and insurance certificates.
  - d. Records of labor and safety audits, if applicable.
  - e. Environmental compliance certificates, if applicable.
  - f. Health, safety, and environmental incident reports, if applicable.

## 27.4 Documentation for Payment Claims:

### 27.4.1 Submission Requirements

The Contractor shall submit **all required supporting documentation** along with each payment claim, as stipulated in **Clause 14 (Payment Terms and Conditions)**. The submitted documentation must be **complete, accurate, and verifiable**, ensuring compliance with contractual, statutory, and quality standards.

### 27.4.2 Mandatory Supporting Documents

Each payment claim shall be accompanied by the following:

- i. **Detailed Tax Invoices**
  - a. Clearly itemized **breakdown of work completed**, including road works, periodic maintenance, routine maintenance, electrical works, and electrical maintenance.
  - b. **GST-compliant format**, where applicable.
- ii. **Certification of Work Completion**
  - a. **Site Supervisor's or Client's Representative's Certification**, confirming satisfactory completion of the claimed work.
  - b. **Measurement Books (MBs) and Work Logs** duly signed and authenticated.
- iii. **Inspection and Test Reports**
  - a. **Quality control and assurance reports**, including material and workmanship compliance records.
  - b. **Inspection and certification reports** for specialized works such as **electrical installations and roadwork quality assessments**.

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### iv. Labor Deployment Records

- a. **Signed timesheets**, specifying workforce details, shift durations, and site attendance.
- b. **Deployment logs** for skilled and unskilled labor.

### v. Material Delivery and Receipt Confirmations

- a. **Supplier delivery challans and invoices**, duly acknowledged by the Client's site representative.
- b. **Material reconciliation statements**, where required.

### vi. Additional Documentation

- a. Any **other document(s) requested by the Client** for verification, including statutory compliance records, safety certifications, and subcontractor invoices, where applicable.

## 27.4.3 Verification and Approval Process

- i. The **Client shall review and verify** the submitted documents within the timeframe specified in **Clause 14 (Payment Terms and Conditions)**.
- ii. In case of **discrepancies or missing documents**, the Contractor shall provide clarifications or resubmissions within the stipulated period, without affecting the overall payment timeline.

## 27.4.4 Consequences of Non-Compliance

Failure to submit **complete and accurate** documentation shall result in:

- i. **Withholding or delay of payment** until compliance is achieved.
- ii. Possible **imposition of penalties** or contractual remedies, as per Clause 14.
- iii. Rejection of the payment claim if deficiencies persist beyond the **specified rectification period**.

## 27.5 Record Keeping and Client Access:

**27.5.1** The Contractor shall maintain records of all work performed, materials supplied, and equipment used for the duration of the contract, including any variations or changes to the original scope. All records shall be made available to the Client upon request.

**27.5.2** The Client or its representatives shall have the right to review, audit, and copy any of the documentation submitted by the Contractor. The Contractor shall cooperate fully with the Client during such audits and inspections, providing all necessary assistance and documentation.

## 27.6 Corrective Actions for Non-Compliance:

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**27.6.1** In the event that the Contractor fails to submit any required reports or documentation in a timely or accurate manner, the Client reserves the right to impose corrective actions, including penalties or suspension of payment, until the required documentation is provided.

**27.6.2** If any discrepancies, omissions, or inaccuracies are found in the documentation provided, the Contractor shall promptly correct and resubmit the documentation within [a specified time frame] at no additional cost to the Client.

### **27.7 Final Documentation:**

**27.7.1** Upon the completion of the contract, and prior to the final acceptance of the works, the Contractor shall submit all relevant final documentation, including but not limited to:

- a) As-built drawings and final construction reports.
- b) Final certification of work completion and acceptance by the Client.
- c) All warranty documents for materials and equipment installed.
- d) Final test and inspection certificates, if applicable.
- e) Any other documents as stipulated in the Special Conditions of Contract or by the Client.

### **27.8 Electronic Submission of Documents:**

**27.8.1** The Contractor is encouraged to submit all reports and documentation electronically, where possible, to facilitate faster processing and easier access. All electronic submissions should be in an acceptable file format, such as PDF, Excel, or Word, as specified by the Client.

**27.8.2** In case of hardcopy submission, the Contractor shall provide the necessary number of copies as requested by the Client.

## **28.Maintenance Responsibilities and Post-Completion Obligations**

### **28.1 Contractor's Obligations for Maintenance Works**

The Contractor shall be fully responsible for the **maintenance, upkeep, and operational performance** of all road infrastructure and associated electrical systems. This includes, but is not limited to:

- i. **Pavements, shoulders, and drainage systems**, ensuring structural integrity and unobstructed water flow.
- ii. **Traffic signage, road markings, and safety barriers**, ensuring visibility and compliance with MoRTH and IRC standards.
- iii. **Street lighting, transformers, and electrical systems**, ensuring a minimum **98% operational uptime**.
- iv. **Emergency maintenance response**, including prompt rectification of damages caused by accidents, adverse weather, or unforeseen events.

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All maintenance activities shall comply with the **contract specifications, MoRTH guidelines, IRC standards, and relevant statutory regulations**. The Contractor shall ensure **timely rectification of defects, preventive maintenance, and performance monitoring** throughout the contract period.

### 28.2 Inspection, Monitoring, and Reporting

The Contractor shall conduct **regular inspections and performance evaluations** as per the approved Maintenance Plan, which shall include:

- i. **Daily inspections** for routine maintenance (potholes, cracks, road markings, signage, and lighting).
- ii. **Weekly inspections** for structural elements, including drains, safety barriers, and electrical systems.
- iii. **Monthly inspections** for periodic maintenance planning, material quality checks, and service life assessments.
- iv. **Post-completion monitoring** of rectified works to ensure durability and adherence to quality standards.

**Inspection reports shall be maintained and submitted** as per Clause 27 (Reporting and Documentation), ensuring traceability of all maintenance activities. Any defects identified shall be rectified **within the prescribed response times**, failing which penalties shall be imposed as per Clause 15 (Performance Standards and Penalties).

### 28.3 Defect Rectification and Performance Assurance

- i. The Contractor shall **immediately address any reported defects or failures** within the contractual response time.
- ii. All rectifications, repairs, and replacements **shall be executed at the Contractor's cost** during the maintenance period.
- iii. If rectification delays exceed the **maximum allowable limit**, the Client reserves the right to undertake corrective actions at the **Contractor's risk and cost**, with recovery through penalties or performance security deductions.
- iv. If a defect reappears in the same location within the maintenance period due to poor workmanship or substandard materials, the Contractor shall be responsible for rework at no additional cost to the Client.
- v. Repeated failures in rectified sections will result in extended performance obligations and additional penalties, as per Clause 15.4.2.

### 28.4 Post-Completion Monitoring and Extended Responsibility

- i. After the completion of **any repair, resurfacing, or structural rectification**, the Contractor shall **monitor the performance** of the restored section for a period as defined in the contract.

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- ii. If failures occur within this monitoring period due to **poor workmanship, substandard materials, or improper execution**, the Contractor shall be obligated to **rework at no additional cost** to the Client.
- iii. The Client or its authorized representative shall have the right to **inspect and assess** the performance of all maintenance works and may impose corrective measures if performance benchmarks are not met.

### 28.5 Documentation and Record-Keeping

The Contractor shall **maintain detailed records** of all maintenance activities, inspections, defect rectifications, and post-completion monitoring. These records shall include:

- i. **Daily maintenance logs** with details of work completed, manpower deployed, and materials used.
- ii. **Inspection reports and defect records**, specifying issues identified, response times, and corrective measures taken.
- iii. **Compliance reports** to verify adherence to MoRTH, IRC, and contractual quality standards.

All reports shall be **submitted to the Client** in accordance with Clause 27 (Reporting and Documentation) and made available for audits or verification at any time.

## 29. Defects Liability Period (DLP)

### 29.1 Definition and Scope

The **Defects Liability Period (DLP)** shall commence from the date of **Substantial Completion** and the issuance of the **Certificate of Substantial Completion** by the Client. During this period, the Contractor shall be responsible for identifying and rectifying any defects, deficiencies, or non-conformities in the works related to **road construction, periodic maintenance, routine maintenance, electrical works, and electrical maintenance**. These defects may arise due to **faulty materials, poor workmanship, or non-compliance** with the contract specifications, approved designs, or relevant standards. The Contractor shall, at its own cost, rectify such defects within the timeframe stipulated by the Client, ensuring that the works meet the required functional, structural, and safety standards. Any failure to address defects within the specified period may result in the Client undertaking the necessary rectifications at the Contractor's risk and expense. The issuance of the **Final Acceptance Certificate** shall be subject to the satisfactory completion of all remedial works.

### 29.2 Rectification of Defects

The Contractor shall promptly investigate and rectify any defects or deficiencies identified by the Client during the **Defects Liability Period (DLP)** within the timeframe

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specified in the Contract or as instructed by the Client. The rectification work shall be carried out in compliance with the contract specifications, applicable standards, and safety requirements, ensuring that the works maintain their structural integrity, functionality, and operational efficiency. All costs associated with defect rectification, including materials, labor, equipment, and any necessary rework, shall be borne entirely by the Contractor. In the event of failure to rectify defects within the stipulated timeframe, the Client reserves the right to impose penalties as per **Clause 15 (Performance Standards and Penalties)** or undertake the rectification work at the Contractor's risk and expense. The Contractor shall also ensure that any remedial work does not disrupt the ongoing operations or compromise the safety of road users and site personnel.

### 29.3 Inspection During DLP

During the **Defects Liability Period (DLP)**, the Client or its authorized representative shall have the unrestricted right to inspect the completed works at any time to assess their performance, structural integrity, and compliance with contractual requirements. The Contractor shall facilitate such inspections by providing full access to all relevant areas, documentation, and personnel necessary for a thorough evaluation. Any defects, deficiencies, or non-conformities identified during these inspections shall be formally notified to the Contractor in writing, specifying the nature and extent of the required remedial actions. The Contractor shall undertake corrective measures without delay, ensuring that all defects are rectified to the satisfaction of the Client. Failure to address the notified defects within the prescribed timeframe shall attract penalties as per **Clause 15 (Performance Standards and Penalties)**, and the Client may undertake the necessary rectifications at the Contractor's cost and risk.

### 29.4 Maintenance During DLP

The Contractor shall ensure that all components related to road construction, periodic maintenance, routine maintenance, electrical works, and electrical maintenance— including road pavements, drainage systems, street lighting, signage, and other associated civil and electrical infrastructure— are maintained in a fully functional and compliant state throughout the Defects Liability Period (DLP). The Contractor shall conduct routine inspections and undertake necessary maintenance activities in accordance with the standards specified in the Contract, MoRTH specifications, and IRC guidelines. Any deterioration, structural failures, electrical malfunctions, or deficiencies identified during this period shall be rectified by the Contractor at its own cost within the timeframe specified in the Contract or as directed by the Client. Non-compliance with maintenance obligations or delays in rectification shall attract penalties as per Clause 15 (Performance Standards and Penalties), and the Client reserves the right to undertake necessary corrective actions at the Contractor's expense.

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### 29.5 Final Inspection and Handover

Before the expiry of the Defects Liability Period (DLP), the Contractor shall formally notify the Client of the readiness for a final inspection. The Client or its authorized representative shall conduct a thorough inspection of all works related to road construction, periodic maintenance, routine maintenance, electrical works, and electrical maintenance, including road pavements, drainage systems, street lighting, signage, and other associated civil and electrical infrastructure. The inspection shall verify that all identified defects, deficiencies, and non-conformities have been rectified as per the contractual requirements, MoRTH specifications, and IRC guidelines. If the works are found to be in compliance and satisfactory, the Client shall issue the Final Acceptance Certificate, formally concluding the DLP. In case of any outstanding deficiencies, the Contractor shall be required to address them within the stipulated timeframe before the certificate is issued.

### 29.6 Extension of DLP

If any defects, deficiencies, or non-conformities related to road construction, periodic maintenance, routine maintenance, electrical works, or electrical maintenance remain unresolved at the expiry of the Defects Liability Period (DLP), the DLP shall be automatically extended until all such defects have been satisfactorily rectified and certified by the Client. The Contractor shall remain fully responsible for rectifying these defects at its own cost, ensuring compliance with the contractual requirements, MoRTH specifications, and IRC guidelines. The extended DLP shall continue until the Client formally certifies that all outstanding defects have been addressed to its satisfaction. Any failure to rectify defects within the extended period may result in penalties, deductions, or other remedies as stipulated in the contract.

### 29.7 Retention Release

The release of retention money or any portion thereof, held as a performance guarantee during the Defects Liability Period (DLP), shall be contingent upon the satisfactory rectification of all defects, deficiencies, and non-conformities related to road construction, periodic maintenance, routine maintenance, electrical works, and electrical maintenance. Upon successful completion of the final inspection and verification that all rectifications have been carried out in accordance with the contract, MoRTH specifications, and IRC guidelines, the Client shall issue the Final Acceptance Certificate. Only upon issuance of this certificate shall the retention money be released to the Contractor. Any pending defects at the time of DLP expiry may lead to a proportional withholding of retention money until all outstanding issues are resolved.

### 29.8 Duration of DLP

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The Defects Liability Period (DLP) shall be **twelve (12) months** or as mentioned in **Contract Data Sheet**, from the date of issuance of the Certificate of Substantial Completion by the Client, unless extended under **Clause 29.6**.

### Exclusions

The Contractor shall not be liable for defects arising due to normal wear and tear, misuse, or acts of God as defined under **Clause 19, Force Majeure**, unless otherwise specified in the Contract.

## 30. Liquidated Damages

### 30.1 Applicability

The Contractor acknowledges that the **timely and satisfactory execution of Road Construction, Periodic Maintenance, Routine Maintenance, Electrical Works, and Electrical Maintenance** is critical to the Client's operations. Any **failure to meet the performance standards, contractual timelines, or obligations** as specified in this Contract shall result in the imposition of **Liquidated Damages (LD)** as **compensation for losses, operational disruptions, or inconvenience caused to the Client**.

### 30.2 Trigger for Liquidated Damages

Liquidated Damages shall become applicable in the following scenarios:

- a) Delayed commencement or completion of any scheduled maintenance activities.
- b) Non-compliance with response times for emergency repairs or incident management.
- c) Failure to maintain performance standards as per **Clause 28, Maintenance and Performance**.
- d) Repeated non-rectification of defects within stipulated time frames during the Defects Liability Period (DLP).

### 30.3 Rate of Liquidated Damages

The LD rate shall be calculated as a percentage of the Contract Value or the specific milestone value, as detailed in the **Contract Data Sheet**. The total LD shall not exceed the maximum cap, **10% of the Contract Value**, unless otherwise specified in the Contract Data Sheet.

### 30.4 Computation and Deduction

The Liquidated Damages shall be calculated on a pro-rata basis for delays or deficiencies, as applicable, and shall be deducted from the Contractor's interim payments, retention money, or any other dues payable under the Contract.

### 30.5 Exemptions

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No Liquidated Damages shall apply if the delay or non-compliance is solely attributable to:

- a) Force Majeure events, as defined in **Clause 19**.
- b) Written instructions or approvals awaited from the Client beyond the stipulated period.

### 30.6 Additional Penalties for Chronic Non-Performance

In cases of persistent or willful non-performance by the Contractor, as determined by the Client, the Liquidated Damages may be supplemented with penalties, termination, or other remedies provided under this Contract.

### 30.7 Non-Exclusivity of LD

The imposition of Liquidated Damages shall not preclude the Client from seeking other remedies, including termination of the Contract or claims for actual damages, where applicable.

### 30.8 Acknowledgement

The Contractor agrees that the Liquidated Damages are a genuine pre-estimate of the loss likely to be suffered by the Client and do not constitute a penalty under applicable laws.

## 31. Notices and Communications

### 31.1 Mode of Communication:

All notices, instructions, approvals, requests, and other communications required or permitted under this contract shall be in writing and delivered through one of the following means:

- a) Registered post or courier to the designated addresses of the parties.
- b) Email communication to the designated official email addresses provided by the parties, provided that such emails are acknowledged by the recipient.

### 31.2 Designated Contact Details:

Each party shall provide and maintain updated contact details, including physical address, email address, and phone number, for all official communications. Notices sent to these addresses shall be deemed to have been duly served.

### 31.3 Effective Date of Notices:

Notices shall be deemed to have been received:

- a) If delivered by registered post or courier, on the date of actual delivery or acknowledgment of receipt.

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- b) If sent by email, on the date of acknowledgment by the recipient, or, if no acknowledgment is received, within 48 hours of dispatch, provided no error or failure message is received.

### 31.4 Change of Address or Contact Details:

Either party may change its designated contact details by giving written notice to the other party. Such changes shall become effective five (5) business days after receipt of the notice.

### 31.5 Language of Communication:

All notices and communications under this contract shall be in English unless otherwise specified in the Special Conditions of Contract.

### 31.6 Binding Nature of Communications:

All instructions, notices, and approvals issued by the Client under this clause shall be binding on the Contractor. Any queries or clarifications from the Contractor must be sought in writing within the stipulated time frame specified in the contract.

### 31.7 Service of Legal Notices:

Legal notices related to the contract shall be served to the respective registered office addresses of the parties and marked "For the Attention of Legal Counsel."

## 32. Confidentiality and Non-Disclosure

### 32.1 Confidential Information:

All information, data, reports, drawings, documents, trade secrets, technical specifications, and other materials, whether written, verbal, or electronic, disclosed by either party during the performance of this contract shall be considered confidential and proprietary ("Confidential Information").

### 32.2 Obligations of the Contractor:

The Contractor agrees to:

- Use Confidential Information solely for the purpose of fulfilling its obligations under this contract.
- Not disclose or permit the disclosure of Confidential Information to any third party without the prior written consent of the Client, except as required by law.
- Protect Confidential Information with the same degree of care used to safeguard its own confidential and proprietary information but no less than reasonable care.

### 32.3 Permitted Disclosures:

The Contractor may disclose Confidential Information to:

- Employees or subcontractors who need access to such information to perform the contract, provided they are bound by confidentiality obligations no less restrictive than those in this clause.
- Government authorities or regulatory bodies, as required by applicable law, after notifying the Client in writing (unless prohibited by law).

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### 32.4 Exclusions from Confidentiality:

The obligations under this clause shall not apply to information that:

- a) Is or becomes publicly available through no breach of this agreement.
- b) Was already in the possession of the receiving party without restriction before its disclosure.
- c) Is independently developed by the receiving party without use of or reference to the Client's Confidential Information.
- d) Is lawfully disclosed to the receiving party by a third party without restriction on disclosure.

### 32.5 Return or Destruction of Information:

Upon the completion, termination, or expiration of this contract, or upon the Client's written request, the Contractor shall return or destroy all copies of the Client's Confidential Information and provide written confirmation of such destruction.

### 32.6 Duration of Confidentiality Obligations:

The confidentiality obligations under this clause shall survive the termination or expiration of this contract for a period of **five (5) years** unless otherwise agreed in writing.

### 32.7 Remedies for Breach:

In the event of a breach or threatened breach of this clause, the Client shall be entitled to seek equitable relief, including but not limited to an injunction, in addition to any other remedies available under law or equity.

## 33. Bank Guarantee Formats

### Provision of Bank Guarantee Formats:

#### 33.1 Bank Guarantee Formats:

**33.1.1** The Client shall provide the Contractor with the required formats for **Bank Guarantees** as per the terms and conditions stipulated in the Contract, including but not limited to:

- i. Performance Bank Guarantee
- ii. Advance Payment Bank Guarantee
- iii. Retention Money Bank Guarantee
- iv. Security Deposit Bank Guarantee, if applicable.

#### 33.2 Availability of Formats:

**33.2.1** The Contractor shall be provided with the Bank Guarantee formats within **[7] days** from the date of contract execution or from the date of any event that triggers the requirement for a Bank Guarantee (e.g., Advance Payment, Performance Guarantee).

**33.2.2** These formats shall be made available either through the following means: - Directly from the Client's Contract Administrator or Authorized Representative. - Via the Client's

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designated electronic document management system (if applicable), accessible to the Contractor.

**33.2.3 Request for Formats:** In the event the Contractor does not receive the Bank Guarantee formats as specified, the Contractor may request the required format(s) in writing. The Client shall make the necessary formats available to the Contractor within **[7] days** of receiving such a request.

### **33.3 Compliance with Format:**

The Contractor shall ensure that the Bank Guarantees are furnished in strict accordance with the formats provided by the Client. Any deviations from the prescribed format shall be subject to the Client's approval.

### **33.4 Submission of Bank Guarantees:**

The Contractor shall submit the original Bank Guarantees to the Client at the appropriate stages, as per the terms of the Contract, and ensure that they are valid for the required period as per the contractual obligations.

### **33.5 Costs of Bank Guarantees:**

All costs, charges, and fees related to the issuance and renewal of the Bank Guarantees shall be borne by the Contractor unless otherwise agreed by the parties in writing.

## **34.Limitation of Liability**

The liability of the Contractor under this Agreement, whether arising from breach of contract, negligence, or any other cause, shall not exceed the total contract value or the amount recoverable under applicable insurance policies, whichever is higher, except in cases of gross negligence, wilful misconduct, or fraud. The Contractor shall not be held liable for indirect, incidental, or consequential damages, including but not limited to loss of profit, revenue, or anticipated savings, unless expressly stated otherwise in this Agreement or applicable law.

The Client's liability under this Agreement is limited to payment for works / services rendered and duly certified in accordance with the terms of this Contract. In no case shall either party be liable for claims arising from delays, disruptions, or failures resulting from events classified as Force Majeure, as defined under **Clause 19**.

This limitation shall not affect the Contractor's obligations related to indemnities, intellectual property, warranties, or the rectification of defects as outlined in this Agreement.

## **35.Annexures and Appendices**

The following annexures and appendices form an integral part of this Contract and shall be referred to for detailed guidelines, specifications, and requirements applicable to the Road Maintenance Works:

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**a) Bill of Quantities (BOQ)**

This annexure includes the detailed schedule of quantities, unit rates, and cost estimates for all items of work covered under the Contract. The BOQ shall form the basis for interim and final payments, subject to adjustments as per the Contract terms.

**b) Specifications for Materials and Equipment**

This document provides the technical specifications for all materials and equipment to be supplied and utilized in the execution of the works, as per the latest MoRTH specifications, IRC standards, and other applicable codes. Compliance with these specifications is mandatory.

**c) Work Orders and Sample Forms**

Standardized templates for issuing work orders, recording daily progress, and maintaining site records are provided. These shall be used for proper documentation and record-keeping during the execution of the Contract.

**d) Inspection and Maintenance Checklists**

Comprehensive checklists detailing the procedures for inspections, periodic maintenance activities, and quality assurance measures are included to ensure compliance with performance standards.

**e) Safety Standards and Procedures**

This appendix outlines the safety protocols, emergency response plans, and mandatory compliance measures to ensure the health and safety of workers and the general public during the execution of works.

**f) Bank Guarantees**

This annexure includes the formats for bank guarantees required under the Contract, such as Performance Bank Guarantee, Advance Payment Guarantee, and Retention Money Guarantee. The Contractor shall ensure that all bank guarantees are submitted in the approved format and within the stipulated timelines as specified in the Contract.

The Contractor shall ensure familiarity with all annexures and appendices and comply with their requirements. Any deviations or non-compliance must be addressed through written approval from the Client.

In case of any conflict between the annexures or appendices and the main Contract terms, the provisions of the main Contract shall prevail unless expressly stated otherwise.

## 36. Other Conditions

### 36.1 General Compliance

The Contractor shall comply with all applicable laws, regulations, codes, and standards governing road maintenance works, including but not limited to labor laws, environmental regulations, safety standards, and other statutory requirements. Any

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failure to comply with such laws and regulations shall be considered a breach of contract, and the Contractor shall bear all resulting consequences, including penalties and corrective actions. The Contractor shall also adhere to industry best practices and ensure that all personnel, subcontractors, and suppliers engaged in the project operate within the boundaries of the law and the terms of this Agreement.

### 36.2 Interpretation of Contract

In the event of ambiguity or inconsistency between clauses of this Contract, the interpretation most consistent with the overall intent and objectives of the Agreement shall prevail. Should disputes regarding interpretation arise, they shall initially be resolved through consultation between the Client and Contractor. If unresolved, the matter shall follow the dispute resolution mechanism outlined in **Clause 18**. Both parties agree that all provisions of this Contract must be interpreted harmoniously to avoid rendering any clause redundant or inapplicable.

### 36.3 Confidentiality and Intellectual Property Rights

#### 36.3.1 Ownership of Deliverables

**36.3.1.1** All data, drawings, designs, reports, calculations, manuals, maps, photographs, and other deliverables produced or supplied by the Contractor under this Contract shall become the sole property of the Client upon submission. The Contractor shall not use, replicate, or disclose such deliverables for any purpose outside the scope of this Contract without the prior written consent of the Client.

#### 36.3.2 Confidential Information

**36.3.2.1** The Contractor agrees to treat all information provided by the Client or generated during the execution of this Contract as confidential. Such information shall not be disclosed to any third party or used for any purpose other than fulfilling the obligations under this Contract, except as required by law or with the written approval of the Client.

#### 36.3.3 Intellectual Property Warranty

**36.3.3.1** The Contractor warrants that all work, methodologies, and materials provided under this Contract do not infringe upon any existing intellectual property rights, including patents, copyrights, or trademarks of third parties, as per the applicable laws in India, including but not limited to the Copyright Act, 1957, and the Patents Act, 1970. The Contractor shall be solely responsible for resolving any claims or disputes arising from such infringements at its own cost.

#### 36.3.4 Proprietary Technology and Methods

**36.3.4.1** If the Contractor uses any proprietary technology, software, or methodologies owned by the Contractor during the performance of this Contract, it shall obtain prior written approval from the Client. Such proprietary elements shall remain the property of the Contractor unless explicitly transferred to the Client in writing.

#### 36.3.5 Return of Data and Materials

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**36.3.5.1** Upon the termination or expiration of this Contract, the Contractor shall return or destroy all confidential information, data, and materials belonging to the Client, as instructed by the Client.

### 36.3.6 Compliance with Laws

**36.3.6.1** The Contractor shall comply with all applicable intellectual property and confidentiality laws in India, including but not limited to the Indian Contract Act, 1872, the Copyright Act, 1957, and any relevant rules or guidelines issued by Indian authorities.

### 36.4 Third-Party Rights

This Contract is intended solely for the benefit of the Client and Contractor. It does not confer any rights, privileges, or remedies upon any third party, nor does it create any obligations or liabilities for the benefit of third parties. However, this limitation does not preclude the enforcement of obligations or liabilities directly related to third-party safety, property damage, or environmental compliance arising out of the Contractor's actions during the execution of this Contract.

### 36.5 Force of Documentation

This General Conditions of Contract (GCC), along with its annexures, appendices, and referenced documents such as technical specifications, MoRTH guidelines, IRC standards, and work orders, forms the complete and binding agreement between the Client and Contractor. Any deviations, amendments, or additions to these documents must be agreed upon in writing and signed by both parties to take effect. In the event of conflict between the main Agreement and its annexures or appendices, the order of precedence specified in the Special Conditions of Contract shall apply.

### 36.6 Provisions for Emergencies

In the event of an emergency, such as natural disasters, accidents, or critical incidents that threaten public safety, the Contractor shall take immediate action to mitigate risks and prevent further harm. This includes mobilizing resources, securing the affected area, and providing necessary assistance in coordination with local authorities. The Contractor must notify the Client of such actions within 24 hours and submit a detailed report outlining the measures taken and any anticipated costs. Any additional work performed under such circumstances shall be subject to review and approval by the Client.

### 36.7 Waiver

The failure of either party to enforce any provision of this Contract shall not constitute a waiver of their rights to enforce the same or any other provision at a later time. A waiver shall only be valid if expressed in writing and signed by the party granting it.

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Such a waiver shall be limited to the specific breach or circumstance outlined and shall not be construed as a continuing waiver of other or future breaches.

### 36.8 Entirety of Agreement

This Contract constitutes the entire agreement between the Client and Contractor concerning the scope of road maintenance works and supersedes all prior agreements, communications, and understandings, whether written or oral. No modifications or amendments to this Agreement shall be valid unless executed in writing and signed by both parties. Both parties affirm that they have entered into this Agreement based on its express terms and not in reliance on any representations, promises, or warranties not explicitly contained herein.

### 36.9 Survival of Terms

Provisions of this Contract that by their nature extend beyond its termination or expiration shall survive and remain in effect. This includes, but is not limited to, clauses related to confidentiality, intellectual property, warranties, dispute resolution, indemnities, and liabilities. The Contractor acknowledges that these surviving obligations are essential to protecting the Client's rights and interests even after the completion or termination of this Contract.

### 36.10 Acknowledgment

The Contractor acknowledges that they have read and understood the terms and conditions of this Contract, including all annexures, appendices, and referenced documents. By signing this Agreement, the Contractor agrees to be bound by its terms and confirms their capability to fulfill all obligations outlined herein. The Contractor also warrants that they have sought independent legal or professional advice as necessary to comprehend the implications of this Contract fully.

### 36.11 Language of the Contract

The official language of this Contract shall be English. All correspondence, documentation, instructions, and deliverables related to this Contract shall be prepared, submitted, and interpreted in English only. In the event of any discrepancy between versions of this Contract or its associated documents in any other language, the English version shall prevail.

The Contractor shall ensure that its personnel, subcontractors, and agents are adequately conversant in English to comply effectively with the terms and obligations under this Contract. Any translation of this Contract or related documentation into another language shall be for convenience only and shall not carry legal validity unless expressly agreed upon by both parties in writing.

The parties agree that clarity and consistency in communication are paramount to the successful execution of the Contract, and this provision is binding on all parties.

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# **Annexure A2 - Special Conditions of Contract**

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## Special Conditions of Contract

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**NOT APPLICABLE**

List of Approved Makes		
S.No	Items Description	Name of Approved Suppliers/Vendors
1	Cement	Ultratech Cement Ltd
		Ambuja Cement-hoischim
		J K Super/Laxmi
		Wonder
		Shree Cement
		Birla/Mangalam Cement
		ACC Ltd
2	Reinforcement Steel	1. SAIL 2. TATA Steel 3. Rashtriya Ispat Nigam Ltd [RINL] 4. Jindal Steel Power Ltd 5. JSW Steel Ltd (Including former JSW Ispat/Ispat industries Ltd)
3	Plates	Essar Steel Limited
		SAIL
		Jindal Steel & Power Limited
		JSW Steel Ltd (Including former JSW Ispat/Ispat industries Ltd)
		RINL
		Uttam Galva Steel
		Bhushan Steel & Power
		Arcelor & Mittal
		Tata Steel
4	Structural Steel	1. Tata Steel 2. SAIL 3. RINL 4. Jindal Steel Power Ltd
5	Bitument (VG 30/ VG 40)	1. HPCL 2. IOCL 3. BPCL 4. MRPL 5. Reliance
6	Emulsion (RS & SS)	1. Hincol 2. Tiki Tar Shell India Ltd. 3. BPCL 4. IOCL
7	Concrete Adxmixture	1. FOSROC 2. Sika 3. BASF 4. Dr. Fixit
8	AC Pipes	Local vendors complying IS requirement
9	PVC/HDPE Pipes	FIP
		Astral
		Finolex
		Prince
		Supreme Industries Ltd
		Kissan Irrigation Ltd.
		Jain Irrigation

List of Approved Makes		
S.No	Items Description	Name of Approved Suppliers/Vendors
10	High Tensile Steel strands	1. Usha Martin 2. TATA 3. Kataria
11	Sealant and sealant Primer for PQC	1. FOSROC 2. Sika 3. BASF 4. Dr. Fixit
12	Curing Compound	1. FOSROC 2. Sika 3. BASF 4. Dr. Fixit
13	Sepration Membrane (LDPE)	1. Vishakha Polyfab 2. D.P. Wires
14	Hume Pipe	Local vendors complying IS requirement
15	Paver Blocks	Local vendors complying IS requirement
16	Drainage Spout	Local vendors complying IS requirement
17	Sheating Pipes	1. Tirupati Plastomatics Private Lintied 2. Usha Martin 3. Dynamic 4. Kataria
18	Expansion joints ( Modular/Strip seal)	1. Dynamic Prestress(I) Pvt Ltd, Navi Mumbai 2. Maurer - Sanfield India Limited 3. Mageba Bridge Products Pvt. Ltd. Kolkata
19	Bearings	
19.01	Elastometric bearing	1. Dynamic Prestress(I) Pvt Ltd, Navi Mumbai 2. Maurer - Sanfield India Limited 3. Mageba Bridge Products Pvt. Ltd. Kolkata
19.02	POT-PTFE Bearings	1. Dynamic Prestress(I) Pvt Ltd, Navi Mumbai 2. Maurer - Sanfield India Limited 3. Mageba Bridge Products Pvt. Ltd. Kolkata
20	Re Wall: Panels with all assecories like Geo Grid Materials, GI Clamp, etc	1. Maccaferri 2. Techfab India 3. Strata Geosystems 4. Reinforced Earth India Pvt. Ltd 5. Geosys India Infrastructure Pvt. Ltd.
21	Geocomosite Material for Filter Media	1. Maccaferri 2. Strata Geosystems 3. Techfab India
22	Traffic Signs, Marking and other Appurtenances:	
22.01	Retro Reflective Tapes for Signages	Any supplier with "3M" Relective sheet
22.02	Delinators(Roadway Indicators)	Any supplier with "3M" Relective sheet
22.03	Reflective pavement markers (road Studs)	Any supplier with "3M" Relective sheet
22.04	Solar blinkers	Any supplier with "3M" Relective sheet
22.05	Solar studs with red flashes	Any supplier with "3M" Relective sheet


List of Approved Makes		
S.No	Items Description	Name of Approved Suppliers/Vendors
23	Highways & toll Illumination & Electrical works	
23.01	High mast	Bajaj/ Philips/ Crompton/ VaLmount (upto 70M)/ Transrail Lighting (upto 30M)/ Utkal (upto 30 M) Sigma Search light (upto 30M)
23.02	Pole with Single Arm	For GI Poles - Bajaj/ Ridhdhi Poles/ Zenith Poles/ Subham Poles/ Aster Teleservices
23.03	Median Lighting, Double Arm	For GI Poles - Bajaj/ Ridhdhi Poles/ Zenith Poles/ Subham Poles/ Aster Teleservices
23.04	Light inside/ under the Structure (i.e. VUP, PUP, Flyover, Toll plaza canopy etc.)	Wipro/ CGL/ Philips/Bajaj/ GE/ Osram/Havells/ Sigma search light
23.05	HT Cable	Polycab/KEI / Ravin Cables/ Universal Cable/ Sterlite/ Gupta Power/ CCI/ Torrent Power/ Finolex /RPG
23.06	LT Cable	Polycab/KEI / Ravin Cables/ Universal Cable/ Torrent/Nicco/ Finolex /RPG/Havells/Cords/Thermo/Delton/Suyog
23.07	LT Panles	BCH/ Siemens/Schneider/ ABB/ L&T / C&S/ Manish Engineering, Mumbai / Akshar Electric. Baroda /Maktel, Vadodara/ Risha Control, Delhi/ Bharat Engineers, Vadodara/ Vidhyut Control, Ghaziabad/ Pyrotech Electronics, Udaipur/Milestone, Rudrapur I Unilec Engineer,Gurgaon/ Electro Control svstem, Noida
23.08	Junction Boxes	Sintex/Hensel
23.09	Cabel Termination	3M/Yamuna/Raychem/Gala shrinkfit
23.1	Cable Glands	Comet/VBI/Dowells/HMI/Sunil & Co/ Arup Engg/Quality Precision
23.11	Conduit	M. Chandra/Supreme/Precisio/BEC Industries/ Elmech India
24	Pavement marking (Hto applied thermoplastic paint)	1. DG group construction, Pune 2. Kataline group, Mumbai 3. Asian Paint, Mumbai
25	Chequered Tiles (25mm thk)	Local vendors complying IS requirement
26	ATMS & Toll Equipments	1. Efkon, Mumbai 2. Metro, Delhi 3. Rajdeep, MP
27	Metal Beam Crash Barrier	1. Ericon Guard Rail, Pune 2. DG group contrstuction, Pune 3. N S Rolling Pvt Ltd, Mumbai 4. GR R Infra Projects Ltd 5. Utkarsh Tubes & Pipes 6. Jindal (india) Limited
28	Static Weigh Bridge	RICELAKE WEIGHING SYSTEM AVERY INDIA LTD ESSAE DIGITRONICS PVT. LTD.
29	Weigh In Motion	1. Efkon, Mumbai 2. Metro, Delhi 3. Rajdeep, MP`
30		

List of Approved Makes		
S.No	Items Description	Name of Approved Suppliers/Vendors
31	Aluminium Section	Hindalco
		BALCO
		NALCO
32	Bajri/Frosted/wired Glass/ Clear Float Glass(5mm Thick) for Doors windows	saint Gobain
		Asahi Float
		Modiguard
33	Ceramic/ Vitrified Tiles	Somany Ceramics Limited
		Nitco Tiles
		Kajaria Ceramics
		Johnson Tiles
34	Paints	Asian Granito India Ltd.
		Jotun
		Asian
		Grandpolycoat
		Nerolac
35	Sanitary Fittings	Berger
		Parryware
		Jaquar
		Hindware
		Cera
36	ACP Panels	Somany
		Eurobond industries
		Alcan Composites India
		Aludecor Lamination
37	Cement Board	SHERA cement board by Mahapant fibre cement
		AEROCON C board from HIL
38	Mortised Locks & Door Accessories	Assa Abloy India Pvt. Ltd (Yale)
		Everiet
		Godrej & Boyce Manufacturing Company Limited
		Link Group of Industries
		Europa
39	Pipes-MS Tube & Pipes (Galvanized)(IS 1239/IS 3589)	Tata Steel
		Indus
		Jindal
		Advance Steel Tubes Ltd.
		PS Steel tubes Ltd
40	Bitumenious Paint	Shalimar
		STP
		Tiki Tar Industries
41	Gypsum Board False Ceiling/Partition Wall/ Fire Proof Partition	saint Gobain Gyproc India Ltd.
		Borai Gypsum India Pvt. Ltd.
		Gypsonite
42	Fasteners for Structural Steel	Nexo Fasteners
		Lakshmi precision Screws Ltd.
		Precision Taps & dies pvt. Ltd.
		Bharti
		Deepak fasteners,
		Sundaram fasteners Ltd
43	Structural Hollow Steel Sections (Square & Rectangular)	Vinay Wires & Poly prouducts (P) limited - (VWPPL)
		Hi Tech Pipes Limited, TISCO
		Riddhi Steel & Tube Limited

List of Approved Makes		
S.No	Items Description	Name of Approved Suppliers/Vendors
44	Structural Tubular Sections	TISCO
		Jindal Steel
		SAIL
		Welspun
		Maharashtra Seamless
		Surya Roshni
		Ratnamani
		PSL Industries
45	RBT/CONCERTINA COIL/BARBED WIRE	Zonate Wire Industries
		Gurukrupa Wire Netting Industries
		A 1 Fence Products Company Pvt. Ltd.
		Sai Wire
		Parmeshwar Wire Products

**Annexure A4 - Utility shifting  
guidelines for safety, compliance,  
and timely execution.**

# National Highways Infra Trust

	Utility shifting guidelines for safety, compliance, and timely execution	Doc No.: RFP/FY25-26/ Bridge Rehabilitation & Repair works
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**NOT APPLICABLE**

## Annexure A5- EHS Responsibilities and Requirements – Work On Live Road

### 1. General

#### 1.1. Personal Protective Equipment & Safety Appliances

The Contractor / Agency shall provide all the PPE (Personal Protective Equipment) and safety appliances required to carry out the job to all the workmen at its own cost and expenses.

#### 1.2. PTW System (Wherever applicable, Sole discretion of - NHIT

The Contractor / Agency shall adhere to all the provisions of EHS requirements. In case of non-compliance or continuous failure in the implementation of any of EHS provisions. NHIT may impose stoppage of work without any cost or time implications /or impose a suitable penalty for non-compliance.

#### 1.3. EHS violation Penalty List in INR

1.3.1. Non usage of PPEs – 1000/-

1.3.2. Violation of Barricading Requirements 2,000/-

1.3.3. Caution boards/signs not displayed.1000/-

1.3.4. Work without PTW system 1000/- (EPC, O&M and Work on Live Road)

1.3.5. Usage tools & tackles without valid third-party certification 2000/-

1.3.6. Deployment and usage of cranes and equipment without valid third-party certification 5000/-

1.3.7. Main carriage way blockage without prior permission and PTW 5,000/-

1.3.8. Failure to deploy a shadow vehicle: ₹2,000 per instance. However, the requirement for a shadow vehicle may be waived at the sole discretion of the EHS Manager, depending on the duration of the activity and the severity of the hazard.

1.3.9. Transportation of manpower using makeshift arrangements or a shadow vehicle: ₹2,000 per instance / per person.

1.3.10. Any other unsafe act and condition 2000/-

Remarks: Fines & Penalties shall be decided & revised by NHIT project manager. Fines & Penalties amount will be deducted from Contractor / Agency payment. Above penalties are per violation per occasion basis.

Repeated EHS violations will result in escalating disciplinary measures. A third occurrence of the same violation may lead to temporary suspension, while a fifth recurrence may result in permanent contract termination.

### 2. Method Statement & HIRA (Wherever applicable, Sole discretion of NHIT. The Contractor / Agency shall submit a detailed Work method statement and Hazard Identification & Risk Assessment (HIRA) for review and approval before commencing work.

### 3. Work on Live Road (Wherever applicable, Sole discretion of NHIT

- 3.1. Work Zone - Contractor / Agency shall create and maintain the Traffic control zones as per Section 4 of IRC SP 55 2014 – Advance warning zone, Approach transition zone, Activity zone, Terminal transition zone, Work zone end, ref figure (a) attached as annexure.
  - 3.1.1. Provide MS board with “Arrow marking & Work in progress” display @ 100 meters ahead of the work zone and fix red flags over it for good visibility.
  - 3.1.2. Ensure to provide LED chevron or blinker in case of fog time or working during inadequate illumination.
  - 3.1.3. Display sign boards such as Go Slow, Speed Limit etc.
  - 3.1.4. Deploy flag man along with Red & Green flags with a whistle or virtual flagman to be placed for better visibility and a risk-free approach.
  - 3.1.5. Contractor / Agency should ensure sufficient manpower to provide the safety arrangement on live carriage way.
  - 3.1.6. MS board with display “Men at Work” (900 mm) & Arrow marking should be placed on the live carriageway in particular lane at least 500 m ahead of working place.

4. ISO 14001 and ISO 45001 Requirement

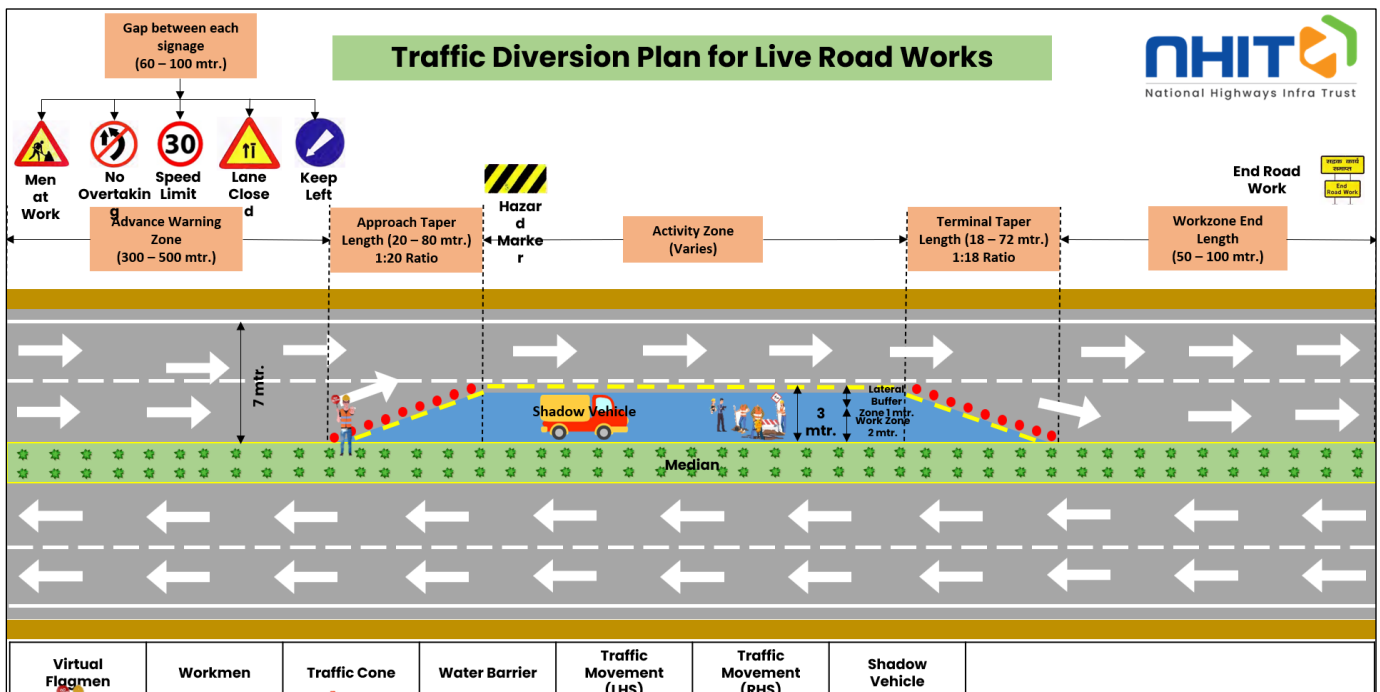
The Contractors and Agencies are encouraged to comply with the requirements of ISO 14001 and ISO 45001.

5. Environment

General – The Contractor/Agency shall be responsible for the storage and disposal of any waste generated as a result of its operations and comply with the respective state / central pollution control board regulations.

Routine maintenance/Initial improvement works – The Contractor/Agency shall obtain Consent to Establish (CTE) and Consent to Operate (CTO) at its own cost and expenses from the respective State Pollution Control Board and comply with the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016.

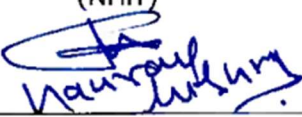
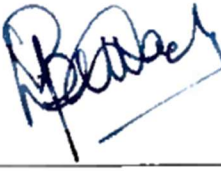
Annexure - figure (a)



## Standard Operating Procedure

### “Safety Measures for Working on Live Road”

(Procedure No. EHS/SOP/031 / R1)

	Prepared by	Approved by
R.1	Corporate EHS Team (NHIT) 	Shubhra Bhattacharya (COO)  01-08-2024
Date	01/08/2024	
Revision History (R0)	Approved on 20.09.2023 and circulated for implementation	
R.1 Changes	<ul style="list-style-type: none"> <li>i. Advanced diversion protocols, as well as the construction and deconstruction of both permanent and temporary traffic zones, integrated into this SOP. This integration ensures efficient traffic management and the safety of all site workmen, staff, and commuters.</li> <li>ii. Name Changed – ‘Working on the Operational Road’ to ‘<b>Safety Measures for Working on Live Road</b>’.</li> </ul>	

## 1. INTRODUCTION

The Standard Operating Procedure (“SOP”) shall form minimum standards to be achieved to mitigate the risk/ impact involved in the road diversion and O&M operations across all project sites.

## 2. SCOPE

This SOP - ‘Safety Measures for Working on Live Road’ is applicable to National Highways Infra Trust (“NHIT”) applicable entity (ies) means the legal entity (ies), under the Trust, which holds the Concession (s) granted by the Authority and includes all such asset (s) forming part of the Concession.

## 3. APPLICABILITY

The SOP is applicable for all the activities to be performed on live road including service road. i.e. – Routine maintenance, Initial Improvement work and any other non-routine activity on live road.

## 4. PURPOSE

The purpose of the SOP is to minimize the hazards and risks in traffic diversion and smoothness of traffic on the National Highways in O&M and improvement works.

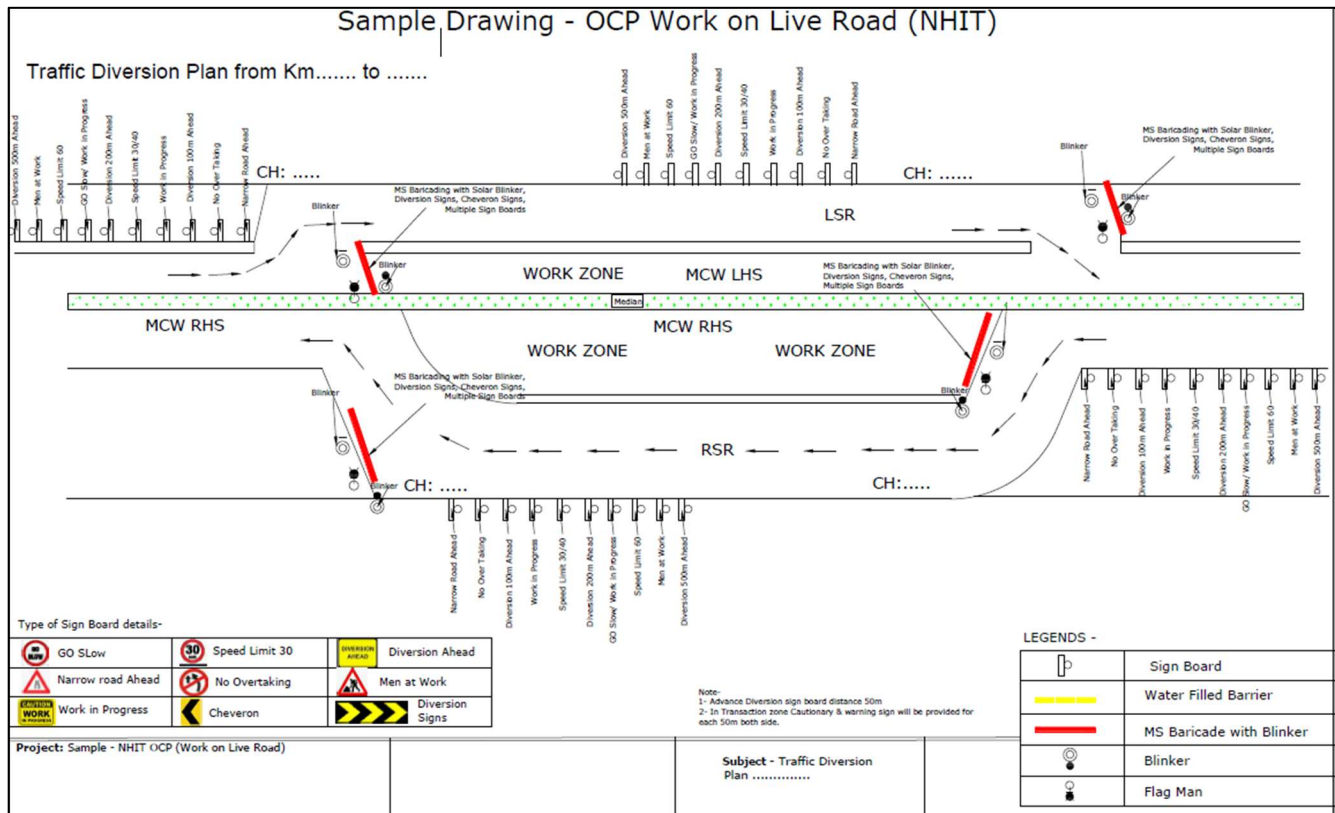
## 5. REFERENCE

- a. IRC: SP: 55 -2014- Guidelines on Traffic Management in Work Zones.
- b. IRC: 35 – 2015 Code of Practice for Road Markings
- c. IRC 67: 2022 Code of Practice for Road Signs
- d. IRC: SP: 84-2019- Manual of Specifications and Standards for Four Laning of Highways
- e. The Building and Other Construction Workers’(Regulation of Employment and conditions of service) Act, 1996
- f. Motor Vehicle Act,1948

## 6. TRAFFIC DIVERSION PLAN AND PROCESSES:

Requirement Of Diversion and Barricading for Working on Live Road: Prior to starting the works, a traffic diversion plan confirming IRC SP 35: 1997, IRC SP 55: 2014 and IRC SP 67: 2022 shall be prepared & followed once approved. Sketch of a diversion plan as sample given below.





### 6.1 Before Start of Work or during execution:

The respective contractor is responsible for preparing the Traffic Management Plan (TMP). The Maintenance Team (Manager/Engineer – NHIT) is responsible for ensuring that the TMP is prepared and implemented as specified in the guidelines, with all sign boards and barricades.

- The plan must be approved by the respective authority or independent engineer, as applicable. In case of non-compliances, the plan must be revised and resubmitted for approval.
- Once approval is received, the plan must be implemented on the ground, and work can then be started accordingly.
- During Execution, the traffic management arrangements must be checked on the ground as per the IRC SP 35: 2015, IRC SP 55: 2014, and IRC SP 67: 2022.

### 6.2 Partially Completed Section:

- In the case of staged construction scenario, partially completed sections are opened for traffic operations. Ensure the TMPs must be prepared before opening the section for traffic to indicate temporary markings and temporary signage.
- Channelizing safety devices (Rope light, Blinkers) shall be placed for identification of path in the nighttime.



## 7. ROAD DIVERSION

### 7.1 Diversion extending beyond the shift / days

#### 7.1.1 Full Lane closure for Road Work

The following safety guidelines to be followed while providing road diversion:

- a. Diversions should be done as per the specifications mentioned in the approved plan.
- b. Diversion pavements should be in good condition with no potholes. Rectify any damaged road or potholes. Ensure the shoulder of the service road is in proper condition to cater to the MCW traffic.
- c. Diversion boards should be aligned with no gaps and managed nicely for better presentation.
- d. A minimum of two diversion boards with blinkers and retro-reflective tape should be provided at every exit.
- e. Blinkers must be provided at exit and entry points.
- f. Traffic channelizing devices such as spring delineators and bollards with three rows of reflectors should be provided at merging, demerging, and along the diversion road.
- g. Thermoplastic marking with road studs should be applied along the diversion and transverse bar markings before the diversion point.
- h. All advanced signboards must be installed as per IRC SP 67: 2022.
- i. Provide barricade boards (Type IV), water barricades, and NJ barriers, etc.
- j. Reflective tape, chevron boards, flashlights, rope lights, etc., should be provided to warn commuters during nighttime.
- k. To facilitate easy traffic flow, the time limit for diverting MCW traffic to a service road must be kept to a minimum.
- l. Adequate lighting arrangements should be provided on the service road used as a diversion.
- m. Ensure flagmen (virtual) are provided at both ends of the diversion and at traffic congestion spots in the market.
- n. Entry and exit points must be situated at a 45-degree angle to facilitate lane changes in traffic.



**Actual photos of Road Diversions are as below for reference:**



**Road Diversion in Day Time**



**Road Diversion in the night**

**Partial Diversion for Road Work:**

The following guidelines are to be followed for allowing work on the main carriageway (MCW) for short durations:

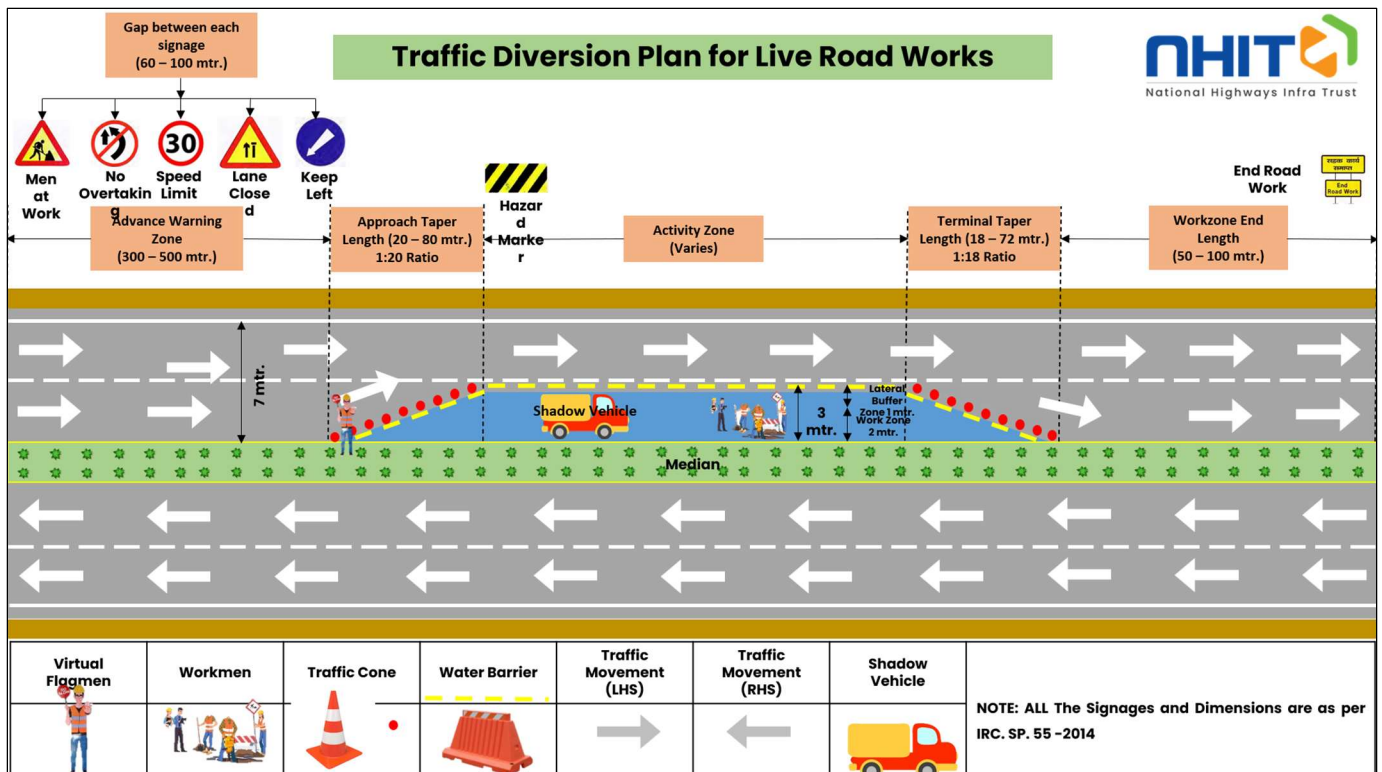
- The lane should be closed by an MS board 500 meters ahead of the work location.
- Blinker or LED chevron lights should be provided.
- A red flag and virtual flagman should be displayed.
- Traffic cones shall be spaced at 5-meter intervals, with one or two layers of cones\* provided in the work zone. The distance between the inner and outer layers of the cones should be 1.2 meters. The outer layer cones should be connected with nylon rope or plastic chain to provide a visible deterrent.
- A signboard (Men at Work) should be displayed to caution commuters at a sufficient distance.
- All signboards shall comply with IRC SP 67: 2022 regulations and IRC SP 55: 2014.

**7.2 Diversion maximum extending up to the day shift – Barricading Requirements for O&M Works:**  
(RRM & any Non routine activity on Live Road including Service Road)

A robust barricading plan must be maintained to ensure the safety of all site workmen, staff, and commuters. The barricading requirements for O&M works on the MCW must strictly adhere to the specifications outlined in the diagram below. If these requirements are not met, the work must not be started.

**Construction and Deconstruction of Work Zone**

- A mechanism shall be put in place to protect workmen on the live carriageway during the construction and deconstruction of the work zone.
- Portable VMS boards should be installed in work zones and for traffic diversions at critical locations.
- Hazard markings and cautionary blinker boards/reflectors should be installed on all vehicles and tractor trolleys hired through subcontractors.




**The following safety guidelines must be implemented for O&M works:**

- a. Provide an MS board with "Arrow marking & Work in progress" display 100 meters ahead of approach zone.
- b. Ensure to provide LED chevron or blinker in case of **fog or when working during inadequate illumination**.
- c. Display signboards such as "**Go Slow**" and "**Speed Limit**" as per the above plan.
- d. Deploy a flagman with red and green flags and a whistle or place a virtual flagman for better visibility and a risk-free approach.
- e. Provide safety arrangements as per the above plan. No work shall be allowed until the arrangement is reviewed by the maintenance in-charge/engineer and approved Permit to Work.
- f. Contractor safety induction must be completed before engaging them in O&M-related work.
- g. The site manager/engineer must evaluate site hazards and risks before planning any type of O&M-related activities on the live road, along with work zone construction and deconstruction precautionary measures.
- h. Unauthorized access should be closed wherever it is opened or used by surrounding people.
- i. Vehicles should be parked with the carriage body facing towards the entrance of the vehicle.
- j. Work shall be executed only when there is dedicated supervision.
- k. Contractors should ensure sufficient manpower to provide safety arrangements on the live carriageway.
- l. In case of road curvature, an MS board with "Men at Work" and arrow markings should be placed on the live carriageway in the lane 500 meters ahead of the working place.
- m. For any work at height, ladders and full-body harnesses should be used by the workmen.
- n. No one should cross the road while talking on the phone and accompanied by supervisor.
- o. Ensure all workers and employees are wearing PPEs at the workplace.
- p. No one should take a rest or sleep in the vicinity of any vehicle at the site.
- q. Contractors should be engaged at the site based on their acceptance of the above safety arrangements as per IRC & NHIT SOP requirements.

**8. TRAINING & AWARENESS:**

Training & Awareness must be conducted to all front-line supervisors & workers for making safe diversions as per approved specifications. It must be included in regular TBTs.

**9. RECORDS:**

Hard copy (Duly filled & signed by maintenance team) of surrendered permit, checklist and other forms & format to be retained & maintained by EHS site EHS department. (Retention period – 4 Months.)



**10. NOTE:**

- a. Tractor-driven water tankers shall not be used for watering median plants or for any other purpose.
- b. Old-generation Hydra cranes shall not be used or engaged for any lifting operations, including incident management works.
- c. Under no circumstances shall manpower be lifted inside a makeshift man basket.
- d. Manpower shall not be transported in a tractor trolley or any other transporting vehicle. The use of passenger vehicles must be ensured at all times.

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# **Annexure B1 - Bank Guarantee Template for Bid Security.**

# National Highways Infra Trust

 National Highways Infra Trust	<b>Bank Guarantee Template</b>	<b>Doc No.:</b> RFP/FY25-26/ Bridge Rehabilitation & Repair works
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## BANK GUARANTEE FORMAT FOR BID SECURITY

(To be stamped in accordance with Stamp Act if any, of the country of issuing bank)

Ref.: **Tender No.** \_\_\_\_\_, **dated** \_\_\_\_\_

Bank Guarantee:

Date:

WHEREAS \_\_\_\_\_ (Name of Bidder) (hereinafter called "the bidder") has submitted his bid dated \_\_\_\_\_ (date) for the **Tender No.** \_\_\_\_\_, **dated** \_\_\_\_\_ (hereinafter called "the Bid").

KNOW ALL MEN by these presents that We, \_\_\_\_\_ [Name of Bank] of \_\_\_\_\_ [Name of Country] having our registered office at \_\_\_\_\_ (hereinafter called "the Bank") are bound unto \_\_\_\_\_ [Name of Client] (hereinafter called "the Client") in the sum of Rs. \_\_\_\_\_ (Rupees \_\_\_\_\_ Lakhs Only) for which payment will and truly to be made to the said Client the Bank binds himself, his successors and assigns by these presents.

SEALED with the Common Seal of the said Bank this \_\_\_\_\_ day of \_\_\_\_\_ 202\_

THE CONDITIONS of this obligation are:

1. If the Bidder withdraws his Bid during the period of bid validity specified in the Bid document; or
2. If the Bidder does not accept the correction of arithmetical errors of his Bid Price in accordance with the Instructions to Bidder; or
3. If the Bidder having been notified of the acceptance of his Bid by the Client during the period of bid validity,
  - a. fails or refuses to execute the Form of Agreement in accordance with the Instructions to Bidders, if required; or
  - b. fails or refuses to furnish the Performance Security, in accordance with the Instructions to Bidders,

we undertake to pay the Client up to the above amount upon receipt of his first written demand, without the Client having to substantiate his demand, provided that in his demand the Client will note that the amount claimed by him is due to him owing to the occurrence of one or any of the conditions, specifying the occurred condition or conditions.

This Guarantee will remain in force up to and including the date 120 (one hundred and twenty) days after the deadline for submission of bids as such deadline is stated in the Instructions to Bidders or as it may be extended by the Client, notice of which extension(s) to the Bank is hereby waived. Any demand in respect of this Guarantee should reach the Bank not later than the above date.

Notwithstanding anything contained herein before, our liability under this guarantee is restricted to Rs. \_\_\_\_\_ (Rs. \_\_\_\_\_) and the guarantee shall remain valid till \_\_\_\_\_. Unless a claim or a demand in writing is made upon us on or before \_\_\_\_\_ all our liability under this guarantee shall cease.

This guarantee shall also be operatable at our New Delhi Branch located at \_\_\_\_\_, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment there under claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation

# National Highways Infra Trust

 National Highways Infra Trust	<b>Bank Guarantee Template</b>	<b>Doc No.:</b> RFP/FY25-26/ Bridge Rehabilitation & Repair works
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DATE \_\_\_\_\_

SIGNATURE OF THE BANK \_\_\_\_\_

SEAL OF THE BANK \_\_\_\_\_

SIGNATURE OF THE WITNESS \_\_\_\_\_

Name and Address of the Witness \_\_\_\_\_

The bank guarantee shall be issued by a bank (Nationalized/Scheduled) located in India

**NOTE for Issuing Bank** (Not to be included in the BG):-

1. *The stamp papers of appropriate value shall be purchased in the name of bank, who issues the "Bank Guarantee".*
2. *The bank guarantee shall be from a Nationalized Indian Bank or reputed foreign commercial Bank acceptable to client for Foreign Consultant with counter guarantee from Nationalized Bank. Bank guarantee furnished by Foreign consultant shall be confirmed by any Nationalized Bank in India.*
3. The bank guarantee(s) contain(s) the name, designation and Code number of the officer(s) signing the guarantee(s).
4. The address, telephone no. and other details of the Head Office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing Branch.
5. The bank guarantee for Rs. 10,000 and above is signed by at least two officials (or as per the norms prescribed by the RBI in this regard).
6. The Bank Guarantee shall be transmitted through SFMS gateway to our banker with following details:

S. No.	Particulars	Details
1	Name of Beneficiary	
2	Beneficiary Bank Account No.	
3	Beneficiary Bank Branch IFSC	
4	Swift Code (For foreign Applicants)	
5	Beneficiary Bank Branch Name	
6	Beneficiary Bank Address	

7. The confirmation with supporting details if any shall be specifically mentioned in the covering letter issued with the Bank Guarantee.

# National Highways Infra Trust

	<b>Bank Guarantee Template</b>	<b>Doc No.:</b> RFP/FY25-26/ Bridge Rehabilitation & Repair works
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## Annexure B2 - Performance Security Template.

# National Highways Infra Trust

 National Highways Infra Trust	<b>Bank Guarantee Template</b>	<b>Doc No.:</b> RFP/FY25-26/ Bridge Rehabilitation & Repair works
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## Bank Guarantee for Performance Security/Additional Performance Security

To,  
NHIT Western/Eastern/Southern Projects Private Limited  
(Formerly National Highway Infra Projects Private Limited)  
G-5 & 6, Sector-10, Dwarka, New Delhi-110075

WHEREAS:

- (A) \_\_\_\_\_ [name and address of contractor] (hereinafter called the “**Contractor**”) and NHIT Western/Eastern/Southern Projects Private Limited, G-5 & 6, Sector-10, Dwarka, New Delhi-110075, (hereinafter called the “**Concessionaire**”) have entered into an agreement (hereinafter called the “**Agreement**”) for the [**Name of Work**], subject to and in accordance with the provisions of the Agreement
- (B) The Agreement requires the Contractor to furnish a Performance Security for due and faithful performance of its obligations, under and in accordance with the Agreement, during the {Construction Period/ Defects Liability Period and Maintenance Period} (as defined in the Agreement) in a sum of Rs..... cr. (Rupees ..... crore) (the “**Guarantee Amount**”).
- (C) We, ..... through our branch at ..... (the “**Bank**”) have agreed to furnish this bank guarantee (*hereinafter called the “**Guarantee**”*) by way of Performance Security.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful performance of the Contractor’s obligations during the {Construction Period/ Defects Liability Period and Maintenance Period} under and in accordance with the Agreement, and agrees and undertakes to pay to the Concessionaire, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the Concessionaire shall claim, without the Concessionaire being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. A letter from the Concessionaire, under the hand of an officer not below the rank of Head SPV in the NHIT Western/Eastern/Southern Projects Private Limited, that the Contractor has committed default in the due and faithful performance of all or any of its obligations under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Concessionaire shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Concessionaire and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.
3. In order to give effect to this Guarantee, the Concessionaire shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or

# National Highways Infra Trust

	<b>Bank Guarantee Template</b>	<b>Doc No.:</b> RFP/FY25-26/ Bridge Rehabilitation & Repair works
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the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

4. It shall not be necessary, and the Bank hereby waives any necessity, for the Concessionaire to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The Concessionaire shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Agreement or to extend the time or period for the compliance with, fulfilment and/ or performance of all or any of the obligations of the Contractor contained in the Agreement or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Concessionaire against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Concessionaire, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Concessionaire of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Concessionaire or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Concessionaire in respect of or relating to the Agreement or for the fulfilment, compliance and/or performance of all or any of the obligations of the Contractor under the Agreement.
7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Concessionaire on the Bank under this Guarantee all rights of the Concessionaire under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The Guarantee shall cease to be in force and effect on \*\*\*\*\$. Unless a demand or claim under this Guarantee is made in writing before expiry of the Guarantee, the Bank shall be discharged from its liabilities hereunder.
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Concessionaire in writing and declares and warrants that it has the power to issue this Guarantee and the undersigned has full powers to do so on behalf of the Bank.
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer

# National Highways Infra Trust

 National Highways Infra Trust	<b>Bank Guarantee Template</b>	<b>Doc No.:</b> RFP/FY25-26/ Bridge Rehabilitation & Repair works
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of the Concessionaire that the envelope was so posted shall be conclusive.

11. This Guarantee shall come into force with immediate effect and shall remain in force and effect for up to the date specified in paragraph 8 above or until it is released earlier by the Concessionaire pursuant to the provisions of the Agreement.
12. This guarantee shall also be operatable at our..... Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.
13. The guarantor/bank hereby confirms that it is on the SFMS (Structural Finance Messaging System) platform & shall invariably send an advice of this Bank Guarantee to the designated bank of NHIT Western/Eastern/Southern Projects Private Limited, details of which is as under:

S. No.	Particulars	Details
1.	Name of Beneficiary	NHIT Western/Eastern/Southern Projects Private Limited
2.	Name of Bank	State Bank of India
3.	Account No.	
4.	IFSC Code	SBIN0017313

Signed and sealed this ..... day of ....., 20..... at .....

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:

(Signature)

(Name)

(Designation)

(Code Number)

(Address)

## NOTES:

- (i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.
- (ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

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## Annexure B3 - Bank Guarantee Template.

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## Guarantee for Advance Payment

To,  
NHIT Western/Eastern/Southern Projects Private Limited  
(Formerly National Highway Infra Projects Private Limited)  
G-5 & 6, Sector-10, Dwarka, New Delhi-110075

WHEREAS:

(A) .....[name and address of contractor]

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(hereinafter called the “**Contractor**”) has executed an agreement (hereinafter called the “**Agreement**”) with NHIT Western/Eastern/Southern Projects Private Limited, G-5 & 6, Sector-10, Dwarka, New Delhi-110075, (hereinafter called the “**Concessionaire**”) have entered into an agreement (hereinafter called the “**Agreement**”) for the [Name of Work], subject to and in accordance with the provisions of the Agreement

- (B) In accordance with Clause [.....] of the Agreement, the Concessionaire shall make to the Contractor an interest bearing [*Specify Percentage*] advance payment (herein after called “**Advance Payment**”) equal to [\_\_% (\_\_\_\_ per cent) ] of the Contract Price; and that the Advance Payment shall be made in \_\_\_\_\_ instalments subject to the Contractor furnishing an irrevocable and unconditional guarantee by a scheduled bank for an amount equivalent to 110% (one hundred and ten percent) of such instalment to remain effective till the complete and full repayment of the instalment of the Advance Payment as security for compliance with its obligations in accordance with the Agreement. The amount of {first/second} installment of the Advance Payment is Rs. ----- cr. (Rupees ----- crore) and the amount of this Guarantee is Rs. ----- cr. (Rupees ----- crore) (the “**Guarantee Amount**”)<sup>§</sup>.
- (C) We, ..... through our branch at ..... (the “**Bank**”) have agreed to furnish this bank guarantee (*hereinafter called the “Guarantee*”) for the Guarantee Amount.

NOW, THEREFORE, the Bank hereby, unconditionally and irrevocably, guarantees and affirms as follows:

1. The Bank hereby unconditionally and irrevocably guarantees the due and faithful repayment on time of the aforesaid instalment of the Advance Payment under and in accordance with the Agreement, and agrees and undertakes to pay to the **Concessionaire**, upon its mere first written demand, and without any demur, reservation, recourse, contest or protest, and without any reference to the Contractor, such sum or sums up to an aggregate sum of the Guarantee Amount as the **Concessionaire** shall claim, without the **Concessionaire** being required to prove or to show grounds or reasons for its demand and/or for the sum specified therein.
2. A letter from the Concessionaire, under the hand of an officer not below the rank of Head SPV in the NHIT Western/Eastern/Southern Projects Private Limited, that the Contractor has committed default in the due and faithful performance of all or any of its obligations for the repayment of the instalment of the Advance Payment under and in accordance with the Agreement shall be conclusive, final and binding on the Bank. The Bank further agrees that the Concessionaire shall be the sole judge as to whether the Contractor is in default in due and faithful performance of its obligations during and under the Agreement and its decision that the Contractor is in default shall be final and binding on the Bank, notwithstanding any differences between the Concessionaire and the Contractor, or any dispute between them pending before any court, tribunal, arbitrators or any other authority or body, or by the discharge of the Contractor for any reason whatsoever.
3. In order to give effect to this Guarantee, the Concessionaire shall be entitled to act as if the Bank were the principal debtor and any change in the constitution of the Contractor and/or the Bank, whether by their absorption with any other body or corporation or otherwise, shall not in any way or manner affect the liability or obligation of the Bank under this Guarantee.

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<sup>§</sup> The Guarantee Amount should be equivalent to \_\_\_\_\_% of the value of the applicable instalment.

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4. It shall not be necessary, and the Bank hereby waives any necessity, for the Concessionaire to proceed against the Contractor before presenting to the Bank its demand under this Guarantee.
5. The Concessionaire shall have the liberty, without affecting in any manner the liability of the Bank under this Guarantee, to vary at any time, the terms and conditions of the Advance Payment or to extend the time or period of its repayment or to postpone for any time, and from time to time, any of the rights and powers exercisable by the Concessionaire against the Contractor, and either to enforce or forbear from enforcing any of the terms and conditions contained in the Agreement and/or the securities available to the Concessionaire, and the Bank shall not be released from its liability and obligation under these presents by any exercise by the Concessionaire of the liberty with reference to the matters aforesaid or by reason of time being given to the Contractor or any other forbearance, indulgence, act or omission on the part of the Concessionaire or of any other matter or thing whatsoever which under any law relating to sureties and guarantors would but for this provision have the effect of releasing the Bank from its liability and obligation under this Guarantee and the Bank hereby waives all of its rights under any such law.
6. This Guarantee is in addition to and not in substitution of any other guarantee or security now or which may hereafter be held by the Concessionaire in respect of or relating to the Advance Payment.
7. Notwithstanding anything contained hereinbefore, the liability of the Bank under this Guarantee is restricted to the Guarantee Amount and this Guarantee will remain in force for the period specified in paragraph 8 below and unless a demand or claim in writing is made by the Concessionaire on the Bank under this Guarantee all rights of the Concessionaire under this Guarantee shall be forfeited and the Bank shall be relieved from its liabilities hereunder.
8. The Guarantee shall cease to be in force and effect on \*\*\*\*.§ Unless a demand or claim under this Guarantee is made in writing on or before the aforesaid date, the Bank shall be discharged from its liabilities hereunder.
9. The Bank undertakes not to revoke this Guarantee during its currency, except with the previous express consent of the Concessionaire in writing and declares and warrants that it has the power to issue this Guarantee, and the undersigned has full powers to do so on behalf of the Bank.
10. Any notice by way of request, demand or otherwise hereunder may be sent by post addressed to the Bank at its above referred branch, which shall be deemed to have been duly authorised to receive such notice and to effect payment thereof forthwith, and if sent by post it shall be deemed to have been given at the time when it ought to have been delivered in due course of post and in proving such notice, when given by post, it shall be sufficient to prove that the envelope containing the notice was posted and a certificate signed by an officer of the Concessionaire that the envelope was so posted shall be conclusive.
11. This Guarantee shall come into force with immediate effect and shall remain in force and effect up to the date specified in paragraph 8 above or until it is released earlier by the

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§ Insert a date being \_\_\_\_\_ days after the end of one year from the date of payment of the Advance payment to the Contractor (in accordance with Clause \_\_\_\_ of the Agreement).

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Concessionaire pursuant to the provisions of the Agreement.

12. This guarantee shall also be operatable at our..... Branch at New Delhi, from whom, confirmation regarding the issue of this guarantee or extension / renewal thereof shall be made available on demand. In the contingency of this guarantee being invoked and payment thereunder claimed, the said branch shall accept such invocation letter and make payment of amounts so demanded under the said invocation.
13. The guarantor/bank hereby confirms that it is on the SFMS (Structural Finance Messaging System) platform & shall invariably send an advice of this Bank Guarantee to the designated bank of NHIT Western/Eastern/Southern Projects Private Limited, details of which is as under:

S. No.	Particulars	Details
1.	Name of Beneficiary	NHIT Western/Eastern/Southern Projects Private Limited
2.	Name of Bank	State Bank of India
3.	Account No.	
4.	IFSC Code	SBIN0017313

Signed and sealed this ..... day of ....., 20..... at .....

SIGNED, SEALED AND DELIVERED

For and on behalf of the Bank by:  
(Signature)

(Name)

(Designation)

(Code Number)

(Address)

NOTES:

- (i) The bank guarantee should contain the name, designation and code number of the officer(s) signing the guarantee.
- (ii) The address, telephone number and other details of the head office of the Bank as well as of issuing branch should be mentioned on the covering letter of issuing branch.

# Contract Data Sheet

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## Contract Data Sheet

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### Contract Data Sheet (CDS)

This Contract Data Sheet (CDS) provides project-specific details as referenced in the Request for Proposal (RFP) for Bridge Rehabilitation & Repair works and General Conditions of Contract.

#### 1. Employer and Contractor – Contact Information

##### 1.1. Employer (Client) Contact Details

Detail	Information
Name of Employer	NHIT Eastern Projects Private Limited
Office Address	Unit no. 3243rd Floor, D21 – Corporate Park, Sector-21, Dwarka –110077, Delhi
Official Contact Person	Sandeep Khosa, GM Procurement
Phone Number	011 49253927
Email ID	tender@nhit.co.in
Employer's Representative (if applicable)	N.A.

##### 1.2. Contractor Contact Details (As per RFP Clause 1.4)

Detail	Information
Name of Contractor	
Office Address	
Authorized Representative	
Phone Number	
Email ID	
If JV/Consortium:	

#### 2. Bid Invitation & Contract Overview (As per RFP Clause 1.1 & 1.2 of RFP; GCC Clause 2)

##### 2.1. Project Title (Clause 4 of RFP)

Request for Proposal (“RFP”) issued by NHIT Eastern Projects Private Limited (NEPPL) for Engagement of Agency/Firm for Bridge Rehabilitation & Repair works for Kachugaon to Kaljhar and Kalijhar to Patacharkuchi Projects in the state of Assam.

##### 2.2. Scope of Work (Brief Overview) (Clause 4.1 of RFP & Annexure [C2] of RFP)

As per attached Annexure C2

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### 2.3. Contract Type & Payment Terms (GCC Clause 14; RFP Clause 2.2.14)

The contract shall be awarded on Item Rate basis. The payment structure shall follow the provisions outlined in the RFP and GCC, as detailed below:

Payment Component	Details
Advance Payment	Not Applicable.
Mobilization Advance Recovery	Not Applicable.
Interim / Milestone Payments	Payments shall be made <b>as per certified progress of work</b> , subject to deductions for advance recovery, retention money, and statutory taxes.
Retention Money	<b>[06] %</b> deduction from each bill, Subject to up to a maximum of 5% of the contract value. Refundable in phases <b>[50] % after substantial completion, [50] % after final acceptance</b> ).
Deductions & Recoveries	Deductions shall include <b>statutory taxes, liquidated damages (if any), and advance recovery</b> as per contract terms.
Price Adjustments (if applicable)	Adjustments for <b>inflation, material cost variations, or statutory changes</b> as per the agreed formula.
Performance Security	<b>[05] %</b> of Contract Value, submitted as <b>BG or FDR</b> , valid until 30 days from the end of the Defect Liability Period (DLP).
Final Payment	Released upon <b>successful completion, certification, and compliance</b> with contract conditions.
Defect Liability Period (DLP) Payment	Any <b>withheld amounts for DLP</b> shall be released <b>after 30 days of rectification of defects</b> within the specified period.
Bank Guarantees (BGs) & Validity	All <b>BGs must be valid for [13] months</b> from the date of submission or as per contract conditions.
Website	www.nhit.co.in

**Note:** NHIT shall be responsible for contract administration, ensuring compliance with the terms and conditions of the RFP and GCC, and overseeing project execution.

### 2.4. Bid Reference & Contract Number

The contract shall be identified by the following references:

Description	Reference
Bid Reference Number	NEPPL/FY25-26/RFP/Bridge Rehabilitation & Repair - Assam
Contract Number	N.A.
Project Code (if applicable)	N.A.
Package Number (if applicable)	N. A.

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## 2.5. Key Dates & Milestones (Clause 1.2 of RFP)

Event Description	Date & Time	Location / Mode (Online/Offline)
Invitation of RFP	08.05.2025	NHIT Office/Offline
Last Date for Receiving Queries / Clarifications	15.05.2025	Online
Pre-Bid Meeting Date	N.A.	N.A.
Pre-Bid Meeting Venue	N.A.	N.A.
Client's Response to Queries / Clarifications	19.05.2025	Online
Last Date of Bid Submission	26.05.2025, 18:00 Hrs	NHIT Office/Offline
Submission of Bid Security & Mandatory Documents	Along with Bid documents	NHIT Office/Offline
Opening of Technical Bid	27.05.2025, 15:00 Hrs	NHIT Office & Online
Declaration of Eligible / Qualified Bidders	To be intimated later	Online
Opening of Financial Bid	To be intimated later	NHIT Office & Online
Letter of Award (LOA)	To be intimated later	Online
Bid Validity Period	120 Days from Submission Date, as per RFP	----
Signing of Agreement	To be intimated later	NHIT Office & Online

**Note: Dates are indicative and subject to change via addendum.**

## 3. Time and Performance Obligations

### 3.1. Commencement and Completion Dates:

(RFP Clause 4; Annexure [C2] of RFP – Scope of Work; Clause 3 of GCC)

Description	Details
<b>Commencement Date</b>	Within 15 days of LoA/WO – The date on which the contract becomes effective, following the issuance of the Letter of Acceptance (LOA) and fulfilment of pre-commencement conditions by the contractor.
<b>Conditions for Commencement</b>	- Submission and approval of Performance Security. - Submission and approval of Insurance Policies as per contract. - Mobilization of key personnel and equipment as per the approved deployment plan. - Submission and approval of the Detailed Work Program.

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<b>Completion Date</b>	Within 06 Months from LoA/WO – The date by which all contractual obligations, including construction, testing, and compliance verification, must be completed as per the approved schedule.
<b>Milestones / Key Project Dates</b>	The contractor shall adhere to the milestone schedule outlined in the contract. Failure to meet key milestones may result in penalties or liquidated damages as per the contract.

### 3.2. Contract Duration

(RFP Clause 4; Annexure [C2] of RFP – Scope of Work; Clause 3 of GCC)

Description	Details
<b>Total Contract Duration</b>	06 Months from the <b>Commencement Date</b> .
<b>Construction / Execution Period</b>	06 Months.
<b>Defects Liability Period</b>	12 Months after the issuance of the Completion Certificate.
<b>Extension of Time (EOT) Conditions</b>	The contractor may apply for an EOT in case of <b>force majeure, employer delays, or other justifiable reasons</b> as per contract provisions. Approval of an EOT is subject to the Engineer’s review and Employer’s approval.
<b>Penalty for Delay</b>	If the contractor fails to complete the works within the stipulated duration, <b>liquidated damages (LD) shall be levied</b> as per contract terms.

### 3.3. Defects Liability Period (Ref: GCC Clause 29)

Description	Details
<b>Defects Liability Period (DLP) Duration</b>	(12 months) from the issuance of the Completion Certificate.
<b>Scope of Contractor’s Obligations</b>	<ul style="list-style-type: none"> <li>- Rectification of any defects, deficiencies, or failures occurring during the DLP.</li> <li>- Conducting necessary inspections and maintenance to ensure the durability of the work.</li> <li>- Responding to defect notifications within the stipulated timeframe.</li> </ul>
<b>Response Time for Rectifications</b>	Minor defects – 10 Days Major defects – 30 Days Critical defects affecting safety – Immediate action required
<b>Retention Money / Security Release</b>	Retention money/security shall be released <b>after successful completion of the DLP</b> and clearance of all outstanding defects.
<b>Failure to Rectify Defects</b>	If the contractor fails to rectify defects within the stipulated time, the Employer may <b>engage a third party to perform the necessary</b>

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	<b>rectifications at the contractor's cost</b> , deducted from retention money or performance security.
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### 3.4. Substantial Completion: (Ref. GCC Clause 23)

Description	Details
<b>Definition of Substantial Completion</b>	The stage when the Works, as per the Contract, are completed except for minor pending works or defects that do not materially affect the intended use of the project.
<b>Conditions for Substantial Completion Certification</b>	<ul style="list-style-type: none"> <li>- All major works are completed as per the approved drawings and specifications.</li> <li>- The project is functional and fit for its intended purpose.</li> <li>- Testing &amp; commissioning (if applicable) is successfully conducted.</li> <li>- Safety and operational compliance are ensured.</li> <li>- Any pending minor rectifications or works do not hinder functionality.</li> </ul>
<b>Issuance of Substantial Completion Certificate (SCC)</b>	Upon fulfilment of the above conditions, the Engineer/Employer shall issue the <b>Substantial Completion Certificate</b> , marking the transition to the Defects Liability Period (DLP).
<b>Responsibility of the Contractor Post-Substantial Completion</b>	<ul style="list-style-type: none"> <li>- Rectification of minor pending works within the specified timeframe.</li> <li>- Adhering to defect rectification obligations during the DLP.</li> <li>- Handover of As-Built Drawings, O&amp;M Manuals, and other necessary documents.</li> </ul>
<b>Final Acceptance and Completion Certification</b>	The <b>Final Completion Certificate</b> shall be issued after the Defects Liability Period, provided all outstanding issues are resolved to the Employer's satisfaction.

This section is structured **in accordance with GCC Clause 23** and provides a clear framework for determining substantial completion.

## 4. Instructions to Bidders (ITB)

### 4.1. Definitions & Interpretations (Ref: RFP Clause 2.1)

All terms shall have the meanings assigned to them as per the **Request for Proposal (RFP)** and **General Conditions of Contract (GCC)**. In case of any inconsistency, the order of precedence shall be as defined in the contract documents.

### 4.2. Earnest Money Deposit (EMD) (Ref: RFP Clause 2.4.1)

EMD Details	Description
<b>EMD Amount</b>	₹ 7,00,000
<b>Mode of Submission</b>	Demand Draft

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<b>Validity of EMD</b>	EMD shall remain valid for a period of [90] days.
<b>Refund Timeline for Unsuccessful Bidders</b>	Within [30] days of bid finalization.
<b>Forfeiture Conditions</b>	<ul style="list-style-type: none"> <li>- Withdrawal or modification of bid during validity period.</li> <li>- Failure to sign the contract or submit performance security within the stipulated time.</li> </ul>
<b>Exemptions (if applicable)</b>	As per the provisions of the RFP, MSME/Startups may be exempted – N.A.

### 4.3. Electronic Submission (If Applicable) (Ref: RFP Clause 2.3.2.8)

Description	Details
<b>Portal for Submission</b>	Not Applicable
<b>Submission Deadline</b>	Not Applicable
<b>File Format &amp; Size Restrictions</b>	Not Applicable
<b>Digital Signature Requirement</b>	Not Applicable
<b>Helpdesk/Support Contact</b>	Not Applicable

## 5. Eligibility & Qualification Criteria

### 5.1. Financial Eligibility (Ref: RFP Clause 3.6.1 & Clause 12.1)

Criteria	Requirement	Reference
<b>Minimum Annual Turnover</b>	₹ [10,00,00,000] (last [03] financial years)	Ref: RFP Clause 3.6.1
<b>Net Worth Requirement</b>	₹ [Should be Positive]	Ref: RFP Clause 3.6.1
<b>Solvency Certificate</b>	Yes	Ref: RFP Clause 3.6.1
<b>Financial Data Submission Format</b>	As per Clause 12.1	Ref: RFP Clause 12.1

### 5.2. Work Experience (Ref: RFP Clause 3 & Clause 12.2)

Criteria	Requirement	Reference
<b>Executed Work Value Requirement</b>	₹ [15,00,00,000] in last [03] years	Ref: RFP Clause 3.2.3
<b>Similar Experience</b>	<ul style="list-style-type: none"> <li>i. Minimum 10 years of experience in Repair &amp; Rehabilitation works out of which at least 5 years should be in Repair &amp; Rehabilitation of All/any of major structural components of a Bridge.</li> <li>ii. Minimum 5 years of experience in replacement of bearings (motion type of</li> </ul>	Ref: RFP Clause 3.2.1

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	Bearing) of Bridges with span not less than 50 meters.  i. Minimum 3 years of experience in undertaking structural strengthening of piers/Girders/Pedestals using Jacketing/Carbon fibre wrapping with minimum 3 nos. completed projects.	
<b>Civil Works Experience</b>	N.A.	Ref: RFP Clause 3.3.3
<b>Electrical Works Experience</b>	N.A.	Ref: RFP Clause 3.3.4
<b>Ongoing Projects (if required)</b>	As per RFP Clause 2.2.7.3 & 12.2	Ref: RFP Clause 2.2.7.3; 12.2
<b>Work Experience Data Submission Format</b>	As per Clause 12.2	Ref: RFP Clause <del>12.2</del>

### 5.3. Joint Venture or Consortium – Not Allowed (For RFP Clause 2.2.1).

## 6. Project Information (Ref: RFP Clause 4)

### 6.1. Time for Completion & Key Dates (Ref: GCC Clause 3.1 & Clause 4; RFP Annexure [C2])

The Contractor shall commence the work within the stipulated time as per the Letter of Acceptance (LoA) and shall ensure completion within the contract duration specified below.

Particulars	Details
Date of Commencement	Within 15 days of LoA/WO
Contract Duration	[06] months from the commencement date
Scheduled Date of Completion	Within 06 months from the date of commencement

### 6.2. Milestones & Performance Benchmarks (RFP Clause 4; Annexure [C2])

The Contractor shall achieve the following key milestones within the stipulated timeline:

Milestone No.	Description	Timeline from Start Date
Milestone 1	Not Applicable	Not Applicable
Milestone 2	Not Applicable	Not Applicable
Milestone 3	Not Applicable	Not Applicable

Failure to meet these milestones shall be subject to penalties or liquidated damages, as per Clause 30 of GCC.

### 6.3. Project Scope (Ref: RFP Clause 4; Annexure [C2])

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As per attached annexure C2

### 6.4. Project Location & Length (Ref: RFP Clause 4.2.4; Annexure [C4])

Description	Details
Project Name	NEPPL/FY25-26/RFP/Bridge Rehabilitation & Repair - Assam
Highway Stretch	Kaljhar – Patacharkuchi and Kachugaon to Kaljhar
Chainage	Refer Annexure C4
Total Length	Refer Annexure C4
State/Region	Assam

### 6.5. Technical Specifications & Standards (Ref: RFP Clause 11.4.2, Section 6.3, Annexure [C7])

The works shall conform to the following applicable standards:

- i. **MoRTH Specifications for Road & Bridge Works**
- ii. **IRC (Indian Roads Congress) Codes & Guidelines**
- iii. **Relevant Indian Standard (IS) Codes**
- iv. **Employer’s Requirements as specified in the RFP**

## 7. Financial Proposal (Ref: RFP Clause 9)

### 7.1. Payment Schedule (Ref: RFP Clause 9.2 & GCC Clause 14)

The Contractor shall be paid as per the approved payment schedule, ensuring compliance with contractual obligations and performance benchmarks.

Particulars	Details
Milestone-Based Payments	[No]
Bill of Quantities-Based Payment	[Yes]
Advance Payment (if applicable)	Not Applicable
Retention Money (Ref: GCC Clause 14.5)	<b>[06] % deduction from each bill, Subject to up to a maximum of 5% of the contract value. Refundable in phases [50] % after substantial completion, [50] % after final acceptance).</b>
Interim Payment Certificates (IPCs)	Issued upon verification of completed work as per BoQ (monthly)
Final Payment	Released after successful completion and final acceptance of works

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<b>Deductions (if any)</b>	Includes retention, penalties, or adjustments for non-conformance
<b>GST Payable Extra</b>	[Yes]
<b>Mode of Payment</b>	[NEFT / RTGS]
<b>Payment Processing Time</b>	Payments shall be processed within [45] days from submission of verified invoice
<b>Taxes &amp; Duties (excluding GST)</b>	As applicable, to be deducted at source (TDS, etc.)

## 7.2. Bills of Quantities (BoQ) (Ref: RFP Clause 9.3)

Measurement and payment shall be made strictly as per the approved **Bill of Quantities (BoQ)** and contractual provisions.

Particulars	Details
<b>Measurement &amp; Payment Terms</b>	As per BoQ
<b>Verification Process</b>	Joint measurement by Engineer & Contractor before certification
<b>Variation in Quantities</b>	Subject to approval and rate adjustments as per contract

## 8. Performance & Security Documents (Ref: RFP Clause 10.1 & 10.2)

### 8.1. Performance Security (Ref: GCC Clause 33 & RFP Clause 10.1)

The Contractor shall submit a **Performance Security** as per the details below:

Particulars	Details
<b>Performance Security Amount</b>	05 % of contract Value
<b>Mode of Submission</b>	Bank Guarantee (BG)
<b>Validity Period</b>	[13] months from the Date of Completion
<b>Issuing Bank Criteria</b>	Scheduled Commercial Bank as per RFP guidelines
<b>Invocation Conditions</b>	Upon default, non-performance, or contract termination

### 8.2. Advance Payment Security (Ref: RFP Clause 10.2)

If an **Advance Payment** is applicable, the Contractor shall provide a **Bank Guarantee (ABG)** as security for the same:

Particulars	Details
<b>Advance Bank Guarantee (ABG) Amount</b>	Equal to the Advance Payment sanctioned

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<b>Format for Bank Guarantee</b>	As per <b>Annexure [B3]</b>
<b>Validity Period</b>	Until full adjustment of advance
<b>Adjustment Mechanism</b>	Deduction from Interim Payments as per the agreed recovery schedule
<b>Bank Guarantee Issuing Authority</b>	Nationalized/Scheduled Commercial Bank

## 9. Payments, Financials, and Security

### 9.1. Insurance Requirements (Ref: GCC Clause 12)

The Contractor shall procure and maintain the following insurances during the contract period:

- i. **Contractor’s All-Risk Insurance** covering loss or damage to works, plant, and materials.
- ii. **Public Liability Insurance** covering third-party claims due to contractor’s operations.
- iii. **Worker’s Compensation Insurance** as per applicable labor laws.
- iv. **Any other insurance required as per Employer’s requirements.**

### 9.2. Currency of Payment (Ref: RFP Clause 2.2.14.3)

All payments shall be made in INR, as per contract terms.

### 9.3. Total Contract Price (RFP Clause 2.1; 2.3)

<b>Total Contract Value</b>	N.A.
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- i. The contract price is inclusive/exclusive of applicable taxes and duties, as defined in the Agreement.
- ii. **GST shall be payable extra, as applicable.**

### 9.4. Liquidated Damages for Delay (Ref: GCC Clause 30)

- i. If the Contractor fails to achieve completion within the stipulated time, **liquidated damages (LD)** shall be levied at **0.5% of contract value per day of delay**, subject to a maximum of **[05] %** of the contract price.
- ii. Delay beyond the maximum LD cap shall be liable for further penalties or contract termination, as per Employer’s discretion.
- iii. In the event of non-payment of liquidated damages as stipulated herein, the Employer shall be entitled to levy an interest @18% till dated of realization of liquidated damages, the said sum shall be payable by sole fact of the delay without the need for any previous notice or any legal proceedings, of proof of damages, which shall in all cases be considered as ascertained. The Employer may, without prejudice to any other method of recovery, deduct the amount of such liquidated damages from any moneys in its hand due for payment to the contractor. The payment of deduction of such damages shall not relieve the contractor of its obligation to complete the work or form any other of its obligations and liabilities under the contract.

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## 10. Supplementary Information for Bidders

Particulars	Details	Reference Clause
<b>Clarifications Issued After Pre-Bid</b>	Any amendments or clarifications post pre-bid meeting will be officially communicated through an addendum.	RFP Clause 11.5 & 2.5
<b>Addendums &amp; Corrigenda</b>	Any modifications to the RFP will be issued through formal addenda. Bidders must regularly check the employer's website/portal.	RFP Clause 11.6
<b>Bidder's Responsibility for Site Conditions</b>	Bidders must examine site conditions before submission. No claims due to lack of site awareness will be entertained.	RFP Clause 2.2.21.4.
<b>Bid Withdrawal &amp; Modification Rules</b>	Conditions under which bidders may withdraw or modify their bids before the submission deadline.	RFP Clause 2.3.2.5.
<b>Confidentiality &amp; non-disclosure</b>	Bidders must not disclose any project-related confidential information. Breach may lead to disqualification.	RFP Clause 2.2.18; 15; GCC Clause 32; 36.3
<b>Disqualification Criteria</b>	Grounds for bid rejection (e.g., non-compliance, blacklisting, fraudulent practices).	RFP Clause 3.8

## 11. Abstract of Relevant Contractual Information

Item No.	Description	Details	GCC Clause
<b>Dispute Resolution and Governing Law</b>			
1	Dispute Resolution Mechanism	Process for resolving disputes (e.g., Arbitration, Mediation).	GCC 18
2	Governing Law	Jurisdiction and applicable laws governing the contract.	GCC 17
<b>Force Majeure and Termination</b>			
3	Force Majeure Clause	Conditions under which force majeure applies and the process for notifying.	GCC 19
4	Termination Clauses	Conditions under which the contract can be terminated by either party.	GCC 20

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Item No.	Description	Details	GCC Clause
<b>Health, Safety, Environment, and Quality Management</b>			
5	Health, Safety, and Environmental Management	Contractor's responsibilities regarding health, safety, and environmental protection.	GCC 11
6	Quality Management	Quality control measures, adherence to standards, and quality certifications required.	GCC 8
<b>Contractor's Obligations</b>			
7	Contractor's Obligations	Contractor's primary responsibilities including timelines, material standards, and compliance.	GCC 4
8	Contractor's Personnel	Details of the required personnel qualifications and roles.	GCC 5
<b>Subcontracting, Risk, and Documentation</b>			
9	Subcontracting and Assignment	Conditions under which the contractor may subcontract or assign parts of the contract.	GCC 6
10	Risk Management	Contractor's obligations for identifying, monitoring, and mitigating risks.	GCC 7
11	Project Documentation and Reporting	Reporting requirements, documentation submission during project progress.	GCC 27
12	Change Management	Procedures for changes in project scope, cost, or time.	GCC 16
<b>Warranties and Maintenance</b>			
13	Warranties and Guarantees	Warranties regarding the quality and performance of work/materials.	GCC 24
14	Maintenance and Performance Standards	Specific maintenance standards and performance benchmarks.	GCC 28
<b>Performance Monitoring, Reporting, and Penalties</b>			
15	Performance Monitoring and Reporting	Requirements for monitoring contractor performance and reporting during execution.	GCC 15

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Item No.	Description	Details	GCC Clause
<b>16</b>	Performance Penalties	Mechanisms for imposing penalties for underperformance.	GCC 15
<b>Intellectual Property</b>			
<b>17</b>	Intellectual Property Rights	Ownership and use of designs, deliverables, or documents created during the project.	GCC 36.3
<b>Miscellaneous Provisions</b>			
<b>18</b>	Compliance with Local Laws & Regulations	Contractor shall comply with labor laws, environmental regulations, and tax obligations.	GCC 4; 13; 17
<b>19</b>	Language of Communication	All official communication, reports, and documents shall be in English.	GCC 31.5
<b>20</b>	Amendments & Modifications	Any modifications to the contract must be agreed upon in writing by both parties.	GCC 16
<b>21</b>	Contractor's Obligations in Case of Termination	Responsibilities in case of contract termination, including project handover.	GCC 3.4; 20

**12. Project-Specific Annexures (Ref: RFP Clause 18)**

The list of project-specific annexures, along with their respective formats and requirements, is detailed in RFP Clause 18 "List of Annexures". Bidders shall refer to Clause 18 (List of Annexures) for complete details and ensure compliance with the submission requirements.

# **Annexure C2- Scope of Works.**

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## A. Preamble

### **Preamble: Scope of Work and Technical Specifications for Comprehensive Bridge Rehabilitation & Strengthening**

This document outlines the scope of work and technical provisions for the **rehabilitation, strengthening, and upgrading of existing bridge structures** under this contract. The objective is to restore the structural integrity, durability, and serviceability of the bridges through systematic repairs, replacement of deteriorated components, and preventive measures against further deterioration.

The Contractor is expected to have conducted a detailed assessment of the site prior to bidding and shall be deemed to have acquainted themselves with the condition of the bridge components, site accessibility, traffic diversion constraints, working height limitations, and safety hazards. **No claims arising from inadequate understanding of site conditions will be entertained during execution.**

**The scope of work includes, but is not limited to:**

- Repair and rehabilitation of superstructure, substructure, and foundation elements;
- Replacement or maintenance of bearings and expansion joints;
- Crack repair using grouting and sealing techniques;
- Shotcreting and surface treatment of distressed concrete;
- Application of protective coatings and waterproofing systems;
- Drainage spout/downpipe repair or replacement;
- Restoration of approach slabs where applicable.

All works shall conform to **the latest revision of the MoRTH Specifications for Road and Bridge Works, relevant IRC codes** (such as IRC:SP:74 and IRC:SP:80), and sound engineering practice. All necessary labour, materials, equipment, safety arrangements, and environmental safeguards shall be arranged by the Contractor.

Each item in this document shall be read alongside the Bill of Quantities (BOQ), which includes item codes, units of measurement, and payment basis. In case of any conflict, the BoQ shall prevail for contractual interpretation, while this document will serve as the execution and quality reference.

The Contractor is responsible for completing the works with due diligence, quality assurance, safety compliance, and within the prescribed timelines to the satisfaction of the Engineer-in-Charge.

## B. Road Works (Typically for Approaches / Deck Slab Overlay)

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## Scope of Work

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### Scope of Activity

## B1. Clearing and Grubbing Debris Around Structures and Vegetation

**Reference Clause:** MoRTH Section 201 (Clearing and Grubbing)

### Scope of Work:

This item includes the clearing and grubbing of debris, vegetation, and plant growth accumulated around structures such as RE panels, retaining walls, abutments, and medians. The work involves the removal of grass, bushes, shrubs, saplings, and trees up to 300 mm girth, including root stumps, without damaging the structure or adjoining facilities. All unserviceable materials shall be disposed of in an approved manner and serviceable materials, if any, shall be stacked for reuse or auction. The entire operation shall be done considering safety, environmental, and aesthetic aspects of the corridor, strictly following Clause 201 of MoRTH Specifications and instructions of the Engineer-in-Charge.

### Methodology:

#### 1. Site Assessment and Demarcation:

- Identify and mark vegetation and debris to be removed.
- Demarcate safe zones to prevent damage to structural elements or utility lines.

#### 2. Vegetation Removal:

- Cut and uproot grass, shrubs, saplings, and trees  $\leq 300$  mm girth using hand tools or mechanized cutters.
- Root removal to be done carefully to avoid disturbing structural foundations.
- Remove any encroaching plantation or waste deposited over RE panels or near walls.

#### 3. Debris and Waste Removal:

- Collect and segregate debris for disposal or reuse.
- Load unserviceable debris into trucks and transport to approved dump yards.
- Stack any salvageable material as per Engineer's direction.

#### 4. Cleaning and Finishing:

- Level and compact the cleared area with manual ramming if necessary.
- Apply herbicide or anti-vegetative chemical (if approved) to prevent regrowth.

#### 5. Safety Measures:

- Workers must wear PPE including gloves, safety boots, and reflective jackets.
- Erect barricades and display warning signs when work is near traffic zones.
- Dispose biodegradable and non-biodegradable waste as per local pollution control norms.

### Materials:

- Hand tools (spades, sickles, crowbars)
- Mechanized bush cutters/chainsaws

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### Scope of Activity

- Bags for segregation of reusable waste
- PPE: gloves, boots, masks, safety vests

#### Indicative Equipment Involved:

- Tractor with trolley or dumper for waste transport
- Chainsaws or mechanical cutters for trees/saplings
- Herbicide spray equipment (if required)
- Manual tools for root extraction

#### Measurement:

- Area in square meters (Sqm) cleaned and grubbed, measured on the plan area around the structure.
- Tree/sapling removal may be measured separately in numbers (Nos) as per girth, if required.

#### Safety and Quality Assurance:

- Ensure minimal disturbance to adjacent infrastructure.
- Regular supervision to ensure roots are fully extracted.
- Waste disposal records to be maintained.
- Follow MoRTH Clause 201 for specifications and workmanship quality.
- Obtain clearance from Engineer-in-Charge before and after execution.

## B2. Approach Slab Mud Jacketing (Void Filling Beneath Slab by Pressure Grouting)

**Reference Clause:** MoRTH Section 2800 (Repair of Structures) — Clause 2806: Grouting, and as directed by Engineer-in-Charge

#### Scope of Work:

This item includes all activities related to the stabilization and re-levelling of settled approach slabs of bridges or culverts by pressure grouting (mud jacking). The process involves drilling holes through the slab, injecting a controlled cementitious grout or mortar mix (or polymer-modified grout) under pressure to fill voids, restore support, and re-establish bearing beneath the slab. This method helps eliminate settlement and prevent further differential movement between the approach slab and the bridge deck.

#### Methodology:

##### 1. Preliminary Inspection and Marking:

- Identify depressions, cracks, or gaps between the approach slab and adjacent pavement/structure.

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## Scope of Work

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### Scope of Activity

- Mark the grid pattern for drilling injection holes (typically at 1.0 to 1.5 m centres or as per site condition).
- 2. Drilling of Injection Holes:**
  - Drill holes of 25–50 mm diameter through the approach slab to reach the voids beneath (depth: 0.5–1.0 m or as encountered).
  - Ensure dust is cleaned from the drilled holes for effective bonding.
- 3. Preparation of Grout/Mortar Mix:**
  - Prepare a cement-sand slurry mix in 1:1 or 1:2 ratio or use PMC grout depending on the extent of void and structural requirement.
  - Add non-shrink or flow-improving admixtures as required.
  - Maintain grout viscosity suitable for pumping and effective filling without creating uplift.
- 4. Grouting Process:**
  - Insert grout nipples into the holes and seal them with suitable fixing compound.
  - Pump the grout using mechanical/manual grouting pumps at a pressure of 3–5 kg/cm<sup>2</sup>.
  - Monitor the uplift or resistance during pumping. Stop when voids are filled or grout appears at adjacent holes.
  - Sequentially inject grout in other holes based on set grid and monitor behaviour.
- 5. Finishing Works:**
  - Remove grout nipples after curing (if temporary).
  - Seal holes with non-shrink grout or polymer-modified mortar.
  - Restore surface level by proper trowelling and curing.

#### Materials:

- OPC Cement (IS: 269/IS: 12269)
- Clean fine sand (zone II)
- Water (potable quality)
- Non-shrink admixture (CICO NSPGC or equivalent)
- Polymer additive (e.g., Tapcrete-151 or equivalent)
- Grout nipples and sealant

#### Indicative Equipment:

- Rotary drill machine
- Mechanical/manual grout pump
- Grout mixing drums with stirrers
- Measuring equipment for pressure and flow

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<b>Scope of Activity</b>
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- PPE: helmets, gloves, gumboots, eye protection, safety harness (if needed)
- Measurement:**
- Measured in **Square Metres (Sqm)** of approach slab area treated, based on actual area covered by mud jacking treatment.
  - Rate includes drilling, material, grouting, sealing, and surface restoration.
- Safety & Quality Assurance:**
- Ensure proper PPE is worn during drilling and grouting.
  - Use barricading and caution signage during work near traffic or open drop.
  - Test pump pressure and material mix before injection.
  - Record pressure and volume injected per hole to ensure consistency.
  - Monitor slab uplift or rebound to prevent over-lifting or cracking.

### **B3. Subgrade Construction with Material from Borrow Pits**

The Contractor shall carry out the construction of subgrade using approved earth sourced from borrow areas in accordance with MoRTH Clause 305 and relevant IRC guidelines. The subgrade forms the bottom-most structural layer of the pavement and is crucial for supporting the overlying layers by providing adequate strength, uniform support, and proper drainage. The borrow earth shall meet the specified requirements for gradation, plasticity, and strength, and be free from organic matter or harmful substances. Before placing the material, the formation shall be dressed, leveled, and approved by the Engineer. The earth shall be laid in layers not exceeding 250 mm (loose), uniformly spread and moisture-conditioned to within  $\pm 2\%$  of the Optimum Moisture Content (OMC), and compacted to not less than 97% of Maximum Dry Density (MDD) as per IS:2720 (Part 8). Earthen shoulders, if any, shall be compacted to 95% MDD. Cross-fall, slope, and line levels shall be maintained throughout the surface to ensure proper drainage and pavement performance. All loose, weak, or segregated areas shall be corrected by scarifying and recompacting. The finished surface shall be dense, stable, and conform to the drawings and approved levels.

- Indicative equipment includes:**
- Excavators for borrow pit operations
  - Tippers/dumpers for material transport
  - Graders/dozers for leveling and dressing
  - Water tankers with sprinklers
  - Vibratory rollers (8–10T) for compaction

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<b>Scope of Activity</b>		
<ul style="list-style-type: none"><li>• Field density testing equipment (core cutter/sand replacement)</li><li>• Camber boards, templates, and levels</li></ul>		

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## Scope of Work

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### C. Concrete Repair & Surface Rehabilitation Works

#### Scope of Activity

#### C1. Removal of damaged concrete (manual/mechanical)

The Contractor shall carry out the **systematic removal of damaged, deteriorated, or delaminated concrete** from structural elements such as girders, piers, abutments, deck slabs, or crash barriers, in accordance with **MoRTH Clause 1700 & Clause 2800** and, where applicable, **Clause 2700**. This activity is intended to restore structural integrity by ensuring that only sound concrete remains prior to repair or retrofitting measures.

The extent of damaged concrete shall be established by **visual inspection, hammer sounding, or Non-Destructive Testing (NDT)** methods such as Rebound Hammer or Ultrasonic Pulse Velocity (UPV), subject to approval by the Engineer-in-Charge. Concrete removal shall be carried out carefully, avoiding damage to adjacent sound concrete or embedded reinforcement.

**Manual methods** using chisels, hammers, and hand breakers shall be employed where delicate removals are needed. For larger or deeper removals, **mechanical means such as electric/pneumatic breakers or hydro-demolition** may be adopted, depending on location, accessibility, and impact on surrounding structure. Reinforcement bars, if exposed or corroded, shall be preserved intact or marked for repair as per further instructions.

The resulting surface shall be free of laitance, dust, loose particles, and shall have an irregular, rough profile suitable for bonding with repair materials. All debris generated shall be collected, transported, and **disposed of safely and legally at an approved location** as per **MoRTH Clause 112**.

Indicative equipment includes:

- **Chisels, hammers, and crowbars** for manual removal
- **Electric or pneumatic concrete breakers**
- **Hydro-demolition equipment (if required)**
- **Wire brushes and surface cleaners**
- **Dust extraction/vacuum units**
- **Waste collection bins and disposal tippers**
- **PPE kits for safety compliance**

#### C2. Surface preparation of exposed concrete area – water jet/sand blasting

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The Contractor shall carry out **surface preparation of exposed concrete areas** by means of **high-pressure water jetting or sand blasting**, as required, to ensure an adequately rough and clean surface for the application of subsequent repair materials in accordance with **MoRTH Clause 1700 & Clause 2800**. This activity is critical for achieving proper mechanical bond between the substrate and patch repair systems such as polymer-modified mortar (PMM), epoxy mortar, or micro-concreting.

All prepared surfaces must be **free from laitance, loose concrete particles, dust, grease, oil, efflorescence, old coatings, and any deleterious substances** that may inhibit bonding. Water jetting shall be done using **high-pressure pumps (typically 350–500 bar or as directed by Engineer-in-Charge)** to remove weak surface layers without damaging sound concrete. For locations requiring aggressive profiling or rust removal from embedded steel, **abrasive blasting with sand or grit** may be employed.

Post surface preparation, the Contractor shall ensure that **reinforcement bars are fully exposed and rust-free** if embedded steel is revealed, and that the **surface is maintained in Saturated Surface Dry (SSD) condition**, wherever required by the repair system manufacturer or specification.

The method of preparation shall be approved in advance and demonstrated through a **mock-up** or sample area for the satisfaction of the Engineer-in-Charge. All waste materials, water, and abrasive media shall be **collected and disposed of in an environmentally safe manner**, conforming to local environmental regulations and **MoRTH Clause 112**.

**Indicative equipment includes:**

- **High-pressure water jetting machine (350–500 bar)**
- **Air compressor with sand blasting gun and grit/sand media**
- **Surface vacuum or blowers for cleaning**
- **Buckets, hand brushes, and SSD maintenance tools**
- **Protective screens, PPEs, and environmental safety enclosures**

### C3. Polymer Modified Mortar (PMM) patch repair

The Contractor shall carry out **patch repair works using Polymer Modified Mortar (PMM)** at all locations where damaged, honeycombed, spalled, or delaminated concrete has been

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removed, as per the direction of the Engineer-in-Charge and in accordance with **MoRTH Clause 1700 & Clause 2800**. The objective is to reinstate the structural integrity, geometry, and surface finish of concrete members by replacing deteriorated sections with a durable, bonded repair material.

Prior to application, the substrate shall be thoroughly **cleaned and prepared** using high-pressure water jetting or sand blasting (as described in Item C2), ensuring a **roughened and dust-free surface**. The **corroded reinforcement bars shall be cleaned**, treated with approved anti-corrosive coating (refer Item D2), and any **additional rebars shall be fixed** as per approved structural drawings.

Polymer Modified Mortar shall consist of **cement, graded sand, water, and polymer additive** in proportions recommended by the manufacturer and approved by the Engineer. The PMM shall be **mixed mechanically** using slow-speed mixers to achieve a homogenous and workable mix. The repair shall be placed manually or with trowels in layers, maintaining good compaction, proper bonding, and profile matching. For large areas or deeper patches, **formwork and layering** shall be adopted as per good repair practices.

The **final surface shall be finished smooth or textured** as required, and the repair shall be **cured using curing compounds or moist curing methods**, maintaining continuous curing for at least 7 days or as specified by the product manufacturer.

**Indicative equipment includes:**

- **Mechanical chisel or breaker for concrete removal**
- **Low-speed mortar mixer (with paddle attachment)**
- **Trowels and finishing tools**
- **High-pressure water jet / sand blaster**
- **Hand tools for mortar application and profiling**
- **Measuring scales and gauges for depth and finish monitoring**

### C4. Epoxy mortar repair

The Contractor shall undertake **epoxy mortar repair works** for restoring localized spalled, cracked, or honeycombed concrete sections, particularly in structural zones where high bond strength and chemical resistance are essential. All works shall be executed in strict compliance with **MoRTH Clause 1700 & Clause 2800** and as directed by the Engineer-in-

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Charge, using pre-approved materials conforming to relevant standards and technical specifications.

The **damaged concrete shall be removed** by mechanical means (using breakers, chisels, or saw cutting) to expose sound concrete with well-defined edges and sufficient depth for effective anchorage. All **loose particles, laitance, oil, or contaminants** shall be removed using **compressed air**, high-pressure water jet, or **abrasive blasting techniques** to achieve a clean, slightly roughened surface for superior bonding.

Exposed reinforcement shall be **cleaned of corrosion**, treated with approved anti-corrosion protective coating, and supplemented with new rebars where required (refer Items D1 to D3). The **epoxy mortar** shall consist of a **two- or three-component system** made of epoxy resin, hardener, and properly graded fillers, mixed in specified ratios using **slow-speed mixers** until a uniform consistency is achieved.

The prepared epoxy mortar shall be **placed manually or with trowels**, compacted into place, and finished to match the adjoining profile. Care shall be taken to ensure that the **substrate is dry and at a permissible temperature range** as recommended by the manufacturer to prevent curing issues. The mortar shall be allowed to cure as per manufacturer's specifications, ensuring **no disturbance, water ingress, or vibration during setting time**.

Indicative equipment includes:

- **Electric or pneumatic breakers and chisels**
- **Low-speed drill-type epoxy mortar mixers**
- **Hand trowels and finishing tools**
- **Compressed air blowers or vacuum cleaners**
- **Surface temperature and moisture meters**
- **Protective gear and epoxy-safe applicators**

### C5. Micro-concreting (flowable repair concrete)

The Contractor shall execute **micro-concreting works** to restore damaged or deficient structural concrete sections, particularly where conventional placement is impractical or inadequate. This activity shall conform to the provisions of **MoRTH Clause 1700 & Clause 2800**, with all operations executed using only approved, high-performance flowable micro-

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concrete materials having requisite compressive strength, flowability, shrinkage-compensation, and bond characteristics.

The **damaged concrete shall first be removed** to a pre-defined depth and boundary using manual/mechanical tools to expose sound concrete. The substrate shall then be **cleaned of dust, debris, grease, or laitance** using pressurized air/water jet and suitably prepared for receiving micro-concrete. Any exposed reinforcement shall be cleaned, treated with anti-corrosive coating, and augmented if necessary.

Formwork shall be designed to be **leakproof, stable, and rigid** to retain the flowable mix without deformation. A **bond coat or epoxy primer** shall be applied to vertical and soffit surfaces if specified by the product manufacturer. The **micro-concrete mix**, either ready-to-use or site-batched using non-metallic aggregates and cementitious grout additives, shall be prepared as per the product datasheet and placed by **gravity flow or pumping**, ensuring complete filling of voids and crevices. Vibrators shall not be used.

The surface shall be **finished flush with adjacent concrete**, and protected from premature drying, vibration, or impact. Curing shall be carried out using **approved curing compounds** or wet hessian cloths for the specified duration to ensure crack-free setting and strength gain.

#### Indicative equipment includes:

- Chipping hammers and electric breakers
- Air/water jet cleaning system
- Mortar mixers or paddle mixers (low-speed)
- Leakproof formwork with injection ports (if required)
- Gravity or pressure-based pumping system
- Measuring gauges and flow cone apparatus
- Curing compound sprayers

### C6. Surface crack filling (epoxy/PMM)

The Contractor shall carry out **surface crack treatment works** involving identification, cleaning, and sealing of visible surface cracks using **Epoxy Resin** or **Polymer Modified Mortar (PMM)** depending on the structural nature of cracks and as directed by the Engineer-in-Charge. All materials, procedures, and quality control shall be strictly in line with **MoRTH Clause 1700 & Clause 2800** and relevant manufacturer specifications.

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The work shall commence with the **visual inspection and mapping** of all surface cracks to classify them as either **structural or non-structural**, and to determine the crack width and depth. **Hairline cracks (<0.5 mm)** shall typically be treated using **low-viscosity epoxy resin**, while **wider surface cracks (>0.5 mm)** or surface irregularities may be repaired using suitably formulated **PMM paste**.

All cracks shall be cleaned thoroughly using **compressed air**, wire brush, or vacuum to remove dust, loose particles, oil, or any contaminants. For epoxy injection, **V-grooves** may be cut along the crack path to improve anchorage where directed. The selected repair compound shall be **injected, brushed, or trowel-applied** depending on the system adopted. Epoxy resin shall be mixed in correct proportions and applied within its pot life.

In the case of PMM application, the surface shall be kept SSD (Saturated Surface Dry) before applying the PMM paste in layers not exceeding the specified thickness. The finished surface shall be **feather-edged with the parent concrete** and left undisturbed during the setting period. Proper **curing or sealing** shall be done as per product recommendation.

#### Indicative equipment includes:

- **Air compressor or vacuum blower**
- **Crack width measuring gauge**
- **Epoxy injection gun (manual or electric)**
- **Hand tools for trowelling PMM**
- **Surface preparation tools (wire brush, grinder, etc.)**
- **Mixing paddle for epoxy/PMM**

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### D. Rebar Treatment & Steel Repair

#### Scope of Activity

#### D1. Removal of corroded steel & rust cleaning

The **Contractor** shall execute the removal of **corroded steel** and **rust cleaning** as part of the structural repair work. This operation shall be carried out with the objective of preparing the steel reinforcement for the application of protective coatings, epoxy bonding agents, or other corrosion inhibitors. The removal of corroded steel and rust shall be conducted in accordance with **MoRTH Clause 1600, Clause 1700 & Clause 2800** and the technical specifications provided by the manufacturer of the repair materials.

The **steel surface preparation** shall be done by **mechanical cleaning methods** such as **abrasive blasting, wire brushing, or grinding**, as necessary, to completely remove rust, loose particles, and corrosion. The surface shall be free from all traces of dirt, oil, grease, or any other contaminants before applying any corrosion protection treatment.

In case of heavy corrosion, **abrasive blasting** using **sandblasting equipment** may be employed to achieve the desired surface cleanliness and roughness. The **minimum level of cleaning** required shall meet the **SSPC-SP6** (Commercial Blast Cleaning) standard or as specified by the Engineer-in-Charge.

Once the corrosion has been removed, the **exposed steel reinforcement** shall be thoroughly examined to identify any pitting or significant damage. In case of excessive damage, **steel replacement** or **augmentation** may be required. The cleaned steel reinforcement shall then be coated with an **anti-corrosive primer** or **zinc-rich epoxy coating** to protect it from future corrosion.

**Indicative equipment includes:**

- **Abrasive blasting machine (sandblasting)**
- **Wire brush**
- **Angle grinder**
- **Handheld power tools for rust removal**
- **Vacuum cleaner or air compressor** for dust and debris removal
- **Coating applicators (spray guns, brushes, etc.)**

#### D2. Anti-corrosive coating for rebars (Zinc-rich, etc.)

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The **Contractor** shall apply an **anti-corrosive coating** to the **exposed steel reinforcement** to prevent further corrosion and ensure the longevity of the structural repair. The coating shall be **zinc-rich, epoxy-based**, or as specified by the Engineer-in-Charge, and shall comply with the requirements stipulated in **MoRTH Clause 1600, Clause 1700 & Clause 2800**.

The surface preparation, as detailed in **D1**, must be completed before the application of the anti-corrosive coating. After the surface preparation and cleaning, the exposed steel shall be **treated with a protective coating**. The coating material must be formulated to provide an **effective barrier** against **moisture, oxygen, and other corrosive agents** that may lead to further degradation of the steel reinforcement.

The **zinc-rich epoxy coating** shall be applied in accordance with the manufacturer's instructions. Typically, it consists of a **two-component system** (primer and finish coat). The primer shall contain a high percentage of zinc, which acts as a sacrificial anode to protect the underlying steel, while the topcoat provides the necessary **mechanical protection** and **adhesion**.

The **dry film thickness (DFT)** of the coating must be verified after application, ensuring that it meets the required specifications and is free of defects such as **pinholes** or **bubbles**. The **minimum DFT** typically ranges from **80 to 120 microns**, depending on the type of coating material specified. Coating thickness shall be measured using **non-destructive testing equipment** such as a **wet film thickness gauge** or **dry film thickness gauge**.

The **contractor** must ensure that the coating is applied under suitable environmental conditions, i.e., temperature and humidity, in accordance with the manufacturer's recommendations. The application shall be carried out using either **spraying, brush application, or roller application**, depending on accessibility and surface configuration.

The **cured anti-corrosive coating** shall provide continuous protection to the rebars and prevent any future corrosion in the reinforced concrete element. Any damage to the coating during construction or after installation must be repaired immediately to maintain the integrity of the protection system.

#### Indicative equipment includes:

- **Airless spray machine** for coating application
- **Brushes and rollers**
- **Wet film thickness gauge**
- **Protective PPE (Personal Protective Equipment)**
- **Zinc-rich epoxy-based primer and topcoat**
- **Dust control systems (vacuum, air compressor)**

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#### D3. Fixing new rebars / anchorage with epoxy grout

The **Contractor** shall fix **new rebars** or **anchorage** using **epoxy grout** as per the project requirements and **MoRTH Clause 1600, Clause 1700 & Clause 2800**. This is typically carried out when additional or replacement steel reinforcement is required in structural repair works. The epoxy grout serves as a bonding agent to secure the rebars in place, ensuring the **structural integrity** and **load transfer** between the existing and new reinforcement.

Before starting the installation of the new rebars or anchorage, the **existing concrete surface** must be **prepared** by cleaning the substrate to remove all **dust, dirt, oil, grease, and other contaminants** that could interfere with the bonding process. Surface preparation shall be carried out using methods such as **abrasive blasting** or **water jetting**, ensuring a **clean, rough surface** to improve bonding.

The **epoxy grout** shall be mixed in strict accordance with the manufacturer's instructions, ensuring the proper ratio of resin and hardener. The **grout** shall be applied using **appropriate tools** and techniques, ensuring thorough penetration and uniform distribution around the rebars or anchorage points. Special attention should be paid to areas where the rebars or anchorage meet the **concrete surface** to avoid air pockets or voids, which may compromise the structural integrity.

Once the **epoxy grout** is applied and the new rebars are in position, they must be kept in place until the **grout has fully cured**. The curing time for the epoxy grout shall be in accordance with the manufacturer's guidelines, but typically it should not be less than **24 to 48 hours** before any loading or stress is applied.

The **Contractor** shall ensure that the **epoxy grout** used is of high quality, **compatible with the type of concrete**, and **suitable for the environmental conditions** (e.g., humidity, temperature). The **epoxy grout** should have high **bond strength, impact resistance**, and be resistant to **chemical attack**, ensuring the longevity of the reinforcement system.

The **Contractor** must also verify the **alignment and positioning of the new rebars** and **ensure proper coverage** of the grout around the rebars. The **finished surface** must be **smooth** and free from defects such as **cracking** or **voids**, which could compromise the bond between the grout and the surrounding concrete.

**Indicative equipment includes:**

- **Epoxy grout mixing equipment** (e.g., paddle mixer)

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- **Injection pumps** (for filling grout into anchorages)
- **Rebar bender and cutter**
- **Drilling machines** (for drilling holes for the new rebars)
- **Surface preparation tools** (abrasive blasters, wire brushes, etc.)
- **Measuring and alignment tools** (laser levels, spirit levels)
- **Protective PPE (Personal Protective Equipment)**

### D4. Rebar augmentation / replacement

The **Contractor** shall carry out the **augmentation or replacement of rebars** as per the **design requirements** and **MoRTH Clause 1600, Clause 1700 & Clause 2800**. Rebar augmentation or replacement is typically required in cases where the existing reinforcement has been **damaged, corroded, or insufficient** for the desired load-carrying capacity of the structure. This procedure is essential for **restoring the structural integrity** of the affected part of the structure and ensuring it meets the **required strength** as per the design specifications.

The **Contractor** shall first conduct a **detailed inspection** of the damaged area to assess the **extent of rebar damage** and determine the **quantity of replacement reinforcement** required. The **existing concrete** shall be **removed** to expose the damaged or insufficient rebars, using **mechanical methods** such as **concrete cutting** or **grinding**, ensuring that the remaining concrete surface is not compromised.

Once the damaged area is cleared, the **new reinforcement** shall be installed in accordance with the **approved design**. The **new rebars** shall be properly **aligned, positioned, and secured** to the surrounding structure. The **Contractor** shall ensure that the replacement rebars match the size and grade specified in the design and that they provide adequate **cover** as per the relevant **design codes**.

If the new rebars are **longer than the existing ones**, the Contractor shall **splice** or **anchor** them properly using **mechanical couplers** or **epoxy grout** as necessary to ensure a **continuous bond** with the existing reinforcement. All splicing and anchoring shall be carried out in accordance with **IRC: 112** and **MoRTH specifications**, ensuring no compromise on the load-carrying capacity.

Once the new rebars are in place, they shall be properly **tied, secured, and supported** using **wire ties, clamps**, or other appropriate methods to prevent **displacement** during subsequent concrete placement. The **Contractor** shall ensure that there is no **overlapping of reinforcement** in critical load-carrying zones unless explicitly permitted by the design.

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After the **rebar installation**, the **Contractor** shall proceed with **concrete pouring** around the new reinforcement, ensuring that the newly placed concrete adheres to the specified **mix design** and **compaction requirements**. The **new concrete** shall be **cured** properly, and the **Contractor** shall verify the **quality of the bonding** between the new and old concrete.

**Indicative equipment includes:**

- **Concrete cutters / diamond saws**
- **Rebar bender and cutter**
- **Mechanical couplers** (if splicing is required)
- **Epoxy injection equipment** (for rebar anchorage)
- **Rebar tying tools**
- **Concrete mixers** (if new concrete is required)
- **Vibrators** (for compaction of newly placed concrete)
- **Surface preparation tools** (grinders, abrasive blasters)
- **Protective PPE** (Personal Protective Equipment)

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### E. Injection Grouting Works

#### Scope of Activity

#### E1. Providing and Inserting Steel Pipe NRV Nipples for Pressure Injection Grouting

**Reference Clause:** MoRTH Section 2800 (Structural Concrete Repairs), IS 9103 (Concrete Admixtures), and as per manufacturer's specification for epoxy/PMC grouting

**Scope of Work:**

This item involves supplying, drilling, fixing, and subsequently removing/sealing steel pipe NRV nipples of 12 mm diameter into structural concrete or similar substrates to facilitate pressure injection grouting using PMC or Epoxy materials. The holes shall be drilled in the range of 16 to 25 mm diameter to a depth between 50 mm and 150 mm at 300 mm c/c (or as directed). NRV Nipples are to be inserted securely with approved fixing compound ensuring a leak-tight fit for injection grouting. After grouting is completed and material has set, NRV nipples shall be cut/removed and holes sealed flush with epoxy mortar or approved sealing compound as directed by the Engineer-in-Charge.

**Methodology:**

**1. Surface Preparation and Marking:**

- Identify and mark locations for insertion of nipples as per grouting plan and spacing.
- Clean surface of dust, oil, loose materials to ensure proper bonding.

**2. Drilling of Holes:**

- Drill holes of 16–25 mm diameter, 50–150 mm deep, at 300 mm c/c (or as required).
- Ensure no reinforcement bars are damaged during drilling.

**3. Insertion of Nipples:**

- Insert 12 mm steel pipe nipples into drilled holes using an approved fixing compound.
- Ensure tight fitting to prevent leakage during injection.
- Let the compound cure as per manufacturer's recommendation.

**4. Grouting:**

- Perform injection grouting using PMC/Epoxy material under pressure through the nipples.
- Grout until refusal or until flow is seen from adjacent ports, indicating saturation.

**5. Post-Grouting Removal and Sealing:**

- After curing of grout, carefully cut/remove nipples flush with surface.
- Seal all holes with epoxy mortar or compatible sealing material as instructed.

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#### Materials:

- 12 mm dia steel pipe NRV nipples (cut to required length)
- Fixing compound: Approved chemical anchoring adhesive or epoxy putty
- Grout: PMC or epoxy injection compound as per specification
- Sealing compound for post-grouting closure
- Water or solvent for surface cleaning

#### Indicative Equipment Involved:

- Rotary hammer drills or core drills with depth control
- Air compressor or electric grouting machine with pressure gauge
- Grout mixing tools
- Hand tools for insertion and cutting of nipples
- PPE for chemical handling

#### Measurement:

- Measured in Number of nipples (Nos) inserted, used, and sealed as per actual executed quantity.

#### Safety and Quality Assurance:

- Use of safety gloves, goggles, and chemical-resistant PPE mandatory.
- Ensure proper ventilation when working with epoxy or PMC materials.
- Verify anchorage of each nipple and perform test injection where required.
- Ensure no voids or leakage during injection – check using flow monitoring.
- Holes must be sealed flush to avoid trip hazards or water ingress after grouting.

## E2. Low-pressure cementitious grouting

The **Contractor** shall carry out **low-pressure cementitious grouting** for the repair and sealing of cracks, voids, and other structural defects in concrete as per the **MoRTH Clause 1700 & Clause 2800** and the relevant **IRC specifications**. Low-pressure cementitious grouting is typically used in **non-structural repairs** and for **sealing active water leaks in concrete structures**. It involves the injection of a **cement-based grout under low pressure to fill voids, cracks, or honeycombing** in concrete.

Prior to the application of grout, the **Contractor** shall thoroughly inspect the damaged or cracked areas. **Surface preparation** shall include **cleaning** the cracks or voids using **compressed air** or **water** to remove any loose debris, dust, or contaminants. In cases where

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the cracks are dry, the **Contractor** shall pre-wet the crack area to ensure better grout penetration.

The **grouting system** shall be prepared using a **cementitious grout mix**, formulated with **water, cement**, and suitable **additives** to ensure optimal **flowability** and **adhesion**. The grout mix shall be designed to meet the specific requirements for **crack filling, waterproofing, and structural repair** as per the relevant **MoRTH specifications**.

The **grouting procedure** involves injecting the grout into the **cracks or voids** under **low pressure**, ensuring that it fills all gaps effectively without causing damage to the surrounding structure. The **Contractor** shall monitor the **pressure levels** during the injection process to avoid over-pressurization, which could lead to further structural damage. The grout shall be injected using appropriate equipment, such as **injection pumps** or **manual pumps**, depending on the size and location of the cracks.

Once the grouting is completed, the **Contractor** shall **seal the injection ports** and allow the grout to **cure** fully. Any excess grout on the surface of the concrete shall be **removed** and the surface shall be **smoothed** as required. If the grouting is intended for **waterproofing**, the **Contractor** shall perform **water testing** after the grout has set to verify the effectiveness of the seal.

#### Indicative equipment includes:

- **Injection pumps** (manual or powered)
- **Grouting equipment** (piping, injectors)
- **Cementitious grout mix preparation units**
- **Compressor or air-blower**
- **Surface preparation tools** (abrasive grinders, wire brushes)
- **Water or air pressure testing devices**
- **Protective PPE** (gloves, safety glasses, etc.)

### E3. Providing and Injecting Polymer Cement Grouting (PMC Grout)

**Reference Clause:** MoRTH Section 2806 (Polymer Modified Cementitious Grouting), IS 1343 (Prestressed Concrete – relevant for pressure grouting), IS 9103 (Concrete Admixtures)

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#### Scope of Work:

This item involves preparing and injecting Polymer Cement Grout (PMC) composed of cement blended with 10% polymer by weight (such as Tapcrete-151 or its equivalent) and a non-shrink admixture (0.5%–1% by weight of cement, such as Cico NSPGC or equivalent), into pre-identified cracks, voids, or honeycombed zones in structural elements. The injection shall be done at a minimum pressure of 4 kg/sq.cm using approved grouting equipment as per the Engineer-in-Charge's direction. The work shall conform to MoRTH Clause 2806 to ensure monolithic structural restoration and durability.

#### Methodology:

##### 1. Surface & Crack Preparation:

- Clean the surface to expose cracks and voids clearly.
- Seal all cracks except for the injection ports using epoxy paste to avoid leakage during grouting.

##### 2. Hole Drilling and NRV Nipple Fixing (if not pre-fixed):

- Drill holes to access voids where required.
- Fix nipples or injection ports using suitable fixing compound.

##### 3. Grout Mixing:

- Mix Ordinary Portland Cement (OPC) with 10% polymer (by weight of cement), and add 0.5% to 1% non-shrink compound.
- Use clean potable water. Maintain Water-Cement ratio as per material supplier's specification for desired flowability and strength.
- Mix uniformly using a mechanical agitator to avoid lumps and air entrapment.

##### 4. Grouting Procedure:

- Inject the prepared PMC grout using a pump capable of maintaining a steady pressure of minimum 4 kg/sq.cm.
- Inject progressively until grout refusal or until it flows from adjacent ports, indicating saturation.
- Plug outlet ports as injection proceeds.

##### 5. Post-Grouting:

- Allow curing of the grout for the prescribed time.
- Cut/remove nipples and seal ports flush using epoxy mortar or compatible filler.
- Maintain curing as per standard protocol.

#### Materials:

- OPC (43 or 53 grade)
- Polymer Additive: Tapcrete-151 or equivalent (10% by weight of cement)
- Non-shrink Admixture: Cico NSPGC or equivalent (0.5–1% by weight of cement)

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- Clean potable water
- Sealing compound for surface crack closing
- Compatible epoxy or sealing compound for post-grouting closure

**Indicative Equipment Involved:**

- Grout mixer with mechanical stirrer
- Grout injection pump with minimum 4 kg/sq.cm pressure rating
- Pressure gauge, injection pipes, and NRV nipples
- PPE including gloves, safety goggles, face mask
- Surface preparation tools (wire brush, chisel, grinder)

**Measurement:**

- Measured in **litres (Ltr)** of polymer cement grout injected based on the actual quantity consumed in the work.

**Safety and Quality Assurance:**

- PPE use mandatory for workers handling chemical admixtures and pressurised injection.
- Trial mix to be conducted before start to confirm flow, setting time, and stability.
- Maintain records of pressure, volume, and location for each injection point.
- Work must comply with MoRTH Clause 2806, ensuring no leakage, good bond, and restoration of monoli thicity.

## E4. Epoxy injection grouting (for structural cracks)

The **Contractor** shall carry out **epoxy injection grouting** for the **repair of structural cracks** in concrete structures as per **MoRTH Clause 1700 & Clause 2800** and **IRC guidelines**. Epoxy grouting is a highly effective method for **restoring structural integrity** in **load-bearing concrete elements** by **filling cracks, voids, and honeycombing** caused by shrinkage, settlement, or structural stresses.

Before applying the **epoxy grout**, the **Contractor** shall thoroughly assess the extent of the **structural damage** and **prepare the cracks** or voids. Surface preparation involves **cleaning** the cracks with **compressed air** or **water**, ensuring the removal of dust, debris, grease, or any foreign material that could affect the bond strength. In case of wet cracks, the **Contractor** shall ensure the area is **dried** or pre-treated to enhance the epoxy adhesion.

The **epoxy grout** mix shall be prepared in accordance with the manufacturer’s guidelines and shall be a two-component system consisting of **epoxy resin** and **hardener**. The mixture

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shall be designed for **high bonding strength**, **low viscosity**, and **high durability** to effectively fill the structural cracks and resist both **physical** and **chemical stresses**. The **Contractor** shall ensure that the grout mix is **free from air pockets** and is mixed to the **correct ratio** to achieve the desired properties.

The **epoxy injection** shall be performed under **high pressure** to force the epoxy grout into the cracks. The grout shall be injected through pre-drilled injection ports located at **strategic points** along the crack line. The **Contractor** shall ensure that the **pressure** used during injection is **controlled** to avoid damaging the surrounding concrete structure. **Pressure gauges** and **flow meters** shall be used to monitor and regulate the **injection process**.

After the epoxy grout has been injected, the **Contractor** shall seal the injection ports and allow the epoxy to **cure** as per the manufacturer's recommendations. Curing shall typically take **12 to 48 hours** depending on the ambient temperature and humidity. Once cured, the **Contractor** shall **clean** the surface and remove any excess epoxy that might have seeped out of the cracks.

The **Contractor** shall conduct a **structural integrity test** to verify that the crack has been successfully sealed, and the strength of the repaired area meets the specified requirements. If required, the **Contractor** shall carry out additional **load testing** to ensure the **restoration of load-carrying capacity**.

#### Indicative equipment includes:

- **Injection pumps** (manual or powered)
- **Epoxy resin and hardener mixing units**
- **Injection ports and valves**
- **Pressure gauges and flow meters**
- **Injection nozzles and tubing**
- **Surface preparation tools** (abrasive tools, wire brushes)
- **Protective PPE** (gloves, safety glasses, respiratory protection)

### E5. PU injection grouting (non-structural/waterproofing)

The **Contractor** shall carry out **Polyurethane (PU) injection grouting** as a **non-structural repair method** primarily aimed at **waterproofing** and **sealing** cracks, voids, and gaps within the **concrete structures**. The **PU grouting** process is highly effective for **hydraulic sealing** applications, especially in **foundations**, **basements**, **tunnels**, and other areas where water

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penetration needs to be controlled or eliminated. The **Contractor** shall adhere to **MoRTH Clause 1700 & Clause 2800** and relevant **IRC guidelines** for executing this work.

Before starting the **PU grouting** process, the **Contractor** shall carefully assess the **cracks, joints, or voids** to be treated. **Surface preparation** involves **cleaning** the cracks or gaps from any dust, debris, or foreign matter, using **compressed air, water jetting**, or any other approved method. Any active water flow within the cracks must be stopped, and the Contractor shall ensure that the area is **dried** before proceeding with the application.

The **PU grout** shall consist of a **single-component** or **two-component system**, depending on the type of grout used. The **Contractor** shall ensure the selected PU grout is **designed for waterproofing** purposes and is **compatible** with the structure's intended use and environmental conditions. The grout should possess **low viscosity** to penetrate deeply into the cracks and **expand upon contact with water**, forming a **flexible and durable seal**.

The **Contractor** shall drill **injection ports** at the crack or void's most strategic locations, ensuring effective injection of the **PU grout**. The **injection process** will involve **low-pressure injection** to ensure that the grout thoroughly fills the cracks and voids. The **Contractor** shall regulate the injection pressure carefully to avoid damaging the surrounding concrete and ensure complete filling of all voids.

Upon injection, the **PU grout** will react with the moisture present in the crack, causing it to **expand and cure**, effectively sealing the area and preventing future water ingress. After the grout has **cured**, the **Contractor** shall remove any residual **excess grout** from the surface and ensure that the area is restored to its original condition.

Once the curing process is completed, the **Contractor** shall **inspect the work** and conduct necessary **tests** to ensure the area is properly sealed and that no further water penetration occurs. The **Contractor** shall carry out a **visual inspection** and may also use **water tests** to confirm the effectiveness of the waterproofing treatment.

#### Indicative equipment includes:

- **Injection pumps** (manual or powered)
- **PU resin and hardener mixing units**
- **Injection ports and nozzles**
- **Pressure gauges**
- **PPE (gloves, safety glasses, respirators)**
- **Surface preparation tools** (abrasive tools, wire brushes)
- **Waterproofing testing kits** (if required)

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#### E6. Microfine/chemical grouting

The **Contractor** shall carry out **Microfine Grouting** or **Chemical Grouting** for sealing **cracks, voids, or injections** in **concrete structures** where **high penetration** and **waterproofing** are required. This method is particularly effective in structures like **foundations, dams, tunnels, and water treatment plants**. The **Contractor** shall ensure compliance with **MoRTH Clause 1700 & Clause 2800** and **IRC guidelines** for the execution of this work.

**Microfine grouting** involves the injection of **finely micronized cementitious materials** mixed with water and specific **chemical additives** to penetrate minute cracks and voids in the concrete. The **chemical grouting** uses materials that react chemically with the surrounding water or moisture in the substrate to form a **gel-like substance**, which effectively fills the voids and **seals** any leaks or cracks.

Before commencing work, the **Contractor** shall conduct a **site survey** to assess the **extent of damage** and the nature of the cracks or voids. The **Contractor** shall then carry out **surface preparation**, including **cleaning** the cracks, voids, and surrounding areas of any debris, dirt, oils, or contaminants, using **high-pressure air** or **water** to ensure that the grouting material adheres properly.

**Microfine grout** consists of **micronized cement** combined with **chemical accelerators** to ensure quick setting and **low viscosity** for deep penetration. The **Contractor** shall mix the grout materials strictly as per the manufacturer's recommendations to achieve the required **consistency** and **performance** standards.

The **grouting process** begins with the installation of **injection ports** at strategic points along the cracks or voids. The **Contractor** shall use **low-pressure injection pumps** to inject the grouting material into the cracks. The **Contractor** must ensure that the grout completely fills all voids and cracks while **avoiding excessive pressure** that could damage the surrounding concrete or structures.

Once injected, the **Microfine grout** will **penetrate deeply** into the cracks, and upon curing, it will bond with the concrete to **seal** and **reinforce** the structure. The **Contractor** shall monitor the curing process and ensure that the grout sets properly, forming a **permanent seal** that prevents water infiltration.

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The **Contractor** shall perform necessary **post-application checks**, including **water leakage tests** and **visual inspections**, to ensure the success of the grouting and confirm that no further leaks or cracks remain in the treated areas.

**Indicative equipment includes:**

- **Grouting pumps (manual or powered)**
- **Microfine cementitious grout**
- **Chemical additives (accelerators, retarders)**
- **Injection nozzles and ports**
- **Pressure gauges**
- **High-pressure air or water cleaning equipment**
- **Surface preparation tools (wire brushes, grinders)**
- **Waterproofing testing kits (if required)**

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## F. Structural Strengthening Measures

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<p data-bbox="204 474 1133 515"><b>F1. Jacketing of beams/columns/Piers with concrete</b></p> <p data-bbox="204 577 1388 766">The <b>Contractor</b> shall carry out <b>jacketing of beams, columns and piers with concrete</b> as part of the structural strengthening and rehabilitation works. This process is aimed at restoring the <b>strength, ductility, and serviceability</b> of deteriorated or damaged structural elements, ensuring they meet the required <b>load-carrying capacity</b>. The work shall be executed in strict accordance with <b>MoRTH Clause 1700 &amp; Clause 2800</b> and relevant <b>IRC guidelines</b>.</p> <p data-bbox="204 826 1388 976"><b>Jacketing</b> involves the application of a <b>reinforced concrete layer</b> around an existing beam or column to <b>increase its strength and enhance its structural performance</b>. The <b>Contractor</b> shall first carry out an <b>assessment</b> of the existing structure to identify the degree of damage, reinforcement corrosion, and areas requiring strengthening.</p> <p data-bbox="204 1037 1388 1263">The work shall begin with <b>surface preparation</b>, where the <b>Contractor</b> will <b>remove</b> any damaged or loose concrete, expose the <b>reinforcement bars (rebars)</b>, and <b>clean</b> them thoroughly using wire brushes, sandblasting, or high-pressure water jets. All <b>corroded rebars</b> shall be cleaned of rust and any debris. If necessary, the rebars shall be treated with <b>anti-corrosive coatings</b> (such as <b>zinc-rich paints</b> or <b>epoxy coatings</b>) as per <b>MoRTH specifications</b>.</p> <p data-bbox="204 1323 1388 1512">After surface preparation, the <b>Contractor</b> shall install <b>additional reinforcement</b> in the form of <b>rebars</b>, which may include <b>vertical stirrups, longitudinal bars, and spirals</b>, ensuring adequate spacing and anchorage in accordance with design specifications. The <b>reinforcement details</b> shall conform to the <b>IS 3370 (Concrete Structures)</b> and <b>IRC SP: 84 for reinforced concrete work</b>.</p> <p data-bbox="204 1572 1388 1798">Once the reinforcement is in place, the <b>Contractor</b> shall <b>mix the concrete</b> in the required proportions, typically using <b>Grade M30 or higher</b> concrete, and shall place it around the reinforcement to form the <b>jacketing layer</b>. The <b>concrete mix</b> shall be designed to provide <b>adequate durability and strength</b> in line with the structural design requirements. The use of <b>self-compacting concrete (SCC)</b> or <b>high-strength concrete</b> may be considered, depending on the specifications and the conditions of the structure.</p> <p data-bbox="204 1859 1388 2009">The <b>concrete placement</b> shall be done carefully, avoiding any air pockets or voids. The <b>Contractor</b> shall ensure proper <b>compaction</b> through <b>vibrators</b> or <b>manual tamping</b> to ensure that the concrete fully envelopes the reinforcement and forms a strong bond with the existing substrate.</p>

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After placing the concrete, the **Contractor** shall **cure** the jacketing using **curing compounds** or **water curing** methods as prescribed in **MoRTH Clause 2800** to ensure that the concrete achieves its designed strength and durability. The curing process shall be maintained for a minimum of **7 days** or as specified in the design documents.

The **Contractor** shall then conduct a thorough **inspection** of the completed jacketing work, ensuring that the concrete is properly bonded, there are no visible cracks, and that the structural performance is as expected. Any defects in the jacketing layer shall be rectified before proceeding further.

#### Indicative equipment includes:

- **Concrete mixers (manual or powered)**
- **Vibration equipment for compaction (needle vibrators, internal vibrators)**
- **Rebar bending and cutting machines**
- **Concrete placement tools (shovels, rakes)**
- **Water curing equipment (if applicable)**
- **Anti-corrosive coating materials**
- **Surface preparation tools (wire brushes, sandblasting equipment)**
- **Curing compounds or water sprayers**

## F2. Carbon Fibre Reinforced Polymer (CFRP) wrapping

The work includes the strengthening of structural elements using **Carbon Fibre Reinforced Polymer (CFRP) wrapping** as per the guidelines outlined in **IS 1343:2012** (Code of Practice for Prestressed Concrete) or **ACI 440.2R-17** (Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures). The scope involves surface preparation, application of CFRP sheets, and ensuring proper bonding of the system with the existing structure. The wrapping shall be installed as per the manufacturer's recommendations and in strict compliance with the relevant design calculations and specifications.

#### Materials:

The CFRP material shall be of the highest quality, conforming to **IS 1343:2012**, and shall be designed for structural strengthening in accordance with the **ACI 440.2R-17** guidelines. The material must be certified for structural applications and meet the standards for tensile strength, durability, and moisture resistance.

#### Methodology:

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- 1. Surface Preparation:** The surface of the concrete to be strengthened shall be cleaned, free from dirt, dust, oil, or any other contaminants that could hinder the bond between the CFRP and the substrate. Surface preparation may include grinding or sandblasting as required.
- 2. Application of CFRP Sheets:** The CFRP sheets shall be carefully applied using a polymer matrix adhesive to bond the sheets to the concrete. The application must be carried out by trained personnel, and the correct amount of resin must be applied to ensure proper bonding.
- 3. Curing and Final Inspection:** After application, the system must be allowed to cure fully according to the manufacturer's specifications. Final inspection shall be done to ensure proper alignment and bonding, and any defects shall be corrected before final approval.

#### Testing and Quality Assurance:

The CFRP wrapping system must be tested in accordance with the **ASTM D3039** standards for tensile properties. Inspection and testing shall be conducted on-site to confirm the proper installation and bonding strength of the CFRP material.

#### Safety Requirements:

Proper safety measures should be followed during the installation of CFRP, including the use of personal protective equipment (PPE) such as gloves, goggles, and respirators to prevent any exposure to harmful chemicals or dust.

#### Indicative Equipment Includes:

- **Surface Preparation Equipment:**
  - **Handheld power grinders or diamond grinders** – for grinding and smoothing the surface to ensure proper bonding of CFRP sheets.
  - **Sandblasting machines** – to prepare the concrete surface by removing contaminants and roughening it for better adhesion.
- **Application Equipment:**
  - **Resin mixing machines** – to mix the polymer matrix adhesive in the required proportions.
  - **Brushes/rollers** – for applying the resin to the surface.
  - **CFRP lamination tools** – for accurately laying down and adhering the CFRP sheets.
  - **Resin pumps** – for applying epoxy-based adhesives for the CFRP.
- **Curing and Monitoring Equipment:**
  - **Moisture content monitoring devices** – to monitor the curing process and ensure proper bonding of the CFRP materials.

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- **Infrared thermometers** – for checking the temperature during the curing process.

**Note:**

The contractor is expected to provide all necessary equipment for the proper execution of the work, as indicated above. The equipment should be in good working condition, and all activities shall be performed in compliance with the relevant safety standards.

### F3. External steel plate bonding

The work involves strengthening the structural elements by bonding **external steel plates** (also referred to as "external steel plate bonding") to the concrete surfaces. This technique is used to enhance the load-carrying capacity of beams, columns, slabs, and other structural members where additional strength is required. The bonding shall be done in accordance with the guidelines of **IS 1343:2012** (Code of Practice for Prestressed Concrete), **ACI 318** (Building Code Requirements for Structural Concrete), and the **ACI 440.2R-17** (Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures), along with relevant industry standards for steel-to-concrete bonding.

The scope includes the following tasks:

1. Surface preparation of the concrete elements to ensure adequate bonding between the steel plate and the concrete.
2. Cleaning and surface preparation of the steel plates.
3. Application of adhesive materials to bond the steel plate to the concrete structure.
4. Proper alignment, positioning, and clamping of the steel plates during the bonding process.
5. Final inspection to ensure the integrity of the bonded system.

**Materials:**

- **Steel Plates:** The steel plates used for bonding shall be of high-strength, corrosion-resistant steel, such as **Fe 415** or **Fe 500** grade. The thickness and size of the steel plate will be as per the design requirements.
- **Adhesives:** The adhesive materials shall be epoxy-based structural adhesives that are specifically designed for bonding steel to concrete. These adhesives must comply with **IS 9103** for construction chemical products, ensuring durability and strength under varying environmental conditions.
- **Surface Preparation Materials:** These include grinding tools, sandblasting equipment, and primers as required for the preparation of the concrete and steel surfaces to facilitate a strong bond.

**Methodology:**

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**1. Surface Preparation:**

a. Concrete Surface: The concrete surface shall be cleaned and roughened to ensure proper bonding of the adhesive. All contaminants, dust, oil, and loose particles must be removed by sandblasting or mechanical means to expose a sound surface for bonding.

b. Steel Surface: The steel plate shall be cleaned, free from rust, oil, or any other contaminants. Grinding or sandblasting should be used to prepare the steel surface for better adhesion.

**2. Application of Adhesive:**

The prepared surfaces of both the steel plate and the concrete shall be coated with the epoxy-based adhesive. The adhesive shall be applied using a trowel, brush, or spray method, ensuring uniform thickness.

**3. Positioning and Clamping:**

The steel plate should be accurately aligned with the concrete surface and then clamped to ensure continuous contact during the curing period. Proper alignment is essential to prevent any shifting or misplacement of the steel plate, which could affect the structural performance.

**4. Curing:**

After placement and clamping, the adhesive shall be allowed to cure as per the manufacturer's instructions. Curing time should be strictly adhered to ensure that the bonding achieves the desired strength. The contractor must monitor the curing process to ensure that the adhesive has properly set before subjecting the structure to any loads.

**5. Final Inspection:**

Once the adhesive has cured, the bonded steel plate shall be visually inspected for proper placement, alignment, and secure adhesion. Non-destructive testing (such as ultrasonic testing) may be required to check the integrity of the bond.

**Testing and Quality Assurance:**

- Bond integrity and adhesion strength shall be tested as per the guidelines in **IS 9103** and other relevant standards.
- Non-destructive testing methods such as ultrasonic testing or pull-off testing may be employed to ensure the effectiveness of the bond between the steel plate and the concrete.

**Safety Requirements:**

- The contractor shall adhere to all safety guidelines for the handling and application of epoxy-based adhesives, including the use of personal protective equipment (PPE) such as gloves, safety goggles, and respiratory protection.

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- Proper ventilation should be maintained while applying adhesives to avoid inhalation of fumes.

#### Indicative Equipment Includes:

- **Surface Preparation Equipment:**
  - **Power grinders or sandblasting machines** – for cleaning and roughening the concrete surface.
  - **Steel grinders or wire brushes** – to remove rust and contaminants from the steel plate surface.
- **Application Equipment:**
  - **Trowels, brushes, or rollers** – for spreading the adhesive on both the steel plate and concrete surface.
  - **Glue dispensing machines** – for precise application of adhesive.
- **Clamping and Positioning Equipment:**
  - **Steel clamps or hydraulic presses** – to ensure proper bonding and alignment of the steel plate with the concrete surface during curing.
  - **Alignment jigs** – for precise positioning of the steel plates.
- **Curing Equipment:**
  - **Infrared thermometers** – to monitor temperature during the curing process to ensure optimal adhesive bonding.

#### Note:

The contractor is responsible for ensuring that all equipment is in proper working condition. The contractor should also provide the required technical manpower to perform the work according to the specifications and within the defined time frame.

## F4. Steel jacketing / confinement

#### Scope of Work:

Steel jacketing or confinement involves wrapping or encasing structural members such as beams, columns, and walls with steel plates or sections to enhance the structural capacity and protect them from further deterioration. This technique is primarily used to restore the load-bearing capacity of structural elements in cases where concrete deterioration, corrosion, or other factors have led to a reduction in strength. Steel jacketing is commonly employed for the repair and strengthening of columns, beams, or structural members as per the **IRC:SP:80** (Guidelines for Strengthening of Concrete Structures) and **IS 3370** (Code of Practice for Concrete Structures for the Storage of Liquids).

The work involves the following tasks:

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1. **Surface preparation** of the concrete member to ensure the proper adhesion of steel plates or jackets.
2. **Cutting, shaping, and installation** of steel plates or structural steel sections to cover the concrete member.
3. **Welding, bolting, or riveting** of the steel plates to ensure a secure and permanent installation.
4. **Surface finishing** to ensure proper sealing and prevention of moisture ingress.

#### Materials:

- **Steel Plates / Sections:**

Steel plates or structural steel sections (angles, channels, I-beams, etc.) used for jacketing should conform to **IS 2062** (Hot Rolled Medium and High Tensile Structural Steel). The steel should have a minimum yield strength of **250 MPa** for mild steel or **415 MPa** for high-strength steel, as per the design requirements.

- **Welding and Fastening Materials:**

- **Weldable steel electrodes** conforming to **IS 814** (Specification for Covered Electrodes for Manual Metal Arc Welding).
- **Bolts, nuts, and washers** should conform to **IS 1367** for high-strength fasteners.

- **Surface Preparation Materials:**

Surface preparation shall be done using sandblasting, wire brushing, or mechanical means to remove all dirt, oil, grease, and corrosion from the concrete and steel surfaces.

- **Epoxy-based Adhesive (if applicable):**

For bonding steel plates to concrete, an epoxy-based adhesive, conforming to **IS 9103**, shall be used. The adhesive should be suitable for the specific environment and ensure long-term bonding.

#### Methodology:

1. **Surface Preparation:**

- **Concrete Surface:** The surface of the concrete member shall be cleaned to remove dirt, debris, oils, and any other contaminants using abrasive blasting or other suitable methods. Any exposed reinforcement shall be cleaned of rust, and the surface should be roughened to promote adhesion.
- **Steel Surface:** The steel plates or sections shall be cleaned by sandblasting or wire brushing to remove mill scale, rust, oil, and dirt. The surface should be prepared to ensure a smooth bonding between the steel and the concrete.

2. **Steel Plate / Section Installation:**

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- The steel plates or sections shall be carefully measured, cut, and shaped to the size and dimensions as per the design drawings.
- These plates shall be aligned with the concrete member and secured using welding, bolting, or riveting, as required. The joints between steel plates shall be tightly fitted to avoid any gaps that could weaken the bond.

#### 3. Welding / Bolting:

- **Welding:** The steel plates shall be welded using appropriate welding methods. All welds should comply with **IS 816** (Code of Practice for Use of Structural Steel in Overhead Line Towers) and **IS 9595** (Code of Practice for Arc Welding of Structural Steel). Welds should be free from cracks, undercuts, or any discontinuities.
- **Bolting:** If bolted connections are used, the bolts should be high-strength, corrosion-resistant bolts, and fastened in accordance with **IS 1367**. The bolted connections should be designed to ensure that the steel jacket remains securely in place under service loads.

#### 4. Sealing and Finishing:

- Once the steel plates are installed and secured, the joints between plates shall be sealed with appropriate **epoxy sealants** to prevent water ingress.
- The finished steel jacket shall be coated with a corrosion-resistant primer or paint to enhance durability, especially if the structure is exposed to aggressive environmental conditions. The coating material should conform to **IS 1477** (Code of Practice for Painting of Ferrous Metals) and should be applied in multiple coats for long-lasting protection.

#### 5. Inspection and Testing:

- The bonded steel jacket shall be inspected for proper alignment, secure fastening, and correct placement. Non-destructive testing methods such as ultrasonic testing or magnetic particle testing may be employed to ensure the integrity of the welds or bolted connections.
- A visual inspection shall be conducted to check for any visible defects or improper installation of the steel jacket.

#### Testing and Quality Assurance:

- All welds shall be tested as per **IS 816** to ensure their strength and durability.
- If bolted connections are used, torque testing should be conducted on the bolts to ensure that they are tightened to the required specifications.
- A visual and ultrasonic inspection of the steel jacket shall be conducted to confirm the integrity and completeness of the work.

#### Safety Requirements:

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- Adequate safety measures shall be adopted while handling heavy steel plates and during the welding or bolting process. The contractor shall ensure that the workers are trained and equipped with the necessary personal protective equipment (PPE) such as welding helmets, gloves, and safety boots.
- The use of proper lifting equipment such as cranes, hoists, or mechanical lifts is mandatory for handling large steel plates or structural sections.

#### Indicative Equipment Includes:

- **Surface Preparation Equipment:**
  - **Sandblasting machines or grinders** for cleaning concrete and steel surfaces.
  - **Wire brushes** for cleaning rust and contaminants from steel surfaces.
- **Welding Equipment:**
  - **Arc welding machines** for welding the steel plates to the concrete surface.
  - **Welding electrodes** conforming to **IS 814**.
- **Cutting Equipment:**
  - **Plasma cutters or cutting torches** for cutting steel plates to the required size.
  - **Angle grinders** for edge finishing and preparation of steel plates.
- **Lifting Equipment:**
  - **Cranes, hoists, or winches** for lifting and positioning heavy steel plates or sections.
  - **Hydraulic jacks** for precise positioning of large steel sections.
- **Bolting and Fastening Equipment:**
  - **Torque wrenches** for tightening bolts to the specified torque.
  - **Riveting tools** (if applicable) for fastening steel sections together.
- **Safety Equipment:**
  - **Personal Protective Equipment (PPE):** Welding helmets, gloves, face shields, and fire-resistant clothing for workers.
  - **Lifting slings and chains** for safe handling of heavy steel components.

#### Note:

The contractor is responsible for ensuring that all equipment used is in proper working condition and complies with the safety standards. The contractor shall also ensure that all personnel are adequately trained to handle the equipment and perform the work as per the required quality standards.

#### Relevant MoRTH / IRC Specifications:

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- **MoRTH Specification:** IRC SP: 74 – Guidelines for Repair and Rehabilitation of Concrete Bridges (This standard includes provisions for the application of steel jacketing for bridge structures).
- **IS 800:2007** – Code of Practice for General Construction in Steel: Provides guidelines for the design and construction of steel structures, including steel jacketing techniques.
- **IS 15988:2013** – Guidelines for Seismic Evaluation and Strengthening of Existing Reinforced Concrete Buildings: Offers guidance on strengthening techniques, including steel jacketing, for structures subjected to seismic forces.
- **IS 456:2000** – Code of Practice for Plain and Reinforced Concrete: Outlines the design and application of jacketing for reinforced concrete elements.
- **ACI 440.2R-17** – Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete Structures: Provides complementary guidance on strengthening concrete structures, including the use of steel jacketing.

## F5. Providing and Fixing MS Lining Plate for Steel Plate Jacketing

**Reference Clauses:** MoRTH Section 2600 (if applicable), IRC: SP:37, IRC:112, and IS:2062 for MS Plates

**Work Type:** Structural Strengthening / Rehabilitation of Bridge Piers, Columns, or Beams

### Scope of Work:

This item involves the supply, fabrication, and fixing of Mild Steel (MS) lining plates as part of **steel plate jacketing** for strengthening deteriorated or deficient structural members such as bridge piers, columns, or beams. The MS plates shall be fabricated as per the approved design and drawing, conforming to IS:2062 Grade-B or higher. The work includes surface preparation, fitting, tack welding, fillet welding, bolt fixing (if specified), and corrosion protection of the plates after installation.

### Methodology:

1. **Surface Preparation of Existing Structure:**

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- Remove any deteriorated concrete, rust, paint, or loose particles from the surface of the pier/column using sandblasting, wire brushing, or mechanical grinding.
  - Clean the surface thoroughly and level it where uneven.
  - Ensure the surface is dry and free of oil, dust, or grease.
2. **Fabrication of MS Plates:**
- Cut the MS plates as per the approved structural design to match the profile of the member to be jacketed.
  - Drill holes or prepare slots if bolted connections are included.
  - Ensure all edges are properly chamfered and burr-free.
3. **Fitting and Fixing of MS Plates:**
- Position the MS plates around the member and temporarily fix them using clamps or tack welds.
  - Use appropriate lifting equipment where necessary.
  - Ensure correct alignment and flush joints between plates.
4. **Welding and Fastening:**
- Perform full fillet welding or stitch welding along all joints, vertical and horizontal, as per design.
  - Where bolts are specified, use high-strength bolts and apply epoxy mortar or grout around them.
  - Provide adequate ventilation and fire protection during welding work.
5. **Injection Grouting (if required):**
- In case of gaps between the jacket and existing concrete, inject non-shrink grout or polymer-modified mortar to fill the void.
  - Ensure complete filling without air pockets using pressure grouting.
6. **Corrosion Protection:**
- After welding and grinding, clean the entire surface of the MS plates.
  - Apply **primer coat** of zinc-rich epoxy and **two coats of epoxy-based paint** or equivalent anti-corrosive coating as approved by the Engineer.
  - Paint should be applied as per manufacturer's recommendations and only under suitable weather conditions.

#### Materials:

- MS Plates (IS:2062 Grade B or better)
- High-strength bolts/nuts/washers (if used)
- Epoxy grout / Non-shrink grout (if grouting is required)
- Zinc-rich primer and epoxy paint for corrosion protection
- Welding rods conforming to IS:814 (E6013 or as specified)

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**Indicative Equipment Involved:**

- Welding machine and accessories
- Cutting torches or plasma cutters
- Grinding and surface preparation tools
- Grouting equipment (for voids)
- Lifting and rigging equipment
- PPE for welding and cutting works

**Measurement:**

- Measured in **square metres (Sqm)** of MS plate surface area fixed in position, including all cuts, laps, overlaps, welding, fasteners, and coatings.

**Safety and Quality Assurance:**

- All welding to be done by certified welders.
- Use appropriate PPE: welding shields, gloves, safety harness (if working at height).
- Ensure continuous supervision and NDT testing of welds (DPT or ultrasonic if critical).
- Maintain material test certificates (MTCs) for MS plates.
- Record of epoxy coating DFT (dry film thickness) to be maintained.

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## G. Expansion Joint Works

Scope of Activity
<p><b>G1. Removal of damaged expansion joint</b></p> <p>The contractor shall carry out the removal of damaged, worn-out, or deteriorated expansion joints from the designated locations as per the project requirements. The scope includes the complete removal of the existing joint materials, including seals, asphalt, and any other associated components, while ensuring that the surrounding structure (deck, bridge, or slab) is not damaged in the process. The contractor shall ensure that the removal is performed in a manner that minimizes disruption to the structure and facilitates a smooth transition for the installation of new expansion joint materials. Proper disposal of the removed materials shall be done in accordance with environmental guidelines.</p> <p>The contractor shall take all necessary precautions during the removal process to ensure the safety of workers, the protection of the surrounding infrastructure, and the prevention of any unnecessary damage to the structural elements. The work shall be executed in compliance with all relevant specifications and standards.</p> <p><b>Relevant MoRTH / IRC Specifications:</b></p> <ul style="list-style-type: none"><li>• <b>MoRTH Specification:</b> IRC SP: 73 – Guidelines for Design and Construction of Expansion Joints for Bridges (This guideline includes the design, removal, and installation processes for expansion joints in bridge structures).</li><li>• <b>MoRTH Clause 2600</b> – Expansion Joints for Bridges (This clause provides specific requirements for the removal and installation of expansion joints on bridges and similar structures).</li><li>• <b>IRC 83 Part II</b> – Guidelines for Highway and Bridge Expansion Joints (This code provides detailed provisions for the design and removal of expansion joints in roadways and bridges).</li><li>• <b>IS 12118:1987</b> – Code of Practice for the Installation of Joint Fillers for Roadways and Bridges (This standard addresses the removal of expansion joints and the installation of new fillers).</li></ul> <p><b>Materials:</b></p> <ol style="list-style-type: none"><li>1. <b>Sealant Material:</b> The existing sealant materials such as bituminous or rubber-based sealants shall be identified and removed according to the applicable specifications for expansion joint removal.</li><li>2. <b>Asphalt or Bituminous Materials:</b> If the expansion joint involves asphaltic materials, they should be removed carefully without damaging the surrounding road surface.</li><li>3. <b>Waste Disposal:</b> All removed materials, including sealants and asphalt, shall be disposed of at approved disposal sites in compliance with environmental norms and regulations.</li></ol>

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#### Execution:

1. **Site Preparation:** The area around the expansion joint shall be cordoned off for safety and to prevent any accidents during the removal process. Proper signage and barricading shall be provided as per MoRTH guidelines.
2. **Removal Process:** The damaged expansion joint material shall be carefully removed using appropriate tools and equipment. Special care shall be taken to avoid causing damage to the adjoining concrete or pavement.
3. **Debris Disposal:** All debris and waste material from the removed expansion joint shall be collected and disposed of as per the project's waste disposal plan and local environmental guidelines.
4. **Cleaning and Inspection:** After removal, the surface of the deck or slab shall be thoroughly cleaned to remove any residual debris, dust, or contaminants to ensure a clean surface for the installation of the new expansion joint.
5. **Safety Measures:** All safety precautions shall be implemented during the removal process, including the use of appropriate personal protective equipment (PPE) and ensuring that workers are trained in safe handling procedures.

#### Indicative Equipment Includes (for site execution):

- **Hydraulic or Pneumatic Tools:** For cutting and removing old expansion joint materials.
- **Angle Grinders / Concrete Cutters:** For cutting through damaged concrete or asphalt sections adjacent to the joint.
- **Excavators / Backhoes:** For removing larger segments of damaged joints or sections that need to be lifted.
- **Waste Disposal Bins:** For the collection and removal of debris.
- **Hand Tools:** Hammers, chisels, and other manual tools for detailed removal work.

## G2. Groove cutting and cleaning

The contractor shall carry out groove cutting and cleaning at the specified locations as per the project requirements for the proper installation of new expansion joints. This work includes cutting grooves of the specified dimensions (depth, width, and length) into the existing concrete or asphalt surface to prepare it for the installation of the new expansion joint systems. The cutting shall be done in a precise manner to ensure that the joint material will fit seamlessly, ensuring effective load transfer and minimal maintenance in the future.

After groove cutting, the contractor shall thoroughly clean the grooves to remove any debris, dust, dirt, oil, or any other contaminants that may interfere with the proper bonding of the joint material. The cleaning shall ensure that the groove surface is free from all

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foreign materials, which might prevent the effective adhesion of the joint system to the substrate.

The contractor must ensure that the work is completed in a safe manner, maintaining all necessary precautions and complying with the relevant specifications, guidelines, and standards.

#### Relevant MoRTH / IRC Specifications:

- **MoRTH Clause 2600** – Expansion Joints for Bridges (This clause outlines the requirements for preparing and cutting grooves in bridge decks and roadways for the installation of expansion joints).
- **IRC SP: 73** – Guidelines for the Design and Construction of Expansion Joints for Bridges (This guideline specifies the process and technical requirements for cutting and cleaning grooves for expansion joints).
- **IS 12118:1987** – Code of Practice for the Installation of Joint Fillers for Roadways and Bridges (This standard provides guidance on the necessary preparation of grooves for expansion joint filler installation).
- **IRC 83 Part II** – Guidelines for Highway and Bridge Expansion Joints (This code includes provisions for the proper treatment and preparation of grooves for effective joint installation).

#### Materials:

1. **Groove Cutting Tools:** Diamond-blade saws or other suitable tools for cutting grooves into the concrete or asphalt.
2. **Cleaning Agents:** Suitable solvents or cleaning agents for the removal of oils, greases, or other contaminants from the groove surfaces.
3. **Cleaning Equipment:** Air compressors, wire brushes, or specialized cleaning equipment to ensure the grooves are free of debris.
4. **Sealant Material:** High-quality sealants or fillers as per the approved specifications to be used for filling grooves once they are cut and cleaned.

#### Execution:

1. **Site Preparation:**
  - The work area shall be marked and cordoned off for safety, with appropriate barricades and signage installed as per MoRTH guidelines.
  - Proper traffic management and safety protocols should be in place if the work is carried out on live roadways or bridges.
2. **Groove Cutting:**
  - The groove shall be cut using diamond blade saws or suitable equipment, ensuring precise dimensions according to the design requirements.

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- Care shall be taken to avoid damaging the surrounding concrete or pavement while cutting the groove. The groove shall be cut to the required depth, width, and length as per the project drawings or specifications.
- The cutting operation shall be carried out with appropriate dust control measures, including water spraying or vacuum systems, to minimize airborne particles and maintain a clean work environment.

#### 3. Cleaning of Grooves:

- After cutting, the grooves shall be thoroughly cleaned using air compressors, wire brushes, and other appropriate tools.
- If necessary, cleaning agents may be applied to remove any oils, greases, or residues from the groove surface.
- The cleaned groove shall then be dried and inspected for any remaining contamination before the installation of the joint sealant.

#### 4. Inspection and Quality Control:

- The groove dimensions and cleanliness shall be checked against the design requirements. Any deviations from the required dimensions shall be rectified before proceeding with the next step.
- The contractor shall ensure that the groove surfaces are smooth, clean, and free from any defects or contamination that might affect the performance of the expansion joint.

#### 5. Safety Measures:

- All workers shall use appropriate personal protective equipment (PPE), including goggles, gloves, and ear protection, during the cutting and cleaning operations.
- Adequate measures shall be taken to ensure that the surrounding infrastructure is protected from damage during the cutting process.
- Proper ventilation shall be provided if any chemicals or solvents are used for cleaning.

#### Indicative Equipment Includes (for site execution):

- **Diamond Blade Saw / Concrete Cutter:** For precise cutting of the grooves to required dimensions.
- **Air Compressor:** For cleaning the grooves and removing debris.
- **Wire Brushes / Hand Tools:** For manual cleaning of the groove surfaces.
- **Cleaning Solvents:** For removing any contaminants from the grooves.
- **Vacuum Systems / Water Spraying Equipment:** For dust control during cutting.
- **PPE:** Safety gear for workers, including protective gloves, goggles, and ear protection.

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#### G3. Fixing of strip seal / compression seal joint

The contractor shall carry out the fixing of strip seal or compression seal joints at specified locations as per the project requirements. This task includes the preparation, installation, and proper sealing of the expansion joint system, ensuring smooth operation and effective protection against weathering, traffic-induced stress, and environmental elements. The work will be executed by following the manufacturer's instructions and relevant standards for the specified joint type.

The contractor shall ensure that the joint system, whether strip seal or compression seal, is securely and accurately fixed in place. The installation process includes placing the joint components into the pre-prepared grooves or slots, ensuring that they are aligned correctly and function optimally in both compression and tension.

The contractor shall also ensure that the proper bonding material, such as adhesives or sealants, is used according to the manufacturer's specifications. All components shall be checked for dimensional accuracy and compliance with design requirements before proceeding with the installation.

#### Relevant MoRTH / IRC Specifications:

- **MoRTH Clause 2600** – Expansion Joints for Bridges (This clause outlines the requirements for the installation and fixing of expansion joints, including strip seal and compression seal systems).
- **IRC SP: 73** – Guidelines for the Design and Construction of Expansion Joints for Bridges (This guideline specifies the correct installation techniques for various types of expansion joints, including strip seal and compression seal joints).
- **IRC 83 Part II** – Guidelines for Highway and Bridge Expansion Joints (This code includes the application and installation of compression and strip seal joints for bridge expansion joints).
- **IS 12118:1987** – Code of Practice for the Installation of Joint Fillers for Roadways and Bridges (This standard provides guidance on the correct installation of joint fillers, which is a component of the strip seal or compression seal system).
- **ASTM D5329-19** – Standard Guide for Installation of Compression Seal Joints (Relevant for the installation of compression seal joints, providing detailed steps and requirements).
- **EN 14188-5:2013** – Asphalt and Bituminous Materials for Expansion Joints (Provides standards for the use of bituminous and elastomeric sealants in expansion joints).

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#### Materials:

1. **Strip Seal / Compression Seal Components:** High-quality pre-manufactured rubber strips or compression seals, as per the project specifications.
2. **Bonding Adhesive/Sealant:** Sealants or adhesives compatible with the rubber components and the substrate, ensuring strong bonding and weatherproofing.
3. **Backing Material:** Suitable backing material to support the sealant, such as foam, to ensure proper compression and expansion.
4. **Cleaning Agents:** Solvents or cleaning agents for preparing the surface before installation.

#### Execution:

##### 1. Site Preparation:

- The work area shall be cleaned and marked as per the project requirements.
- All expansion joints and adjacent surfaces must be free from debris, dirt, dust, and moisture to ensure proper bonding and effective sealing.
- Temporary barricades or safety signs shall be placed to ensure safe working conditions around live roadways or bridges.

##### 2. Groove Preparation:

- The grooves or slots in the pavement or bridge deck shall be checked to ensure they meet the design dimensions, including width, depth, and length.
- If necessary, the contractor shall carry out any additional groove cutting, cleaning, or preparation work to ensure that the joint system fits correctly and securely.

##### 3. Fixing of Strip Seal / Compression Seal Joint:

- The contractor shall install the strip seal or compression seal joint in the prepared groove, ensuring that the seal is properly aligned.
- The seal shall be positioned in a way that ensures its compression and expansion abilities are maintained throughout its service life.
- The bonding adhesive or sealant shall be applied as per the manufacturer's guidelines, ensuring uniform distribution along the surface of the joint.
- The seal shall be pressed into place, ensuring that it fits snugly and is adequately compressed for optimal sealing performance.
- The contractor shall also ensure that any backing material is positioned as required, providing additional support to the sealant.

##### 4. Inspection and Quality Control:

- After the joint is installed, the contractor shall inspect the alignment, compression, and overall installation to ensure compliance with the design requirements and specifications.

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- The joint shall be checked for any air pockets, improper alignment, or insufficient compression. Any defects shall be rectified before proceeding with the completion of the work.
- The contractor shall also check the sealant's bonding quality to ensure that the adhesive or sealant is properly cured and providing a strong bond.

#### 5. Safety Measures:

- All workers shall use appropriate personal protective equipment (PPE), including gloves, goggles, and safety shoes, during the installation process.
- Proper traffic management and safety protocols must be in place if the work is carried out on live roadways or bridges.
- The contractor shall ensure that adequate ventilation and dust control measures are taken if any adhesives or sealants are used during the process.

#### Indicative Equipment Includes (for site execution):

- **Rubber Strip Seal / Compression Seal Materials:** High-quality pre-manufactured joint materials for installation.
- **Sealant and Adhesive Applicators:** Equipment for applying adhesives or sealants to the joint surfaces.
- **Cleaning Tools (Wire Brushes / Air Compressors):** For cleaning grooves and ensuring proper surface preparation before installation.
- **Backer Rods / Foam Materials:** To ensure proper compression and expansion capabilities for the seal.
- **Measuring and Alignment Tools:** For accurate fitting and alignment of the joint.
- **PPE (Personal Protective Equipment):** Safety gear, including gloves, goggles, and safety footwear.

### G4. Providing and Fixing New Expansion Joint – Filler Type

**Reference Clause:** MoRTH Section 2600 – *Expansion Joints* (Clause 2602 to 2607), IRC: SP:69, and as directed by the Engineer-in-Charge

#### Scope of Work:

This item includes all works related to the removal of damaged or deteriorated expansion joints (if any) and the provision and installation of new **filler-type expansion joints** across bridge deck joints. The filler-type joint is intended to accommodate thermal expansion and contraction, vehicular load movements, and structural deflections while ensuring a watertight seal and continuity of the wearing surface.

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The scope includes surface preparation, installation of compressible filler board, edge protection angles, sealants, primer, and protective coating. The work shall be executed in accordance with MoRTH specifications and approved drawings.

#### Methodology:

##### 1. Site Preparation:

- Mark the exact location of the expansion joint as per approved drawings.
- Remove existing damaged joint materials, debris, or concrete (if applicable) using appropriate cutting or chiselling tools.
- Clean the joint gap thoroughly, ensuring it is free from dust, grease, loose particles, and moisture.

##### 2. Installation of Filler Board:

- Insert a pre-moulded **compressible filler board** (such as bitumen impregnated fibreboard or closed-cell polymer board) of the specified thickness and depth into the joint gap.
- Ensure the filler board is continuous along the length and tightly fits the joint to avoid movement or displacement.

##### 3. Fixing of Edge Protection (if specified):

- Provide mild steel or galvanized edge angles on either side of the joint gap, properly aligned and anchored using bolts/dowels embedded in epoxy grout.
- Weld or mechanically fix the angle sections to ensure a neat and protected edge for the bituminous or concrete wearing surface.

##### 4. Sealant Application:

- Apply a compatible primer on the vertical faces of the joint groove.
- Install **backer rod** (compressible foam) if required to control the depth of the sealant.
- Pour **polysulphide or elastomeric sealant** using a sealant gun, ensuring it adheres well and remains slightly concave to accommodate expansion/contraction.

##### 5. Surface Restoration:

- Restore the wearing course (bituminous or cement concrete) adjacent to the joint using approved material.
- Finish the surface flush with the deck to ensure smooth passage for traffic.

#### Materials:

- Pre-moulded compressible filler board (bitumen impregnated, polymer type, or as specified)
- Elastomeric / polysulphide sealant conforming to IS:12118
- Primer compatible with sealant

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- MS or GI edge angles (if required)
- Backer rod (PE foam)
- Fasteners, epoxy grout (for angle anchorage)

#### Indicative Equipment:

- Angle grinders/cutters
- Drilling machine for dowel fixing
- Sealant gun and primer applicator
- Grouting tools
- PPE for site workers (gloves, eye protection, safety shoes)

#### Measurement:

- Measured in **running metres (RM)** of expansion joint fixed as per approved drawing.
- Rate to include complete material supply, surface preparation, fixing, sealing, anchoring, and surface reinstatement.

#### Safety & Quality Assurance:

- Ensure joints are placed accurately and securely with no obstruction to expansion.
- All sealants and filler boards must be as per approved make and test-certified.
- Ensure adequate curing of sealant before opening to traffic.
- Provide barricading during work and ensure joint edges are chamfered or protected.
- Maintain joint width uniformity throughout and ensure watertightness is achieved.

### G5. Pourable sealant fixing in joints

The contractor shall carry out the fixing of pourable sealant in the joints of the specified locations as per the project requirements. The work involves cleaning, preparation, and application of pourable sealant to fill the joint gaps, providing an effective seal against environmental factors, water penetration, and other potential stresses. The contractor shall ensure that the sealant is applied correctly, adhering to the design specifications and manufacturer's instructions, and providing a long-lasting and durable solution for the joint.

The contractor shall ensure that the joint is properly cleaned and all loose debris, contaminants, and moisture are removed before the sealant is poured. The pourable sealant shall be mixed, applied, and cured according to the manufacturer's specifications, ensuring its effectiveness over the long term in various environmental conditions.

#### Relevant MoRTH / IRC Specifications:

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- **MoRTH Clause 2600** – Expansion Joints for Bridges (This clause outlines the installation and sealing of expansion joints, which may include pourable sealant in specific applications).
- **IRC SP 73** – Guidelines for the Design and Construction of Expansion Joints for Bridges (This guideline includes provisions for the installation of pourable sealants in bridge joints).
- **IS 12118:1987** – Code of Practice for the Installation of Joint Fillers for Roadways and Bridges (This standard includes installation guidelines for sealants and fillers, which are a part of the pourable sealant fixing process).
- **ASTM D6690-17** – Standard Specification for Joint Sealants, Hot-Applied, for Concrete and Asphalt Pavements (This standard specifies the use of hot-applied pourable sealants for concrete and asphalt joints).
- **EN 14188-5:2013** – Asphalt and Bituminous Materials for Expansion Joints (This European standard specifies pourable sealants and their application in expansion joints).

#### Materials:

1. **Pourable Sealant:** High-quality, polymer-modified bitumen or elastomeric-based sealant, as per the project specifications. The sealant must be compatible with the materials of the joint and provide resistance to environmental factors such as temperature fluctuations, UV rays, and moisture.
2. **Cleaning Agents:** Suitable solvents or cleaners to ensure that the joint surfaces are free of dust, debris, and moisture before applying the sealant.
3. **Backing Material (Optional):** Suitable foam backer rods or similar materials to support the sealant and ensure proper compression and expansion capabilities, if required.
4. **Adhesive (If required):** For bonding the sealant to the substrate, depending on the type of joint and surface.

#### Execution:

1. **Site Preparation:**
  - The contractor shall ensure that the joint surfaces are clean, dry, and free from contaminants. Cleaning should be done using wire brushes, air compressors, or vacuum systems to remove dust, dirt, and moisture.
  - The contractor shall verify that the joint dimensions (width, depth) are in accordance with the design requirements. Any excess materials or irregularities in the joint shall be removed prior to sealant application.

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- Temporary barriers or covers shall be placed to protect the joint from contamination during the installation process, especially if work is performed on active roadways or bridge decks.

#### 2. Mixing of Sealant (If Applicable):

- If the sealant requires mixing before application, the contractor shall ensure that the sealant is mixed according to the manufacturer's instructions to ensure proper consistency and performance.
- The sealant must be thoroughly blended to ensure uniform distribution of all components and prevent any separation or inconsistency during curing.

#### 3. Application of Pourable Sealant:

- The contractor shall pour the sealant into the joint, ensuring that it completely fills the joint cavity and that there is no air entrapment.
- For hot-applied sealants, the contractor shall use proper heating equipment to bring the sealant to the required temperature before application.
- The sealant must be applied evenly and should slightly overfill the joint to account for shrinkage during curing.
- The contractor shall ensure that the sealant is applied in layers if necessary, especially for joints with deeper cavities, ensuring each layer is fully cured before applying the next.

#### 4. Finishing and Curing:

- After pouring, the sealant shall be leveled and smoothed to a uniform surface, ensuring that the sealant is flush with the joint edges.
- The contractor shall allow the sealant to cure as per the manufacturer's instructions, ensuring that the joint is fully sealed and waterproof.
- Curing times will vary depending on the type of sealant used and environmental conditions (temperature, humidity). The contractor shall ensure that no traffic or loads are applied to the joint until the sealant has fully cured.

#### 5. Inspection and Quality Control:

- The contractor shall inspect the installed sealant to ensure that it has been applied correctly, fills the joint completely, and is free from defects such as air pockets, cracks, or improper curing.
- The contractor shall also inspect the surrounding joint surfaces for any imperfections or contamination that could affect the bonding or performance of the sealant.
- Any defects or issues identified during inspection shall be rectified immediately.

#### 6. Safety Measures:

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- All personnel shall wear appropriate personal protective equipment (PPE), including gloves, goggles, and safety boots, while handling hot sealants or sealant-related chemicals.
- Safety barriers, cones, and warning signs must be used to demarcate the work area, especially if work is conducted near live roadways or bridges.

#### Indicative Equipment Includes (for site execution):

- **Sealant Dispensers (Manual or Automated):** For accurate and controlled application of the pourable sealant.
- **Heating Equipment (For Hot-Applied Sealant):** To heat the sealant to the required temperature for application.
- **Cleaning Tools (Wire Brushes / Air Compressors):** For cleaning the joint surfaces before sealant application.
- **Backer Rods / Foam Materials (If Required):** To ensure proper sealant compression and expansion.
- **Measuring Equipment:** For checking joint dimensions and sealant level.
- **PPE (Personal Protective Equipment):** Gloves, goggles, and safety footwear for the protection of workers.

### G6. Elastomeric concrete in joint chamber

The contractor shall carry out the installation of elastomeric concrete in the joint chambers as per the project requirements. Elastomeric concrete is a specialized type of concrete designed to provide enhanced flexibility and durability in high-stress areas such as expansion joints and bridge deck chambers. The work includes surface preparation, mixing, placing, compacting, and curing of elastomeric concrete in the designated joint chambers. The primary purpose of using elastomeric concrete is to ensure a strong, flexible, and durable joint system that accommodates movement and reduces the risk of joint failure.

The elastomeric concrete shall be applied in strict accordance with the project specifications, ensuring that it meets the required mechanical properties, bonding capabilities, and durability standards.

#### Relevant MoRTH / IRC Specifications:

- **MoRTH Clause 2600** – Expansion Joints for Bridges (This clause provides general guidelines for the installation and sealing of expansion joints, which include the use of elastomeric concrete in certain applications).
- **IRC SP 73** – Guidelines for the Design and Construction of Expansion Joints for Bridges (This IRC guideline includes specifications for the use of elastomeric concrete in joint chambers for bridges).

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- **IRC SP 79** – Guidelines for Strengthening and Rehabilitation of Bridges (Elastomeric concrete can be part of strengthening applications, particularly in joint chambers).
- **IS 13311-2:1992** – Non-Destructive Testing of Concrete: Part 2 – Ultrasonic Pulse Velocity (This standard may be used to assess the integrity of elastomeric concrete post-application).
- **IS 456:2000** – Code of Practice for Plain and Reinforced Concrete (General guidelines for the mixing and placement of concrete, applicable for elastomeric concrete).
- **ASTM C309-18** – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete (Relevant when considering curing compounds for elastomeric concrete).
- **ACI 548.2R-13** – Guide for the Use of Fiber-Reinforced Concrete (For fiber-reinforced elastomeric concrete applications, if applicable).

#### Materials:

1. **Elastomeric Concrete:** A specially formulated concrete mixture containing elastomeric resins, polymer modifiers, and appropriate aggregates. The concrete must exhibit the required flexibility, tensile strength, and resistance to environmental degradation, ensuring the durability of the joint system.
2. **Aggregates:** Well-graded aggregates with the appropriate size and grading as per the specifications, ensuring proper mix consistency and bond strength.
3. **Polymer/Elastomeric Additives:** Materials such as rubber or polymer compounds that are added to the concrete mix to enhance its flexibility, reduce cracking, and improve its durability under dynamic loads.
4. **Water:** Clean, potable water shall be used for mixing the concrete.
5. **Curing Compounds (If Applicable):** Suitable curing agents that will be used to maintain proper hydration and strength gain in the elastomeric concrete.

#### Execution:

1. **Site Preparation:**
  - The contractor shall ensure that the joint chamber surfaces are clean, free from any debris, dust, oil, grease, or other contaminants that could affect the bond between the elastomeric concrete and the joint surfaces.
  - The chamber should be adequately dried (if needed) before the application of elastomeric concrete.
  - Any loose or deteriorated concrete within the joint chamber must be removed and replaced, ensuring a sound substrate for the new elastomeric concrete.
2. **Mixing of Elastomeric Concrete:**

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- The elastomeric concrete shall be mixed in accordance with the manufacturer's specifications and project requirements, ensuring proper proportions of cement, polymer additives, aggregates, and water.
- The contractor shall ensure that the mix is homogeneous and free from air pockets.
- If fiber reinforcement is part of the design, it shall be added to the mixture as per the specifications, ensuring even distribution throughout the concrete.

#### 3. Placement of Elastomeric Concrete:

- The elastomeric concrete shall be placed in the joint chamber as a continuous pour, ensuring complete filling of the cavity without leaving gaps or voids.
- The contractor shall use mechanical vibrators or hand tools (depending on the size of the chamber) to ensure proper compaction and consolidation of the concrete.
- The joint chamber should be filled completely to the required level, with any excess concrete removed or leveled to match the finished surface.

#### 4. Curing:

- The elastomeric concrete shall be cured immediately after placement to ensure proper hydration and strength development. The contractor shall use water-based curing methods or curing compounds as per the manufacturer's recommendations.
- Curing time and conditions shall be monitored closely, with the contractor ensuring that the curing process is completed without interruption for the required duration to ensure maximum strength and durability.

#### 5. Finishing:

- The surface of the elastomeric concrete should be finished to the specified texture and smoothness.
- The contractor shall ensure that the final surface is flush with the surrounding deck or joint surfaces and that no cracks or irregularities are present after the curing process.

#### 6. Inspection and Quality Control:

- The contractor shall inspect the completed elastomeric concrete to ensure that it meets the required thickness, surface finish, and bond strength.
- Any defects, such as air pockets, cracks, or inconsistencies in the surface, must be rectified immediately.
- The contractor shall also test the compressive strength of the elastomeric concrete, ensuring that it meets the specified strength requirements before the joint chamber is opened to traffic or further use.

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**Indicative Equipment Includes (for site execution):**

- **Concrete Mixers:** For thorough mixing of elastomeric concrete.
- **Vibration Equipment (Mechanical/Hand Vibrators):** For proper compaction and consolidation of the poured elastomeric concrete.
- **Finishing Tools (Trowels/Floaters):** For smoothing and leveling the concrete surface.
- **Curing Equipment (Sprayers/Water Tanks):** For ensuring proper curing of the elastomeric concrete.
- **Cleaning Tools (Wire Brushes/Blowers):** For cleaning the joint chamber surfaces before application.
- **PPE (Personal Protective Equipment):** Gloves, goggles, and safety boots to protect workers during concrete placement and curing.

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### H. Bearing Replacement Works

#### Scope of Activity

#### H1. Lifting of girders (hydraulic jacking)

**Refer MoRTH clause 1400, Clause 2000, Clause 2200**

The contractor shall undertake the safe and effective lifting of girders using **hydraulic jacking** methods to facilitate the replacement of bearings or other structural interventions. This operation involves raising the girder to a predetermined height to provide sufficient clearance for bearing replacement while maintaining structural integrity throughout the process. The method must comply with the relevant safety, technical, and environmental standards.

The **hydraulic jacking** system should be capable of lifting the girder uniformly without introducing any differential stresses that may affect the structure's alignment or stability. It must be equipped with precise lifting equipment such as synchronized hydraulic jacks and load cells to monitor and control the applied force. The lifting operation should be performed under the supervision of qualified engineers and according to the guidelines provided by the manufacturer of the hydraulic equipment.

The contractor shall ensure that all necessary safety measures are in place, including barricading the work area, providing appropriate personal protective equipment (PPE) to workers, and ensuring proper signaling and communication systems are established. A comprehensive risk assessment and method statement must be provided prior to commencing the work.

**Materials & Equipment:**

- **Hydraulic Jacks:** Capable of safely lifting the girder to the required height.
- **Synchronized Jacking System:** Ensures uniform lifting to avoid angular displacement.
- **Load Cells & Sensors:** To measure and control the load during lifting.
- **Steel Lifting Beams and Spreader Bars:** To distribute the lifting force evenly across the girder.
- **Temporary Supports:** To stabilize the girder during the lifting and bearing replacement process.

**Procedure:**

1. **Pre-Lifting Inspection:** Ensure that the girder, lifting points, and hydraulic jacking equipment are structurally sound and safe for operation.
2. **Positioning of Hydraulic Jacks:** Place the hydraulic jacks under the girder at designated lifting points, ensuring that they are symmetrically aligned to prevent any misalignment during the lifting process.

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3. **Lifting Process:** Gradually raise the girder using the synchronized hydraulic jacks. Continuously monitor the load applied to each jack using load cells. Ensure that the girder is raised uniformly and avoid any sudden movements or jerks.
4. **Height Adjustment:** Maintain the girder at the required height, ensuring it remains stable and properly aligned.
5. **Post-Lifting Inspection:** Once the girder is lifted to the specified height, inspect the temporary support systems and ensure that the girder remains secure before proceeding with the bearing replacement.

#### Safety and Quality Considerations:

- Ensure the lifting procedure is conducted in compliance with relevant **IS codes, MoRTH guidelines, and IRC standards.**
- The lifting equipment and procedure should be reviewed and approved by a structural engineer.
- The contractor must maintain **adequate monitoring systems** to track and control the lifting operation.
- All equipment used should be regularly inspected and certified for safe use.

#### Testing and Measurement:

- Verification of the **lifting capacity** and performance of the hydraulic jacks.
- Ensure that the **height of lifting** is measured accurately to meet the required clearance for bearing replacement.

## H2. Dismantling of old bearing

### Refer MoRTH Clause 2000 & Clause 2200

The contractor shall undertake the dismantling and removal of the **old bearings** from the bridge structure. The scope includes the complete removal of all existing bearings, along with any associated components such as anchor bolts, base plates, and other materials connected to the bearing system. The work must be executed in a manner that minimizes any impact on the structural integrity of the bridge, ensuring no damage to surrounding elements like girders, supports, or the deck.

Prior to dismantling, the contractor shall assess the condition of the bearings and surrounding areas to develop a strategy for safe removal. The method of dismantling should be chosen to avoid causing any damage to the foundation, substructure, or any part of the structure that is to remain intact.

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#### Materials & Equipment:

- i. **Wrenches & Torque Tools:** To remove bolts and nuts without damaging the surrounding structure.
- ii. **Cutting Equipment:** In case of the need to cut through any corroded or damaged components.
- iii. **Lifting Cranes or Hydraulic Jacks:** For removing large or heavy bearing components.
- iv. **Hoisting Slings & Supports:** To handle the bearings and ensure safe removal.
- v. **Personal Protective Equipment (PPE):** Including helmets, gloves, and fall protection for workers involved in dismantling operations.

#### Procedure:

##### 1. Preparation & Safety Measures:

- Secure the work area, setting up barriers and safety zones to prevent unauthorized access.
- Perform a safety check to ensure all workers have appropriate PPE and that all equipment is in good working order.
- Check the structural stability of the area around the bearing, and ensure temporary supports are in place if necessary.

##### 2. Disconnection of Bearings:

- Remove any anchor bolts, nuts, and washers securing the old bearings to the bridge structure.
- Use appropriate **tools** such as wrenches, impact drivers, or cutting tools to disconnect the bearings without damaging surrounding components.

##### 3. Removal of Bearings:

The **removal of bearings** is a critical operation that requires careful planning and execution to avoid any structural damage and ensure the safety of personnel and equipment. The method used will depend on the type, size, and condition of the existing bearings.

#### Step-by-Step Procedure for Bearing Removal:

##### i. Preparation for Lifting:

- Before starting the lifting operation, ensure that all **surrounding structural elements** (such as girders, bridge deck, and substructure) are adequately supported with temporary supports or **shoring**. This prevents any unwanted movement of the structure during the bearing removal process.
- Confirm that the **bearing pedestal area** is clean, free from debris, and any obstacles that might hinder the lifting operation.

##### ii. Disconnection from Supporting Structure:

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- **Anchor Bolts:** First, remove the **anchor bolts** or other fastening mechanisms securing the bearing to the pedestal or structural base. Use appropriate **wrenches, impact drivers, or torque tools** to unscrew the bolts. Ensure that no bolts are left loosely attached, as they could create hazards during the lift.
- **Isolation of the Bearing:** If the bearing is fixed in place due to corrosion or adhesion, it may be necessary to apply a **cutting tool** (such as a **grinder** or **diamond cutter**) to release any hardened material or bond. This should be done carefully to avoid damaging the bearing pedestal or nearby structures.
- iii. **Lifting and Extraction of the Bearing:**
  - Once the bearing is disconnected, **hydraulic jacks** or **lifting cranes** (depending on the bearing size and location) should be used to gently lift the bearing off its base. The lifting must be performed **symmetrically** and **gradually** to ensure the load is evenly distributed.
  - **Lifting Slings and Hoists:** If using cranes, **lifting slings** should be properly secured around the bearing, ensuring that the slings are positioned correctly to avoid any slippage. Always check the **lifting angle** to ensure stability during the lift.
  - **Hydraulic Jacks:** If using hydraulic jacks, ensure that the lifting points are strong and stable. The jacks should be placed on firm, level ground, and the bearing should be raised slowly and steadily to avoid any sudden shifts or stresses on the structure.
- iv. **Handling of Bearings:**
  - As the bearing is lifted, care must be taken to **avoid sudden impacts or shocks** that might cause damage to the bearing, surrounding components, or the structure itself.
  - **Large bearings:** For large, heavy bearings, **multiple lifting points** may be necessary to ensure balanced lifting. It is important to coordinate the lifting operation with all involved parties to ensure the lifting equipment works in unison.
  - **Fragile bearings:** If the bearing is fragile or has been deteriorated due to environmental factors (e.g., corrosion), extra care should be taken to avoid any crushing, bending, or distortion during the lifting process.
- v. **Transporting the Bearing for Disposal:**
  - Once the bearing has been lifted, it should be carefully moved from the bridge structure. Depending on its size and weight, **heavy-duty trolleys** or **flatbed trucks** may be used to transport it to the disposal site.
  - Ensure that the bearing is securely fastened during transport and does not shift, potentially damaging nearby infrastructure or causing an accident.
- vi. **Final Inspection and Documentation:**

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- After removal, inspect the **bearing pedestal** and the surrounding areas to assess any **wear and tear** caused by the removal process. Check for **abrasions, scratches, or damage to the substrate** that might need repair before installing new bearings.
- Document the **removal process**, including any unusual issues encountered (such as corrosion or damage) and corrective actions taken. This documentation should be used for future reference when installing the new bearings.

#### 4. Disposal of Removed Components:

- Safely transport and dispose of the old bearings and associated components as per local environmental regulations and standards.

#### 5. Site Clean-Up & Final Inspection:

- Clean the bearing pedestal and surrounding areas to remove any debris or residue that may affect the installation of the new bearings.
- Ensure that the site is clear and ready for the installation of new bearings.

#### Safety and Quality Considerations:

- vii. All dismantling operations should be conducted in compliance with relevant **MoRTH guidelines** and **IRC standards**.
- viii. Work should be performed by skilled personnel under the supervision of a qualified engineer.
- ix. Prior to starting the dismantling, ensure that the bridge's structural integrity is confirmed to avoid accidental damage.
- x. Maintain clear communication and coordination between all workers involved in the operation to avoid accidents.

#### Testing and Measurement:

- xi. **Verification of Structural Integrity:** Ensure that the bridge's substructure is unaffected by the removal of bearings.
- xii. **Quality Inspection:** The condition of the bearing pedestal and surrounding areas should be inspected to confirm that it is suitable for receiving new bearings.

### H3. Cleaning of bearing pedestal & epoxy levelling pad

Refer MoRTH Clause 2000 & Clause 2200

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This item involves thorough **cleaning and preparation** of the bearing pedestal surface after removal of the existing bearing, followed by the application of an **epoxy-based levelling pad** to ensure a uniform and stable surface for the new bearing installation.

#### Detailed Description:

##### 1. Surface Cleaning of Bearing Pedestal:

- The **concrete pedestal surface** shall be cleaned of all loose particles, dust, debris, grease, old mortar, or adhesive materials by **wire brushing, air blasting, or grit blasting**, as required.
- Any **residual adhesive or deteriorated epoxy** from previous bearing installation shall be completely removed to expose the bare concrete surface. The surface should be **dry, sound, and free from laitance**.
- In case of damage to the concrete surface, **minor surface repairs** may be carried out using a suitable **polymer-modified mortar** or repair concrete as per the approved methodology.

##### 2. Surface Preparation for Epoxy Application:

- The cleaned surface shall be checked for **level and evenness**. Any undulations exceeding the permissible tolerance (typically  $\pm 1$  mm over the bearing seating area) shall be corrected before applying epoxy.
- Prior to epoxy application, the surface should be **blown with compressed air** to remove any remaining fine dust.

##### 3. Application of Epoxy Levelling Pad:

- A **two-component epoxy resin system**, conforming to **ASTM C881** or equivalent approved standard, shall be used. The material should be **non-shrink, high-strength, and with excellent bond properties** to both concrete and steel.
- The epoxy shall be mixed as per the manufacturer's instructions and **applied uniformly** over the pedestal surface using a trowel or screed to achieve a **level, smooth, and even layer**.
- The **thickness of the epoxy pad** should typically be in the range of **3 mm to 10 mm**, or as recommended by the bearing manufacturer and the structural design.
- The epoxy layer shall be allowed to **cure as per specified time**, maintaining proper ambient temperature and avoiding any movement or loading on the area.

##### 4. Quality Checks:

- After curing, the surface shall be checked with a **spirit level or precision straight edge** to confirm that it is truly horizontal and suitable for bearing installation.

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- Adhesion and compressive strength tests of epoxy samples (as per the technical specification) may be conducted, if required.

#### Indicative Equipment Involved:

- Wire brushes and scrapers
- Air compressor and air blowers
- Grinders or scarifiers (for tough adhesion removal)
- Mixing tools for epoxy resin
- Trowels and levelling tools
- Protective gear for workers (PPE, gloves, goggles)

## H4. Fixing of POT/PTFE/Elastomeric bearing

Refer MoRTH Clause 2000 & Clause 2200

This item includes the precise **positioning and installation of POT, PTFE, or Elastomeric bearings** over the prepared pedestal and under the girder, ensuring proper alignment, anchorage, and seating in accordance with MoRTH specifications and manufacturer's instructions. The process is to be executed after pedestal preparation and immediately prior to girder lowering.

#### Detailed Description:

##### 1. Inspection & Pre-Installation Checks:

- Bearings shall be **inspected for physical damage**, dimensional accuracy, and compliance with the approved drawings, technical specifications, and manufacturer's data sheet.
- Bearing type (POT, PTFE, or Elastomeric) shall match the **design requirement** for the particular location and structure.
- Identification marks such as bearing number, location code, and orientation arrow shall be **verified before installation**.

##### 2. Surface Preparation:

- The **epoxy levelling pad** (installed as per H3) should be checked for level, cleanliness, and full curing.
- A **thin layer of approved epoxy adhesive or grout** may be applied just before setting the bearing to ensure uniform contact and bonding.

##### 3. Setting and Positioning of Bearing:

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- The bearing shall be **carefully lowered** into its designated location using **crane, chain pulley, or manual guiding**, ensuring **precise alignment** in both longitudinal and transverse axes.
  - Orientation of the bearing shall match the **direction of movement or restraint**, as per the structure's design.
  - Bearings shall be placed such that the **centre of rotation and load transfer** aligns with the girder's centreline and pedestal centreline.
- 4. Fixing and Anchoring:**
- For **POT and PTFE bearings**, anchor bolts shall be **inserted into preformed pockets or sleeves** and grouted using **non-shrink grout** as per manufacturer's specification.
  - For **Elastomeric bearings**, which are usually unanchored, **anti-skid pads or recesses** in the pedestal may be provided to restrict movement during service.
- 5. Gap and Clearance Checks:**
- Ensure specified **horizontal and vertical clearances** around the bearing and ensure there is **no constraint** on movement.
  - Use **feeler gauges and spirit levels** to confirm level placement and even contact pressure.
- 6. Grouting of Anchor Pockets (if applicable):**
- Pockets for anchor bolts or holding-down bolts shall be grouted using **non-shrink, flowable grout** conforming to IS 4031 / ASTM C1107.
  - Curing of grout shall be ensured as per manufacturer's recommendation.
- 7. Final Inspection & Documentation:**
- Post-installation, conduct **visual alignment check** and verify with the approved checklist.
  - Manufacturer's installation certificate and inspection report shall be **recorded and submitted**.
  - Bearing rotation or movement (if expected) shall be **checked under trial loading**, if specified.

#### Applicable Codes and Standards:

- **MoRTH Section 2200**
- **IRC:83 Part II – Specifications for POT/PTFE Bearings**
- **IRC:83 Part I – For Elastomeric Bearings**
- **IS 2062 – For structural steel parts used in bearings**
- **ASTM D4014 – Standard for Elastomeric Bearings**
- **IS 10270 – For POT/PTFE type bearings**

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#### Indicative Equipment Involved:

- Chain pulley blocks / cranes
- Levelling instruments (spirit levels, laser levels)
- Epoxy adhesive tools
- Grouting pumps or mixers
- Steel wedges / bearing jigs
- Lifting platforms / scaffolding
- Torque wrench for tightening anchor bolts

### H5. Lowering of girders post replacement

Refer MoRTH Clause 1400, Clause 2000, Clause 2200

This item includes the **controlled lowering of bridge girders** after successful placement of new bearings. The work shall be executed using appropriate hydraulic jacks or lifting mechanisms, ensuring **uniform transfer of loads** onto the newly fixed bearings without inducing eccentric stresses, misalignments, or undue shocks to the structure.

#### Detailed Description:

##### 1. Pre-Lowering Checks:

- Ensure that the **new bearings are securely fixed**, grouted, aligned, and fully cured where applicable.
- All **temporary supports**, scaffolds, or falsework should be cleared from the girder line.
- Confirm that **bearing anchor bolts (if any)** are tightened as per torque specifications and that **manufacturer's guidelines** are followed.

##### 2. Hydraulic System Verification:

- Check for **synchronization of hydraulic jacks**, pressure settings, oil levels, hoses, and control valves.
- Perform a **dry run or partial load test** to verify that the lowering mechanism is responding uniformly and safely.

##### 3. Lowering Operation:

- Lowering shall be carried out **gradually and uniformly** from both ends or multiple points as required, not exceeding **5 mm per stage** to prevent tilting or rotational stress on the girders.
- **Communication** among the operating team must be coordinated throughout the lowering to avoid differential settlement.

##### 4. Load Transfer and Monitoring:

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- Use **dial gauges, load cells, or displacement meters** to monitor load transfer and settlement at each step.
- Ensure that the full structural dead load is **properly transferred to the new bearings** with no excessive tilt or gap.

#### 5. Post-Lowering Inspection:

- Conduct a **visual inspection of the bearings** to ensure there is no movement, cracking of grout, or displacement.
- All jacks and lifting equipment must be **safely removed** after confirming that the structure is fully stable on the bearings.

#### 6. Documentation & Records:

- Maintain a **stage-wise logbook** of jack pressures, lowering sequence, time, and observations.
- A final **as-built bearing placement report** and **load transfer confirmation certificate** shall be submitted by the contractor.

#### Indicative Equipment Involved:

- Hydraulic jacks with pressure gauge & synchronized control
- Load monitoring gauges (dial gauges / load cells)
- Steel wedges / safety supports
- Torque wrenches and alignment tools
- Communication devices (intercoms / walkie-talkies)

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### I. Crack & Joint Treatments

#### Scope of Activity

#### 11. Groove cutting & PU sealant filling

**Reference Clause:** MoRTH Section 2600 (Joints in Concrete Pavement) and relevant practices from IRC:57 and IRC:15 as applicable

**Scope of Work:**

This item includes cutting of a neat, uniform groove over construction joints, cracks, or predetermined locations on concrete bridge decks or approach slabs, followed by cleaning, priming, and filling with high-performance Polyurethane (PU) sealant to ensure durable watertight joints. The work is intended to accommodate limited joint movement, prevent ingress of water, chlorides, and other contaminants, and preserve the durability and service life of the deck surface.

**Methodology:**

**1. Surface Marking and Layout:**

Marking of groove alignment shall be done precisely using chalk or chalk line, ensuring it aligns with the joint layout plan or visible cracks to be sealed.

**2. Groove Cutting:**

- Use a **mechanized diamond-blade cutter** to cut a straight groove, typically **10–20 mm wide and 20–25 mm deep**, or as directed by the Engineer-in-Charge.
- The groove edges shall be sharp, with no chipping or spalling.
- Depth and width shall be checked using a steel scale or depth gauge at regular intervals.

**3. Cleaning of Groove:**

- After cutting, clean the groove thoroughly using **compressed air (minimum 100 psi)** and a wire brush.
- Remove all loose particles, laitance, moisture, grease, or any foreign matter.
- If the surface is damp, allow adequate time for drying or use a **hot air blower**.

**4. Primer Application:**

- Apply a **compatible primer** recommended by the PU sealant manufacturer, using a brush or low-pressure spray.
- Allow the primer to cure as per product data sheet (typically 30–60 minutes) before sealant application.
- Do not allow traffic or dust accumulation after priming.

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#### 5. Backer Rod Placement (if required):

- A **closed-cell polyethylene backer rod** shall be inserted to the desired depth to provide a firm base and control the depth of sealant.
- Diameter of backer rod shall be 20–25% larger than the groove width to ensure snug fit.

#### 6. PU Sealant Application:

- Use a **hand-held or pneumatic sealant gun** to fill the groove with cold-applied, **self-leveling polyurethane sealant**.
- The sealant shall conform to **ASTM C920 / BS EN 14188-2**, with movement capability of  $\pm 25\%$  minimum, and excellent UV and chemical resistance.
- The sealant shall be applied slightly convex to allow for shrinkage.
- Tooling (if needed) must be done within the sealant's open time to ensure proper adhesion and finish.

#### 7. Curing and Protection:

- Allow sealant to cure undisturbed for minimum 24 hours or as per manufacturer's recommendation.
- Traffic shall not be allowed until full curing is achieved.

#### Materials:

- PU Sealant: Cold-applied, self-leveling, moisture-cured, with elongation > 600%
- Primer: Manufacturer-recommended
- Backer Rod: Closed-cell polyethylene, compressible
- All materials shall be from approved vendors and supported by manufacturer's datasheets and test certificates.

#### Indicative Equipment Involved:

- Concrete groove cutting machine (diamond blade)
- Air compressor with nozzle
- Sealant gun (manual or pneumatic)
- Hot air blower (if required)
- Wire brushes, hand tools, PPE kits

#### Measurement:

- Measurement shall be in **Running Metres (RM)** of completed and sealed groove, conforming to the specified width and depth, accepted by the Engineer.

#### Safety and Quality Assurance:

- Operatives shall wear protective gear including gloves, goggles, and masks.

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- Proper signage, barricading, and caution tape shall be used to restrict access during cutting and curing.
- Work shall comply with MoRTH Clause 111 (Safety Precautions) and IS:962 for quality workmanship.
- Quality checks shall include width, depth, adhesion test (ASTM C794), and visual inspection for continuity, smoothness, and voids.

## 12. V-groove cutting and crack stitching

**Reference Clause:** MoRTH Section 2800 (Repair of Structures), aligned with IRC:SP:80 and IRC:SP:74 guidelines on structural crack repair and durability enhancement.

### Scope of Work:

This item covers the work of addressing active and dormant cracks in concrete elements of bridge structures through **V-groove cutting followed by stitching using steel staples or stitching bars**, bonded with structural epoxy. The activity is intended to arrest further propagation of cracks, restore structural continuity, and enhance long-term durability of concrete components such as decks, girders, crash barriers, or piers.

### Methodology:

#### 1. Crack Identification and Marking:

- Conduct a **detailed crack mapping survey** using crack width measurement tools (crack comparator) to record crack width, depth, and orientation.
- Only structural cracks (typically >0.3 mm wide or showing signs of movement) are to be treated under this item.
- Mark crack lines clearly on the concrete surface for groove preparation.

#### 2. V-Groove Cutting:

- Use a handheld or mechanized **angle grinder fitted with a diamond wheel** to cut a V-shaped groove along the marked crack.
- The groove shall be approximately **10–15 mm wide and 12–20 mm deep**, depending on crack depth and extent, as directed by the Engineer.
- The cut should expose clean, sound concrete surfaces free of laitance or dust.

#### 3. Drilling for Stitching Bars:

- Drill **horizontal or slightly inclined holes (typically 8–12 mm dia)** at regular intervals (typically every 300–500 mm along the crack line), crossing the crack perpendicularly.

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- The embedment length on each side of the crack shall be as per design, usually 50–75 mm minimum.
- 4. Surface and Hole Cleaning:**
  - Clean the groove and drilled holes thoroughly using **compressed air and brushes** to remove dust, slurry, and moisture.
  - Ensure the substrate is dry and free from oil or contaminants before epoxy application.
- 5. Epoxy Application and Stitching Bar Fixing:**
  - Prepare and apply **structural-grade epoxy resin (as per ASTM C881 Type IV/V or equivalent IS standard)** to the groove and inside the drilled holes.
  - Insert pre-bent stitching bars or **U-shaped mild steel bars (8–12 mm dia)** into the holes with full contact bonding using epoxy.
  - Fill the remaining groove flush with structural epoxy mortar or paste, ensuring no voids remain.
- 6. Finishing and Curing:**
  - Tool the surface smoothly and allow curing as per manufacturer's recommendations.
  - Protect the area from vibration, moisture, and direct sunlight during the curing period.

#### Materials:

- Stitching Bars: Mild steel or stainless steel U-bars of 8–12 mm diameter, rust-free and of specified shape.
- Structural Epoxy: Two-part epoxy adhesive conforming to ASTM C881 / IS 9103 for bonding and filling.
- Cleaning Agents: Acetone or suitable degreaser if required for pre-cleaning.

#### Indicative Equipment Involved:

- Angle grinder with diamond blade
- Electric rotary drill with masonry bits
- Compressed air blower
- Hand tools: brushes, trowels, putty knives
- PPE kit, measuring gauges, epoxy dispensers

#### Measurement:

- Measured in **Running Metres (RM)** of crack line treated, including groove cutting, bar insertion, epoxy filling, and finishing, accepted by the Engineer.

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#### Safety and Quality Assurance:

- Workers shall wear gloves, eye protection, and masks during epoxy handling and grinding operations.
- Area shall be cordoned off with signage as per Clause 111 of MoRTH.
- Crack width and depth shall be recorded pre- and post-repair.
- Core samples or pull-out tests may be conducted at random locations for quality validation.
- All epoxy and bar placement shall be supervised by an experienced technician.

#### 13. Installation of glass fibre mesh for crack control

**Reference Clause:** MoRTH Section 2800 (Repair of Structures); aligned with IRC:SP:80 and IRC:SP:74 guidelines for crack mitigation and surface strengthening.

#### Scope of Work:

This item involves surface preparation and application of **alkali-resistant glass fibre mesh** embedded in polymer-modified mortar or cementitious overlay to control microcracks and arrest further surface deterioration of concrete elements such as decks, crash barriers, parapets, or substructure faces. The process enhances tensile resistance across potential crack zones and ensures long-term surface durability under thermal and shrinkage stresses.

#### Methodology:

##### 1. Surface Preparation:

- Clean the designated concrete surface to remove all loose particles, dirt, laitance, oil, and any previous coating using **wire brushing and compressed air or water jetting**.
- Repair minor defects (such as honeycombs, minor cracks) using polymer mortar before mesh installation.
- Ensure the surface is sound, slightly rough (minimum surface profile of CSP 3–4), and moist but not wet at the time of application.

##### 2. Primer / Bond Coat Application:

- Where specified or recommended by the product manufacturer, apply a **bonding primer or slurry coat** (typically cement + polymer + water) to improve adhesion between substrate and mortar.

##### 3. Mortar Base Layer Application:

- Apply a **first coat of polymer-modified cementitious mortar**, 2–4 mm thick using a trowel or spatula.

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- The mortar shall be prepared using approved polymer admixtures conforming to ASTM C881 or IS 2645 standards.
- Ensure even spreading without air pockets.
- 4. Glass Fibre Mesh Embedding:**
  - Immediately after the base coat, embed the **alkali-resistant glass fibre mesh (typically 45–60 gsm with 5x5 mm grid size)** into the wet mortar.
  - The mesh shall be gently pressed into the mortar ensuring full contact and no wrinkles, overlaps, or voids.
  - Where overlaps are unavoidable, provide a minimum **50 mm overlap** in both directions.
- 5. Second Coat and Finishing:**
  - Apply a second coat of polymer mortar (1.5–3 mm) to fully encapsulate the mesh and create a smooth finish.
  - Total thickness of the finished layer shall generally be **5–8 mm**, or as directed.
  - Surface should be finished with a steel trowel for uniformity.
- 6. Curing:**
  - Begin moist curing after initial set for a minimum of 3–5 days, unless a **curing compound** (as per MoRTH 2800) is applied.
  - Protect from rapid drying, rain, or physical damage during curing.

#### Materials:

- **Glass Fibre Mesh:** Alkali-resistant, woven, 45–60 gsm, approved by the Engineer.
- **Polymer Modified Mortar:** Blend of OPC, graded sand, and approved polymer (SBR or Acrylic) with water–cement ratio <0.45.
- Bonding agent or slurry coat as specified.

#### Indicative Equipment Involved:

- Power grinder and wire brush for surface cleaning
- Trowels, spatulas, and mixing paddles
- Water sprayer or compressed air blower
- Mortar mixing drums or mechanical mixers
- PPE kits, scaffoldings for vertical/hard-to-access surfaces

#### Measurement:

- Measured in **Square Metres (Sqm)** of finished surface area with mesh fully embedded, cured, and accepted by the Engineer.

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#### **Safety and Quality Assurance:**

- Use of gloves, goggles, and masks is mandatory during surface preparation and mortar mixing.
- All scaffolding must comply with IS:3696 for working at heights.
- Material certifications for mesh and polymer must be submitted before use.
- Test patches may be conducted for bond strength, finish, and mesh placement uniformity.
- Surface shall be visually inspected for wrinkles, detachment, or air gaps post-application.

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## J. Shotcreting / Guniting Works

Scope of Activity
<p><b>J1. Preparatory Work for Shotcreting (Surface Preparation and Reinforcement Fixing)</b></p> <p><b>Reference Clause:</b> MoRTH Section 2800 (Repair of Structures); aligned with IRC: SP:80 and IRC:SP:74 guidelines on rehabilitation of concrete structures using shotcrete/gunite.</p> <p><b>Scope of Work:</b></p> <p>This item includes thorough surface preparation of deteriorated concrete elements and fixing of reinforcement mesh or dowel bars prior to application of shotcrete/gunite. The aim is to ensure effective bonding of the shotcrete layer with the existing substrate and provide necessary reinforcement to restore the structural integrity of components such as girders, piers, abutments, retaining walls, or crash barriers.</p> <p><b>Methodology:</b></p> <ol style="list-style-type: none"><li><b>1. Surface Preparation:</b><ul style="list-style-type: none"><li>○ Remove all unsound, loose, cracked, or delaminated concrete using <b>chisels, electric hammers, or hydro-demolition</b>, as per Engineer's direction.</li><li>○ All rusted or exposed rebars must be cleaned using <b>wire brushing, sandblasting, or mechanical tools</b> to remove corrosion products, followed by application of <b>anti-corrosion primer</b>.</li><li>○ Substrate shall be prepared to a rough surface profile (minimum CSP 5–7), free from dust, laitance, oil, or contaminants.</li></ul></li><li><b>2. Substrate Cleaning:</b><ul style="list-style-type: none"><li>○ After chipping and preparation, thoroughly clean the surface using <b>compressed air</b> or high-pressure water jet (<math>\geq 2000</math> psi).</li><li>○ Remove standing water and ensure saturated surface dry (SSD) condition before reinforcement or shotcrete placement.</li></ul></li><li><b>3. Fixing of Reinforcement Mesh / Dowels (if specified):</b><ul style="list-style-type: none"><li>○ Fix <b>welded wire mesh (typically 6–8 mm dia at 100–150 mm c/c)</b> using stainless steel tie wires or welded studs.</li><li>○ Maintain a minimum <b>cover of 20–25 mm</b> behind the mesh using spacers or plastic chairs.</li><li>○ Dowels or rebars (8–16 mm dia) may be anchored into pre-drilled holes using <b>epoxy resin or grout</b> where structural enhancement is required.</li><li>○ The fixing system shall ensure no displacement during shotcreting.</li></ul></li></ol>

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### Scope of Activity

#### 4. Final Inspection Before Shotcreting:

- The prepared surface and fixed reinforcement shall be inspected and approved by the Engineer before any shotcrete application.
- Surface must be pre-wetted in advance and brought to SSD condition prior to placing shotcrete.

#### Materials:

- Welded wire mesh of required diameter and spacing (IS 1566 / IS 432)
- Anchoring rebars / dowels (Fe500D as per IS 1786)
- Anti-corrosion primer for rebars (zinc-rich epoxy or equivalent)
- Polymer bonding agent or slurry coat if required
- Anchoring grout / epoxy (conforming to ASTM C881 / IS 9103)

#### Indicative Equipment Involved:

- Light-duty demolition hammers or chisels
- Needle scalers or scarifiers
- Rebar cleaning tools (wire brushes, grinders)
- Air compressor or water jetting pump
- Drilling machine with rotary bits
- Mesh tying tools and scaffolding
- PPE kits and safety harnesses

#### Measurement:

- Measured in **Square Metres (Sqm)** of surface prepared and reinforcement mesh fixed, ready for shotcreting and accepted by the Engineer.

#### Safety and Quality Assurance:

- All demolition or chipping work shall be carried out with proper PPE including face shield, ear protection, and safety goggles.
- Fall protection shall be ensured for work at height using scaffolds and lifelines per IS:3696.
- Mesh and bars shall be cut, bent, and fixed as per bar bending schedule and approved shop drawings.
- All materials must carry valid test certificates.
- Bond pull-off or adhesion tests may be carried out to check surface suitability.

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### Scope of Activity

## J2. Shotcrete application (wet/dry mix)

**Reference Clause:** MoRTH Section 2800 (Repair of Structures); aligned with IRC:SP:80, IRC:SP:74 and IS 9012 (Recommended Practice for Shotcreting)

### Scope of Work:

This item includes the application of shotcrete using wet or dry mix methods over prepared concrete surfaces for structural rehabilitation or protective overlay. Shotcreting shall be used for strengthening, restoring cross-section, arresting progressive deterioration, or providing a durable overlay on concrete elements such as girders, piers, abutments, and retaining walls.

### Methodology:

#### 1. Pre-Application Preparation:

- Ensure the substrate is properly prepared, clean, sound, and in **Saturated Surface Dry (SSD)** condition as per Item J1.
- Reinforcement mesh or dowels (if specified) shall be fixed and inspected prior to shotcrete application.
- All utilities, inserts, joints, and boundary elements shall be masked or protected from rebound and over-spray.

#### 2. Material Preparation:

##### ○ For Wet Mix Method:

- Prepare the shotcrete mix with **cement, graded sand, coarse aggregates ( $\leq 10$  mm), water, and admixtures** in a controlled batching plant.
- Mix shall conform to the specified design grade (typically M25–M40), with **water-cement ratio  $\leq 0.45$**  and slump of 60–80 mm.
- Use of **polymer admixtures, silica fume, or steel fibres** is permitted as per structural requirement.

##### ○ For Dry Mix Method:

- Cement and aggregates shall be pre-mixed and fed into the shotcrete machine dry; water is added only at the nozzle during application.
- Used primarily for patch repairs or where water availability is limited.

#### 3. Shotcrete Application:

- Apply shotcrete using a **rotary or piston pump (wet mix) or gunite machine (dry mix)** with compressed air, ensuring a **uniform pressure of 5–7 bars**.
- Nozzle shall be held at approximately **right angles ( $75^\circ$ – $90^\circ$ )** to the surface, at a distance of **0.5–1.0 metres**.

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- Apply in multiple passes (lift thickness 20–40 mm), especially on vertical or overhead surfaces to avoid sagging or rebound.
- Ensure minimum rebound and reapplication over previous layers only after initial set.

#### 4. Finishing & Surface Tolerance:

- Screed or trowel the final surface to desired finish (rough/textured/smooth as required).
- Minimum thickness as per design; typically 25–75 mm in single/multiple layers.

#### 5. Curing:

- Initiate curing after initial setting using **moist burlap, water fogging, or curing compound** for a minimum of 7 days.
- For polymer-modified or fibre-reinforced shotcrete, curing shall follow the manufacturer's recommendation and MoRTH 2800 guidelines.

#### Materials:

- OPC 43/53 grade (IS 269 / IS 12269)
- Graded fine and coarse aggregates (IS 383)
- Water conforming to IS 456
- Admixtures: Plasticizers, polymers, accelerators as per IS 9103 / ASTM C494
- Fibre reinforcement if specified (steel / polypropylene, as per ASTM C1116)

#### Indicative Equipment Involved:

- Shotcrete pump / gunite machine with compressor
- Transit mixer or on-site batching plant
- Nozzle assembly with water injection (for dry mix)
- Vibrating screeds, trowels
- Water curing system / curing compound sprayers
- PPE including shotcrete shields, gloves, goggles, and ear protection

#### Measurement:

- Measured in **Cubic Metres (Cum)** of shotcrete applied and accepted as per design thickness and surface area.
- Measurement shall be based on **approved drawings** or **actual thickness** verified by depth pins or core samples.

#### Safety and Quality Assurance:

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<b>Scope of Activity</b>
<ul style="list-style-type: none"><li>• Operators shall wear full PPE, including face shields and protective clothing due to rebound and high-velocity projection.</li><li>• Scaffolding and fall protection to conform with IS:3696.</li><li>• Rebound material shall not be reused.</li><li>• Trial panels shall be prepared for mix approval and nozzleman proficiency before execution.</li><li>• In-situ core testing or rebound hammer tests (as per IS 13311) may be conducted to check compressive strength.</li><li>• Minimum 3–5 test cores per 100 sqm shall be extracted, if directed by Engineer.</li></ul>

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### K. Surface Protection and Coatings

#### Scope of Activity

#### K1. Anti-carbonation / waterproof coatings

**Reference Clause:** MoRTH Section 2800 (Repair of Structures); aligned with IRC:SP:80 and IS 14177 (Waterproofing of Concrete Structures)

#### Scope of Work:

This item covers the application of anti-carbonation and waterproof coatings over concrete surfaces, particularly on exposed elements like facades, beams, columns, and other structures vulnerable to carbonation, water ingress, and environmental degradation. These coatings help in extending the service life of the structure by preventing moisture-related deterioration and reinforcing the surface against carbonation-induced corrosion.

#### Methodology:

##### 1. Surface Preparation:

- Ensure that the surface to be treated is thoroughly cleaned by removing all dirt, oil, dust, grease, and any contaminants using high-pressure water jetting, sandblasting, or mechanical cleaning methods.
- If surface deterioration or scaling is observed, carry out **light abrasive treatment** to expose a clean, sound surface.
- Moisture content on the surface should be reduced to **SSD (Saturated Surface Dry)** condition before application.

##### 2. Coating Application:

- **Anti-carbonation Coating:**
  - Apply a **breathable anti-carbonation coating** that allows moisture vapor to escape while preventing carbon dioxide from penetrating the concrete.
  - The coating shall be applied in **two coats**, with the second coat applied after the first has dried, ensuring uniform coverage without runs.
  - Follow the manufacturer's recommendation for curing time between coats (typically 4–6 hours).
- **Waterproofing Coating:**
  - Apply **waterproofing coating** using **brush, roller, or spray** as per the manufacturer's guidelines.
  - The coating shall be continuous, without gaps or voids, and should form an **impermeable barrier** to prevent water penetration.

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### Scope of Activity

- Multiple coats may be applied depending on the required thickness (usually 2–3 coats).

#### 3. Curing:

- Allow the coating to cure as per the manufacturer's recommended time (typically 7 days), avoiding any traffic or exposure during this period.
- Ensure the coatings are not subjected to mechanical damage or heavy weather conditions until curing is complete.

#### Materials:

- **Anti-carbonation Coating:** Water-based, breathable, and high-durability anti-carbonation coating (IS 14177 / manufacturer-specific specifications).
- **Waterproofing Coating:** Cementitious or polymer-based waterproofing products (IS 2645 / IS 9103).
- **Additives (if required):** Accelerators, pigments, or thickeners as per product specifications.

#### Indicative Equipment Involved:

- High-pressure water jetting pump
- Sandblasting machine
- Roller, brush, or spray equipment for coating application
- Scaffolding (for working at height)
- PPE, including gloves, goggles, and face shields
- Curing equipment (plastic sheets, misting system, etc.)

#### Measurement:

- Measured in **Square Metres (Sqm)** of surface area treated and accepted by the Engineer, as per approved drawings or site measurement.
- The measurement will include all applied coats as per the agreed scope.

#### Safety and Quality Assurance:

- Personnel involved in surface cleaning, preparation, and coating application must wear the appropriate PPE including gloves, safety goggles, respirators (if required), and protective clothing.
- During surface preparation, ensure that the work area is barricaded to avoid exposure to dust or debris.
- Only certified, approved waterproofing and anti-carbonation coatings with valid test certificates should be used.

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### Scope of Activity

- Application shall be in accordance with the manufacturer's instructions and MoRTH standards for coating thickness and application techniques.
- Performance of the coating shall be verified by **adhesion tests** and **water penetration tests** at random spots.
- Coating will be tested for its **thickness, uniformity, and cure time** by the Engineer.

## K2. Silane/Siloxane-based water repellent

**Reference Clause:** MoRTH Section 2800 (Repair of Structures); aligned with IS 9103 (Waterproofing of Concrete Structures)

### Scope of Work:

This item covers the application of **Silane/Siloxane-based water repellent** treatment to concrete and masonry surfaces to enhance their resistance to water penetration. These treatments form a hydrophobic layer on the surface, preventing moisture ingress while maintaining the substrate's ability to breathe, thus protecting the structure from weathering, freeze-thaw damage, and carbonation-related corrosion.

### Methodology:

#### 1. Surface Preparation:

- Clean the surface thoroughly by **pressure washing, abrasive blasting**, or using **mechanical cleaning** methods to remove any dirt, oil, grease, and other contaminants.
- Ensure the surface is in a **Saturated Surface Dry (SSD)** condition, and free from any loose particles or damaged concrete.
- If the surface shows signs of previous water damage or efflorescence, appropriate remedial treatment should be done before the application.

#### 2. Application Process:

- **Silane/Siloxane Treatment:**
  - The water repellent solution is typically supplied as a ready-to-use liquid. It is applied by **brush, roller, or low-pressure spray** (to ensure even coverage).
  - The treatment should be applied uniformly across the surface, ensuring that the coating does not leave streaks or gaps.
  - The application should cover the entire surface to form a continuous, hydrophobic barrier.

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### Scope of Activity

- If multiple coats are needed, apply subsequent coats after the first one has dried (generally 1–2 hours, depending on temperature and humidity).

#### 3. Curing and Drying:

- Allow the treated surface to cure for **48–72 hours** before subjecting it to any moisture or exposure to heavy traffic.
- Ensure the treated surface is not exposed to rain or high moisture during the curing period.

#### 4. Post-Application Inspection:

- Inspect the treated surface for uniformity and to ensure that no area has been missed.
- Perform a **water drop test** to ensure the surface is effectively repelling water. If any section fails, reapply the water repellent as necessary.

#### Materials:

- **Silane/Siloxane-based Water Repellent Solution:** Conforming to IS 9103 and manufacturer specifications.
- **Solvent (if required for thinning):** Conforming to applicable standards for coatings.
- **Additives (optional):** For enhanced performance under extreme weather conditions, certain additives or boosters may be incorporated as per the manufacturer's instructions.

#### Indicative Equipment Involved:

- Pressure washing equipment
- Abrasive blasting machines
- Spray equipment (airless sprayers or low-pressure sprayers)
- Brushes and rollers for manual application
- PPE including gloves, goggles, and face masks to avoid inhalation of fumes
- Scaffolding (for working at height)

#### Measurement:

- Measured in **Square Metres (Sqm)** of surface area treated with Silane/Siloxane-based water repellent, based on approved drawings or actual field measurements.
- Measurement shall be made for the total area covered by the water repellent treatment, including multiple coats if applicable.

#### Safety and Quality Assurance:

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### Scope of Activity

- Personnel applying the water repellent treatment shall wear appropriate **PPE**, including gloves, face shields, and protective clothing.
- Ensure proper ventilation in enclosed areas during the application of solvents or chemicals.
- Manufacturer's specifications must be adhered to for the **drying time, coverage rate**, and **environmental conditions** (temperature, humidity) during the application.
- Ensure that the surface is **uniformly treated**, with no missed patches or inconsistencies.
- A **water drop test** should be conducted on random spots to check for proper water repellency post-application.

### K3. Elastomeric acrylic coatings

**Reference Clause:** MoRTH Section 2800 (Repair of Structures); aligned with IS 1661 (Code of Practice for Application of Coatings to Concrete Surfaces) and IS 11957 (Acrylic Coatings for Concrete)

#### Scope of Work:

This item involves the application of **elastomeric acrylic coatings** to concrete surfaces to provide a flexible, durable, and waterproof protective layer. These coatings are designed to bridge small cracks and offer excellent resistance to weathering, UV degradation, and water ingress, making them ideal for use on external concrete surfaces, including façades, beams, and columns.

#### Methodology:

##### 1. Surface Preparation:

- Clean the surface thoroughly to remove **dust, dirt, grease, oil, and other contaminants** using pressure washing or abrasive cleaning methods.
- Repair any visible cracks or damages on the concrete surface using appropriate **crack fillers** or **patching compounds**.
- Ensure that the surface is in a **Saturated Surface Dry (SSD)** condition before applying the coating.

##### 2. Primer Application:

- Apply a **bonding primer** suitable for acrylic coatings, following the manufacturer's instructions.
- The primer should be applied evenly, ensuring full coverage across the surface. Allow the primer to cure for the specified time (typically 4–6 hours) before proceeding with the coating.

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### Scope of Activity

#### 3. Coating Application:

##### ○ Elastomeric Coating:

- Apply the elastomeric acrylic coating using **brush, roller, or spray** (depending on the surface and accessibility).
- The coating should be applied in **two coats**, with the second coat applied after the first coat has dried (usually 4–6 hours).
- Ensure a uniform, crack-bridging film with no pinholes or voids. The coating must be applied at the specified **wet film thickness** (usually 200–300 microns per coat).

#### 4. Curing and Drying:

- Allow the coating to cure as per the manufacturer's specifications (typically 7–10 days).
- During the curing period, the surface should be protected from heavy traffic, rain, or mechanical damage.
- Avoid any exposure to moisture or excessive UV light until the coating is fully cured.

#### 5. Post-Application Inspection:

- Conduct a thorough inspection of the coated surface to ensure uniformity, proper adhesion, and coverage.
- Check the cured surface for **flexibility, crack-bridging properties, and water resistance**.

#### Materials:

- **Elastomeric Acrylic Coating:** Conforming to IS 11957 and manufacturer-specific formulations.
- **Bonding Primer:** Acrylic or epoxy-based primer suitable for use with elastomeric coatings.
- **Crack Filler:** Non-shrinking, flexible crack filler material for pre-repair of cracks.

#### Indicative Equipment Involved:

- Pressure washing or sandblasting equipment for surface preparation
- Brushes, rollers, or spray equipment for application
- Scaffolding for elevated areas
- PPE including gloves, goggles, and face masks to avoid inhalation of fumes
- Curing sheets or protective covers (if needed)

#### Measurement:

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### Scope of Activity

- Measured in **Square Metres (Sqm)** of surface area covered by the elastomeric acrylic coating, based on actual site measurement or approved drawings.
- Measurement shall be taken after the full application of all coats, as per the specified thickness.

#### Safety and Quality Assurance:

- Workers applying the coating should wear appropriate **PPE**, including gloves, face shields, and respiratory protection if required.
- Ensure proper ventilation during the application of solvents or acrylic-based coatings, particularly in confined spaces.
- All materials used must meet the relevant **BIS and MoRTH standards** for quality and durability.
- The coating should be checked for **flexibility** and **adhesion strength** using standard test methods.
- During curing, the work area must be barricaded to prevent unauthorized access and protect the surface from potential damage.

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### L. Drainage Spouts

#### Scope of Activity

#### L1. Providing and Replacing Drainage Spout Assembly

**Reference Clause:** MoRTH Section 2705 (Drainage Spouts for Bridge Decks)

**Scope of Work:**

This item includes all charges for providing, replacing, and installing drainage spout assemblies on bridge decks as per approved drawings and MoRTH Clause 2705. The work involves removal of damaged or non-functional spouts (if applicable), cleaning of deck scuppers, supply and installation of new drainage spout assembly including pipes, hoppers, collars, anti-clogging mesh, and sealing works. The objective is to ensure quick and uninterrupted drainage of rainwater from the bridge deck to prevent water accumulation, deterioration of wearing course, or corrosion of reinforcement.

**Methodology:**

**1. Survey and Preparation:**

- Identify locations of existing or proposed drainage spouts as per structural drawings.
- Mark locations and inspect deck scupper openings for blockages or damage.
- Ensure that the number, spacing, and placement of spouts meet the drainage design intent.

**2. Dismantling of Existing Spout Assembly (if applicable):**

- Carefully cut or unfasten existing damaged spouts using mechanical tools.
- Remove the entire spout assembly including mesh, pipe, and collar.
- Clean the scupper opening with wire brushes or compressed air.

**3. Surface Preparation:**

- Remove loose mortar or concrete around the opening.
- Prepare the contact surface by chiselling and cleaning to receive new components.
- Ensure that the opening slope allows free water flow without backflow or clogging.

**4. Installation of New Spout Assembly:**

- Insert GI or SS pipe (as per design, typically 100 mm to 150 mm diameter) through the scupper hole.
- Fix the hopper or funnel at the inlet side of the pipe, flush with the deck level.
- Attach the anti-clogging stainless steel mesh or HDPE filter inside the hopper to prevent debris ingress.

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### Scope of Activity

- Provide anchorage collars or brackets to support the spout and ensure rigidity.
- If spout is to be grouted, apply polymer-modified mortar or epoxy grout around the pipe where it passes through the slab.
- Seal all joints with weatherproof and leakproof sealant to avoid water leakage to the substructure.

#### 5. Finishing and Water Testing:

- Apply finishing mortar to ensure smooth transition between deck and installed spout.
- Pour water from the deck to test flow through the spout, ensuring no leakage or backpressure.
- Make corrections if the water does not drain properly.

#### 6. Disposal of Debris:

- Collect and dispose dismantled material and debris away from the site as per environmental guidelines.
- Ensure no blockage or waste is left near bridge piers or slopes.

#### Materials:

- GI or SS pipe (diameter as per design, corrosion-resistant)
- Stainless steel/HDPE mesh for clog protection
- Grout: Polymer modified mortar or epoxy grout
- Hopper and collar assembly (as per standard drawing)
- Weatherproof sealant (PU or epoxy-based)
- Fasteners, support brackets, and mounting hardware

#### Indicative Equipment Involved:

- Angle grinder/cutting machine
- Grouting tools and mixing pans
- Wire brushes, blowers or compressed air for cleaning
- Measuring tape and alignment tools
- PPE for workers (gloves, helmets, face shield, boots)

#### Measurement:

- Measured in **number of assemblies (Each/No.)** provided or replaced and made functional.
- Includes dismantling (if any), cleaning, and complete installation including testing.

#### Safety and Quality Assurance:

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### Scope of Activity

- Use only corrosion-resistant materials for durability.
- Ensure all fixings are rigid to prevent detachment due to water flow or vibration.
- Workers to use fall protection if working at deck edges.
- Ensure no tools or debris fall through openings during dismantling or installation.
- Testing of each installed spout to ensure proper drainage before approval.
- Follow all safety protocols under MoRTH Clause 111 for working on live traffic bridges.

## L2. Providing / Replacing Missing or Damaged Down Take Pipes

**Reference Clause:** MoRTH Section 2705 (Drainage Spouts and Down Take Pipes for Bridge Decks)

### Scope of Work:

This item includes all operations for providing and fixing new down take pipes or replacing damaged or missing ones, as per approved drawings and MoRTH specifications Clause 2705. The work involves removal of existing broken pipes (if any), surface preparation, alignment and fixing of new pipes, ensuring a continuous drainage path from the deck-level drainage spouts to the discharge point. The objective is to ensure effective drainage and avoid water accumulation on structural components such as piers, abutments, or bearings.

### Methodology:

#### 1. Site Assessment and Marking:

- Identify all locations with missing or damaged down take pipes.
- Cross-check with the drainage layout and structural drawings to confirm pipe sizes and anchorage design.

#### 2. Dismantling of Damaged Pipes (if applicable):

- Cut and remove broken or corroded pipes using mechanical tools.
- Remove all clamps, fasteners, and sealants associated with the old pipe.
- Clean the mounting surface thoroughly to prepare for new installation.

#### 3. Surface Preparation:

- Clean and remove loose concrete or rust from the mounting zones.
- Repair damaged mounting areas using polymer mortar or non-shrink grout, if needed.

#### 4. Supply and Fixing of Down Take Pipe:

- Use corrosion-resistant GI/SS/UPVC pipes of required diameter (typically 100 mm to 150 mm).
- Cut the pipe to length and align it vertically from the spout outlet to the designated discharge level.

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### Scope of Activity

- Fix the pipe using stainless steel brackets/clamps anchored with expansion bolts at regular intervals (usually 1.0 to 1.5 m).
- Ensure the pipe connection to the spout is watertight using rubber gaskets or sealant.
- Provide bell mouth or shoe at the outlet end to direct water away from the bridge substructure.

#### 5. Sealing and Finishing:

- Seal joints with approved weatherproof sealant.
- Paint GI pipes with two coats of epoxy-based anti-corrosive paint, if applicable.
- Ensure all components are aligned, secured, and allow free flow of water.

#### 6. Water Testing and Quality Check:

- Pour water from the deck to verify proper drainage through the newly installed pipe.
- Check for leakages, loose fixings, or blockages.
- Rectify defects before final approval.

#### Materials:

- GI/SS/UPVC down take pipe of approved make and diameter
- Clamps, anchors, and fixing hardware
- Weatherproof sealant (PU or epoxy)
- Epoxy primer and anti-corrosive paint (if using GI pipes)
- Rubber gaskets or connectors

#### Indicative Equipment Involved:

- Cutting/grinding tools
- Drill machine and anchor bolt kit
- Measuring tape, plumb bob or laser level
- Water hose for testing
- PPE kits (gloves, helmets, harness for elevated work)

#### Measurement:

- Measured in **running metres (RM)** of pipe length provided and installed in position.
- Includes all accessories, dismantling (if applicable), and full functional testing.

#### Safety and Quality Assurance:

- Ensure all fixing points are strong enough to bear the pipe's weight with water load.

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### Scope of Activity

- Use scaffolding or suspended platforms for safe working at heights (in line with IS 3696).
- Ensure pipes do not interfere with bearings or expansion joints.
- Conduct load and water flow tests before acceptance.
- Follow MoRTH Section 111 for safety compliance during elevated work.

### L3. Providing and Fixing Missing Mild Steel (MS) Grating at Drainage Spouts

**Reference Clause:** MoRTH Section 2705 (Drainage Spouts and Down Take Pipes for Bridge Decks) and IS 2062 for MS material

#### Scope of Work:

This item includes fabrication, supply, and fixing of missing MS gratings over drainage spout openings to prevent debris, stones, and other objects from entering and blocking the down take pipes. The grating is an essential component to ensure smooth drainage and longevity of the bridge drainage system. The work involves measuring the opening, preparing the grating, applying corrosion protection, and securely fixing it in place with approved anchoring arrangements.

#### Methodology:

##### 1. Site Inspection and Measurement:

- Identify all spouts without gratings.
- Measure the opening dimensions of each drainage outlet precisely.
- Record shape and depth for custom fabrication if needed.

##### 2. Fabrication of Grating:

- Fabricate MS bar grating using IS 2062 Grade steel, bars typically spaced at 20–40 mm centres.
- The grating should be capable of withstanding incidental foot loads and debris impact.
- Provide welded frame, if required, to support the grating.

##### 3. Surface Treatment:

- Clean and apply one coat of zinc chromate primer followed by two coats of epoxy-based anti-corrosive paint.

##### 4. Alternatively, provide hot-dip galvanization as per IS 4759 (recommended in corrosive/humid environments).

##### 5. Fixing the Grating:

- Place the fabricated grating over the drainage spout securely.

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Scope of Activity
<ul style="list-style-type: none"> <li>• Fix using stainless steel bolts or welding onto existing frames or embedded metal inserts.</li> <li>• Ensure it is flush with the deck surface or slightly recessed to avoid tripping hazards.</li> </ul> <p><b>6. Testing and Finishing:</b></p> <ul style="list-style-type: none"> <li>• Pour water to ensure drainage is not impeded.</li> <li>• Ensure the grating is rigid and doesn't rattle or move.</li> </ul> <p><b>Materials:</b></p> <ul style="list-style-type: none"> <li>• MS Flat/Bar Sections (IS 2062 compliant)</li> <li>• Epoxy or zinc primer and anti-corrosive paint (or galvanization)</li> <li>• Anchoring bolts, fasteners, or welding rods</li> <li>• Cutting, grinding, and measuring tools</li> </ul> <p><b>Indicative Equipment:</b></p> <ul style="list-style-type: none"> <li>• Welding set (if welding used)</li> <li>• Hand tools (wrench, drill, grinder)</li> <li>• Measuring tape and clamps</li> <li>• PPE for cutting/welding work</li> </ul> <p><b>Measurement:</b></p> <ul style="list-style-type: none"> <li>• Measured <b>per number (each)</b> of MS grating fabricated and fixed in place.</li> <li>• Includes all fittings, anchorage, painting, and site preparation.</li> </ul> <p><b>Safety &amp; Quality Assurance:</b></p> <ul style="list-style-type: none"> <li>• Ensure sharp edges of the grating are ground smooth to prevent injury.</li> <li>• All welds and bolts must be rust-proof and tightly secured.</li> <li>• Paint/galvanize to prevent long-term corrosion.</li> <li>• Conduct a functional water test and physical inspection after installation.</li> </ul>

## M. General / Supporting Activities

Scope of Activity
<p><b>M1. Barricading and safety signage</b></p> <p><b>Reference Clause:</b> MoRTH Section 111 (General Requirements for Traffic Safety); IRC 67-2022 (Code of Practice for Road Signs)</p>

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## Scope of Work

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### Scope of Activity

#### Scope of Work:

This item involves the installation, maintenance, and removal of **barricades** and **safety signage** to ensure safety at the worksite during bridge maintenance activities. The purpose of this is to warn, inform, and guide traffic and pedestrians, preventing accidents and ensuring smooth movement around the work zone. The installation shall adhere to **MoRTH and IRC standards**, ensuring proper visibility, reflectivity, and structural integrity.

#### Methodology:

##### 1. Barricade Installation:

- **Materials:** Barricades shall be made of **reflective tape, plastic/metal panels, and warning lights**. Depending on the traffic and area, **type I, type II, or type III** barricades (as defined by MoRTH and IRC guidelines) shall be used.
- **Location:** Barricades should be installed at critical points such as the beginning and end of the work zone, **on both sides of traffic lanes**, and at intersections if necessary.
- **Placement:** Barricades should be placed at a distance of **5-10 meters** from the work area to give enough warning to approaching vehicles. The **clearance** between the barricade and any part of the work zone should be at least **1.5 meters**.
- Ensure that the barricades are visible both during the **daytime** and **nighttime**, by using appropriate **reflective materials** and **lighting**.

##### 2. Safety Signage:

- **Type of Signs:** Safety signs should include **warning signs, directional signs, and informational signs**. These should be made of **reflective, high-visibility materials** and placed at locations where drivers and pedestrians can clearly see them.
- **Placement:**
  - Warning signs (e.g., “Men at Work”, “Slow Down”) should be placed at **100 meters before** the work zone.
  - Directional signs (e.g., “Detour”, “Right Turn Only”) should be placed at appropriate points to guide traffic smoothly around the work area.
  - Signs should be installed on **stand-alone poles** or **mounted on barricades**, ensuring that they are **clear of traffic** and **visible from all directions**.

##### 3. Nighttime Operations:

- During nighttime operations, ensure that **flashing lights** or **LED signal boards** are installed alongside the barricades and signs to improve visibility.

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- For night signage, use **high-intensity reflective tapes** and **LED lights** to ensure that the signs are clearly visible from a distance.
- 4. **Maintenance and Monitoring:**
  - **Regular checks** should be conducted to ensure that the barricades and signs remain upright, undamaged, and visible at all times.
  - Barricades and signs must be **repositioned or replaced** immediately if they are damaged or obstructed due to weather or work activities.
- 5. **Removal of Barricades and Signs:**
  - Once the maintenance work is completed, remove all barricades and signs promptly to restore the traffic flow.
  - Ensure that removal is done in a safe manner, following traffic control procedures, and ensuring no traffic hazards remain.

#### Materials:

- **Barricades:** Reflective panels, metal or plastic frames, high-visibility materials (orange/white), reflective sheeting, warning lights.
- **Safety Signage:** Reflective vinyl sheets, metal/wooden poles, LED lights for nighttime visibility, and mounting accessories.
- **Warning Lights:** Solar-powered or battery-operated lights for placement on barricades or at critical points.

#### Indicative Equipment Involved:

- Traffic cones and barriers
- Flashing LED or solar lights
- Signs and signposts
- Drilling equipment (for pole installation)
- Manual or motorized lifting equipment for large signage
- PPE including **helmets, gloves, high-visibility vests, and safety shoes.**

#### Measurement:

- Measured in **Linear Metres (Lm)** of barricading (distance along the road covered by barricades).
- **Unit of Measurement for Signs:** Each sign installed (each unit).
- Measurement should account for **barricades used for the duration of the work**, including both temporary and permanent signage installations.

#### Safety and Quality Assurance:

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- Ensure all personnel involved in the installation and removal of barricades wear appropriate **PPE** (helmet, high-visibility clothing, gloves).
- The **reflectivity** of signs must meet MoRTH specifications for nighttime visibility, and the installation of **flashing lights** or **LED signals** must be done as per guidelines.
- Barricades and signs should be checked regularly during work for **stability, reflectivity, and visibility**.
- Compliance with **IRC-67-2022** must be ensured, ensuring that the signage is visible, placed at the correct distance, and meets the required dimensions.

## M2. Scaffolding / suspended platforms

**Reference Clause:** MoRTH Section 111 (General Requirements for Traffic Safety) and IS 3696 (Code of Practice for Scaffolds and Scaffolding)

### Scope of Work:

This item involves the provision, installation, and maintenance of **scaffolding** or **suspended platforms** to facilitate safe access for workers performing maintenance or repair work on bridges and elevated structures. The scaffolding shall be designed, constructed, and maintained in accordance with the relevant standards and the structural requirements of the project. This includes the necessary safety measures to protect the workers and pedestrians in and around the work zone.

### Methodology:

#### 1. Scaffolding Design and Planning:

- The design of the scaffolding or suspended platforms must be **site-specific** and in line with the dimensions and load-bearing capacity of the work zone.
- Scaffolding shall be designed by qualified engineers to ensure **stability, adequate load-bearing capacity, and accessibility** to workers and materials.
- The scaffolding design must include **safety rails, toe boards, and platform decking** to ensure the safety of workers at height.

#### 2. Installation of Scaffolding / Suspended Platforms:

- **Scaffolding Installation:**
  - Erect scaffolding according to the approved design, ensuring that the base is level and secure, and the structure is **properly braced** to prevent any swaying or shifting.
  - Ensure that the scaffolding is free from defects and that all connections are secure, with **metal clips or couplers** used to fix the components.

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- **Vertical and horizontal tie-ins** must be provided at intervals according to the height of the structure to prevent lateral movement.
- **Suspended Platforms:**
  - Install **suspended platforms** using a combination of **ropes, pulleys, and counterweights** as per the design.
  - Platforms should be equipped with safety guardrails, **safety harness points**, and **non-slip surfaces** for worker safety.
  - Ensure that the platform is securely anchored and tested for load-bearing capacity before use.
- 3. **Inspection and Maintenance:**
  - **Pre-Use Inspection:**
    - Conduct a thorough inspection before use, ensuring that all **bracing, securing components, and guardrails** are in place and that the scaffold is **stable**.
    - Any **defective parts** such as broken pins, damaged planks, or weakened ties must be replaced immediately.
  - **Routine Inspection:**
    - Scaffolding and suspended platforms should be inspected regularly during use, particularly after any weather events, such as **strong winds** or **rain**.
    - Check for the integrity of all components and ensure **safe access** for workers at all times.
  - **Post-Use Inspection:**
    - After completing the work, dismantle the scaffold or suspended platform carefully, checking for any damage that may have occurred during use.
    - Ensure that the dismantling process is done in a controlled and safe manner to prevent accidents.
- 4. **Safety Measures:**
  - **PPE:** All workers using the scaffolding or platform must wear appropriate **fall protection gear** such as **harnesses, lifelines, helmets**, and **non-slip footwear**.
  - **Barrier Protection:** For scaffolds near live traffic or pedestrian zones, install **temporary barriers** or **netting** to prevent falling objects from causing injury.
  - Ensure that scaffolding is **not overloaded**, and weight limits should be clearly marked and adhered to at all times.
- 5. **Dismantling:**
  - Dismantle scaffolding or suspended platforms after use by reversing the installation process, ensuring safety protocols are followed.

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- The dismantling process should be conducted from **top to bottom** in a controlled manner to avoid any falling debris or components.

#### Materials:

- **Scaffolding Materials:** Steel pipes, couplers, planks, nuts, bolts, ties, and braces.
- **Suspended Platform Components:** Ropes, pulleys, counterweights, steel beams, non-slip decking, guardrails.
- **Safety Gear:** Harnesses, ropes, helmets, non-slip footwear, and other fall protection gear.

#### Indicative Equipment Involved:

- **Scaffolding tools** for installation (wrenches, levels, etc.)
- **Crane or manual hoists** for lifting materials to elevated work areas
- **Ropes, pulleys, and counterweights** for suspended platforms
- **Lifting equipment** for transporting materials to the work zone
- **PPE** for workers, including **fall arrest systems**, helmets, gloves, and safety shoes

#### Measurement:

- Measured in **Square Metres (Sqm)** of scaffold or platform area provided and maintained, based on the actual area covered by scaffolding or suspended platform during the project.
- **Measurement for Suspended Platforms:** Measured by the **length of the platform** and the **area covered**, not the number of platforms installed.

#### Safety and Quality Assurance:

- Ensure compliance with **MoRTH and IS 3696** standards for scaffolding design, installation, and maintenance.
- Scaffolding must be designed and constructed to **withstand wind loads, live loads, and dead loads**.
- Only qualified personnel should install, inspect, and maintain scaffolding and suspended platforms.
- Use of **safety nets, fall arrest systems, and barriers** is mandatory around scaffoldings or platforms located near open or high-traffic areas.

### M3. Curing using curing compounds

**Reference Clause:** MoRTH Section 2800 (Curing of Concrete)

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### Scope of Activity

#### Scope of Work:

This item involves the application of **curing compounds** to freshly laid concrete surfaces to ensure proper hydration and strength development. Curing is a crucial process for maintaining moisture in concrete, preventing early drying, and promoting proper cement hydration. The curing compounds should be applied in accordance with **MoRTH** and **BIS standards** to enhance the quality and durability of the concrete.

#### Methodology:

##### 1. Preparation of Surface:

- Ensure that the concrete surface to be cured is **clean**, free from dust, debris, or any contaminants that could affect the bonding of the curing compound.
- The concrete should have reached the **initial set** stage before the application of the curing compound.

##### 2. Application of Curing Compound:

###### ○ Selection of Curing Compound:

- The curing compound should be **water-based, non-toxic, and non-flammable**, with a **white pigmented or clear type** to ensure uniform coverage. The compound must be compatible with the specific type of concrete used.
- Examples of acceptable curing compounds include **water-based films, acrylic-based curing agents, or membrane-forming agents** that comply with relevant **BIS** standards such as IS 9103 (Specifications for Curing Compounds).

###### ○ Method of Application:

- Apply the curing compound using **sprayers, brushes, or rollers** depending on the area and surface type. For large areas, **mechanical sprayers** should be used for uniform coverage.
- Ensure **uniform application** over the entire surface, covering all exposed areas. The recommended coverage rate is typically **4-5 square meters per litre** of curing compound.
- The curing compound must be applied immediately after the concrete surface has reached the **initial set** and while the surface is still moist.

##### 3. Post-Application:

- Once applied, the curing compound will form a **continuous film** over the concrete surface, retaining moisture and preventing evaporation.
- Allow the curing compound to **cure** for a minimum period of **7 days** or as per the specific project requirement. The curing duration may vary depending on the concrete grade, ambient temperature, and humidity conditions.

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#### 4. Environmental Conditions:

- Avoid applying curing compounds during **rainy or windy weather**, as these conditions may reduce the effectiveness of the compound.
- For **high-temperature conditions**, additional measures such as using **wet burlap or polyethylene sheets** in conjunction with the curing compound may be recommended to prevent rapid evaporation.

#### Materials:

- **Curing Compounds:** Water-based curing compounds, white pigmented or clear types, non-toxic, and suitable for the concrete mix used.
- **Sprayers, Brushes, and Rollers** for applying the curing compound to ensure uniform coverage.

#### Indicative Equipment Involved:

- **Sprayers** (manual or mechanical) for applying the curing compound
- **Rollers and brushes** for smaller areas or detailing
- **Protective gear** (gloves, goggles, and masks) for workers handling chemicals.

#### Measurement:

- Measured in **Square Metres (Sqm)** of surface area treated with the curing compound.
- The measurement is based on the area where the compound is applied, ensuring uniform coverage.

#### Safety and Quality Assurance:

- Ensure that the curing compound complies with **BIS IS 9103** for curing materials.
- Follow proper **handling and application procedures** as specified by the manufacturer of the curing compound.
- Ensure that **PPE (Personal Protective Equipment)** such as gloves, goggles, and protective clothing is worn during the handling and application of the curing compound.
- The curing compound must be applied as per the **recommended coverage rate** to ensure effective curing.

### M4. Concrete cutting / coring

**Reference Clause:** MoRTH Section 2800 (Concrete Cutting and Coring)

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### Scope of Activity

#### Scope of Work:

This item involves the **cutting** and **coring** of concrete surfaces as part of bridge maintenance activities. Concrete cutting may be necessary for repairs, modifications, or the installation of structural elements such as reinforcement or expansion joints. Coring is often used to extract samples for testing or for creating holes for services like ducts or pipes. The work must be performed with precision to avoid damaging the structural integrity of the concrete, while adhering to relevant safety, quality, and environmental standards.

#### Methodology:

##### 1. Surface Preparation:

- Inspect the concrete surface to identify the cutting or coring location. The area should be free from debris, loose particles, and any other material that might interfere with the cutting or coring process.
- Mark the cutting or coring line with appropriate tools, such as **chalk lines** or **laser markers**, to ensure accuracy.

##### 2. Concrete Cutting:

- **Selection of Cutting Method:**
  - The cutting method depends on the thickness of the concrete and the required precision. **Diamond cutting blades** are preferred for most applications due to their precision and ability to cut through reinforced concrete.
  - For smaller cuts or openings, **circular saws** or **abrasive cutting tools** may be used.
- **Cutting Process:**
  - Ensure that the cutting is done using appropriate **wet or dry cutting methods**. Wet cutting is preferred for controlling dust and cooling the blade.
  - Use **water-fed cutting equipment** for wet cutting to minimize dust, prevent overheating of the blade, and improve cutting efficiency.
  - Maintain consistent speed and pressure to ensure clean, straight cuts without damaging the concrete or reinforcing steel.

##### 3. Concrete Coring:

- **Selection of Coring Method:**
  - **Diamond core drills** are typically used for coring operations, as they provide smooth, clean holes for services or testing purposes.
  - Select the appropriate **diameter** and **depth** of the core based on the requirements of the project (e.g., hole size for pipes, cables, or testing).

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- **Coring Process:**
  - Install the **diamond core drill** securely and ensure the alignment is correct before beginning.
  - Apply **water** to the drill bit to reduce friction and cooling, ensuring the longevity of the core bit.
  - **Cores** should be extracted carefully without disturbing the surrounding concrete.
  - After extraction, the cores should be **stored safely** for later analysis or testing as required.
- 4. **Post-Work Procedures:**
  - **Debris Removal:**
    - After the cutting or coring process, clean the area of any concrete dust, chips, or debris. This ensures that the work zone remains safe and ready for further operations.
  - **Inspection of Work:**
    - Inspect the cut or core to verify its alignment, depth, and quality. Ensure the work meets the specified requirements and that no damage has occurred to surrounding concrete or reinforcement.
- 5. **Safety Measures:**
  - **Dust Control:** For dry cutting, use **vacuum systems** or **water-fed tools** to minimize dust emissions. Dust control is essential for worker safety and environmental protection.
  - **Personal Protective Equipment (PPE):** Workers should wear **face shields, ear protection, dust masks, gloves, and safety boots** to protect from debris and noise.
  - **Safety Barriers:** Erect **barriers** around the work area to prevent access by unauthorized personnel, as concrete cutting can create sharp debris and dust.

#### Materials:

- **Diamond Cutting Blades** for concrete
- **Core Drills** with diamond bits for coring operations
- **Water** for wet cutting
- **Vacuum Systems** for dust control (if required)
- **Reinforcement Cutting Tools** for cutting through steel bars when necessary

#### Indicative Equipment Involved:

- **Concrete Cutting Machines** (diamond saws, abrasive cutters, etc.)

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### Scope of Activity

- **Diamond Core Drills**
- **Water Supply Systems** (for wet cutting)
- **Vacuum Systems** (for dust extraction)
- **Personal Protective Equipment (PPE)**

#### Measurement:

- **Concrete Cutting:** Measured in **Linear Metres (Lm)** of concrete cut, based on the length of the cut made, including any variations in depth.
- **Concrete Coring:** Measured in **Number of Cores** taken, or **Linear Metres (Lm)** for core length, depending on the project requirements.

#### Safety and Quality Assurance:

- Ensure that cutting and coring operations comply with **MoRTH** and **BIS** standards for equipment safety and quality.
- Conduct a **pre-work inspection** of cutting equipment to ensure that it is in good working condition.
- Ensure that workers are adequately trained in **safe operation** of the cutting and coring equipment.
- Follow all **environmental guidelines** for dust control and waste disposal.

### M5. Controlled demolition of RCC

**Reference Clause:** MoRTH Section 202 (Demolition of Concrete)

#### Scope of Work:

This item involves the **controlled demolition of reinforced cement concrete (RCC)** structures or components to facilitate repairs, modifications, or the complete removal of sections as part of bridge maintenance activities. The demolition process must be executed with precision to ensure the safety of surrounding structures, personnel, and the environment. The method of demolition should be chosen based on the nature of the structure and the scale of work, ensuring minimal disturbance to the remaining structure and surroundings.

#### Methodology:

1. **Preparation of Site:**
  - **Inspection and Assessment:**

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- Perform a thorough **inspection** of the RCC structure to be demolished. Assess the structural integrity and identify any potential hazards.
  - Mark the area to be demolished, and set up safety barriers to restrict access to unauthorized personnel.
  - **Documentation:**
    - Prepare detailed **demolition plans**, including safety procedures, equipment details, and methodology, to be approved by the relevant authorities before starting work.
2. **Safety Measures:**
- Erect **scaffolding, protective barriers, and safety nets** around the demolition area to prevent debris from falling and to protect workers and passersby.
  - Ensure that **warning signs** and **safety signage** are clearly visible to alert workers and the public of the ongoing demolition.
  - Workers should wear full **PPE**, including **helmet, safety boots, gloves, eye protection**, and **hearing protection**.
3. **Demolition Process:**
- **Mechanical Demolition:**
    - Use **hydraulic breakers, excavators, or crushers** for large-scale concrete demolition. These machines should be equipped with proper attachments for effective demolition without causing excessive vibration or damage to adjacent structures.
  - **Manual Demolition:**
    - For smaller or delicate areas, use **manual tools** such as **jackhammers** or **cutting torches** to break up the concrete. Manual demolition allows for more controlled and precise removal.
  - **Controlled Explosive Demolition (if applicable):**
    - In cases where mechanical methods are impractical, **controlled explosive demolition** may be used. This method involves strategically placing explosives in pre-drilled holes in the concrete to safely bring down the structure. This should only be performed under strict supervision and with detailed planning to ensure safety.
4. **Removal and Disposal of Debris:**
- After demolition, **remove all debris** from the site immediately. The debris should be sorted for recycling, especially **rebar and concrete** materials that can be reused.
  - **Disposal of waste** should follow local environmental regulations, ensuring that any hazardous material, such as **asbestos**, is handled according to safety protocols.

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- Dispose of non-recyclable materials in accordance with **local waste management** policies.

#### 5. Post-Demolition Inspection:

- Inspect the remaining structure after demolition to ensure that it is stable and safe for further work. Remove any residual debris or materials that may obstruct further construction or maintenance activities.
- Ensure that the demolition site is cleared of any hazardous materials and that the area is safe for workers to begin subsequent tasks.

#### Materials:

- **Explosives** (if controlled explosive demolition is used)
- **Cutting Tools** (saws, jackhammers, etc.)
- **Mechanical Equipment** (excavators, hydraulic breakers, crushers)
- **Recycling Containers** for sorting and disposing of concrete, steel, and other debris.

#### Indicative Equipment Involved:

- **Excavators** with **hydraulic breakers** or **crushers** for mechanical demolition
- **Jackhammers, cutting torches, and diamond saws** for manual demolition
- **Explosives** for controlled explosive demolition (if applicable)
- **Scaffolding, protective barriers, and safety nets** for safety
- **Waste removal equipment** such as **dump trucks** or **cranes** for lifting debris

#### Measurement:

- **Controlled Demolition of RCC:** Measured in **Cubic Metres (Cum)** of concrete demolished, based on the volume of RCC removed.
- Measurement is taken based on the depth, width, and height of the demolished area or structure, as per the approved demolition plan.

#### Safety and Quality Assurance:

- Adhere to **MoRTH** guidelines and **BIS standards** for demolition works to ensure the safety of workers and nearby structures.
- Conduct a **risk assessment** and ensure all safety measures are in place before commencing the work.
- Demolition activities should be supervised by experienced personnel to avoid accidents and ensure adherence to the specified methodology.
- Ensure that all waste is disposed of in compliance with **environmental** and **regulatory requirements**.

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Bill Of Quantities (Abstract) : Kachugaon - Kaljhar		Annexure C3 - Section 1				
S.No	Item Description	Short Description	Unit	Quantity	Rate	Total
	<b>Design &amp; Drawing</b>					
1	<p><b>Preparation of Design &amp; Drawing for Bridge Structural Interventions</b> This item includes all charges towards the preparation of structural design and detailed drawings by a qualified structural designer or agency for various strengthening interventions on existing bridge structures. The scope includes site inspection, condition assessment, structural health evaluation, load analysis, design calculations, drawings, preparation of bar bending schedules, and submission of construction drawings and support during vetting and approval process. The deliverables shall include design reports, editable CAD drawings, construction drawings, PDFs, and BBS (as applicable). All designs shall conform to relevant IRC codes, MoRTH guidelines, and sound engineering practice. The scope shall also include technical support during execution for any design-related clarifications and revisions.</p> <p><b>Client reserves the right to get the design vetted by IIT/NIT or any other institute of repute, if deemed necessary. The Contractor shall obtain a structural stability certificate from the design engineer engaged for the work, and the full responsibility for the adequacy, safety, and structural stability of the design shall lie solely with the Contractor.</b></p> <p><b>Rate includes:</b> All professional charges, site visits, analysis, preparation and submission of drawings and reports (in editable and PDF formats), and all required documentation and compliance support. The contractor shall ensure the designer provides complete support during approval and execution phases as per Engineer-in-Charge directions.</p>	Design & Drawing	No.	Rate Only		
2	<p><b>Design and Drawing of Bridge Bearings</b> This subitem covers the design and drawing of load-bearing arrangements for each span, including POT-PTFE bearings and elastomeric bearings. The design shall consider actual field conditions and verify the existing bearing capacity. The work includes preparation of layout drawings, bearing schedules, and design report. Rate to be paid per span irrespective of number of bearings per span.</p>	Design and Drawing of Bridge Bearings	Per Span	Rate Only		
3	<p><b>Design and Drawing for Jacketing</b> This subitem includes structural design and detailing of RC jacketing for bridge elements such as piers, abutments, and pedestals. The design shall account for existing section, reinforcement, deterioration level, and required confinement. Work includes preparation of jacketing layout, reinforcement drawings, and BBS. Payment shall be made per number of members designed and detailed.</p>	Design and Drawing for Jacketing	Per Member	Rate Only		
4	<p><b>Design and Drawing for Superstructure Strengthening</b> This subitem involves the structural design and detailing of strengthening methods for girders, deck slabs, or cross girders, which may include techniques such as section enlargement, additional prestressing, or carbon wrapping (subject to site requirement). The work includes preparation of structural analysis, strengthening layout drawings, reinforcement/civil detailing, and BBS. Rate is payable per superstructure member designed and delivered.</p>	Design and Drawing for Superstructure Strengthening	Per Span	Rate Only		
	<b>SITE CLEARANCE</b>					
5	<p><b>Clearing and Grubbing Around Structures (Including RE Panels, Walls, and Medians)</b> Clearing and grubbing debris spilled over structures including removal of vegetation, bushes, grass, shrubs, and trees up to 300 mm girth, along with extraction of stumps and cutting around RE panels, walls, and medians. The work includes disposal of unserviceable material and stacking of serviceable items as per instructions, with all necessary leads and lifts. The activity shall be executed in line with MoRTH Clause 201 and the detailed methodology outlined in the approved Scope document. The quoted rate shall include all costs necessary to complete the work in accordance with the specifications, drawings and directions of the Engineer-in-Charge, including but not limited to the cost of all labour, materials, machinery, tools, plants, transportation, handling, testing, safety arrangements, temporary works and site clearance, whether specifically mentioned or implied.</p>	Clearing and Grubbing Around Structures (Including RE Panels, Walls, and Medians)	Sqm	Rate Only		
6	<p><b>Dismantling of Existing Concrete Structures</b> Dismantling of existing concrete structure including breaking and removal of concrete, cutting and removal of embedded reinforcement, clearing the site, and transportation and disposal of debris to an approved disposal site, all as directed by the Engineer-in-Charge. The work shall be executed using appropriate equipment and safety measures to prevent any damage to adjoining structures. The activity shall be executed in accordance with the methodology provided in the approved Scope document and relevant specifications. The quoted rate shall include all costs necessary to complete the work in accordance with the specifications, drawings and directions of the Engineer-in-Charge, including but not limited to the cost of all labour, materials, machinery, tools, plants, transportation, handling, testing, safety arrangements, temporary works and site clearance, whether specifically mentioned or implied.</p>	Dismantling of Existing Concrete Structures	Rmt	4316.00		
	<b>EARTHWORK, EROSION CONTROL AND DRAINAGE</b>					

7	<p><b>Construction of Subgrade</b></p> <p>Construction of subgrade with approved material obtained from borrow pits, transported with all lifts and leads, including royalty, and spread in uniform layers of not more than 250 mm thickness. The material shall meet the quality requirements specified in MoRTH Clause 305, ensuring compliance with gradation, plasticity, and moisture content parameters. Compaction of the subgrade shall achieve a minimum of 97% of Maximum Dry Density (MDD) as per IS 2720 (Part 8) using mechanical equipment. Grading shall be performed to ensure the required slope, alignment, and stability, with final finishing to the levels specified in the approved drawings. The work includes surface dressing, preparation of shoulders for proper drainage, and all necessary field and laboratory tests, such as field density and moisture content tests, to verify compliance with Table 300-2 of MoRTH specifications. The item covers all costs for material procurement, royalty, transportation, labor, machinery, and incidental works. Safety measures and environmental compliance shall be ensured during execution. The final surface shall be stable, durable, and suitable for traffic loading, conforming to project specifications and ensuring proper integration with adjacent structures.</p>	Subgrade	Cu.m	90.00		
8	<p><b>Quarter Coning Repair</b></p> <p><b>Repair of Eroded Side Slopes near Structures (Quarter Coning Areas) Using Select Fill</b></p> <p>The work includes all activities related to restoring eroded or damaged side slopes (quarter coning) around culverts, bridges, and other road structures using approved select earth fill. The scope involves removing loose debris, dressing the existing slope profile, placing select earth material in layers, and compacting each layer by hand-ramming or light mechanical tamping to ensure slope stability. The final slope shall be dressed to match the original embankment geometry (typically 2H:1V or as directed), ensuring uniformity and adequate drainage. The material used shall be free of organic matter, roots, or oversized clods, and sourced from an approved borrow area or designated stack. No stone pitching or turfing is included in this item.</p> <p>Rate includes all charges for removing debris, spreading and levelling of approved earth, hand compaction, dressing of slope, transportation of material within lead, and all manpower, material, and incidental costs as per MoRTH Clause 305 &amp; 306 and as directed by the Engineer-in-Charge. Measurement shall be done in square metres of slope surface restored.</p>	Repair and Restoration of Quarter Coning	Sq.m	9.00		
<b>TRAFFIC SIGNS, MARKINGS AND OTHER ROAD APPURTENANCES</b>						
9	<p><b>Application of Cement Paint on Concrete Handrails / Crash Barrier</b></p> <p>Providing and applying two coats of water-based cement paint on unplastered concrete surfaces of handrails / crash barrier after thorough surface preparation as per IS 2395 (Part 1): 1994 and IS 5410:1992. The surface shall be cleaned of all dirt, dust, grease, oil, efflorescence, and loose particles by wire brushing and water jetting, followed by drying. No primer is required if the surface is rough and porous; however, in case of smooth or dense surfaces, a compatible cement-based primer may be applied to ensure proper adhesion. The paint shall be applied at a coverage of 1 litre for every 2 sqm in each coat, ensuring uniform thickness, shade, and finish. All painting shall be carried out using appropriate tools such as brushes or rollers in two coats with sufficient drying time between coats as per manufacturer's instructions and relevant IS standards.</p> <p><b>The quoted rate shall include</b> all costs necessary to complete the work in accordance with the specifications, drawings and directions of the Engineer-in-Charge, including but not limited to the cost of all labour, materials, machinery, tools, plants, transportation, handling, testing, safety arrangements, temporary works and site clearance, whether specifically mentioned or implied.</p>	Application of Cement Paint on Concrete Handrails / Crash Barrier	Rmt	5189.00		
<b>FORMWORK</b>						
10	<p><b>Providing and fixing temporary double steel scaffolding system with safety features.</b></p> <p>Providing, erecting, maintaining, and removing temporary engineered double steel tubular scaffolding system or suspended platforms for safe access to elevated structures for all heights, conforming to IS 3696 and MoRTH Section 1500. The scaffolding shall include standards, ledgers, bracings, runners, toe boards, guardrails, and working platforms as per approved design. It shall be securely anchored, adequately stiffened, and safely accessible, ensuring structural stability throughout its use. Suspended platforms, if used, shall be supported with ropes, pulleys, counterweights, and non-slip decking, equipped with proper anchorage and fall protection systems.</p> <p>All scaffolding shall be designed and erected by trained personnel, inspected before use, and maintained regularly, including after adverse weather. Safety measures such as PPE, safety harness anchorage points, debris netting, and temporary barriers near traffic zones shall be ensured. Post-use dismantling shall be carried out in a controlled manner.</p> <p><b>The quoted rate shall include</b> all costs necessary to complete the work in accordance with the specifications, drawings and directions of the Engineer-in-Charge, including but not limited to the cost of all labour, materials, machinery, tools, plants, transportation, handling, testing, safety arrangements, temporary works and site clearance, whether specifically mentioned or implied.</p>	Providing and fixing temporary double steel scaffolding system with safety features.	Cum	15339.00		
<b>STEEL REINFORCEMENT</b>						

11	<p><b>Extra Reinforcement with Zinc-Rich Epoxy Coating</b></p> <p>All charges for providing and laying extra reinforcement wherever required for rehabilitation and strengthening work, including surface preparation and application of two coats of Zinc-rich epoxy primer (such as CICO Zincilate 500 or equivalent), ensuring uniform coverage and anti-corrosive protection. The coating shall be carried out as per manufacturer's recommendations and MoRTH Specifications Clause 1600. The work shall include cleaning of steel surfaces, proper drying, application with brush or spray, and curing, complete in all respects.</p> <p><b>The quoted rate shall include</b> all costs necessary to complete the work in accordance with the specifications, drawings, and directions of the Engineer-in-Charge, including but not limited to the cost of all labour, materials, machinery, tools, plants, transportation, handling, testing, safety arrangements, temporary works, and site clearance, whether specifically mentioned or implied.</p>	Extra Reinforcement with Zinc-Rich Epoxy Coating	MT	1		
<b>STRUCTURAL CONCRETE</b>						
12	<p><b>Jacketing of Structural Members with M-40 Concrete (150 mm to 175mm Thick)</b></p> <p>All charges for <b>structural jacketing of beams, columns, or piers</b> using M-40 grade concrete of <b>150 mm to 175mm thickness</b>, executed as part of rehabilitation/strengthening of deteriorated members, including complete removal of loose or damaged concrete, surface roughening, exposure of existing reinforcement, cleaning of rebars using wire brush/sandblasting/high-pressure water jet, and applying anti-corrosive coating (Zinc-rich epoxy or equivalent) to existing reinforcement wherever required. The item includes supplying, cutting, bending, and fixing of new 12 mm diameter reinforcement bars @ 150 mm c/c both ways (or as per design) with proper lapping, anchorage, and tying with old rebars. All work shall be carried out with adequate surface preparation to ensure full bond between old and new concrete, including fixing of leak-proof formwork/shuttering, placement of M-40 grade concrete using conventional, pumpable or self-compacting concrete as per design requirement, proper compaction with vibrators or suitable means, finishing of exposed surfaces, and curing by approved methods for the prescribed period.</p> <p><b>The quoted rate shall include</b> all costs necessary to complete the work in accordance with the specifications, drawings, and directions of the Engineer-in-Charge, including but not limited to labour, materials, machinery, shuttering, reinforcement, anti-corrosive treatment, curing, surface preparation, and all safety arrangements. No extra payment shall be made for working at any height, in congested zones, night work, or difficult access conditions. The work shall conform to MoRTH Specifications Section 1700 &amp; 2800, IRC-SP:84, and relevant IS Codes.</p>	Jacketing of Structural Members with M-40 Concrete (150 mm to 175mm Thick)	Sqm	408		
<b>BEARINGS</b>						
13	<p><b>Lifting of Superstructure Span by Hydraulic Jacking (Span Length up to 50m)</b></p> <p>All-inclusive charges for safe and controlled <b>lifting of the superstructure span (up to 50m in length) by hydraulic jacking</b> from below, i.e. by placing synchronized hydraulic jacks on pier or abutment caps, to facilitate the replacement of bearings or other structural interventions. The work includes detailed pre-inspection of lifting points, design of jacking system, staging and positioning of jacks, synchronized and monitored lifting, stabilization, and controlled lowering after completion of intervention works.</p> <p>The lifting shall be executed using synchronized hydraulic jacks, load cells, and associated lifting frames or beams to ensure uniform vertical movement without causing differential stresses, distortion, or misalignment of the girder. Temporary supports/staging shall be provided to secure the girder during operations. The contractor shall ensure deployment of qualified structural engineers, supervisors, and jacking specialists at site.</p> <p>All equipment (hydraulic jacks, pressure gauges, sensors, spreader beams) shall be calibrated and certified. The operation shall comply with MoRTH guidelines, IRC standards, IS codes, and approved method statements, with complete documentation and risk assessment submitted prior to execution.</p> <p><b>The quoted rate shall include</b> all costs necessary to complete the work in accordance with the specifications, drawings, and instructions of the Engineer-in-Charge, including but not limited to supply of lifting equipment, manpower, safety barricading, PPEs, communication systems, environmental compliance, temporary support systems, and all incidental works. No extra payment shall be made for night work, space constraints, safety arrangements, risk assessment preparation, or multiple jacking attempts, if required for completion of the task.</p>	Lifting of Superstructure Span by Hydraulic Jacking (Span Length up to 50m)	Nos	54.00		

14	<p><b>Replacement of Existing Bearing with New POT-PTFE Bearing Including Pedestal Preparation and Levelling</b></p> <p>All charges for <b>replacing the existing bearing with a new POT-PTFE bearing of equivalent load-carrying capacity</b>, including removal and disposal of old bearing, thorough cleaning of the bearing pedestal, levelling using epoxy levelling pad (3 mm to 10 mm thick), and accurate positioning, alignment, and installation of the new bearing. The bearing shall conform to IRC:83 Part 3, and the epoxy resin used for levelling shall comply with ASTM C881 or equivalent approved standard. The installation shall conform to MoRTH Clauses 2000 &amp; 2200, IRC:83 Part 3, and the approved drawings. Work under this item shall commence only after the superstructure is lifted under a separate item.</p> <p><b>The scope includes:</b></p> <ul style="list-style-type: none"> <li>a) Mechanical cleaning and preparation of the concrete pedestal surface</li> <li>b) Application and curing of high-strength epoxy levelling pad</li> <li>c) Positioning and alignment of new bearing with reference to structure's longitudinal and transverse axes</li> <li>d) Application of epoxy adhesive, where specified</li> <li>e) Grouting of anchor bolt pockets using non-shrink grout conforming to IS 4031 / ASTM C1107</li> <li>f) Ensuring correct orientation, specified clearances, and uniform seating</li> <li>g) Final inspection, verification of bearing position, and submission of compliance records</li> </ul> <p><b>The quoted rate shall include</b> complete cost of bearing (supply of POT-PTFE bearing conforming to IRC:83 (Part 3)), and installation), epoxy materials, non-shrink grout, tools, equipment, manpower, alignment instruments, specifically required for bearing replacement work. No extra shall be payable for dismantling or disposal of existing bearing, pedestal cleaning, or staging. Lifting of superstructure is excluded and covered under a separate item.</p>	Replacement of Existing Bearing with New POT-PTFE Bearing Including Pedestal Preparation and Levelling	Nos	6.00		
15	<p><b>Replacement of Existing Bearing with New Elastomeric Bearing</b></p> <p>All charges for replacing the <b>existing bearing with a new elastomeric bearing of equivalent load-carrying capacity</b>, including complete cleaning and levelling of the pedestal using epoxy levelling pad (3 mm to 10 mm thick), and proper positioning and alignment of the new bearing. The elastomeric bearing shall conform to IRC:83 (Part 2), and the epoxy resin shall conform to ASTM C881 or equivalent. The work shall be executed only after lifting of the superstructure has been completed under a separate payable item.</p> <p>The scope includes removal and disposal of the existing bearing, mechanical cleaning of the bearing pedestal, preparation of surface, application and curing of epoxy levelling pad to achieve uniformity, accurate placement of elastomeric bearing as per approved drawings, and verification of alignment and seating. As elastomeric bearings are typically unanchored, anti-skid arrangements or recessed pedestals shall be used where specified. Bearings shall be positioned with proper orientation, ensuring even contact pressure and adequate clearances in all directions.</p> <p><b>The quoted rate shall include</b> cost of supply of elastomeric bearing conforming to IRC:83 (Part 2), epoxy levelling pad, labour, tools, equipment, alignment instruments, all required for execution of the bearing replacement work. No extra payment shall be made for surface preparation, or disposal of removed bearings. Lifting of the superstructure is excluded and shall be paid under a separate item.</p>	Replacement of Existing Bearing with New Elastomeric Bearing	Nos	282.00		
16	<p><b>Cutting of Metallic Bearing Locks Using Electric Grinder</b></p> <p>All charges for <b>cutting and removal of existing metallic bearing locks</b> on both sides of the bearing using electric grinder, without causing any damage to the bearing, including careful marking, controlled cutting, shielding of bearing surfaces, and disposal of dismantled metallic parts as per the direction of the Engineer-in-Charge. The work shall be executed using suitable angle grinders with abrasive or diamond-tipped discs, ensuring vibration-free and spark-controlled cutting. Necessary protective covers such as fire-resistant blankets or metallic shields shall be used to prevent any impact on the bearing housing.</p> <p><b>The quoted rate shall include</b> the cost of all labour, cutting equipment, grinders, blades and discs, supervision, safety PPE, protective shielding required for safe access, and collection and disposal of all dismantled metallic pieces from the site. No extra payment shall be made for consumables, tools, safety arrangements, temporary working platforms or for any precautionary measures adopted to protect the existing bearings during the cutting operation.</p>	Cutting of Metallic Bearing Locks Using Electric Grinder	Nos	46.00		

17	<p><b>Rust Removal and Anti-Corrosive Zinc Painting on Bearings (As per MoRTH Specifications)</b></p> <p>All charges for removing rust from bearing surfaces and applying anti-corrosive zinc-based protective coating, including necessary access arrangements such as erection and removal of scaffolding, as per MoRTH Specifications Clause 2006 and as per the direction of Engineer-in-Charge at site. The work shall involve thorough cleaning of the bearing surfaces by manual or mechanical wire brushing, emerying or grit blasting wherever required, to remove rust, dust, oil, grease, and loose particles. After surface preparation to near white metal finish (Sa 2½), the protective painting system shall be applied in accordance with manufacturer's recommendations and as per technical specifications.</p> <p>The painting system shall consist of two coats of epoxy primer enriched with metallic zinc, followed by one intermediate coat of high-build epoxy paint reinforced with Micaceous Iron Oxide (MIO), and finished with one coat of high-performance epoxy topcoat. The total dry film thickness (DFT) of the entire system shall not be less than 160 microns, conforming to MoRTH Clause 2006(xv). All safety precautions during scaffolding, surface preparation, and painting shall be strictly adhered to.</p> <p><b>Rate includes the cost of</b> all labour, materials, tools, access arrangements, safety gear, surface preparation, cleaning, and application of the complete anti-corrosive coating system as specified, as well as all incidental works necessary to execute the job in a safe and workmanlike manner to the satisfaction of the Engineer-in-Charge. The contractor shall be fully responsible for making all necessary arrangements to access the bearings, including over rivers, high piers, or confined spaces.</p>	Rust Removal and Anti-Corrosive Zinc Painting on Bearings (As per MoRTH Specifications)	Nos	552.00		
18	<p><b>Greasing of Steel Bearings (Roller-cum-Rocker and Pin &amp; Roller Types)</b></p> <p>The work includes the thorough cleaning and application of approved quality grease to mechanical steel bearings, including roller-cum-rocker and pin &amp; roller bearings, as per MoRTH Specifications Clause 2003.1.7 and as directed by the Engineer-in-Charge. The scope involves cleaning of bearing components such as rollers, pins, saddles, and contact surfaces using appropriate manual or mechanical means to remove dust, rust flakes, hardened grease, and other contaminants. After cleaning, high-quality lithium-based or calcium-based waterproof grease conforming to IS: 7623 or equivalent international standards shall be applied to all moving and mating surfaces to ensure smooth functioning and prevention of corrosion.</p> <p><b>The rate includes the cost of</b> all labour, materials (including grease and cleaning agents), tools, equipment, safety gear, access arrangements or working platforms, and all incidental works necessary to complete the job in a safe, workmanlike manner. All operations shall be carried out with proper traffic and structural safety precautions and to the satisfaction of the Engineer-in-Charge. Vetting or approval of the activity is under the client's scope.</p>	Greasing of Steel Bearings (Roller-cum-Rocker and Pin & Roller Types)	Nos	306.00		
<b>Dirt Wall, Return Wall and Wing Wall</b>						
19	<p><b>Reconstruction of Damaged Return Wall (Cast-in-situ RCC up to 4m Height)</b></p> <p>All-inclusive charges for dismantling the existing damaged return wall and <b>casting of new return wall up to 4.0 m height using cast-in-situ M35 grade reinforced cement concrete (or as specified)</b>, including site clearance, disposal of dismantled material, excavation (if applicable), surface preparation, fabrication and fixing of steel reinforcement as per design, fixing of shuttering/formwork, mixing, placing, compacting and curing of concrete, and achieving required surface finish as per drawings and MoRTH specifications. The item includes the supply of all materials (cement, aggregates, water, reinforcement bars, shuttering materials, binding wires, cover blocks, curing compounds), all labour, tools, plant &amp; equipment required for the execution.</p> <p>The work shall also include proper alignment, verticality, and plumb of the wall, maintaining construction joints (if any), provision of weep holes, waterstops or expansion joint materials (if required), and removal of formwork after achieving initial setting time. All works shall conform to relevant IS codes and MoRTH Specifications under the supervision and direction of the Engineer-in-Charge.</p> <p><b>The quoted rate shall include</b> all costs necessary to complete the work in accordance with the specifications, drawings, and instructions of the Engineer-in-Charge, including but not limited to procurement and royalty of materials, transportation, loading/unloading, labour charges, use of machinery, safety measures (PPE, barricading, signage), environmental compliance, and disposal of waste. No extra payment shall be made for working in constrained areas, night work, site-specific difficulties, water arrangement, curing arrangement, or any incidental work required to complete the job in all respects.</p>	Reconstruction of Damaged Return Wall (Cast-in-situ RCC up to 4m Height)	Rmt	Rate Only		
<b>Stone Pitching for Erosion Protection</b>						

20	<p><b>Stone Pitching on Side Slopes near Culverts/Bridges for Embankment Protection (As per MoRTH Clause 2504)</b></p> <p>The item involves providing stone pitching on earthen or embankment slopes near culverts, bridges, or other road structures to prevent erosion and ensure long-term stability. The scope includes dressing and preparing the slope surface to the required lines and gradient. A 75 mm thick granular filter layer shall be laid over the slope if required, using clean, well-graded sand or stone aggregate (as per MoRTH specifications), to facilitate drainage and prevent soil migration. Subsequently, hand-packed stone pitching shall be done using approved hard stones (nominal size 150–250 mm), properly wedged with spalls to ensure interlocking and stability. The stones shall be sound, durable, and angular in shape.</p> <p>The slope surface shall be dressed and compacted prior to laying the granular filter and stone pitching, it shall be carried out manually or by light mechanical means. The finished surface shall be neat, uniform, and to the required slope.</p> <p>Adequate temporary precautions shall be taken during the monsoon or on steep slopes, such as bunds, diversion drains, or tarpaulin covers, to prevent damage to the executed work until permanent protections like turfing or toe walls are constructed (which are payable under separate items).</p> <p><b>Rate includes</b> the cost of all labour, material (stone, filter media, spalls), transportation, dressing, packing, wedging, temporary protection, and all incidental works. Measurement shall be in square metres (Sqm) of actual surface area pitched. Work shall conform to MoRTH Clause 2504 and be executed as per the approved drawing and as directed by the Engineer-in-Charge.</p>	Stone Pitching	Sq. Mtr	Rate Only	
<b>EXPANSION JOINTS</b>					
21	<p><b>Expansion Joints and Related Works (MoRTH Clause 2600)</b></p> <p>This item includes all charges related to the provision, replacement, and rectification of expansion joints and associated components for bridges, in accordance with MoRTH Specifications Clause 2600 and as directed by the Engineer-in-charge. The scope is further elaborated in the following sub-items.</p>	Expansion Joints			
21.a	<p><b>Providing New Expansion Joint Assembly – Filler Type</b></p> <p>Providing and fixing new expansion joint assembly of filler type conforming to MoRTH Clause 2600 (Clauses 2602 to 2607) and IRC:SP:69, including all operations necessary for ensuring proper functionality of the joint. The work includes marking the location of the joint, removal of damaged or deteriorated joint material (if any), groove cutting, thorough cleaning, and surface preparation. Pre-moulded compressible filler board (bitumen impregnated fibreboard or closed-cell polymer board) of approved thickness and depth shall be fixed into the cleaned joint gap. Edge protection angles of mild steel/galvanized steel shall be fixed on both sides using dowels embedded in epoxy grout. Backer rod, primer and approved elastomeric or polysulphide sealant shall be applied to seal the joint, ensuring water-tightness and flexibility. Work shall include all labour, tools, equipment, safety measures, traffic control, and environmental compliance, and shall be executed as per drawings and direction of Engineer-in-Charge.</p> <p><b>The rate shall include</b> cost of all materials, cutting, cleaning, surface preparation, fixing, sealing, curing, waste disposal, safety arrangements, and incidental charges for completing the work in all respects.</p>	Providing New Expansion Joint Assembly – Filler Type	Rmt	842.00	
22.b	<p><b>New Expansion Joint – Strip Seal Type</b></p> <p>Providing and fixing strip seal expansion joint assembly, including supply and installation of steel edge beams with elastomeric sealing element (strip seal), conforming to MoRTH Clause 2600 and IRC 83 (Part II). Work includes removal of existing joint (if any), groove cutting and cleaning, placing and aligning anchorages and edge beams, and fixing the elastomeric strip seal using manufacturer-approved system ensuring proper compression fit. All components shall conform to approved specifications and design drawings. The sealing element shall be resistant to fatigue, wear, UV, and chemicals.</p> <p><b>Rate includes all</b> materials, labour, joint removal, site preparation, groove preparation, alignment, sealing, testing, and disposal of waste as per direction of Engineer-in-Charge.</p> <p>MoRTH Ref: Clause 2607 Relevant Codes: IRC SP:73, IRC 83 Part II, IS 12118:1987</p>	New Expansion Joint – Strip Seal Type	Rmt	1440.00	
23.c	<p><b>Providing Seal for Strip Seal Expansion Joint</b></p> <p>Providing and fixing <b>elastomeric sealing element (seal only)</b> in existing strip seal expansion joint assembly as per Clause 2600 of MoRTH Specifications and IRC 83 (Part II). The work includes removal of old seal (if any), thorough cleaning of seal grooves using air compressor/wire brush, application of adhesive/primer if required, and inserting new approved elastomeric seal ensuring uniform compression.</p> <p><b>Rate includes all</b> labour, equipment, cleaning, sealant, primer, installation of sealing strip, quality checks, and disposal of removed material in compliance with environmental guidelines. Seal shall be UV and fatigue resistant, suitable for repeated vehicular movements, and capable of withstanding temperature variations.</p> <p>MoRTH Ref: Clause 2607 Relevant Codes: IRC 83 Part II, IS 12118:1987</p>	Providing Seal for Strip Seal Expansion Joint	Rmt	1276.00	
<b>Railings and Crash Barrier</b>					

24	<p><b>Reconstruction of RCC Crash Barrier (Post Dismantling)</b></p> <p>Construction of new RCC crash barrier in place of a damaged/dismantled barrier, including preparation of base surface, layout marking, supplying and fixing steel reinforcement conforming to IS:1786, fixing dowel bars/anchor rebars (wherever required) by core drilling and grouting with approved resin-based compound, providing and fixing steel formwork, and placing M40 grade concrete using mechanical/manual methods. Scope includes proper compaction by needle vibrators, finishing, curing for minimum 7 days, de-shuttering, and surface rectification, all in line with approved drawings and site requirements.</p> <p>This work shall be carried out as per MoRTH Specifications Sections 1700 (Concrete), 1500 (Formwork), 1600 (Reinforcement), and Section 2703 (for crash barrier dimensions and geometry). The contractor shall take utmost care to ensure proper jointing with existing structure and reinforcement continuity for safety performance.</p> <p><b>Rate includes all materials, labour, equipment, safety barriers, curing, site cleaning, and incidental works. No extra payment shall be made for dowel fixing, formwork over uneven base, or working in restricted locations. Finished barrier shall be true in line and level, with uniform cross-section and surface finish.</b></p>	Reconstruction of RCC Crash Barrier (Post Dismantling)	Rmt	4316.00		
<b>WEARING COAT AND APPURTENANCES</b>						
25	<p><b>Drainage Spouts and Appurtenances (MoRTH Clause 2705)</b></p> <p>This item includes all charges towards provision, replacement, or rectification of drainage spouts and their associated components as per MoRTH Specifications Clause 2705 and as directed by the Engineer-in-charge. Detailed scope is covered under the following sub-items:</p>	Drainage spout				
25.a	<p><b>Replacement/Providing of Drainage Spout Assembly</b></p> <p>The work includes providing and fixing new drainage spout assemblies or replacing damaged/non-functional ones to ensure effective deck drainage of bridge superstructures. The scope covers supply, fabrication, and installation of spout assemblies as per MoRTH Specifications Clause 2705, including spout body, MS grating, connecting down take pipe, brackets, fasteners, and protective coatings. The spouts shall be made of mild steel conforming to IS:2062, hot-dip galvanized or epoxy-painted for corrosion resistance, and of dimensions suitable for ensuring proper drainage as per site conditions. The assembly shall be fixed by drilling through the deck wearing coat and securely embedding into the drainage recess using approved sealants and fasteners. All loose concrete shall be repaired prior to fixing, and proper alignment and slope shall be ensured. This item includes removal of debris, disposal of old/damaged components, reinstatement of wearing coat around the spout, and restoration of any surface affected during work. The contractor shall supply all men, materials, and machinery required and carry out the work with proper safety, traffic control, and due diligence under the guidance of the Engineer-in-charge.</p> <p><b>Rate includes the cost of all materials (spout body, grating, down take pipe, fasteners, sealants), fabrication, protective coatings, transportation, skilled and unskilled labour, machinery, surface preparation, disposal of dismantled material, and all incidental works required for completing the job in accordance with MoRTH specifications and direction of Engineer-in-charge.</b></p>	Replacement/Providing of Drainage Spout Assembly	Nos	212.00		
25.b	<p><b>Provision of Missing MS Grating over Drainage Spouts</b></p> <p>This item includes providing and fixing MS grating over existing drainage spouts wherever missing, as per MoRTH Clause 2705. The grating shall be fabricated from mild steel flats of adequate strength and spacing to allow unimpeded flow of water and to prevent debris ingress. The size and configuration of the grating shall suit the existing spout mouth and shall be fixed securely either by welding or bolting as per site condition and as directed by the Engineer-in-charge. The MS grating shall be hot-dip galvanized or epoxy painted to prevent corrosion and ensure long life. If any reshaping or cleaning of the spout mouth is required before installation, it shall be done carefully. This item also includes removal of rust or scaling from the existing spout where necessary, and surface preparation before fixing the grating. The contractor shall be responsible for the supply of all required men, materials, and tools, and shall ensure that work is carried out with proper traffic safety, without disturbing the drainage system, and with due diligence as per standard specifications.</p> <p><b>Rate includes cost of fabrication, galvanization/painting, transportation, welding/bolting, labour, surface cleaning, minor chipping, rust removal, site preparation, safety arrangements, and all other accessories and tools required to complete the work as per the specifications and direction of the Engineer-in-charge.</b></p>	Provision of Missing MS Grating over Drainage Spouts	Nos	244		

25.c	<p><b>Replacement of Missing/Damaged Down Take Pipe (PVC)</b></p> <p>This item includes supplying and fixing missing or damaged down take pipes connected to drainage spouts, as per MoRTH Clause 2705. The down take pipe shall be made of PVC (Polyvinyl Chloride), conforming to IS:4985 or other relevant standards, with a suitable diameter as per the design requirements. The pipe shall be properly anchored to the substructure using clamps or brackets, ensuring the alignment and slope are adequate for the drainage system to function without leakage or water splashing.</p> <p>In case the previous pipe or clamps were embedded, necessary chipping and re-concreting shall be done to restore the original position and strength of the system. The work includes cutting, jointing, and sealing the pipe with approved PVC solvent cement or adhesive to ensure a leak-proof connection. The joints must be sealed to prevent water leakage, and all necessary measures shall be undertaken to avoid damage during the replacement process.</p> <p>All necessary scaffolding, working platforms, safety harnesses, and protective measures shall be ensured during the execution of this work. The contractor shall deploy skilled manpower, quality materials, and required machinery, and complete the work as per standard practices, ensuring compliance with the specifications to the satisfaction of the Engineer-in-charge.</p> <p><b>The rate includes the cost of</b> PVC pipes, clamps, fasteners, brackets, fabrication, adhesives, sealants, cutting, jointing, labour, disposal of old pipes, tools, and all incidentals necessary to complete the work in a safe and workmanlike manner, as per MoRTH specifications and as directed by the Engineer-in-charge.</p>	Replacement of Missing/Damaged Down Take Pipe (PVC)	Nos	208		
<b>REPAIR OF STRUCTURES</b>						
26	<p><b>Sealing of Cracks in RCC Members by V-Groove Cutting and Sealing with Epoxy Mortar</b></p> <p>All charges for preparing and sealing of visible or identified cracks in RCC structural elements (such as deck slab, crash barrier, pier cap, etc.) using epoxy mortar, including forming V-groove of appropriate width and depth using suitable tools (grinder/cutter), thorough cleaning of the groove and adjoining surface with air/water jet and wire brush to remove all dust, laitance, or loose particles, application of epoxy-based bond coat on the prepared groove and surrounding concrete surface, and subsequent filling of the groove using a pre-approved non-shrink, high-strength epoxy mortar conforming to manufacturer's recommendations. The epoxy mortar shall be applied in layers if required, ensuring complete filling of the groove, proper compaction, and a flush finish with adjoining surface. The final surface shall be finished to match the existing profile and be cured as per epoxy system requirement.</p> <p>The epoxy materials used shall conform to relevant provisions of IRC:SP-80, MoRTH Clause 2800, and manufacturers' specifications. All operations shall be carried out under controlled conditions with surface temperature and moisture levels suited for epoxy application, as per the material technical data sheet.</p> <p><b>Rate includes all</b> labour, materials (including epoxy system), V-groove cutting, surface preparation, bond coat, filling, tools, safety equipment, and consumables required to complete the work in a professional and durable manner. The contractor shall make necessary arrangements to access work locations at any height or depth with due safety, and shall complete the work to the satisfaction of the Engineer-in-Charge.</p>	Sealing of Cracks in RCC Members by V-Groove Cutting and Sealing with Epoxy Mortar	Rmt	514.00		
27	<p><b>Provision and Installation of Grouting Nipples for Pressure Injection in RCC Structures (using Non-return Valve (NRV) Nipples)</b></p> <p>This item covers all necessary operations for the provision and secure installation of 12 mm diameter steel grouting nipples with Non-return Valve (NRV) in RCC members for the purpose of pressure injection grouting. The work includes core drilling of holes ranging from 16 mm to 25 mm in diameter and 50 mm to 150 mm in depth at intervals of approximately 300 mm center-to-center, as per site requirements and grouting layout approved by the Engineer-in-Charge.</p> <p>After drilling, the holes shall be cleaned thoroughly, and the steel NRV nipples shall be fixed firmly using an approved fixing compound to ensure leakproof anchorage suitable for pressure injection using Polymer Modified Cementitious (PMC) grout or Epoxy resin, as per the technical specifications. The NRV nipple shall be specifically designed to prevent the backflow of injected material, ensuring that the grouting pressure is maintained during the injection process.</p> <p>Upon completion of the grouting process, all installed nipples shall be either cut flush with the surface or removed, and the holes shall be sealed with epoxy mortar or equivalent sealant to restore structural surface continuity.</p> <p><b>Rate includes:</b> Cost of all materials including steel NRV nipples and fixing compound, labour for drilling, insertion, fixing, cutting/removal, surface preparation, cleaning, sealing of holes post grouting, tools &amp; tackles, and all incidental items necessary to complete the work in accordance with MoRTH Specification Section 2800 and as per directions of the Engineer-in-Charge.</p>	Provision and Installation of Grouting NRV Nipples for Pressure Injection in RCC Structures	Nos	1553.00		

28	<p><b>Low Viscosity Epoxy Pressure Injection Grouting in RCC Members (using Non-return valve (NRV) nipples)</b></p> <p>This item includes all operations required for pressure injection grouting using low viscosity epoxy resin to fill cracks and voids in RCC members, ensuring monolithic structural restoration. The epoxy grout shall be a two-component system (resin and hardener) such as Sikadur-52 (LP) or equivalent conforming to MoRTH Specifications Clause 2803, mixed in specified proportions as recommended by the manufacturer to achieve a minimum compressive strength of 4 kg/cm<sup>2</sup>.</p> <p>Injection shall be carried out using a pressure grouting pump, ensuring proper penetration of epoxy into hairline and fine cracks through previously installed grouting nipples, which shall be Non-return valve (NRV) type nipples spaced as per the engineer's direction. The NRV nipples shall allow for unidirectional flow of the grout, preventing any backflow during the injection process. The grouting pressure and flow shall be controlled to avoid overpressurization and material wastage. Grouting shall be continued until refusal or confirmed crack filling is achieved. Surface temperature, humidity, and substrate moisture content shall be verified prior to application, as per product requirements.</p> <p>Post injection, the surface shall be sealed, NRV nipples removed (if not reusable), and the area finished to match the adjoining surface. Grouting shall be executed by skilled personnel trained in handling epoxy-based systems, with due consideration to safety protocols for handling reactive materials.</p> <p><b>Rate includes:</b> Cost of approved epoxy resin system including all components, mixing, application, cleaning, labour, pressure grouting equipment, sealing of cracks and injection points, removal of NRV nipples, and all tools, safety measures, and incidentals to complete the job as per specifications and direction of the Engineer-in-Charge.</p>	Low Viscosity Epoxy Pressure Injection Grouting in RCC Members (using NRV Nipples)	Kg	429.00		
29	<p><b>Repair of Damaged Concrete Surfaces Using Polymer Modified Mortar (PMM Mortar) up to 50mm Thickness</b></p> <p>This item includes all charges for removal of damaged, cracked, leached, honeycombed, or spalled concrete in RCC structural members such as piers, pier caps, abutments, abutment caps, crash barriers, and superstructures; followed by surface preparation and application of Polymer Modified Cement (PMM) mortar not exceeding 50 mm thickness per layer. The work shall be executed as per MoRTH Specifications Clause 2804.2 and in accordance with the directions of the Engineer-in-Charge.</p> <p><b>Scope of Work Includes:</b></p> <p><b>Concrete Removal:</b> Manual or mechanical removal of delaminated, loose, or deteriorated concrete using hammers, pneumatic tools, or hydro-demolition. Concrete shall be removed to sound substrate based on visual/NDT-based inspection. Adjacent healthy concrete and embedded reinforcement shall be preserved. All debris shall be removed and disposed of safely per Clause 112.</p> <p><b>Surface Preparation:</b> Cleaning of exposed surfaces using high-pressure water jetting or sand blasting to achieve a rough, laitance-free profile. Exposed rebars shall be cleaned of rust and corrosion using CICO Rust Clean or its equivalent, and the surface shall be kept in SSD condition.</p> <p><b>Reinforcement Treatment:</b> Corroded rebars shall be coated with Zinc-rich epoxy primer (e.g., CICO Zincilate 500 or equivalent) for corrosion protection.</p> <p><b>Bond Coat Application:</b> Bond coat shall be applied on prepared surfaces using approved products like Nitobond EP or its equivalent to enhance adhesion.</p> <p><b>PMC Mortar Application:</b> Polymer modified cement mortar containing 10% polymer by weight (e.g., Tapecrete P151 or equivalent) shall be mixed and applied in layers up to 50 mm thickness using trowels. The mix shall be prepared using slow-speed mechanical mixers and placed to match the original concrete profile.</p> <p><b>Finishing &amp; Curing:</b> Final surface shall be finished as required and curing shall be carried out using approved curing compound (e.g., CICO Cure-free or equivalent) or moist curing for not less than 7 days.</p> <p><b>Rate Includes:</b> Cost of all materials including polymer additive, cement, sand, rust remover, zinc rich primer, bonding agent, curing</p>	Repair of Damaged Concrete Surfaces Using Polymer Modified Mortar (PMM Mortar) up to 50mm Thickness	sq.m	1084.00		
30	<p><b>Injection of Polymer Cement Grout with Non-Shrink Additive at 4 kg/cm<sup>2</sup> Pressure using NRV Nipples</b></p> <p>All charges for providing and injecting polymer cement grout composed of Ordinary Portland Cement (OPC) mixed with 10% polymer additive by weight of cement (e.g., Tapcrete-151 or its equivalent) and 0.5% to 1% non-shrink compound (e.g., Cico NSPGC or its equivalent), into cracks, voids, or honeycombed concrete sections at a minimum injection pressure of 4 kg/cm<sup>2</sup> using approved mechanical grouting equipment, including surface sealing, fixing of non-return valve (NRV) type nipples, grout preparation, progressive injection, and post-injection sealing, as per MoRTH Specifications Clause 2806 and directions of the Engineer-in-Charge.</p> <p>The work includes cleaning and preparation of concrete surfaces and cracks, drilling injection holes if required, fixing NRV nipples to permit controlled one-way grout flow, sealing cracks to avoid grout leakage, and mixing the grout to specified proportions ensuring homogeneity and flowability. Grouting shall be done progressively using suitable pumps and techniques to ensure complete filling and bonding of internal voids. Post-grouting sealing of ports and curing of injected areas shall be completed using compatible materials.</p> <p><b>Rate includes all materials, consumables, equipment, NRV type nipples, labour, safety measures, documentation, and disposal of waste as required for successful execution of the activity.</b></p>	Injection of Polymer Cement Grout (PMC) with Non-Shrink Additive at 4 kg/cm <sup>2</sup> Pressure	Kg	1344.00		

31	<p><b>Carbon Fibre Wrapping for Strengthening of Structural Members</b></p> <p>All charges for providing and applying Carbon Fibre Reinforced Polymer (CFRP) wrapping for structural strengthening or jacketing of girders or other structural components, using <b>high-strength CFRP bonded</b> with epoxy resin or equivalent polymer matrix adhesive, in accordance with manufacturer's specifications, relevant design calculations, and as directed by the Engineer-in-Charge. The activity shall comply with IS 1343:2012, ACI 440.2R-17, and ASTM D3039 standards for tensile strength and structural application.</p> <p>The scope includes thorough surface preparation of the concrete substrate by mechanical grinding or sandblasting to ensure removal of laitance, oil, grease, or any bond-inhibiting material, followed by application of CFRP sheets using appropriate tools and techniques to ensure full contact and proper resin impregnation. The applied system shall be allowed to cure as per the manufacturer's recommended protocol. Final inspection shall be conducted to verify uniform bonding and proper alignment, and any defects shall be rectified.</p> <p><b>The rate includes</b> cost of all materials (CFRP sheet, resin, etc.), labour, surface preparation, safety measures, equipment, and testing required to complete the work in all respects.</p>	Carbon Fibre Wrapping for Strengthening of Structural Members	Sqm	1146.00		
32	<p><b>Providing and Laying of Micro-concrete for Structural Repairs</b></p> <p>All charges for providing and laying flowable micro-concrete by removing/dismantling damaged concrete portions to a pre-defined profile, cleaning the exposed surface and reinforcement with Rust remover (such as CICO Rustoclean or equivalent), followed by application of one coat of zinc-rich primer (e.g., CICO Zincilate 500 or equivalent) on exposed rebars, and a suitable bond coat (e.g., Nitobond or equivalent) on the prepared concrete substrate. Micro-concrete shall be mixed in 1:1 ratio (1 part micro-concrete to 1 part 10mm down well-graded aggregates), placed by gravity flow or pump into properly supported, rigid and leakproof formwork as per manufacturer's guidelines and site conditions.</p> <p>The material shall meet the performance requirements of ASTM C 109:99, ASTM C 307, and BS 1881 Part 207, ensuring minimum shrinkage, high flowability, corrosion resistance, and compressive strength as specified. Reinforcement, if corroded or insufficient, shall be cleaned and/or supplemented as per structural direction. No mechanical vibration is permitted during placement. The repaired surface shall be finished flush with the surrounding concrete and cured using approved methods. The entire work shall be executed as per MoRTH Clauses 1700 &amp; 2800 and under the direction of Engineer-in-Charge.</p> <p><b>Rate includes:</b></p> <ul style="list-style-type: none"> <li>• Removal/dismantling of damaged concrete portions</li> <li>• Cleaning of exposed reinforcement and application of anti-corrosive coating (CICO Rustoclean or equivalent)</li> <li>• Application of zinc-rich primer on reinforcement (CICO Zincilate 500 or equivalent)</li> <li>• Bond coat application (e.g., Nitobond or equivalent)</li> <li>• Mixing and laying of micro-concrete in the specified 1:1 ratio with aggregates</li> <li>• Ensuring the formwork is rigid and leakproof, and placing the concrete without mechanical vibration</li> <li>• Curing of the concrete to prevent premature drying</li> <li>• All necessary equipment and labor</li> </ul>	Providing and Laying of Micro-concrete for Structural Repairs	Cum	3.00		
33	<p><b>Approach Slab Mud Jacketing (Void Filling Beneath Slab by Pressure Grouting)</b></p> <p>The work involves the stabilization and re-leveling of settled approach slabs of bridges or culverts using the pressure grouting (mud jacking) method. This process includes drilling holes through the slab to inject a controlled cementitious grout or mortar mix under pressure to fill voids beneath the slab and restore support. The grouting procedure eliminates settlement and prevents differential movement between the approach slab and the bridge deck. The contractor shall remove any damaged or defective portions of the slab, clean the surface of dust, debris, or laitance, and prepare the substrate for grouting. Exposed reinforcement, if any, shall be cleaned and treated with an anti-corrosive coating. The grouting material shall include a cement-sand slurry or polymer-modified grout, prepared to the required consistency for effective filling. The grouting shall be carried out using mechanical or manual pumps at a pressure of 3–5 kg/cm<sup>2</sup>, ensuring complete filling of voids and preventing any uplift or damage to the structure. After grouting, the holes shall be sealed, and the surface shall be restored to its original level. The work shall be carried out in strict accordance with the MoRTH specifications and as directed by the Engineer-in-Charge.</p> <p><b>The rate includes</b> the cost of drilling holes, supplying and applying grout, sealing, surface restoration, and necessary material, including non-shrink admixtures, polymer additives, and grout nipples. All equipment, including drill machines, grout pumps, mixers, and PPE, is to be provided by the contractor. Safety measures such as proper PPE, traffic control, and barricading shall be implemented during the execution of the work to ensure safety and quality assurance.</p>	Approach Slab Mud Jacketing (Void Filling Beneath Slab by Pressure Grouting)	Sq.m	1848.00		

34	<p><b>Providing and fixing of Mild Steel (MS) lining plates (8mm thick) for jacketing and structural strengthening of pedestals</b></p> <p>All charges for providing and fixing MS lining plates of 8mm thickness for jacketing and structural strengthening of pedestals on all sides, including surface preparation of the existing pedestal by chipping, cleaning, and exposing sound concrete. The work includes fabrication of Mild Steel plates conforming to IS 2062 Grade E250, cutting, edge preparation, bending as per site requirement, and fixing around pedestal using anchor bolts (minimum M16, Hilti/Equivalent) or shear connectors embedded in epoxy grout. The plates shall be fully welded along the vertical and horizontal joints using approved low-hydrogen electrodes (E7018 or equivalent), ensuring continuous structural bonding. All exposed metal surfaces shall be cleaned to SA 2.5 finish using mechanical methods, then applied with one coat of zinc-rich primer (minimum 60 microns) and two coats of anti-corrosive epoxy paint (DFT 120 microns minimum) conforming to IS 1477 &amp; IS 8629. Gaps between steel plate and concrete shall be pressure-grouted or sealed using epoxy mortar (Fosroc/Sika/Equivalent) to prevent water ingress. The fixing shall be executed strictly as per approved structural drawings and MoRTH Clause 804, including all scaffolding, staging, tools, tackles, welding equipment, grinding machines, safety gear (PPE), material handling, transportation, and skilled manpower.</p> <p><b>Rate includes the cost of all labour, materials, tools, machinery, consumables, surface protection works, and safety arrangements required to complete the work in all respects to the satisfaction of the Engineer-in-Charge.</b></p>	Providing and fixing of Mild Steel (MS) lining plates (8mm thick) for jacketing and structural strengthening of pedestals	Sq.m	1.6		
<p><b>* The Quantities mentioned in BoQ may vary up to ± 25% of original BoQ quantity of single BoQ item subject to maximum of ± 20% of original Contract price. The decision of the Employer shall be final and binding on the contractor</b></p>						
					Sub total =	
					Gst - 18% =	
					Total =	

Bill Of Quantities (Abstract) : Kaljhar – Patacharkuchi		Annexure C3 - Section 2				
S.No	Item Description	Short Description	Unit	Quantity	Rate	Total
<b>Design &amp; Drawing</b>						
1	<p><b>Preparation of Design &amp; Drawing for Bridge Structural Interventions</b> This item includes all charges towards the preparation of structural design and detailed drawings by a qualified structural designer or agency for various strengthening interventions on existing bridge structures. The scope includes site inspection, condition assessment, structural health evaluation, load analysis, design calculations, drawings, preparation of bar bending schedules, and submission of construction drawings and support during vetting and approval process. The deliverables shall include design reports, editable CAD drawings, construction drawings, PDFs, and BBS (as applicable). All designs shall conform to relevant IRC codes, MoRTH guidelines, and sound engineering practice. The scope shall also include technical support during execution for any design-related clarifications and revisions.</p> <p><b>Client reserves the right to get the design vetted by IIT/NIT or any other institute of repute, if deemed necessary. The Contractor shall obtain a structural stability certificate from the design engineer engaged for the work, and the full responsibility for the adequacy, safety, and structural stability of the design shall lie solely with the Contractor.</b></p> <p><b>Rate includes:</b> All professional charges, site visits, analysis, preparation and submission of drawings and reports (in editable and PDF formats), and all required documentation and compliance support. The contractor shall ensure the designer provides complete support during approval and execution phases as per Engineer-in-Charge directions.</p>	Design & Drawing	No.	Rate Only		
2	<p><b>Design and Drawing of Bridge Bearings</b> This subitem covers the design and drawing of load-bearing arrangements for each span, including POT-PTFE bearings and elastomeric bearings. The design shall consider actual field conditions and verify the existing bearing capacity. The work includes preparation of layout drawings, bearing schedules, and design report. Rate to be paid per span irrespective of number of bearings per span.</p>	Design and Drawing of Bridge Bearings	Per Span	Rate Only		
3	<p><b>Design and Drawing for Jacketing</b> This subitem includes structural design and detailing of RC jacketing for bridge elements such as piers, abutments, and pedestals. The design shall account for existing section, reinforcement, deterioration level, and required confinement. Work includes preparation of jacketing layout, reinforcement drawings, and BBS. Payment shall be made per number of members designed and detailed.</p>	Design and Drawing for Jacketing	Per Member	Rate Only		
4	<p><b>Design and Drawing for Superstructure Strengthening</b> This subitem involves the structural design and detailing of strengthening methods for girders, deck slabs, or cross girders, which may include techniques such as section enlargement, additional prestressing, or carbon wrapping (subject to site requirement). The work includes preparation of structural analysis, strengthening layout drawings, reinforcement/civil detailing, and BBS. Rate is payable per superstructure member designed and delivered.</p>	Design and Drawing for Superstructure Strengthening	Per Span	Rate Only		
<b>EARTHWORK, EROSION CONTROL AND DRAINAGE</b>						
5	<p><b>Construction of Subgrade</b> Construction of subgrade with approved material obtained from borrow pits, transported with all lifts and leads, including royalty, and spread in uniform layers of not more than 250 mm thickness. The material shall meet the quality requirements specified in MoRTH Clause 305, ensuring compliance with gradation, plasticity, and moisture content parameters. Compaction of the subgrade shall achieve a minimum of 97% of Maximum Dry Density (MDD) as per IS 2720 (Part 8) using mechanical equipment. Grading shall be performed to ensure the required slope, alignment, and stability, with final finishing to the levels specified in the approved drawings. The work includes surface dressing, preparation of shoulders for proper drainage, and all necessary field and laboratory tests, such as field density and moisture content tests, to verify compliance with Table 300-2 of MoRTH specifications. The item covers all costs for material procurement, royalty, transportation, labor, machinery, and incidental works. Safety measures and environmental compliance shall be ensured during execution. The final surface shall be stable, durable, and suitable for traffic loading, conforming to project specifications and ensuring proper integration with adjacent structures.</p>	Subgrade	Cu.m	650.00		
<b>TRAFFIC SIGNS, MARKINGS AND OTHER ROAD APPURTENANCES</b>						
6	<p><b>Application of Cement Paint on Concrete Handrails / Crash Barrier</b> Providing and applying two coats of water-based cement paint on unplastered concrete surfaces of handrails / crash barrier after thorough surface preparation as per IS 2395 (Part 1): 1994 and IS 5410:1992. The surface shall be cleaned of all dirt, dust, grease, oil, efflorescence, and loose particles by wire brushing and water jetting, followed by drying. No primer is required if the surface is rough and porous; however, in case of smooth or dense surfaces, a compatible cement-based primer may be applied to ensure proper adhesion. The paint shall be applied at a coverage of 1 litre for every 2 sqm in each coat, ensuring uniform thickness, shade, and finish. All painting shall be carried out using appropriate tools such as brushes or rollers in two coats with sufficient drying time between coats as per manufacturer's instructions and relevant IS standards. <b>The quoted rate shall include</b> all costs necessary to complete the work in accordance with the specifications, drawings and directions of the Engineer-in-Charge, including but not limited to the cost of all labour, materials, machinery, tools, plants, transportation, handling, testing, safety arrangements, temporary works and site clearance, whether specifically mentioned or implied.</p>	Application of Cement Paint on Concrete Handrails	Rmt	7198.00		
<b>FORMWORK</b>						

<p><b>Providing and fixing temporary double steel scaffolding system with safety features.</b></p> <p>Providing, erecting, maintaining, and removing temporary engineered double steel tubular scaffolding system or suspended platforms for safe access to elevated structures for all heights, conforming to IS 3696 and MoRTH Section 1500. The scaffolding shall include standards, ledgers, bracings, runners, toe boards, guardrails, and working platforms as per approved design. It shall be securely anchored, adequately stiffened, and safely accessible, ensuring structural stability throughout its use. Suspended platforms, if used, shall be supported with ropes, pulleys, counterweights, and non-slip decking, equipped with proper anchorage and fall protection systems.</p> <p>All scaffolding shall be designed and erected by trained personnel, inspected before use, and maintained regularly, including after adverse weather. Safety measures such as PPE, safety harness anchorage points, debris netting, and temporary barriers near traffic zones shall be ensured. Post-use dismantling shall be carried out in a controlled manner.</p> <p><b>The quoted rate shall include</b> all costs necessary to complete the work in accordance with the specifications, drawings and directions of the Engineer-in-Charge, including but not limited to the cost of all labour, materials, machinery, tools, plants, transportation, handling, testing, safety arrangements, temporary works and site clearance, whether specifically mentioned or implied.</p>	<p>Providing and fixing temporary double steel scaffolding system with safety features.</p>	<p>Cum</p>	<p>12172.00</p>		<p>-</p>
<p><b>STEEL REINFORCEMENT</b></p>					
<p><b>Extra Reinforcement with Zinc-Rich Epoxy Coating</b></p> <p>All charges for providing and laying extra reinforcement wherever required for rehabilitation and strengthening work, including surface preparation and application of two coats of Zinc-rich epoxy primer (such as CICO Zincilate 500 or equivalent), ensuring uniform coverage and anti-corrosive protection. The coating shall be carried out as per manufacturer's recommendations and MoRTH Specifications Clause 1600. The work shall include cleaning of steel surfaces, proper drying, application with brush or spray, and curing, complete in all respects.</p> <p><b>The quoted rate shall include</b> all costs necessary to complete the work in accordance with the specifications, drawings, and directions of the Engineer-in-Charge, including but not limited to the cost of all labour, materials, machinery, tools, plants, transportation, handling, testing, safety arrangements, temporary works, and site clearance, whether specifically mentioned or implied.</p>	<p>Extra Reinforcement with Zinc-Rich Epoxy Coating</p>	<p>MT</p>	<p>0.50</p>		<p>-</p>
<p><b>STRUCTURAL CONCRETE</b></p>					
<p><b>Jacketing of Structural Members with M-40 Concrete (150 mm to 175mm Thick)</b></p> <p>All charges for <b>structural jacketing of beams, columns, or piers</b> using M-40 grade concrete of <b>150 mm to 175mm thickness</b>, executed as part of rehabilitation/strengthening of deteriorated members, including complete removal of loose or damaged concrete, surface roughening, exposure of existing reinforcement, cleaning of rebars using wire brush/sandblasting/high-pressure water jet, and applying anti-corrosive coating (Zinc-rich epoxy or equivalent) to existing reinforcement wherever required. The item includes supplying, cutting, bending, and fixing of new 12 mm diameter reinforcement bars @ 150 mm c/c both ways (or as per design) with proper lapping, anchorage, and tying with old rebars. All work shall be carried out with adequate surface preparation to ensure full bond between old and new concrete, including fixing of leak-proof formwork/shuttering, placement of M-40 grade concrete using conventional, pumpable or self-compacting concrete as per design requirement, proper compaction with vibrators or suitable means, finishing of exposed surfaces, and curing by approved methods for the prescribed period.</p> <p><b>The quoted rate shall include</b> all costs necessary to complete the work in accordance with the specifications, drawings, and directions of the Engineer-in-Charge, including but not limited to labour, materials, machinery, shuttering, reinforcement, anti-corrosive treatment, curing, surface preparation, and all safety arrangements. No extra payment shall be made for working at any height, in congested zones, night work, or difficult access conditions. The work shall conform to MoRTH Specifications Section 1700 &amp; 2800, IRC-SP:84, and relevant IS Codes.</p>	<p>Jacketing of Structural Members with M-40 Concrete (150 mm Thick)</p>	<p>Sqm</p>			<p>-</p>
<p><b>BEARINGS</b></p>					

10	<p><b>Lifting of Superstructure Span by Hydraulic Jacking (Span Length up to 50m)</b></p> <p>All-inclusive charges for safe and controlled <b>lifting of the superstructure span (up to 50m in length) by hydraulic jacking</b> from below, i.e. by placing synchronized hydraulic jacks on pier or abutment caps, to facilitate the replacement of bearings or other structural interventions. The work includes detailed pre-inspection of lifting points, design of jacking system, staging and positioning of jacks, synchronized and monitored lifting, stabilization, and controlled lowering after completion of intervention works.</p> <p>The lifting shall be executed using synchronized hydraulic jacks, load cells, and associated lifting frames or beams to ensure uniform vertical movement without causing differential stresses, distortion, or misalignment of the girder. Temporary supports/staging shall be provided to secure the girder during operations. The contractor shall ensure deployment of qualified structural engineers, supervisors, and jacking specialists at site.</p> <p>All equipment (hydraulic jacks, pressure gauges, sensors, spreader beams) shall be calibrated and certified. The operation shall comply with MoRTH guidelines, IRC standards, IS codes, and approved method statements, with complete documentation and risk assessment submitted prior to execution.</p> <p><b>The quoted rate shall include</b> all costs necessary to complete the work in accordance with the specifications, drawings, and instructions of the Engineer-in-Charge, including but not limited to supply of lifting equipment, manpower, safety barricading, PPEs, communication systems, environmental compliance, temporary support systems, and all incidental works. No extra payment shall be made for night work, space constraints, safety arrangements, risk assessment preparation, or multiple jacking attempts, if required for completion of the task.</p>	Lifting of Superstructure Span by Hydraulic Jacking (Span Length up to 50m)	Nos	12.00		-
11	<p><b>Replacement of Existing Bearing with New POT-PTFE Bearing Including Pedestal Preparation and Levelling</b></p> <p>All charges for <b>replacing the existing bearing with a new POT-PTFE bearing of equivalent load-carrying capacity</b>, including removal and disposal of old bearing, thorough cleaning of the bearing pedestal, levelling using epoxy levelling pad (3 mm to 10 mm thick), and accurate positioning, alignment, and installation of the new bearing. The bearing shall conform to IRC:83 Part 3, and the epoxy resin used for levelling shall comply with ASTM C881 or equivalent approved standard. The installation shall conform to MoRTH Clauses 2000 &amp; 2200, IRC:83 Part 3, and the approved drawings. Work under this item shall commence only after the superstructure is lifted under a separate item.</p> <p><b>The scope includes:</b></p> <ol style="list-style-type: none"> <li>Mechanical cleaning and preparation of the concrete pedestal surface</li> <li>Application and curing of high-strength epoxy levelling pad</li> <li>Positioning and alignment of new bearing with reference to structure's longitudinal and transverse axes</li> <li>Application of epoxy adhesive, where specified</li> <li>Grouting of anchor bolt pockets using non-shrink grout conforming to IS 4031 / ASTM C1107</li> <li>Ensuring correct orientation, specified clearances, and uniform seating</li> <li>Final inspection, verification of bearing position, and submission of compliance records</li> </ol> <p><b>The quoted rate shall include</b> complete cost of bearing (supply of POT-PTFE bearing conforming to IRC:83 (Part 3)), and installation), epoxy materials, non-shrink grout, tools, equipment, manpower, alignment instruments, specifically required for bearing replacement work. No extra shall be payable for dismantling or disposal of existing bearing, pedestal cleaning, or staging. Lifting of superstructure is excluded and covered under a separate item.</p>	Replacement of Existing Bearing with New POT-PTFE Bearing Including Pedestal Preparation and Levelling	Nos	16.00		-
12	<p><b>Replacement of Existing Bearing with New Elastomeric Bearing</b></p> <p>All charges for <b>replacing the existing bearing with a new elastomeric bearing of equivalent load-carrying capacity</b>, including complete cleaning and levelling of the pedestal using epoxy levelling pad (3 mm to 10 mm thick), and proper positioning and alignment of the new bearing. The elastomeric bearing shall conform to IRC:83 (Part 2), and the epoxy resin shall conform to ASTM C881 or equivalent. The work shall be executed only after lifting of the superstructure has been completed under a separate payable item.</p> <p>The scope includes removal and disposal of the existing bearing, mechanical cleaning of the bearing pedestal, preparation of surface, application and curing of epoxy levelling pad to achieve uniformity, accurate placement of elastomeric bearing as per approved drawings, and verification of alignment and seating. As elastomeric bearings are typically unanchored, anti-skid arrangements or recessed pedestals shall be used where specified. Bearings shall be positioned with proper orientation, ensuring even contact pressure and adequate clearances in all directions.</p> <p><b>The quoted rate shall include</b> cost of supply of elastomeric bearing conforming to IRC:83 (Part 2), epoxy levelling pad, labour, tools, equipment, alignment instruments, all required for execution of the bearing replacement work. No extra payment shall be made for surface preparation, or disposal of removed bearings. Lifting of the superstructure is excluded and shall be paid under a separate item.</p>	Replacement of Existing Bearing with New Elastomeric Bearing	Nos	8.00		-

13	<p><b>Cutting of Metallic Bearing Locks Using Electric Grinder</b></p> <p>All charges for <b>cutting and removal of existing metallic bearing locks</b> on both sides of the bearing using electric grinder, without causing any damage to the bearing, including careful marking, controlled cutting, shielding of bearing surfaces, and disposal of dismantled metallic parts as per the direction of the Engineer-in-Charge. The work shall be executed using suitable angle grinders with abrasive or diamond-tipped discs, ensuring vibration-free and spark-controlled cutting. Necessary protective covers such as fire-resistant blankets or metallic shields shall be used to prevent any impact on the bearing housing.</p> <p><b>The quoted rate shall include</b> the cost of all labour, cutting equipment, grinders, blades and discs, supervision, safety PPE, protective shielding required for safe access, and collection and disposal of all dismantled metallic pieces from the site. No extra payment shall be made for consumables, tools, safety arrangements, temporary working platforms or for any precautionary measures adopted to protect the existing bearings during the cutting operation.</p>	Cutting of Metallic Bearing Locks Using Electric Grinder	Nos	104.00		-
14	<p><b>Rust Removal and Anti-Corrosive Zinc Painting on Bearings (As per MoRTH Specifications)</b></p> <p>All charges for removing rust from bearing surfaces and applying anti-corrosive zinc-based protective coating, including necessary access arrangements such as erection and removal of scaffolding, as per MoRTH Specifications Clause 2006 and as per the direction of Engineer-in-Charge at site. The work shall involve thorough cleaning of the bearing surfaces by manual or mechanical wire brushing, emerying or grit blasting wherever required, to remove rust, dust, oil, grease, and loose particles. After surface preparation to near white metal finish (Sa 2½), the protective painting system shall be applied in accordance with manufacturer's recommendations and as per technical specifications.</p> <p>The painting system shall consist of two coats of epoxy primer enriched with metallic zinc, followed by one intermediate coat of high-build epoxy paint reinforced with Micaceous Iron Oxide (MIO), and finished with one coat of high-performance epoxy topcoat. The total dry film thickness (DFT) of the entire system shall not be less than 160 microns, conforming to MoRTH Clause 2006(xv). All safety precautions during scaffolding, surface preparation, and painting shall be strictly adhered to.</p> <p><b>Rate includes the cost of</b> all labour, materials, tools, access arrangements, safety gear, surface preparation, cleaning, and application of the complete anti-corrosive coating system as specified, as well as all incidental works necessary to execute the job in a safe and workmanlike manner to the satisfaction of the Engineer-in-Charge. The contractor shall be fully responsible for making all necessary arrangements to access the bearings, including over rivers, high piers, or confined spaces.</p>	Rust Removal and Anti-Corrosive Zinc Painting on Bearings (As per MoRTH Specifications)	Nos	514.00		-
15	<p><b>Greasing of Steel Bearings (Roller-cum-Rocker and Pin &amp; Roller Types)</b></p> <p>The work includes the thorough cleaning and application of approved quality grease to mechanical steel bearings, including roller-cum-rocker and pin &amp; roller bearings, as per MoRTH Specifications Clause 2003.1.7 and as directed by the Engineer-in-Charge. The scope involves cleaning of bearing components such as rollers, pins, saddles, and contact surfaces using appropriate manual or mechanical means to remove dust, rust flakes, hardened grease, and other contaminants. After cleaning, high-quality lithium-based or calcium-based waterproof grease conforming to IS: 7623 or equivalent international standards shall be applied to all moving and mating surfaces to ensure smooth functioning and prevention of corrosion.</p> <p><b>The rate includes the cost of</b> all labour, materials (including grease and cleaning agents), tools, equipment, safety gear, access arrangements or working platforms, and all incidental works necessary to complete the job in a safe, workmanlike manner. All operations shall be carried out with proper traffic and structural safety precautions and to the satisfaction of the Engineer-in-Charge. Vetting or approval of the activity is under the client's scope.</p>	Greasing of Steel Bearings (Roller-cum-Rocker and Pin & Roller Types)				
16	<p><b>Dirt Wall, Return Wall and Wing Wall</b></p> <p><b>Reconstruction of Damaged Return Wall (Cast-in-situ RCC up to 4m Height)</b></p> <p>All-inclusive charges for dismantling the existing damaged return wall and <b>casting of new return wall up to 4.0 m height using cast-in-situ M35 grade reinforced cement concrete (or as specified)</b>, including site clearance, disposal of dismantled material, excavation (if applicable), surface preparation, fabrication and fixing of steel reinforcement as per design, fixing of shuttering/formwork, mixing, placing, compacting and curing of concrete, and achieving required surface finish as per drawings and MoRTH specifications. The item includes the supply of all materials (cement, aggregates, water, reinforcement bars, shuttering materials, binding wires, cover blocks, curing compounds), all labour, tools, plant &amp; equipment required for the execution.</p> <p>The work shall also include proper alignment, verticality, and plumb of the wall, maintaining construction joints (if any), provision of weep holes, waterstops or expansion joint materials (if required), and removal of formwork after achieving initial setting time. All works shall conform to relevant IS codes and MoRTH Specifications under the supervision and direction of the Engineer-in-Charge.</p> <p><b>The quoted rate shall include</b> all costs necessary to complete the work in accordance with the specifications, drawings, and instructions of the Engineer-in-Charge, including but not limited to procurement and royalty of materials, transportation, loading/unloading, labour charges, use of machinery, safety measures (PPE, barricading, signage), environmental compliance, and disposal of waste. No extra payment shall be made for working in constrained areas, night work, site-specific difficulties, water arrangement, curing arrangement, or any incidental work required to complete the job in all respects.</p>	Reconstruction of Damaged Return Wall (Cast-in-situ RCC up to 4m Height)	Rmt	10.00		-
	<b>Stone Pitching for Erosion Protection</b>					

17	<p><b>Stone Pitching on Side Slopes near Culverts/Bridges for Embankment Protection (As per MoRTH Clause 2504)</b></p> <p>The item involves providing stone pitching on earthen or embankment slopes near culverts, bridges, or other road structures to prevent erosion and ensure long-term stability. The scope includes dressing and preparing the slope surface to the required lines and gradient. A 75 mm thick granular filter layer shall be laid over the slope if required, using clean, well-graded sand or stone aggregate (as per MoRTH specifications), to facilitate drainage and prevent soil migration. Subsequently, hand-packed stone pitching shall be done using approved hard stones (nominal size 150–250 mm), properly wedged with spalls to ensure interlocking and stability. The stones shall be sound, durable, and angular in shape.</p> <p>The slope surface shall be dressed and compacted prior to laying the granular filter and stone pitching, it shall be carried out manually or by light mechanical means. The finished surface shall be neat, uniform, and to the required slope.</p> <p>Adequate temporary precautions shall be taken during the monsoon or on steep slopes, such as bunds, diversion drains, or tarpaulin covers, to prevent damage to the executed work until permanent protections like turfing or toe walls are constructed (which are payable under separate items).</p> <p><b>Rate includes</b> the cost of all labour, material (stone, filter media, spalls), transportation, dressing, packing, wedging, temporary protection, and all incidental works. Measurement shall be in square metres (Sqm) of actual surface area pitched. Work shall conform to MoRTH Clause 2504 and be executed as per the approved drawing and as directed by the Engineer-in-Charge.</p>	Stone Pitching				
<b>EXPANSION JOINTS</b>						
18	<p><b>Expansion Joints and Related Works (MoRTH Clause 2600)</b></p> <p>This item includes all charges related to the provision, replacement, and rectification of expansion joints and associated components for bridges, in accordance with MoRTH Specifications Clause 2600 and as directed by the Engineer-in-charge. The scope is further elaborated in the following sub-items.</p>	Expansion Joints	Rmt			-
18.a	<p><b>Providing New Expansion Joint Assembly – Filler Type</b></p> <p>Providing and fixing new expansion joint assembly of filler type conforming to MoRTH Clause 2600 (Clauses 2602 to 2607) and IRC:SP:69, including all operations necessary for ensuring proper functionality of the joint. The work includes marking the location of the joint, removal of damaged or deteriorated joint material (if any), groove cutting, thorough cleaning, and surface preparation. Pre-moulded compressible filler board (bitumen impregnated fibreboard or closed-cell polymer board) of approved thickness and depth shall be fixed into the cleaned joint gap. Edge protection angles of mild steel/galvanized steel shall be fixed on both sides using dowels embedded in epoxy grout. Backer rod, primer and approved elastomeric or polysulphide sealant shall be applied to seal the joint, ensuring water-tightness and flexibility. Work shall include all labour, tools, equipment, safety measures, traffic control, and environmental compliance, and shall be executed as per drawings and direction of Engineer-in-Charge.</p> <p><b>The rate shall include</b> cost of all materials, cutting, cleaning, surface preparation, fixing, sealing, curing, waste disposal, safety arrangements, and incidental charges for completing the work in all respects.</p>	Providing New Expansion Joint Assembly – Filler Type	Rmt	1178.00		-
18.b	<p><b>New Expansion Joint – Strip Seal Type</b></p> <p>Providing and fixing strip seal expansion joint assembly, including supply and installation of steel edge beams with elastomeric sealing element (strip seal), conforming to MoRTH Clause 2600 and IRC 83 (Part II). Work includes removal of existing joint (if any), groove cutting and cleaning, placing and aligning anchorages and edge beams, and fixing the elastomeric strip seal using manufacturer-approved system ensuring proper compression fit. All components shall conform to approved specifications and design drawings. The sealing element shall be resistant to fatigue, wear, UV, and chemicals.</p> <p><b>Rate includes all</b> materials, labour, joint removal, site preparation, groove preparation, alignment, sealing, testing, and disposal of waste as per direction of Engineer-in-Charge.</p> <p>MoRTH Ref: Clause 2607 Relevant Codes: IRC SP:73, IRC 83 Part II, IS 12118:1987</p>	New Expansion Joint – Strip Seal Type	Rmt	464.00		-
18.c	<p><b>Providing Seal for Strip Seal Expansion Joint</b></p> <p>Providing and fixing <b>elastomeric sealing element (seal only)</b> in existing strip seal expansion joint assembly as per Clause 2600 of MoRTH Specifications and IRC 83 (Part II). The work includes removal of old seal (if any), thorough cleaning of seal grooves using air compressor/wire brush, application of adhesive/primer if required, and inserting new approved elastomeric seal ensuring uniform compression.</p> <p><b>Rate includes all</b> labour, equipment, cleaning, sealant, primer, installation of sealing strip, quality checks, and disposal of removed material in compliance with environmental guidelines. Seal shall be UV and fatigue resistant, suitable for repeated vehicular movements, and capable of withstanding temperature variations.</p> <p>MoRTH Ref: Clause 2607 Relevant Codes: IRC 83 Part II, IS 12118:1987</p>	Providing Seal for Strip Seal Expansion Joint	Rmt	146.00		-
<b>Railings and Crash Barrier</b>						

19	<p><b>All charges for Repair and construction of damaged railings over bridges as per IRC Specifications</b></p> <p>All charges for repairing and constructing damaged railings over bridges shall be executed in accordance with IRC specifications, MoRTH Section 2700, and as directed by the Engineer-in-Charge. The work includes dismantling of existing damaged railing elements, cleaning and preparation of the base structure, <b>supplying, cutting and fixing of reinforcement steel</b> as per approved drawings, formwork installation, and concreting with M-30 grade concrete or as specified. Repairs shall include epoxy patching, section replacement, alignment correction, or structural strengthening wherever needed. The contractor shall ensure that the new railing portions match the existing design profile in terms of alignment, finish, and dimensions. Adequate safety barricading, signage, and traffic control measures shall be provided throughout the execution period.</p> <p><b>Rate includes the cost of all materials (cement, reinforcement, aggregates, shuttering),</b> labour, machinery, tools, equipment, transportation, dismantling and disposal of debris, scaffolding, curing materials, safety measures, and all incidental items required to complete the work in a safe, compliant, and workmanlike manner to the satisfaction of the Engineer-in-Charge.</p>	Repair and construction of damaged railings over bridges	Rmt	10			-
20	<p><b>All charges for casting of damaged handrail wall up to height of 1.2 m with manpower and material</b></p> <p>All charges for casting of damaged handrail walls up to a height of 1.2 metres shall be executed as per technical specifications and the directions of the Engineer-in-Charge. The scope includes dismantling of damaged wall sections, site preparation, <b>supplying reinforcement, cutting and placement,</b> formwork erection, and concreting using M-30 grade concrete or as specified. The contractor shall ensure proper line, level, and finish of the handrail wall consistent with adjoining portions. Compaction shall be done using vibrators to eliminate voids, and curing shall be performed using wet gunny bags or curing compound. The finished surface shall be free of honeycombing and visually acceptable.</p> <p><b>Rate includes all costs for material procurement (cement, aggregates, reinforcement, shuttering),</b> royalty, transportation, manpower, equipment, mixing, formwork, compaction, curing, safety precautions, debris removal, and compliance with environmental and technical requirements. The contractor shall execute the work with proper workmanship and safety, completing the activity to the satisfaction of the Engineer-in-Charge.</p>	Casting of damaged handrail wall up to height of 1.2 m	Rmt	10.00			-
21	<p><b>Reconstruction of RCC Crash Barrier (Post Dismantling)</b></p> <p>Construction of new RCC crash barrier in place of a damaged/dismantled barrier, including preparation of base surface, layout marking, supplying and fixing steel reinforcement conforming to IS:1786, fixing dowel bars/anchor rebars (wherever required) by core drilling and grouting with approved resin-based compound, providing and fixing steel formwork, and placing M40 grade concrete using mechanical/manual methods. Scope includes proper compaction by needle vibrators, finishing, curing for minimum 7 days, de-shuttering, and surface rectification, all in line with approved drawings and site requirements.</p> <p>This work shall be carried out as per MoRTH Specifications Sections 1700 (Concrete), 1500 (Formwork), 1600 (Reinforcement), and Section 2703 (for crash barrier dimensions and geometry). The contractor shall take utmost care to ensure proper jointing with existing structure and reinforcement continuity for safety performance.</p> <p><b>Rate includes all materials, labour, equipment, safety barriers, curing, site cleaning, and incidental works.</b> No extra payment shall be made for dowel fixing, formwork over uneven base, or working in restricted locations. Finished barrier shall be true in line and level, with uniform cross-section and surface finish.</p>	Reconstruction of RCC Crash Barrier (Post Dismantling)	Rmt	10.00			-
<b>WEARING COAT AND APPURTENANCES</b>							
22	<p><b>Drainage Spouts and Appurtenances (MoRTH Clause 2705)</b></p> <p>This item includes all charges towards provision, replacement, or rectification of drainage spouts and their associated components as per MoRTH Specifications Clause 2705 and as directed by the Engineer-in-charge. Detailed scope is covered under the following sub-items:</p>	Drainage spout					-
22.a	<p><b>Replacement/Providing of Drainage Spout Assembly</b></p> <p>The work includes providing and fixing new drainage spout assemblies or replacing damaged/non-functional ones to ensure effective deck drainage of bridge superstructures. The scope covers supply, fabrication, and installation of spout assemblies as per MoRTH Specifications Clause 2705, including spout body, MS grating, connecting down take pipe, brackets, fasteners, and protective coatings. The spouts shall be made of mild steel conforming to IS:2062, hot-dip galvanized or epoxy-painted for corrosion resistance, and of dimensions suitable for ensuring proper drainage as per site conditions. The assembly shall be fixed by drilling through the deck wearing coat and securely embedding into the drainage recess using approved sealants and fasteners. All loose concrete shall be repaired prior to fixing, and proper alignment and slope shall be ensured. This item includes removal of debris, disposal of old/damaged components, reinstatement of wearing coat around the spout, and restoration of any surface affected during work. The contractor shall supply all men, materials, and machinery required and carry out the work with proper safety, traffic control, and due diligence under the guidance of the Engineer-in-charge.</p> <p><b>Rate includes the cost of all materials (spout body, grating, down take pipe, fasteners, sealants),</b> fabrication, protective coatings, transportation, skilled and unskilled labour, machinery, surface preparation, disposal of dismantled material, and all incidental works required for completing the job in accordance with MoRTH specifications and direction of Engineer-in-charge.</p>	Replacement/Providing of Drainage Spout Assembly	Nos	79.00			-

22.b	<p><b>Provision of Missing MS Grating over Drainage Spouts</b></p> <p>This item includes providing and fixing MS grating over existing drainage spouts wherever missing, as per MoRTH Clause 2705. The grating shall be fabricated from mild steel flats of adequate strength and spacing to allow unimpeded flow of water and to prevent debris ingress. The size and configuration of the grating shall suit the existing spout mouth and shall be fixed securely either by welding or bolting as per site condition and as directed by the Engineer-in-charge. The MS grating shall be hot-dip galvanized or epoxy painted to prevent corrosion and ensure long life. If any reshaping or cleaning of the spout mouth is required before installation, it shall be done carefully. This item also includes removal of rust or scaling from the existing spout where necessary, and surface preparation before fixing the grating. The contractor shall be responsible for the supply of all required men, materials, and tools, and shall ensure that work is carried out with proper traffic safety, without disturbing the drainage system, and with due diligence as per standard specifications.</p> <p><b>Rate includes cost of</b> fabrication, galvanization/painting, transportation, welding/bolting, labour, surface cleaning, minor chipping, rust removal, site preparation, safety arrangements, and all other accessories and tools required to complete the work as per the specifications and direction of the Engineer-in-charge.</p>	Provision of Missing MS Grating over Drainage Spouts	Nos	208.00		-
22.c	<p><b>Replacement of Missing/Damaged Down Take Pipe (PVC)</b></p> <p>This item includes supplying and fixing missing or damaged down take pipes connected to drainage spouts, as per MoRTH Clause 2705. The down take pipe shall be made of PVC (Polyvinyl Chloride), conforming to IS:4985 or other relevant standards, with a suitable diameter as per the design requirements. The pipe shall be properly anchored to the substructure using clamps or brackets, ensuring the alignment and slope are adequate for the drainage system to function without leakage or water splashing.</p> <p>In case the previous pipe or clamps were embedded, necessary chipping and re-concreting shall be done to restore the original position and strength of the system. The work includes cutting, jointing, and sealing the pipe with approved PVC solvent cement or adhesive to ensure a leak-proof connection. The joints must be sealed to prevent water leakage, and all necessary measures shall be undertaken to avoid damage during the replacement process.</p> <p>All necessary scaffolding, working platforms, safety harnesses, and protective measures shall be ensured during the execution of this work. The contractor shall deploy skilled manpower, quality materials, and required machinery, and complete the work as per standard practices, ensuring compliance with the specifications to the satisfaction of the Engineer-in-charge.</p> <p><b>The rate includes the cost of</b> PVC pipes, clamps, fasteners, brackets, fabrication, adhesives, sealants, cutting, jointing, labour, disposal of old pipes, tools, and all incidentals necessary to complete the work in a safe and workmanlike manner, as per MoRTH specifications and as directed by the Engineer-in-charge.</p>	Replacement of Missing/Damaged Down Take Pipe (PVC)	Nos	394.00		-
<b>REPAIR OF STRUCTURES</b>						
24	<p><b>Sealing of Cracks in RCC Members by V-Groove Cutting and Sealing with Epoxy Mortar</b></p> <p>All charges for preparing and sealing of visible or identified cracks in RCC structural elements (such as deck slab, crash barrier, pier cap, etc.) using epoxy mortar, including forming V-groove of appropriate width and depth using suitable tools (grinder/cutter), thorough cleaning of the groove and adjoining surface with air/water jet and wire brush to remove all dust, laitance, or loose particles, application of epoxy-based bond coat on the prepared groove and surrounding concrete surface, and subsequent filling of the groove using a pre-approved non-shrink, high-strength epoxy mortar conforming to manufacturer's recommendations. The epoxy mortar shall be applied in layers if required, ensuring complete filling of the groove, proper compaction, and a flush finish with adjoining surface. The final surface shall be finished to match the existing profile and be cured as per epoxy system requirement.</p> <p>The epoxy materials used shall conform to relevant provisions of IRC:SP-80, MoRTH Clause 2800, and manufacturers' specifications. All operations shall be carried out under controlled conditions with surface temperature and moisture levels suited for epoxy application, as per the material technical data sheet.</p> <p><b>Rate includes all</b> labour, materials (including epoxy system), V-groove cutting, surface preparation, bond coat, filling, tools, safety equipment, and consumables required to complete the work in a professional and durable manner. The contractor shall make necessary arrangements to access work locations at any height or depth with due safety, and shall complete the work to the satisfaction of the Engineer-in-Charge.</p>	Sealing of Cracks in RCC Members by V-Groove Cutting and Sealing with Epoxy Mortar	Rmt	359.00		-

25	<p><b>Provision and Installation of Grouting Nipples for Pressure Injection in RCC Structures (using Non-return Valve (NRV) Nipples)</b></p> <p>This item covers all necessary operations for the provision and secure installation of 12 mm diameter steel grouting nipples with Non-return Valve (NRV) in RCC members for the purpose of pressure injection grouting. The work includes core drilling of holes ranging from 16 mm to 25 mm in diameter and 50 mm to 150 mm in depth at intervals of approximately 300 mm center-to-center, as per site requirements and grouting layout approved by the Engineer-in-Charge.</p> <p>After drilling, the holes shall be cleaned thoroughly, and the steel NRV nipples shall be fixed firmly using an approved fixing compound to ensure leakproof anchorage suitable for pressure injection using Polymer Modified Cementitious (PMC) grout or Epoxy resin, as per the technical specifications. The NRV nipple shall be specifically designed to prevent the backflow of injected material, ensuring that the grouting pressure is maintained during the injection process.</p> <p>Upon completion of the grouting process, all installed nipples shall be either cut flush with the surface or removed, and the holes shall be sealed with epoxy mortar or equivalent sealant to restore structural surface continuity.</p> <p><b>Rate includes:</b> Cost of all materials including steel NRV nipples and fixing compound, labour for drilling, insertion, fixing, cutting/removal, surface preparation, cleaning, sealing of holes post grouting, tools &amp; tackles, and all incidental items necessary to complete the work in accordance with MoRTH Specification Section 2800 and as per directions of the Engineer-in-Charge.</p>	Provision and Installation of Grouting Nipples for Pressure Injection in RCC Structures	Nos	1078.00		-
26	<p><b>Low Viscosity Epoxy Pressure Injection Grouting in RCC Members (using Non-return valve (NRV) nipples)</b></p> <p>This item includes all operations required for pressure injection grouting using low viscosity epoxy resin to fill cracks and voids in RCC members, ensuring monolithic structural restoration. The epoxy grout shall be a two-component system (resin and hardener) such as Sikadur-52 (LP) or equivalent conforming to MoRTH Specifications Clause 2803, mixed in specified proportions as recommended by the manufacturer to achieve a minimum compressive strength of 4 kg/cm<sup>2</sup>.</p> <p>Injection shall be carried out using a pressure grouting pump, ensuring proper penetration of epoxy into hairline and fine cracks through previously installed grouting nipples, which shall be Non-return valve (NRV) type nipples spaced as per the engineer's direction. The NRV nipples shall allow for unidirectional flow of the grout, preventing any backflow during the injection process. The grouting pressure and flow shall be controlled to avoid overpressurization and material wastage. Grouting shall be continued until refusal or confirmed crack filling is achieved. Surface temperature, humidity, and substrate moisture content shall be verified prior to application, as per product requirements.</p> <p>Post injection, the surface shall be sealed, NRV nipples removed (if not reusable), and the area finished to match the adjoining surface. Grouting shall be executed by skilled personnel trained in handling epoxy-based systems, with due consideration to safety protocols for handling reactive materials.</p> <p><b>Rate includes:</b> Cost of approved epoxy resin system including all components, mixing, application, cleaning, labour, pressure grouting equipment, sealing of cracks and injection points, removal of NRV nipples, and all tools, safety measures, and incidentals to complete the job as per specifications and direction of the Engineer-in-Charge.</p>	Low Viscosity Epoxy Pressure Injection Grouting in RCC Members	Kg	25.00		-

<p><b>Repair of Damaged Concrete Surfaces Using Polymer Modified Mortar (PMM Mortar) up to 50mm Thickness</b></p> <p>This item includes all charges for removal of damaged, cracked, leached, honeycombed, or spalled concrete in RCC structural members such as piers, pier caps, abutments, abutment caps, crash barriers, and superstructures; followed by surface preparation and application of Polymer Modified Cement (PMM) mortar not exceeding 50 mm thickness per layer. The work shall be executed as per MoRTH Specifications Clause 2804.2 and in accordance with the directions of the Engineer-in-Charge.</p> <p><b>Scope of Work Includes:</b></p> <p><b>Concrete Removal:</b> Manual or mechanical removal of delaminated, loose, or deteriorated concrete using hammers, pneumatic tools, or hydro-demolition. Concrete shall be removed to sound substrate based on visual/NDT-based inspection. Adjacent healthy concrete and embedded reinforcement shall be preserved. All debris shall be removed and disposed of safely per Clause 112.</p> <p><b>Surface Preparation:</b> Cleaning of exposed surfaces using high-pressure water jetting or sand blasting to achieve a rough, laitance-free profile. Exposed rebars shall be cleaned of rust and corrosion using CICO Rust Clean or its equivalent, and the surface shall be kept in SSD condition.</p> <p><b>Reinforcement Treatment:</b> Corroded rebars shall be coated with Zinc-rich epoxy primer (e.g., CICO Zincilate 500 or equivalent) for corrosion protection.</p> <p><b>Bond Coat Application:</b> Bond coat shall be applied on prepared surfaces using approved products like Nitobond EP or its equivalent to enhance adhesion.</p> <p><b>PMC Mortar Application:</b> Polymer modified cement mortar containing 10% polymer by weight (e.g., Tapcrete P151 or equivalent) shall be mixed and applied in layers up to 50 mm thickness using trowels. The mix shall be prepared using slow-speed mechanical mixers and placed to match the original concrete profile.</p> <p><b>Finishing &amp; Curing:</b> Final surface shall be finished as required and curing shall be carried out using approved curing compound (e.g., CICO Cure-free or equivalent) or moist curing for not less than 7 days.</p> <p><b>Rate Includes:</b></p>	<p>Repair of Damaged Concrete Surfaces Using Polymer Modified Mortar (PMM Mortar) up to 50mm Thickness</p>	<p>sq.m</p>	<p>2230.00</p>		<p>-</p>
<p><b>Injection of Polymer Cement Grout with Non-Shrink Additive at 4 kg/cm<sup>2</sup> Pressure using NRV Nipples</b></p> <p>All charges for providing and injecting polymer cement grout composed of Ordinary Portland Cement (OPC) mixed with 10% polymer additive by weight of cement (e.g., Tapcrete-151 or its equivalent) and 0.5% to 1% non-shrink compound (e.g., Cico NSPGC or its equivalent), into cracks, voids, or honeycombed concrete sections at a minimum injection pressure of 4 kg/cm<sup>2</sup> using approved mechanical grouting equipment, including surface sealing, fixing of non-return valve (NRV) type nipples, grout preparation, progressive injection, and post-injection sealing, as per MoRTH Specifications Clause 2806 and directions of the Engineer-in-Charge.</p> <p>The work includes cleaning and preparation of concrete surfaces and cracks, drilling injection holes if required, fixing NRV nipples to permit controlled one-way grout flow, sealing cracks to avoid grout leakage, and mixing the grout to specified proportions ensuring homogeneity and flowability. Grouting shall be done progressively using suitable pumps and techniques to ensure complete filling and bonding of internal voids. Post-grouting sealing of ports and curing of injected areas shall be completed using compatible materials.</p> <p><b>Rate includes all</b> materials, consumables, equipment, NRV type nipples, labour, safety measures, documentation, and disposal of waste as required for successful execution of the activity.</p>	<p>Injection of Polymer Cement Grout (PMC) with Non-Shrink Additive at 4 kg/cm<sup>2</sup> Pressure</p>	<p>Kg</p>	<p>1033.00</p>		<p>-</p>
<p><b>Carbon Fibre Wrapping for Strengthening of Structural Members</b></p> <p>All charges for providing and applying Carbon Fibre Reinforced Polymer (CFRP) wrapping for structural strengthening or jacketing of girders or other structural components, using <b>high-strength CFRP bonded</b> with epoxy resin or equivalent polymer matrix adhesive, in accordance with manufacturer's specifications, relevant design calculations, and as directed by the Engineer-in-Charge. The activity shall comply with IS 1343:2012, ACI 440.2R-17, and ASTM D3039 standards for tensile strength and structural application.</p> <p>The scope includes thorough surface preparation of the concrete substrate by mechanical grinding or sandblasting to ensure removal of laitance, oil, grease, or any bond-inhibiting material, followed by application of CFRP sheets using appropriate tools and techniques to ensure full contact and proper resin impregnation. The applied system shall be allowed to cure as per the manufacturer's recommended protocol. Final inspection shall be conducted to verify uniform bonding and proper alignment, and any defects shall be rectified.</p> <p><b>The rate includes</b> cost of all materials (CFRP sheet, resin, etc.), labour, surface preparation, safety measures, equipment, and testing required to complete the work in all respects.</p>	<p>Carbon Fibre Wrapping for Strengthening of Structural Members</p>	<p>Sqm</p>	<p>92.00</p>		<p>-</p>

### **Kaljhar – Patacharkuchi**

A four-lane road on NH-27 with project length of 27.3 kms.

This road is adjacent to the Kochugaon – Khaljhar Road (Asset 6) and starts at Khaljar in the state of Assam at km 1013+000 and ends at Patacharkuchi in the state of Assam at km 1040+300. The asset has one toll plaza at Galia (km 1017+350) located 120 kms west of Guwahati.

In continuation to other six assets, this asset is located near origin of east – west corridor of India under NH-27. The asset forms part of the most industrialized state (Assam) within northeast (NE) region of India.

Kaljhar – Patacharkuchi has similar traffic pattern and connectivity as Kochugaon – Khaljhar Road

### **Kochugaon – Khaljhar**

A four-lane road on NH-27 with project length of 114.171 kms.

It starts at Kochugaon in the state of Assam at km 30+000 of NH-27 (old NH-31C) and passes through Rakhaldubi Bus Junction at km 92+671 / 961+500 of NH-27 (old NH-31) and ends at Kaljhar in the state of Assam at km 1013+000. The asset has two toll plazas at Patgaon (km 49+600) and Dahalapara (KM 971+200) located 215 kms and 160 km west of Guwahati respectively.

The Asset, is connected via the Siliguri corridor, also famously referred as the Chicken Neck. The Siliguri Corridor and the asset connects the seven sisters of northeast India to the rest of India. The Asset acts as a feeder for the NE India and caters to the long-distance traffic entering the region via Assam.

**Annexure C5 - Design requirements including parameters for structural and safety submissions.**

# National Highways Infra Trust

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## As per Contract Data Sheet

# **Annexure C6 - Construction requirements covering quality, workmanship, and testing standards.**

# National Highways Infra Trust

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## As per Contract Data Sheet

# **Annexure C7 - Technical specifications based on MoRTH, IRC, and IS codes.**

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## As per Contract Data Sheet

**Annexure C8 - Approved drawings including layouts, GADs, and structural details.**

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**NOT APPLICABLE**

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## Annexure C9 - Draft Contract Agreement

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**NOT APPLICABLE**