NOIDA METRO RAIL CORPORATION (NMRC) LIMITED

CONTRACT NO: NGNC-01

E Tender No.: NMRC/Civil/NGNC/123/2020

TENDER DOCUMENTS

VOLUME 2

GENERAL CONDITIONS OF CONTRACT

Noida Metro Rail Corporation (NMRC) Limited
Block-III, 3rd Floor, Ganga Shopping Complex, Sector-29, Noida -201301,
District Gautam Budh Nagar, Uttar Pradesh, India

GENERAL CONDITIONS OF CONTRACT

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1 DEFINITIONS AND INTERPRETATION

Definitions

1.1 In the contract (as defined below) the words and expressions defined below shall have the meanings assigned to them, except where the context requires otherwise. Words indicating persons or parties include corporations and other legal entities except where the context requires otherwise.

1.1.1 **Documents**

1.1.1.1 **"Appendix to Form of Tender"** means the completed pages in title Appendix, which are appended to and form part of the Tender.

1.1.1.2 **"Bill of Quantity"** means a document containing various items of payment and contains schedule of Payment also.

1.1.1.3 **"Construction and/or Manufacture Documents"** means all drawings, operation and maintenance manuals, and other manuals and information of a similar nature, to be submitted by the Contractor.

1.1.1.4 **"Contract"** means the Contract Agreement, the Letter of Acceptance, the letter of tender, General Conditions of Contract, Special Conditions of Contract, the Employer's Requirements, the Notice Inviting Tender, Instructions To Tenderers, the Contractor's Proposal, the Schedules, and such further documents which are listed in the Letter of Acceptance or Contract Agreement (in completed).

1.1.1.5 **"Contract Agreement"** means the contract agreement referred to in Sub-clause 1.4. It shall also include all subsequent modifications/ amendments to the Contract as a result of the communications or negotiation proceedings between the parties.

1.1.1.6 **"Contractor's Proposal"** means the proposal submitted by the Contractor with the Tender, as modified and accepted by the Employer and included in the Contract. Such documents may include the Contractor's preliminary design.

1.1.1.7 **"Contractor's Document"** means the calculations, computer programme and other softwares, drawings, manuals and other documents of a technical nature(if any) supplied by the Contractor under the Contract.

1.1.1.8 **"Design Data"** means all specifications, plans, drawings, details, graphs, sketches, models, levels, setting-out dimensions, calculations duly checked by the Contractor and other documents relating to the design of the Works prepared or to be prepared by or on behalf of the Contractor.

1.1.1.9 **"Drawings"** means the Employer's Drawings and the Drawings submitted by the Contractor and any modification of such drawings as any, from time to time, be furnished or for which the Engineer has issued a Notice of No Objection.

1.1.1.10 **"Employer's Requirements"** means the description of the scope, standard, design criteria, specifications, drawings, programme of work, indigenization programme (where applicable) as included in the Contract, and any alterations and modifications thereto in accordance with the Contract.

1.1.1.11 **"Interim Payment Schedule"** means the schedule included for each Cost Centre in the Pricing Document and accepted by the Employer to be used for interim payments in relation to achievement of milestones under that Cost Centre, as the same may be revised from time to time in accordance with Clause 11.

1.1.1.12 **"Letter of Acceptance"** means the formal acceptance to work by the Employer of the Tender.

1.1.1.13 **"Notice to Proceed"** means the notice issued by the Employer to the Contractor communicating the date on which the Works are to be commenced.

1.1.1.14 **"Letter of Tender"** means the document entitled letter of tender, which was completed by the Contractor and includes the signed offer to the Employer for the Works.

1.1.1.15 **"Conditions of Contract on Safety & Health and Environment""Safety, Health and Environmental (SHE) Manual"** means the Employer's manual containing the requirements and conditions to be met during the execution of the Works by the Contractor.

1.1.1.16 **"Schedules"** means the information and data submitted with the Tender, as included in the Contract.

1.1.1.17 **"Tender"** means the Contractor's priced offer to the Employer for the designing where ever applicable, execution, manufacture, and completion of the whole of Works, testing and commissioning (including Integrated Testing and Commissioning where ever applicable) and remedying of any defects therein, as accepted by the Letter of Acceptance.

1.1.1.18 **"Schedule of Milestones"** means the schedule included in each Cost Centre in the Pricing Document, describing the Milestones and stipulating dates by which the Milestones are to be achieved under that Cost Centre in order to maintain interim payments by the Employer to the Contractor in accordance with the Interim Payment Schedule for that Cost Centre, as the same may be revised from time to time in accordance with the Contract.

1.1.1.19 "**Schedule of Payment**" means the schedule included in the Bill of Quantity for payment in various stages on part of the works.

1.1.1.20 **"Special Conditions of Contract"** means any special conditions of contract issued by the Employer prior to submission of the Tender or negotiated and agreed in writing by the Employer and the Contractor prior to conditional upon acceptance of the Tender.

1.1.1.21 **"Works Programme"** means the programme showing the sequence, method and timing of investigations, design, issue of No Objection Notices, execution, manufacture, delivery to site, erection, installation, testing, commissioning of the Works (including Integrated Testing and Commissioning), indigenization (where applicable) and related activities in the form and content prescribed by the Employer's Requirements, or any amended or varied version thereof, as submitted by the Contractor and for which the Engineer has issued a Notice of No Objection.

1.1.2 Persons

1.1.2.1 "**Party"** means the Employer or the Contractor as the context requires.

1.1.2.2 "**Tenderer or Bidder**" means the person submitting a bid/Tender.

1.1.2.3 **"Contractor"** means the person whose Tender has been accepted by

the Employer and the legal successors in title to such person, but not (except with the consent of the Employer) any assignee of such person.

1.1.2.4 **"Contractor's Representative"** shall mean a person named by the Contractor in the Contract or appointed from time to time by the Contractor under Sub-clause 4.3 to act on behalf of Contractor.

1.1.2.5 **"Designated Contractors"** means any of the following whose activities or the works they are engaged to carry out, affect or are affected by the Works, in any way or at any time:

a. contractors, design consultants and utility authorities engaged on the Project from time to time by the Employer;

b. Sub-contractors of any tier of the contractors above; provided that the definition shall exclude the Contractor and his Sub-contractors of any tier in relation to the Works.

1.1.2.6 "**Other Contractor**" means a person employed by or having Contract directly or indirectly with the Employer otherwise than through the Contractor.

1.1.2.7 **"Designer"** means the Contractor, or part of the group forming the contractor, person, firm or company or group of companies, or any replacement, carrying out the Design of Works or part thereof.

1.1.2.8 **"Employer"** means NOIDA METRO RAIL CORPORATION LIMITED (NMRC), its legal successors and assignees.

1.1.2.9 **"Engineer"** means any person nominated or appointed from time to time by the Employer to act as the Engineer for the purposes of the Contract and notified as such in writing to the Contractor.

1.1.2.10 **"Engineer's Representative"** means any Assistant of the Engineer appointed from time to time by the Engineer under Sub-clause 3.3

1.1.2.11 **"Sub-contractor"** means any person named in the Contract as a sub-contractor, manufacturer or supplier for a part of the Works or any person to whom a part of the Works has been sub-contracted with the consent of the Employer and the legal successors in title to such person, but not any assignee of such person.

1.1.3 Dates, Times and Periods

1.1.3.1 **"Commencement Date"** means the date on which the Contractor shall commence the Works on the written instructions of the Employer contained in the Notice to Proceed.

1.1.3.2 **"Contract Period"** means the period from the Commencement Date to the end of Defects Liability Period including Integrated Testing and Commissioning and as certified by the Engineer under Clause 7.11 (or as extended under Sub-clause 10.3).

1.1.3.3 **"Day"** means a calendar day, **"Week"** means 7 calendar days, "Month" means a calendar month and **"Year"** means 365 days.

1.1.3.4 **"Effective Date"** means the date on which the Contract comes into force and effect.

1.1.3.5 **"Gazetted Holiday"** means every holiday which is observed by NOIDA METRO Rail Corporation Limited as a gazetted holiday as well as a weekly holiday.

1.1.3.6 **"General Holiday"** means Sunday.

1.1.3.7 **"Key Date"** means a date identified as such in the Contract.

1.1.3.8 **"Milestone"** means the completion of a part of the Works or the occurrence of an event identified as such in the Schedule of Milestones.

1.1.3.9 **"Milestone Date"** means the date prescribed in the Schedule of Milestone by which a Milestone is to be achieved, if Interim Payments for the Cost Centre in which the Milestone is included are not to be suspended.

1.1.3.10 **"Stage"** means level of progress of the works identified as such and more particularly described in the Employer's Requirements for which a Key Date for the achievement thereof is stipulated in the Contract.

1.1.3.11 **"Time for Completion"** means the time for completing the Works or a section or a part thereof (as the case may be), and passing the Tests on Completion, including Integrated Testing and Commissioning, as stated in the contract, calculated from the Commencement Date.

1.1.4 Tests and Completion

1.1.4.1 **"Factory Tests"** means the tests required to be carried out in the factory premises on components, equipment, subsystem, system, etc. during and/or after manufacture in the factory.

1.1.4.2 **"Integrated Testing"** in the contracts where applicable means the programme of tests performed by the Contractor at the direction of the Engineer following satisfactory completion of Contractor's tests on his equipment, sub-systems or system to verify and confirm the compatibility and compliant performance of his equipment/ sub-system/ system with the equipment/ sub-system/ system provided by others.

1.1.4.3 **"Milestone Certificate"** means the certificate to be issued by the Engineer in relation to the achievement or otherwise of Milestones.

1.1.4.4 **"Performance Certificate"** means the certificate issued by the Engineer under Sub-clause 10.9.

1.1.4.5 **"Taking Over Certificate"** means a certificate issued under Clause 9.1.

1.1.4.6 **"Tests on Completion"** means the tests specified in the Contract and designated as such, including Integrated Testing where applicable and any other such tests as may be agreed by the Engineer and the Contractor, or instructed as a Variation, which are to be carried out before the Works, or any Section are taken over by the Employer.

1.1.5 Money and Payments

1.1.5.1 **"Contract Price"** means the sum stated in the Letter of Acceptance as payable to the Contractor, subject to such additions thereto or deductions therefrom as may be made under the provisions of the Contract.

1.1.5.2 **"Cost"** means all expenditure properly incurred (or to be incurred) by the Contractor, whether on or off the Site,

1.1.5.3 **"Cost Centre Amount"** means the amount apportioned to a Cost Centre as set out in the Pricing Document, as the same may be revised fromtime to time in accordance with the Contract.

1.1.5.4 **"Final Payment Certificate"** means the payment certificate issued by the Engineer under Sub-clause 11.9.

1.1.5.5 **"Final Statement"** means the agreed statement defined in Sub-clause

11.10.

1.1.5.6 **"Foreign Currency"** means a freely convertible international trading currency in which part of the Contract Price is payable, but not the Local Currency.

1.1.5.7 **"Interim Payment Certificate"** means any payment certificate issued by the Engineer under Sub-clause 11.5, other than the Final Payment Certificate.

1.1.5.8 **"Local Currency"** means Indian Rupees (INR).

1.1.6 Other Definitions

1.1.6.1 **"Approval or Approved"** means Approval in writing including subsequent written confirmation of previous verbal approval.

1.1.6.2 **"Contractor's Equipment"** means all machinery, apparatus, appliances, other things of whatsoever nature required for purpose of the Contract, including without limitation, Contractor's Plant and Equipment, or Materials to or from the Site, but does not include Plant, or Materials intended to form or forming part of the Permanent Works.

1.1.6.3 **"Cost Centre"** means a group of activities and/ or items of work identified as such in the Pricing Document.

1.1.6.4 **"Materials"** means things of all kinds (other than Plant) to be provided and incorporated in the Permanent Works by the Contractor, including the supply-only items (if any), which are to be supplied by the Contractor as specified in the Contract.

1.1.6.5 **"Plant"** means the machinery, equipment, and apparatus and the likes, intended to form or forming part of the Permanent Works, including the supply-only items (if any), which are to be supplied by the Contractor as specified in the Contract.

1.1.6.6 **"Section"** means a part of the Works specifically designated in the Appendix to Form of Tender as a Section (if any)

1.1.6.7 **"Site"** means the places provided by the Employer where the Works are to be executed and to which Plant, Rolling Stock and Materials are to be delivered and any other place as may be specifically designated in the Contract as forming part of the Site. Site includes Depot, where Rolling Stock will be delivered, tested and commissioned as provided in the Contract.

1.1.6.8 **"Scheduled Bank"** means a bank included in the second schedule to the Reserve Bank of India Act, 1934, or modifications thereto.

1.1.6.9 "**Specification**" means the Specification referred to in the contract and any modification thereof or addition thereto, as may from time to time be furnished or approved in writing by the Engineer.

1.1.6.10 "**Test**" means such Tests as are prescribed in the Specifications or by the Engineer or Engineer's Representative, whether performed by the Contractor or by the Engineer or his Representative or any agency acting under the direction of the Engineer.

1.1.6.11 **"Variation"** means any alteration and/ or modification to the Employer's Requirements, which is instructed by the Engineer or approved as a variation by the Engineer, in accordance with Clause 12.

1.1.6.12 **"Works"** means the work, both permanent and temporary, or services to

be carried out, designed, manufactured, fabricated, delivered to Site, erected, installed, completed, tested, commissioned, (including Integrated Testing and Commissioning) and remedying of any defects, and/ or supplied in accordance with the Contract and include Plant, Rolling Stock and Materials and their accessories.

1.1.6.13 **"Permanent Works"** means the permanent works to be designed and executed in accordance with the Contract.

1.1.6.14 **"Temporary Works"** means all temporary works of every kind (other than Contractor's Equipment) required for the execution and completion of the Works, and the remedying of any defects.

1.1.6.15 **"Project"** means Noida- Greater Noida Mass Rapid Transport System (MRTS),

Interpretation **1.2** In the Contract except where the context requires otherwise:

1.2.1 a. words indicating one gender include all genders;

b. words indicating the singular also include the plural and words indicating the plural also include the singular and

c. "written" or " in writing" means hand-written, type written, printed or electronically made and resulting in a permanent record.

The marginal words and other headings shall not be taken into consideration in the interpretation of these conditions.

1.2.2 Terms and expressions not herein defined" shall have the meanings assigned to them in the "Indian General Clauses Act, 1897" or the Indian Contract Act or the Indian Sale of Goods Act or any other applicable Indian Law, as the case may be.

Law and Language **1.3** The Contract shall be governed by the Acts and Laws of India, the rules, regulations and bye-laws of the concerned public bodies and authorities. Language of the Contract shall be English.

Contract Agreement **1.4** The Employer and the Contractor shall execute a Contract Agreement, with such modifications as may be necessary to record the Contract. The costs of stamp duties and similar charges imposed by law shall be borne by the Contractor.

Priority of Documents **1.5** The documents forming the Contract are to be taken as mutually explanatory of one another. If there is an ambiguity or discrepancy or inconsistency in the documents, the Engineer shall issue any necessary clarification or instruction to the Contractor, and the priority of the documents shall be as follows:

a. The Contract Agreement;
b. The Letter of Acceptance;
c. Pre and Post bid proceeds
d. Form of Tender
e. BOQ/Payment schedule
f. NIT
g. ITT
h. The Outline Design Specifications (Design Criteria) and Outline Construction Specifications; or any other specification
i. Drawings

j. The Employer's Requirements

k. The Special Conditions of Contract;

l. The General Conditions of Contract;

m. The Contractor's Proposal; and

n. Any other document forming part of the Contract.

Care and Supply of Construction and/or Manufacture Documents **1.6** The Construction and/or Manufacture Documents shall be in the custody and care of the Contractor during the Contract. Unless otherwise stated in the Employer's Requirements, the Contractor shall provide three copies for the use of the Engineer and Assistants (as referred to in Sub-clause 5.3).

The Contractor shall keep, on the Site, one complete set of the documents forming the Contract, the Construction and/or Manufacture Documents, Variations, other communications given or issued from time to time and the documents/samples mentioned in Sub-clause 5.3. The Employer, the Engineer and their Assistants (as referred to in Sub-clause 3.3) shall have the right to access these documents at all reasonable times.

On discovery of any technical error or defect in a document intended to be used for the purpose of Contract, the Contractor shall promptly give notice to the Engineer of such error or defect.

Communications **1.7** Communications between parties, unless otherwise specified shall be effective only when made in writing. A notice will be effective only when delivered sent to the address of the Party by registered post or by telex or telefax or by an e-mail to the email ID of the Party or delivered by hand to the Party.

Employer's Use of Contractor's Documents **1.8** As between the Parties, the Contractor shall retain the copyright and other intellectual property rights in the Contractor's Documents and other design documents made by (or on behalf of) the Contractor.

The Contractor shall be deemed (by signing the Contract) to give to the Employer a non-terminable, transferable, non-exclusive royalty-free licence to copy, use and communicate the Contractor's Documents, including making and using modifications of them. This licence shall:

a. apply throughout the actual or intended working life (whichever is longer) of the relevant parts of the Works,

b. entitle any person in proper possession of the relevant part of the Works to copy, use and communicate the Contractor's Documents for the purposes of completing, operating, maintaining, altering, adjusting, repairing and demolishing the Works, and

c. in the case of Contractor's Documents which are in the form of computer programs and other software, permit their use on any computer on the Site and other places as envisaged by the Contract, including replacements of any computers supplied by the Contractor.

After payment of the consideration under the Contract to the Contractor all the intellectual property rights of Contractor vested in the Works, executed under the Contract, should get transferred and vested in the Employer.

Contractor's Use of Employer's Documents **1.9** As between the Parties, the Employer shall retain the copyright and other intellectual property rights in the Employer's Requirements and other documents made by (or on behalf of) the Employer. The

Contractor may, at his cost, copy, use, and obtain communication of these documents for the purposes of the Contract.

They shall not, without the Employer's consent, be copied, used or communicated to a third party by the Contractor, except as necessary for the purposes of the Contract.

Compliance with Statutes, Regulations and Laws **1.10** The Contractor shall familiarize themselves and conform in all aspects with:

a. the provision of any enactment in India as applicable from time to time

b. the regulations or bye-laws of any local body and utilities.

c. The Contractor shall be bound to give all notices required by statute, regulations or bye-laws, as aforesaid and to pay all fees and bills payable in respect thereof. The Contractor will arrange necessary clearances and approvals before the Work is taken up.

Ignorance of Rules, Regulations and Bye-laws shall not constitute a basis for any claim at any stage of work.

The Contractor shall indemnify the Employer against all penalties and liabilities of every kind of breach of any such enactment, laws, regulations, bye-laws or rules.

Joint and Several Liability **1.11** If the Contractor is (under applicable Laws) a joint venture, consortium, or other incorporated or unincorporated grouping of two or more Persons:

a. these Persons shall be deemed to be jointly and severally liable to the Employer for the performance of the Contract;

b. these Persons shall notify the Employer of their leader who shall have authority to bind the Contractor and each of these persons; and

c. the Contractor shall not alter its composition or legal status without the prior consent of the Employer.

2 THE EMPLOYER

General Obligations **2.1** The Employer shall provide the Site/area of works and shall pay the Contractor in accordance with the Contract.

Access to and Possession of the Site **2.2** The Employer shall grant the Contractor right of access to, and / or possession of, the Site progressively for the completion of Works. Such right and possession may not be exclusive to the Contractor. The Contractor will draw/modify the schedule for completion of Works according to progressive possession/right of such sites.

If the Contractor suffers delay from failure on the part of the Employer to grant right of access to, or possession of the Site, the Contractor shall give notice to the Engineer in a period of 28 days of such occurrence. After receipt of such notice, the Engineer shall proceed to determine any extension of time to which the Contractor is entitled and shall notify the Contractor accordingly.

For any such delay in handing over of site, Contractors will be entitled to only reasonable extension of time and no monetary claims, whatsoever shall be paid or entertained on this account.

Permits, Licences or **2.3** It shall be Contractor’s exclusive responsibility to get approvals, permits or license required for the Contract. However, the Employer may (where

Approvals

he is in a position to do so) provide reasonable assistance to Contractor at the request and cost of the Contractor in getting Permits, License or Approvals required during the Contract.

The rendering of such assistance by the Employer shall not be interpreted as a pretext by the Contractor as condoning of any delay or non-performance of any of the Contractors obligations. The following-up of all such applications shall be the responsibility of the Contractor.

Assignment by the Employer **2.4**

The Employer shall be fully entitled without the consent of the Contractor, to assign the benefit of the part thereof and any interest therein or thereunder to any third Party.

3 THE ENGINEER

Appointment of Engineer **3.1**

The Employer shall notify the Contractor in writing of the appointment and identity of the Engineer and of any replacement from time to time, in absence of any written communication from the Employer about the appointment/identity/replacement of the Engineer, the Chief Project Manager/HOD of the Employer, in charge of the Works being executed by the Contractor, would be the Engineer under the Contract..

Duties and Authorities of the Engineer **3.2**

The Engineer shall carry out the duties specified in the Contract. The Engineer shall have no authority to amend the Contract.

The Engineer may exercise the authority specified in, or necessarily to be implied from the Contract. If the Engineer is required to obtain the specific approval of the Employer before exercising such authority, such requirements shall be as stated in Special Conditions of Contract. Any requisite approval shall be deemed to have been given by the Employer for any such authority exercised by the Engineer.

The Engineer shall have no authority to relieve the Contractor of any of his duties, obligations, or responsibilities under the Contract. Any proposal, inspection, examination, testing, consent, approval or similar act by the Engineer (including absence of disapproval) shall not relieve the Contractor from any responsibility, including responsibility for his errors, omissions, discrepancies, and non-compliance with Sub-clause 5.4.

The Engineer shall copy to the Employer all communications given or received by him in accordance with the Contract.

Engineer's Authority to Delegate **3.3**

(i) The Engineer may from time to time assign and delegate authority to Engineer's Representatives/Assistants and may also revoke such assignments and delegations. The delegation or revocation shall be in writing and shall be applicable only after same has been notified in writing to the Contractor.

(ii) Each Assistant to whom duties have been assigned or authority has been delegated shall be authorized to issue instructions to the Contractor to the extent defined by the delegation. Any determination, approval, check, certificate, consent, examination, inspection, instruction, notice, proposal, request, test or similar act by an Assistant shall have the same effect as though the act had been an act of the Engineer. However:

a. Any failure to disapprove any Plant, Goods, Material, Design and Workmanship shall not prejudice the right of the Engineer to reject such Plant, Goods, Material, Design and Workmanship;

b. if the Contractor questions any determination or instruction of an Assistant of the Engineer, the Contractor may refer the matter to the Engineer within three days of such decision having been given, who shall confirm, reverse or vary such determination or instruction.

Engineer's Instructions **3.4** The Contractor shall comply with instructions given by the Engineer in accordance with the Contract.

The Contractor shall give reasonable notice to the Engineer of any instruction, which he considers necessary for the execution of the Works, to enable the Engineer to issue the instruction so that progress of the Works is not delayed. The Engineer shall not, however, be bound to issue any instruction which, in his opinion, is unnecessary.

No act or omission by the Engineer or the Assistants to the Engineer in the performance of any of the Engineer's duties or the exercise of any of the Engineer's powers under the Contract shall, in any way, operate to relieve the Contractor of any of the duties, responsibilities, obligations or liabilities imposed upon the Contractor by any of the provisions of the Contract.

Engineer to Attempt Agreement **3.5** When the Engineer is required to determine value, cost or extension of time, he shall consult with the Contractor and the Employer in an endeavour to reach agreement. If agreement is not achieved, the Engineer shall determine the matter fairly, reasonably and in accordance with the Contract, with the approval of Employer.

4 THE CONTRACTOR

General Obligations **4.1** The Works as completed by the Contractor shall be wholly in accordance with the Contract and fit for the purposes for which they are intended, as defined in the Contract. The Works shall include any work which is necessary to satisfy the Employer's Requirements, the Contractor's Proposal and Schedules, or is implied by the Contract, or arises from any obligation of the Contractor, and all works not mentioned in the Contract but which may be inferred to be necessary for stability, or completion, or the safe, reliable and efficient operation of the Works.

The Contractor shall design, if in the scope of work, manufacture, execute, install, complete, test (including Integrated Testing in case of rolling stock and signalling contracts) and commission, the Works, including providing Construction and/or Manufacture Documents, within the Time for Completion and shall remedy any defects within the Contract Period. The Contractor shall provide all superintendence, labour, Plant, Materials, Contractor's Equipment, Temporary Works and all other things, whether of a temporary or permanent nature, required in and for such design, works and remedying of defects.

Before commencing design, if in the scope of the Contract, the Contractor shall satisfy himself regarding the Employer's Requirements (including design criteria and calculations, if any) and the items of reference mentioned in Sub-clause 4.8.

The Contractor shall give notice to the Engineer of any error, fault or other defect in the Employer's Requirements or such items of reference. After receipt of such notice, the Engineer shall determine whether Clause 12 shall be applied, and shall notify the Contractor accordingly.

The Contractor shall take full responsibility for the adequacy, stability and safety of all Site operations, of all methods of construction, manufacture,

and of all the Works, irrespective of any approval or consent by the Engineer.

The Contractor shall be deemed to have satisfied himself before submitting his Tender as to the correctness and sufficiency of his Tender to cover all his risks, liabilities and obligations set out in or implied by the Contract and all matters and things necessary for the proper design, manufacture, execution, installation, completion, testing, Integrated Testing whichever is in the scope of the Contract, commissioning of the Works and remedying of the Defects.

The Contractor acknowledges responsibility for ascertaining and securing at his own cost:

a. conditions bearing upon the proper transportation, disposal, handling and storage of materials (including but not limited to hazardous toxic substances and excavated materials);

b. availability of electricity, water and gas;

c. availability of skilled manpower;

d. the character of equipment and facilities needed preliminary to and during the manufacture, installation, execution, testing, Integrated Testing, and commissioning of the Works and remedying of any defects;

e. the protection of the environment and adjacent structures which will be necessary preliminary to and during the manufacture, installation, execution, testing, Integrated Testing, and commissioning of the Works and remedying of any defects;

f. the location of and the authorization required for and the means of diversion of any services and facilities required for the purposes of the Works.

The Contractor shall whenever required by the Engineer, submit details of the arrangement and methods which the Contractor proposed to adopt for the execution of the Works. No alteration to these arrangements or methods shall be made without the approval of the Engineer.

Performance Security Amount **4.2**

4.2.1 Within 30 days from date of issue of the Letter of Acceptance, the successful Tenderer shall furnish Performance Security, for an amount of ten per cent of the Contract value in types and proportions of currencies in which the Contract Price is payable either in the form of a Bank Draft, FDR or in the form of a Bank Guarantee from a branch in India of a scheduled foreign bank or from a scheduled commercial bank in India acceptable to the Employer. The Extension of time for submission of Performance Security beyond 30 (Thirty) days up to 60 days from date of issue of LOA may be given by the Authority who is competent to sign the Contract Agreement. However, a Penal Interest of 15% per annum shall be charged for the entire period i.e. from the date of issue of LOA to the date of submission of Performance Security. In case the Contractor fails to submit the requisite Performance Security within 60 days from the date of issue of LOA, the Contract shall be annulled duly forfeiting Tender Security and other dues, if any payable against the Contract. The failed Contractor shall be debarred not only from participating in re-tender for that work but also in any other tender of NMRC for a period of one year from date of issue of LOA. The approved form provided in the “Instructions to Tenderers” shall be used for Bank Guarantee.

The successful Tenderer shall have the following options for submission of Performance Security;
(i) Performance Security for an amount of 10% of Contract value, if the same is in the form of Bank Guarantee/FDR, it shall be valid up to 6 months beyond the Defect Liability Period, or

(ii) Performance Security in the form of two Bank Guarantees/FDRs, each for an amount of 5% of Contract Value with one Bank Guarantee/FDR valid up to 6 months beyond the date of completion of work and second Bank Guarantee/FDR valid up to 6 months beyond the Defect Liability Period, or

(iii) One part of Performance Security for an amount of 5% of Contract value, if the same is in the form of Bank Guarantee/FDR, it shall be valid up to 6 months beyond the Defect Liability Period. For 2nd part of Performance Security for an amount of 5% of Contract value, amount shall be deducted at the rate of 5% of the gross amount of each running on-account bill. The Performance Security so deducted from running on-account bill, shall be released on completion of entire work in terms of Clause 4.2.3(i) of GCC. After achieving every 25% of financial progress w.r.t. Original Contract Value, Contractor can ask for release of such amount deducted towards Performance Security on submission of Bank Guarantee/FDR for an equal amount with validity up to 6 months beyond the date of completion of work. The Contractor shall always have the option during the currency of Contract to submit 2nd part of Performance Security for an amount of 5% of Contract value in the form of Bank Guarantee/FDR with validity up to 6 months beyond the date of completion of work. In such a case, further deduction of Performance Security amount from running on-account bill shall be stopped and the amount deducted towards Performance Security shall be released.

In case, if Contract is terminated due to Contractor's default in terms of GCC Clause 13.2, the full 10% Performance Security amount shall be forfeited. Shortfall amount, if any, shall be recovered by the Employer from monies due to the Contractor under the Contract including, without limitation, and the Employer shall have the power to recover any balance from monies due to the Contractor under any other Contract between the Employer and the Contractor.
In case the Contract value exceeds beyond 25% of the Original Contract Value, the Contractor shall have to submit additional Performance Security as follows:.

If variation amount on plus side exceeds 25% of the Original Contract Value either due to Employer's variation or due to Contractor's variation, the Contractor shall submit additional performance security equal to an amount of 10% of the variation amount exceeding 25% of the Original Contract Value.

No additional Performance Security will be required to be submitted if the variation amount on plus side is within 25% of the Original Contract Value.

Forfeiture **4.2.2** Failure of the successful Tenderer to furnish the required Performance Security shall be a ground for the annulment of the award of Contract and forfeiture of the Tender Security.

The whole of the Performance Security amount shall be liable to be forfeited by the Employer at the discretion of the Employer, in the event of any breach of contract on the part of the Contractor. The forfeiture of

the Performance Security amount by the Employer would be without prejudice to any amount(s) of money that the Employer may recover as Liquidated Damages or any other damages from the Contractor. The forfeiture of Performance Security amount by the Employer, would not operate as bar/set off/ adjustment from any amount of money which becomes recoverable or is recovered by the Employer. In case of the Performance Security Amount Bank Guarantee being invoked and forfeited by the Employer, the Contractor would immediately replenish the amount of Performance Security Bank Guarantee.

Release **4.2.3** i.On completion of the entire Work/part Work, one half of the proportionate Performance Security shall be refunded to the Contractor, on issue of Taking Over Certificate/part Taking Over Certificate by the Engineer, in accordance with Sub-clause 9.1 and 9.2 of these conditions. The above shall not relieve the Contractor from his obligations and liabilities, to make good the defects that may be detected during the Defect Liability Period

i.The balance amount shall become due and shall be paid to the Contractor on signing of the Performance Certificate after the expiry of the final Defect Liability Period as per Clause 10.9 of these conditions.

Guarantees and Warranties **4.2.4** Within 30 days of the date of Letter of Acceptance of the Tender, the Contractor shall submit to the Employer:

i.An Undertaking in the approved format from a Parent Company, the identity of which shall have been submitted in writing to the Employer prior to acceptance of the Tender and against which the Employer shall have raised no objection.

i.A written Guarantee in the approved format from a Parent Company, the identity of which shall have been submitted in writing to the Employer prior to acceptance of the Tender and against which the Employer shall have raised no objection.

i.A warrantee in the approved format from the Contractor.

In the event that the Contractor shall comprise two or more members, corporations acting in partnership, joint venture, consortium or otherwise each such member or corporation shall submit a Parent Company Undertaking and Guarantee.

Notwithstanding any other provision of the Contract:

a. submission by the Contractor of the requisite Performance security, Parent Company Undertakings and written Guarantees shall be condition precedent to the Contractor's entitlement to any payment, under the Contract; and

b. failure by the Contractor to provide a Performance Security or Parent Company Undertakings or Parent Company Guarantees shall entitle the Employer either to suspend the Works or to terminate the Contract forthwith by notice in writing to that effect, notwithstanding that the Contractor may have been permitted to proceed with the Works, and the Contractor shall not be entitled to any compensation whatsoever as a consequence of such suspension or termination.

Representation on Works **4.3** Unless the Contractor's Representative is named in the Contract, the Contractor shall, within 14 days of Notice to Proceed, submit to the Engineer for consent the name and particulars of the person the Contractor proposes to appoint. The Contractor shall not revoke the appointment of the Contractor's Representative without the prior consent

of the Engineer. The Contractor's Representative so nominated shall have full authority to act on behalf of the Contractor. The Contractor's Representative shall give his whole time to directing the preparation of the Construction and/or Manufacture Documents and the execution of the Works. The Contractor's Representative shall receive (on behalf of the Contractor) all notices, instructions, consents, no objection certificate, approvals, certificates, determinations and other communications under the Contract. Whenever the Contractor's Representative is to be absent from the Site, a suitable replacement person shall be appointed, with prior consent of Engineer.

Failure on part of the Contractor to comply with these provisions shall constitute a breach of Contract leading to action under Sub-clause 13.2.

The Contractor's Representative may delegate any of his powers, functions and authorities to any competent person, and may at any time revoke any such delegation. Any such delegation or revocation shall be in writing and shall not take effect until the Engineer has given prior consent thereto. The Contractor's Representative and such persons shall be fluent in the language of day to day communication and the Contractor shall be bound by and fully liable for the acts or omissions of the Contractor's Representatives or any of his employees and/or delegates, agents or nominees.

Facilities for and co- ordination with Others. **4.4** The Contractor shall not impede and shall afford all necessary facilities, access and/or services to the Employer, Engineer, Designated Contractors, utility undertakings, other relevant authorities and other Contractors (whether employed by the Employer or not) who are carrying out on, or in the vicinity of, the Site, Works not included in the Contract but forming part of the Project:

a. The Contractor shall take all reasonable steps to ensure that the Works are co-ordinated and integrated with the design, manufacture, installation execution and testing of such other Works and shall in particular (but without limitation):

i. comply with any direction which the Engineer may give for the integration of the design of the Works with the design of any other part of the Project;

i. consult, liaise and co-operate with those responsible for carrying out such other Works, including where necessary, in the preparation of the respective designs, the preparation of co-ordinated programmes, method statements, co-ordination drawings and specifications together with arrangements of service priorities and zoning;

i. participate in Integrated Testing and Commissioning of the system with Designated Contractors and demonstrate to the satisfaction of the Engineer that the Works have been designed and constructed in a manner compatible with the Works of Designated Contractors.

b. The Contractor shall undertake design co-ordination with other Contractors who are carrying out Works forming part of the Project as described in the Employer's Requirements. At the end of each such co-ordination period, the Contractor and the other Contractor with whose Works the interface period refers shall jointly state in writing that their design co-ordination activities are complete and that their respective designs are integrated and can be finalized without interference with each other's designs or the designs with which their

designs have already been integrated. A copy of this joint written statement shall be provided to the Engineer within 7 days of the end of the said design co-ordination period. Unless and until copies of all relevant and necessary design co-ordination statements have been submitted to the Engineer, the Engineer shall be entitled to suspend any review or further review of the Contractor's or the other Contractor's design submissions. Such suspension shall not be grounds for the Contractor to claim nor shall be entitled to receive an extension of time or additional payments.

c. The Contractor shall provide within the Site, staging, storage and unloading areas for the use of Designated Contractors, if any, who are undertaking trackwork, fare collection system, supply, testing and commissioning of Rolling Stock, escalators, lifts, signalling and telecommunications and traction power installation Works, etc. Separate locations shall be provided for each such Contractor. The exact size and location of these staging, storage and unloading areas, and the commencement date shall be co-ordinated and agreed during the design interface period with each Designated Contractor.

d. Any other contract which depends for its execution on the Contract or upon which the Contract is dependent for its own execution shall be identified by the Engineer as a "Designated Contract". The Contractor shall provide attendance on Designated Contractors in accordance with the Employer's Requirements and as instructed by the Engineer. The identity of the Contractor for a Designated Contract may not be known before the execution of the Contract but this shall not be a ground for the Contractor to object to the subsequent appointment of a Designated Contractor.

e. The Contractor shall in accordance with the requirements of the Engineer co-ordinate his own Works with that of Designated Contractors through Co- ordinated Installation Programme (CIP) stated in the Employer's Requirements, or as the Engineer may require, and shall afford the Designated Contractors all reasonable opportunities for carrying out their Works.

f. The Contractor shall afford all reasonable opportunities, for carrying out their Work, to other Contractors employed by the Employer and their workmen respectively and the workmen of the Employer who may be engaged on or near the Site of any Work, ancillary to the Works, but, not included in the Contract and shall not cause them inconvenience.

g. If the Contractor suffer delay by reasons of failure by any Designated Contractor to meet the specified installation interfacing and co-ordination, completion dates and if such delay has been caused otherwise than the fault of the Contractor, or, if compliance with Sub-clause (f) herein shall involve the Contractor in delay beyond that which could be reasonably foreseen by an experienced Contractor at the time of Tender, then the Engineer shall take such delay into account in determining any extension of time to which the Contractor is entitled under the Contract.

h. It shall be the responsibility of the Contractor to ensure that the full extent of the Works under the Contract and the Works to be carried out by Designated Contractors within the Works or, in, on, under, through and over the Site are co-ordinated and integrated in their design,

manufacture, installation and construction. Such responsibility shall neither be mitigated nor in any other way affected by virtue of similar responsibilities being placed on other Contractors.

The Contractor shall be deemed to have made adequate allowance in the Contract Price and in the Works Programme in respect of these obligations.

If any act or omission of the Contractor whether directly or indirectly results in the delay in the execution of the Works of a Designated Contractor, the Contractor, in addition to his liability in respect of Liquidated Damages if they become due, shall pay to the Employer, or the Engineer may deduct from Interim Payment Certificates such amount as the Engineer shall have certified in respect of additional payments or costs to the Designated Contractor in respect of such delay.

Sub-contractors **4.5**

4.5.1 t Contractor shall not sub-contract the whole of the Works.

4.5.2 Unless otherwise stated in the Special Conditions of Contract:

a. the Contractor shall not be required to obtain consent for purchases of Materials which are in accordance with the makes specified in the Contract or provisions of labour or for the sub-contracts for which the Sub-contractor is named in the Contract;

b. the prior consent of the Engineer shall be obtained for other proposed Sub- contractors;

c. not less than 28 days before the intended date of each Sub-contractor commencing work, the Contractor shall notify the Engineer of such intention; and the Contractor shall give fair and reasonable opportunity for Contractors in India to be appointed as Sub-contractors.

4.5.3 The Contractor shall be responsible for observance by all Sub-contractors of all the provisions of the Contract. The Contractor shall be responsible for the acts or defaults of any Sub-contractor, his representatives or employees, as fully as if they were the acts or defaults of the Contractor, his representatives or employees and nothing contained in Sub-clause (a) of clause 4.5 shall constitute a waiver of the Contractor's obligations under this Contract. The Contractor shall provide to the Engineer of all the Sub-contracts including terms, conditions and pricing. The Contractor shall endeavour to resolve all matters and payments amicably and speedily with the Sub-contractors.

4.5.4 The Contractor shall ensure that their Sub-contractors, material/equipment Suppliers, Consultants and other Agencies deployed by them in connection with execution of the Contract do not make any claim or raise any dispute before NMRC. For this, necessary provision is to be made in the agreement between Contractor and their Sub-contractors/Consultants/other Agencies. Similarly the agreement should also incorporate the provision of dispute resolution. An undertaking in the following format shall be submitted by Contractor in respect of each such agency:-

"Name of Work……..

In connection with above Work, M/s……, Contractor has/is engaging M/s……, as Sub-contractor(or Consultant or material/equipment Supplier or Service provider). For this, the terms and conditions of agreement include necessary provisions for

resolution of dispute if any arising between Contractor and Sub-contractor.

It is confirmed by the Sub-contractor that any claim/dispute arising out of the above Work shall be resolved in terms of agreement and shall not be raised before NMRC and also shall not make any claim against NMRC before any forum/court.

Signature of Contractor

Assignment of Contractor's and Sub- contractor's Obligations **4.6** The Contractor shall not assign a right or benefit under the Contract without first obtaining Employer's prior written consent, otherwise than by :

charge in favour of the Contractor's bankers of any money due or to become due under the Contract.

a. It is submitted that the NMRC should ensure that the contractor has obtained such insurance policies in which right of subrogation o the insurer is waived off i.e. the insurer after paying of the insurance claim to Contractor should not be in a position to obtain any monetary relief against the NMRC by stepping into the shoes of Contractor.

b. assignment to the Contractor's insurers (in cases where the insurers have discharged the Contractor's loss or liability) of the Contractor's right to obtain relief against any other party liable.

If a Sub-contractor's obligations extend beyond the expiry date of Defects Liability Period then the Contractor shall assign the benefits of such obligations to the Employer.

In the event that a Sub-contractor of any tier provides to the Contractor or any other Sub-contractor a warranty in respect of Plant, Materials or Services supplied in connection with the Works, or undertakes a continuing obligation of any nature whatsoever in relation to such Plant, Materials or Services (including without limitation an obligation to maintain stocks of spare parts) extending for a period exceeding that of the Defects Liability Period or where there is more than one Defects Liability Period exceeding that of the latest Defects Liability Period, and if the Engineer so directs in writing within 21 days of the expiry of the Defects Liability Period or the latest Defects Liability Period (as the case may be), the Contractor shall immediately assign or obtain the assignment of the benefit of such warranty or obligation to the Employer or at the direction of the Employer, to any third Party referred to in Sub-Clause 2.4.

Compensation for Breach **4.7** Any breach of Sub-clauses 4.5 to 4.6shall entitle the Employer to rescind the Contract under Clause 13.2of these conditions and also render the Contractor liable for loss or damage arising due to such cancellation.

Setting Out **4.8**

Accurate Setting Out **4.8.1** The Contractor shall be responsible for

a. the accurate setting out of the Works in relation to the original points, lines and levels of reference given by the Engineer in writing

b. the correctness of position, levels, dimensions and alignments of all parts of the Works

c. the provisions of all necessary instruments, equipment, apparatus and labour in connection with the foregoing responsibilities

d. Carefully protecting and preserving all bench marks, sight-rails, pegs and other things used in setting out the Works

The checking of any setting-out or of any line or level by the Engineer shall not in any way relieve the Contractor of his responsibility for the accuracy or correctness thereof and the Contractor shall carefully protect and preserve all bench-marks, sight-rails, pegs and other things used in setting out the Works.

Errors in Setting out **4.8.2** If at any time during the execution of the Work, an error appears in the positions, levels, dimensions or alignment of any part of the Works, the Contractor on being required to do so by the Engineer shall, at Contractor's cost, rectify such error to the satisfaction of the Engineer.

Site Data **4.9**

i. The Employer shall have made available to the Contractor with the Tender documents such relevant data in Employer's possession on hydrological and sub-surface conditions. The accuracy or reliability of the data/studies/reports and of any other information supplied at any time by the Employer or Engineer is not warranted including with respect to the viability of his design and execution of Works and the Contractor shall be responsible for interpreting validity, and interpretation of all such data. The Contractor shall conduct further investigations considered necessary by him at his own cost and any error, discrepancies if found in Employer's data at any stage will not constitute ground for any claim for extra time, damages and costs.

ii. The Contractor shall be deemed to have obtained all necessary information as to risks, contingencies and other circumstances which may influence or affect the Tender or Works.

iii. The Contractor shall also be deemed to have inspected and examined the Site, its surroundings, the above data and other available information including with respect to the viability of his design and execution of Works and to have satisfied himself before submitting the Tender, as to all the relevant matters including without limitation:

a. the form and nature of the Site, including the sub-surface conditions; the hydrological and climatic conditions;

b. the extent and nature of the Work, Plant, and Materials necessary for the execution and completion of the Works and the remedying of any defects;

c. the applicable laws, procedures and labour practices

d. The Contractor's requirement for access, accommodation, facilities, personnel, power, transport and other services.

e. the risk of injury or damage to property adjacent to the Site and to the occupiers of such property or any other risk.

Sufficiency of accepted Contract Amount **4.10** The Contractor shall be deemed to have satisfied himself as to the correctness and sufficiency of the Contract Price. Unless otherwise stated in the Contract, the Contract Price shall cover all his obligations under the Contract and all things necessary for the proper design, execution and completion of the Works, testing and commissioning (including Integrated Testing and Commissioning) and remedying of any defects.

Access Route **4.11** The Contractor shall be deemed to have satisfied himself as to the suitability and availability of the access routes he chooses to use. The

Contractor shall (as between the Parties) be responsible for the maintenance of access routes. The Contractor shall provide at his cost signs or directions, which he may consider necessary or as instructed by Engineer for the guidance of his staff, labour and others. The Contractor shall obtain any permission concessions and related easement right that may be required from the relevant authorities for the use of such routes, signs and directions.

The Employer will not be responsible for any claims which may arise from the use or otherwise of any access route. The Employer does not guarantee the suitability or availability of any particular access route, and will not entertain any claim for any non-suitability or non-availability for continuous use during construction of any such route.

Rights of Way and Facilities **4.12** The Employer will acquire and provide land for Permanent Works and right of way (within NMRC's land) for access thereto over routes established by the Contractor. The Contractor shall bear all cost and charges for special or temporary rights of way which he may require including those for access to the Site. The Contractor shall also obtain, at his risk and cost, any additional facility outside the Site which he may require for the purpose of the Works. The Employer reserves the right to make use of these service roads/rights of way for itself or for other Contractors working in the area, as and when necessary without any payment to the Contractor.

Programmes **4.13** The Contractor shall submit a detailed Programme to the Engineer after receipt of the Letter of Acceptance not later than 28 days from the date of receipt of Letter of Acceptance. The Contractor shall also submit a revised Programme whenever the Engineer finds that the previous Programme is inconsistent with actual progress or with the Contractor's obligations.

Each Programme shall include the following:

a. the order in which the Contractor proposes to carry out the Works (including each stage of design, procurement, manufacture, delivery to Site, construction, erection, testing and commissioning),

b. all major events and activities in the production of Construction or Manufacture Documents; and

c. the sequence of all tests specified in the Contract including Integrated Testing and Commissioning.

Unless otherwise stated in the Contract, the Programmes shall be developed using precedence networking techniques, showing early start, late start, early finish and late finish dates.

No significant alteration to the Programmes, or to such arrangements and methods, shall be made without obtaining consent of the Engineer. If the progress of the Works does not conform to the Programmes, the Engineer may instruct the Contractor to revise the Programmes, showing the modifications necessary to achieve completion within the Time for Completion.

Consent by the Engineer to Programmes shall not relieve the Contractor of any of his responsibilities or obligations under the Contract. If the Programmes indicate that a Key Date has not, or will not be met, it shall not, by itself entitle the Contractor to an extension of time in relation to such Key Date or would entitle the Contractor for any amount of

money/damages/compensation.

Progress Reports **4.14** The Contractor shall submit to the Engineer by the end of each calendar month his Monthly Progress Report which shall, amongst other things, highlight actual or potential departures from the Works Programmes and/or the Design Submission Programme and state the measures which the Contractor proposes to take in order to make good or reduce any delay. The submission of Monthly Progress Report by of the Contractor would not absolve the Contractor of its obligation/right to notify any events/information to the Employer. The submission of Monthly Progress Report by Contractor would not amount to admission of its content by the Employer.

If requested by the Engineer, the Contractor shall submit to the Engineer, at weekly intervals, a written report as to the progress of off-Site manufacture of Plant, Rolling Stock and Materials.

The Contractor shall also submit to the Engineer such other reports as may reasonably be required by him or any relevant authority or public body.

The progress reports shall conform to the Employer's Requirements.

Contractor's Equipment **4.15**

4.15.1 All Contractor's Equipment and Temporary Works provided by the Contractor shall, when brought on to the site, be deemed to be exclusively intended for execution of the Works and not be removed without the consent in writing of the Engineer. Such consent shall not be unreasonably withheld or delayed.

4.15.2 Upon completion of the Works, the Contractor shall remove from the Site all the said Constructional Plant and his unused materials

4.15.3 The Employer shall not, at any time, be liable for the loss or damage to any of the Constructional Plant, Temporary Works or materials save as mentioned in Clauses 14.1.

4.15.4 In respect of any Constructional Plant which the Contractor shall have imported for the purpose of the Works, the Employer may assist the Contractor, where required, in procuring any necessary Government consent for re-export of the same after the completion of the Works.

4.15.5 The Employer may assist (but is not obligated to) the Contractor, where required, in obtaining clearance through the Customs of Constructional Plant, materials and other things required for the Works.

Safety of Works **4.16** The Contractor shall throughout the execution of the Works including the carrying out of any testing, commissioning (including Integrated Testing and Commissioning), or remedying of any defect:

a. take full responsibility for the adequacy, stability, safety and security of the Works, Plant, Rolling Stock, Contractor's Equipment, Temporary Works, operations on Site and methods of manufacture, installation, construction and transportation;

b. have full regard for the safety of all persons on or in the vicinity of the Site (including without limitation persons to whom access to the Site has been allowed by the Contractor), comply with all relevant safety regulations, including provision of safety gear, and in so far as the Contractor is in occupation or otherwise is using areas of the Site, keep

the Site and the Works (so far as the same are not completed and occupied by the Employer) in an orderly state appropriate to the avoidance of injury to all persons and shall keep the Employer indemnified against all injuries to such persons.

c. provide and maintain all lights, guards, fences and warning signs and watchmen when and where necessary or required by the Engineer or by laws or by any relevant authority for the protection of the Works and for the safety and convenience of the public and all persons on or in the vicinity of the Site; and

d. where any work would otherwise be carried out in darkness, ensure that all parts of the Site where Work is being carried out are so lighted as to ensure the safety of all persons on or in the vicinity of the Site and of such Work.

Contractor is required to take note of all the necessary provisions in Employer's Conditions of Contract on Safety & Health and Environment and the Contractor's price shall be inclusive of all the necessary costs to meet the prescribed safety standards. In the case, the Contractor fails in the above, the Employer may provide the necessary arrangements and recover the costs from the Contractor.

Protection of the Environment **4.17**

The Contractor shall take all reasonable steps to protect the environment (both on and off the Site) and to avoid injury, damage and nuisance to people and property resulting from pollution, noise and other results of his operations. The Contractor shall ensure that air emissions, surface discharges and effluent from the Site during the Contract Period shall not exceed the values indicated in the Employer's Requirements, and shall not exceed the values prescribed by law. The Contractor shall conform to the Employer's Requirements and shall indemnify the Employer against any liability or damages or claims arising out of his operations. The Contractor shall be responsible and liable for any stoppage, closure or suspension of the works due to any contravention of statutory requirements relating to the protection of the environment and shall indemnify and keep indemnified the Employer in this regard.

The Contractor's Site Environmental Plan shall be developed from his Employer's Conditions of Contract on Safety & Health and Environment, as per the Employer's Requirements and Special Conditions of Contract. Nothing extra shall be payable to the Contractor on this account and his Tender price shall be inclusive of expenditure required to be incurred for working as per Conditions of Contract on Safety & Health and Environment.

Electricity Water and Gas **4.18**

The Contractor shall be responsible for making his own arrangements at his own cost to obtain supply of water, electricity or gas for the Works. The Employer where feasible may at its discretion assist the Contractor in this respect.

Tools, Plants and Equipment Supplied by the Employer **4.19**

Except for any specific item mentioned in the Special Conditions of Contract or in Employer's Requirements, the Contractor shall provide all Tools, Plants and Equipment for the Works. In respect of such exceptional Tools, Plants or Equipment committed to be provided by the Employer under terms and conditions specified in the Special Conditions of Contract, the Contractor shall take all reasonable care and shall be responsible for all damages or loss caused by him, his representatives, sub- contractors or his workmen or others while they are in his charge.

On completion of the Works, the Contractor shall hand over the unused

balance of the Tools, Plants and Equipments to the Employer in good order and repair, fair wear and tear expected, and shall be responsible for any failure to account for the same or any damage done thereto.

The decision of the Engineer as to the amount recoverable from the Contractor on this account shall be final and binding.

Employer's Materials & Excavated Materials **4.20** (i) Except for items mentioned in the Special Conditions of Contract, the Contractor shall provide all materials for the Works. Material if any, to be provided by Employer will be done only in a phased manner as per pre-approved program, against a Bank Guarantee for the value of the Material and at terms and conditions for issue, upkeep, usage, return and recovery of such Materials as specified in Special Conditions of Contract.

(ii) Unless otherwise specified, the Contractor shall not sell or remove, except for the purpose of this Contract, sand, stone, clay, ballast, earth, rock or other materials obtained from the Work Site and these shall be the property of the Employer and will be disposed off only in the manner instructed by him.

Sheds, Stores, Yards **4.21** It shall be the responsibility of the Contractor to provide at his own expense the required sheds, store houses, and yards for both Permanent and Temporary Works and provide free access to the Engineer and the Engineer's Representative who will have right of inspection including that of instructing the Contractor to remove a particular material from the stores and not to use the same on the Works.

Temporary Works **4.22** All temporary Works necessary for the proper execution of the Works shall be provided and maintained by the Contractor at his own cost and subject to the consent of the Engineer shall be removed by Contractor at his own expense when they are no longer required and in such manner as the Engineer shall direct. In case the Contractor fails to remove the temporary Works on completion, the Engineer is authorized to get the same removed and recover the cost thereof from the Contractor.

Unforeseeable Physical Conditions **4.23** In this Clause "physical conditions" means natural physical conditions, which the Contractor encounters at Site while executing the Works excluding climatic conditions.

If, during the execution of the Works, the Contractor shall encounter physical conditions, which, in his opinion, could not have been reasonably foreseen by an experienced Contractor, the Contractor shall forthwith give written notice thereof to the Engineer and if, in the opinion of the Engineer, such conditions could not have been reasonably foreseen by an experienced Contractor, then the Engineer may certify and the Employer shall may pay reasonable additional cost to which the Contractor shall have been put by reason of such conditions in the following cases:

a. for complying with any instruction which the Engineer may issue to the Contractor in connection therewith, and

b. for any proper and reasonable measures approved by the Engineer which the Contractor may take in the absence of specific instructions from the Engineer, as a result of such conditions or obstructions being encountered.

The decision of the Engineer as to the additional cost shall be final and

binding.

Access for Engineer **4.24** The Contractor shall allow the Engineer or the Engineer's Representative or any other person authorized by him, at all times access to the Site, and to any place where Work in connection with the Contract is being carried out or is intended to be carried out and to any place where materials or plant are being manufactured, fabricated and/or assembled for the Works. The Contractor shall ensure that sub-contracts if any shall contain provisions entitling the Engineer or any person authorized by him to have such access.

Access Road and Way Leaves **4.25** Providing access roads/ way leaves to the site will be Contractor's responsibility.

Contractor to keep Site Clear **4.26** During the execution of the Works, the Contractor shall keep the Site free from all unnecessary obstruction, and shall store or dispose of any Contractor's Equipment or surplus materials. The Contractor shall clear away and remove from the Site, any wreckage, rubbish or Temporary Works which are no longer required.

On completion of the Works, the Contractor shall clear away and remove from site all Contractor's Plant, surplus material and Temporary Works. He should leave the whole of the site and Works in a clean, tidy and workman like condition to the satisfaction of the Engineer.

On completion of Work, the Contractor shall also clear away the labour camps, hutments and other related installations and restore the land to its original condition to the satisfaction of the Engineer within 45 days of the physical completion of Work. The cost on account of delay in return of land and reinstatement to its original condition within the stipulated time as determined by Engineer, will be recovered from the Contractor's dues.

No final payment in settlement of the accounts for Works shall be made or held to be due to the Contractor, till, in addition to any other condition necessary for such final payment, site clearance and clearances of labour camps etc. shall have been effected by him. Such clearance may be made by the Engineer through any other agency at the expense of the Contractor, in the event of the Contractor's failure to comply with this provision within 7 days after receiving notice to that effect from the Engineer. All expenses on such removal/clearance shall be debitable to the Contractor as loans due from the Contractor to the Employer, and the Employer shall be competent to recover the same from Contractor's on-account or final bills, or from Performance Security amount or from any other amount payable to the Contractor in any other Contract.

Security of the Site **4.27** The Contractor shall be wholly responsible for security of Site and Works.

Unless otherwise stated in Special Conditions of Contract

a. the Contractor shall be responsible for keeping unauthorized persons off the Site; and

b. Authorized persons shall be limited to the Employees of the Contractor, Sub-contractor or persons authorized by the Engineer.

Contractor's Operations on Site **4.28** The Contractor shall confine his operations to the Site, and to any additional area which may be provided to the Contractor and agreed by the Engineer as working areas. The Contractor shall take all necessary precautions to keep his personnel and equipment within the Site and

such additional areas, and to keep and prohibit them from encroaching on adjacent land.

Discoveries **4.29** All fossils, coins, articles of value or antiquity, structures and other remains or things of geological or archaeological interest, in addition to oil and other minerals discovered on the Site shall be the absolute property of the Government of India. The Contractor shall take all the necessary precautions to prevent its workmen or its Sub-contractors' workmen or any other person from removing or damaging any such article or thing and shall immediately upon discovery thereof, acquaint the Engineer of such discovery and carry out the instructions of the Engineer.

Publicity **4.30** The Contractor shall not publish or otherwise circulate alone or in conjunction with any other person, any articles, photographs or other materials relating to the Contract, the Site, the Works, the Project or any part thereof, nor impart to the Press, or any radio or television network any information relating thereto, nor allow any representative of the media access to the Site, Contractor's Works Areas, or off-Site place of manufacture, or storage except with the permission, in writing, of the Employer. The Contractor shall ensure that his Sub-contractors of any tier shall be bound by similar obligation and shall, if so required by the Employer, enforce the same at his own expense. The provisions of this Sub-clause shall not exempt the Contractor from complying with any statutory provision in regard to the taking and publication of photographs.

Disclosure of Relationship **4.31** If the Contractor or any partner of the Contractor or Director of the Contractor’s company is closely related to any of the Officers of the Employer or the Engineer, or alternatively, if any close relative of an officer of the Employer or the Engineer has financial interest/stake in the Contractor’s firm, the same shall be disclosed by the Contractor at the time of filing his tender. Any failure to disclose the interest involved, shall entitle the Employer to rescind the Contract, without payment of any compensation to the Contractor**.** The Contractor shall note that he is prohibited from developing such interest during the Contract period also.

Use of Explosives **4.32** Explosives if required on the Work shall be used by Contractor only with prior Approval of the Engineer and in the manner and to the extent permitted by him. The Contractor shall be responsible for safe upkeep of such explosives in a special magazine as per the law on explosives as well as for taking all the precautions in the usage of the explosives with proper license and at Contractor’s cost, sole risk and responsibility. The Contractor shall hold the Employer harmless and indemnify for the above.

Corrupt /or Fraudulent/ Collusive/ Coercive Practices **4.33**

Definition **4.33.1** The Employer requires that the Bidders/Contractors, their designated Contractors and/or their Agents observe the highest standards of ethics during Tendering and execution of this Contract. In pursuance with this Policy, the Employer:

a. defines, for the purpose of these provisions, the terms set forth

below as follows:

(i) “corrupt practice” means the offering, giving, receiving or soliciting of anything of value to any officer/employee of NMRC or Engineer or to any other person to influence in the procurement process or in Contract execution and/or after the execution of the Contract.

(ii) “fraudulent practice” means a concealment or misrepresentation of facts in order to influence a procurement process or during the execution of a Contract and/or after the execution of the Contract, which may or may not be to the detriment of the Employer and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition and further includes concealment or misrepresentation of facts leading to breach of any of the Contract condition during execution of the Contract which may or may not be to the detriment of the Employer.

(iii) “collusive practice” means amongst Bidders (prior to or after bid submission) a scheme or arrangement designed to establish bid prices at artificial non-competitive levels and to deprive NMRC of the benefits of free and open competition.

(iv) “coercive practice” means impairing or harming or threatening to impair or harm directly or indirectly, any Agency or NMRC or its employees/ consultants or its property, to influence improperly the actions of an Agency or NMRC or its employees/ consultants, obstruction of any investigation or auditing of a Procurement/ Contract process.

(v) Breach of any of the contract condition during execution.

(vi) “Suspension”: Business dealings with an Agency may be suspended in exceptional cases if there is gross and blatant violation of the provisions of the Suspension/ Banning Policy by the Agency and it is considered not desirable to continue the business with the Agency pending detailed enquiry for Banning of Business Dealing. Suspension shall be for a period upto six months from the date of approval of decision of Suspension.

(vii) “Banning”: Shall mean officially debarring or forbidding an Agency from participating as Vendor/ Supplier/Contractor etc. with NMRC, for its requirement related to all Tenders / Contracts. Business dealings with an Agency may be banned if it violates/ infringes the provisions of the Suspension/ Banning policy of the NMRC. Banning shall be for a period ranging from one year from the date of issue of Banning Order or Suspension Order (if suspension imposed on the Agency) and upto five years.

(a) If it is found that the Bidder/Contractor has indulged in corrupt/fraudulent/ collusive/coercive practices, actions such as rejection of bid/forfeiture of Tender Security or rescission/termination of Contract/forfeiture of Performance Security etc. shall be taken as per Suspension/Banning Policy of NMRC.

(b) The successful Bidders/Contractors shall apprise the Employer through Chief Vigilance Officer, NMRC of any fraud/suspected fraud/corrupt practices as soon as it comes to their notice.

Compensation to Contractor on rescission of Contract **4.33.2** In the event of rescission of Contract under Sub-clause 4.33.1, the Contractor shall not be entitled to any compensation whatsoever, except for the Work done up to the date of rescission, payable as per the provisions of the Contract.

5 DESIGN

The clauses under the head 'Design' are applicable only in 'Design & Build' Contracts and in case of 'Part Design & Build' Contracts, these are applicable only to part of the Contract in which the design is the responsibility of the Contractor.

General Obligations **5.1** The Contractor shall design and provide all necessary specifications for the Works in accordance with the site plans and Employer's requirements. Any design detail, plan, drawing, specifications, notes, annotations, and information required shall be provided in such sufficient format, details, extent, size and scale and within such time as may be required to ensure effective execution of Works and/or as otherwise required by the Engineer.

The Contractor holds himself, and his Designers as having the experience and capability necessary for the design. The Contractor undertakes that the Designers shall be available to attend discussions with the Engineer at all reasonable times during the Contract Period.

The Designer shall be the same entity as proposed by the Contractor at the time of pre-qualification, unless otherwise approved by the Employer. The Contractor shall furnish Designer's Warranty in the format approved by the Employer.

Contractor's warranty of design **5.2**

a. The Contractor shall be fully responsible, for the suitability, adequacy, integrity, durability and practicality of the Contractor's proposal and design.

b. The Contractor warrants that the Contractor's Proposals and design meet the Employer's Requirements and is fit for the purpose thereof. Where there is any inadequacy, insufficiency, impracticality or unsuitability in or of the Employer's Requirements or any part thereof, the Contractor's Proposal shall take into account, address or rectify such inadequacy, insufficiency, impracticality or unsuitability at Contractor's own cost.

c. The Contractor warrants that the Works have been or will be designed, manufactured, installed and otherwise constructed and to the highest standards available using proven up-to-date good practice

d. The Contractor warrants that the Works will, when completed, comply with enactments and regulations relevant to the Works

e. The Contractor warrants that the design of the Works and the manufacture of Plant have taken or will have taken full account of the effects of the intended manufacturing and installation methods, Temporary Works and Contractor's Equipment

f. The Contractor shall also provide a Guarantee from the Designer for the design for suitability, adequacy, practicality of design for Employer's Requirements

g. The Contractor shall indemnify the Employer against any damage, expense, liability, loss or claim, which the Employer might incur, sustain or be subject to arising from any breach of the Contractor's

design responsibility and/or warranty set out in this Clause.

h. The Contractor further specifies and is deemed to have checked and accepted full responsibility for the Contractor's Proposal and warrants absolutely that the same meets the Employer's Requirements:

i. Notwithstanding that such design may be or have been prepared, developed or issued by the Employer, any of Contractor's Consultants, his Sub-contractors and/or his qualified personnel/persons or cause to be prepared, developed or issued by others.

j. Notwithstanding any warranties, guaranties and/or indemnities that may be or may have been submitted by any other person.

k. Notwithstanding that the same have been accepted by the Engineer

The Contractor shall be fully responsible for the Plants, Materials, goods, workmanship, preparing, developing and coordinating all design Works to enable that part of the Works to be constructed and/or to be fully operational in accordance with the Contract's requirements.

Apart from the Contractor, the above warranty shall also be applicable for his Designer. This warranty shall be a part of his Sub-contract with the Designer and should be made available at the time of signing of the Agreement.

No claim for additional payment or extension of time shall be entertained and/or the Contractor shall not be relieved from any obligation/liability under the Contract, for any delay, suspension, impediment to or adverse effect upon the progress of the Works due to any mistake, inaccuracy, discrepancy or omission in or between the Contractor's, the Definitive Design and the final design, or any failure by the Contractor to prepare any Design Data or submit the same to the Engineer in due time and the Contractor shall promptly make good any such defect at his own cost.

Construction and/or Manufacture Documents **5.3**

The Manufacture Documents shall comprise the technical documents specified in the Employer's Requirements, documents required to satisfy all regulatory approvals, documents described in Sub Clause 5.6 (As Built Document), and Sub Clause 5.7 (Operations and Maintenance Manuals). The Contractor shall prepare all Manufacture Documents in sufficient detail and shall also prepare any other document necessary to instruct the Contractor's personnel. The Engineer shall have the right to inspect the preparation of all these documents wherever they are being prepared.

Each of the Construction and/or Manufacture Documents shall, when considered ready for use, be submitted to the Engineer for pre-construction or pre- manufacture review. Unless otherwise stated in Employer's Requirements, each review by the Engineer shall not exceed 21 days, calculated from the date on which the Engineer receives the Manufacture Document.

The Engineer may during the review period, give notice to the Contractor that a Manufacture Document fails (to the extent stated) to comply with the Employer's Requirements, it shall be rectified, resubmitted and reviewed (and if specified, approved) in accordance with this Sub-clause, at the Contractor's cost.

For each part of the Works, and except to the extent that the prior

consent of the Engineer shall have been obtained:

a. In the case of a Construction and/or Manufacture Document which has (as specified) been submitted for the Engineer's approval

(i) The Engineer shall give notice to the Contractor that the Construction and/or Manufacture Document is provided with no objection, with or without comments, or that it fails (to the extent stated) to comply with the Contract

(ii) Execution of such part of the Works shall not commence until the Engineer has provided with no objection for the Construction and/or Manufacture Document; and

(iii) The Engineer shall be deemed to have provided with no objection for the Construction and/or Manufacture Document upon the expiry of the review periods for all the Construction and/or Manufacture Documents which are relevant to the design and execution of such parts, unless the Engineer has previously notified otherwise in accordance with sub-paragraph (i)

a. construction and/or manufacture of such part of the Works shall not commence prior to the expiry of the review of the Construction and/or Manufacture Documents which are relevant to its design and execution;

b. construction and/or manufacture shall be in accordance with such reviewed (and if specified, approved) Construction and/or Manufacture Documents; and (d) if the Contractor wishes to modify any design or document which has previously been submitted for such pre-construction and/or pre- manufacture review, the Contractor shall immediately notify the Engineer, and based on Engineer's approval shall subsequently submit revised documents to the Engineer in accordance with the above procedure.

If the Engineer instructs that further Construction and/or Manufacture Documents are necessary for carrying out the Works, the Contractor shall promptly and at Contractor's cost prepare such documents,

Errors, omissions, ambiguities, inconsistencies, inadequacies and other defects if found at any stage in construction or any operations manufacture documents, then shall be rectified by the Contractor at his own cost and any approval or consent or review (under this sub-clause or otherwise) by the Employer/Engineer of the Manufacture and Construction Documents under this Sub-clause shall not relieve the Contractor from any obligations or responsibility under the Contract.

Technical Standards and Regulations **5.4** The design, the Construction and/or Manufacture Documents, the execution and the completed Works (including remedying of defects therein) shall comply with the specifications, technical standards, building construction, safety and environmental regulations and other standards specified in the Employer's Requirements applicable to the Works or defined by the applicable laws and regulations

Samples **5.5** The Contractor shall submit at his own cost the following samples and relevant information to the Engineer for pre-construction and/or pre-manufacture review in accordance with the procedure for Construction and/or Manufacture Documents described in Sub-clause 5.3:

a. manufacturer's standard samples of Materials,

b. samples (if any) specified in the Employer's Requirements.

nple shall be labelled as to origin and intended use in the Works

As-Built Drawings and Documents **5.6**

This clause is applicable for 'Build' part of Contract also. The Contractor shall prepare, and keep up-to-date, a complete set of "as-built" records of the execution of the Works, showing the exact "as-built" locations, sizes and details of the Works as executed, with cross references to relevant specifications and data sheets. These records shall be kept on the Site and shall be used exclusively for the purposes of this Sub-clause. Six copies shall be submitted to the Engineer prior to the commencement of the Tests on Completion.

In addition, the Contractor shall prepare and submit to the Engineer "as-built drawings" of the Works, showing all Works as executed. The drawings shall be prepared as the Works proceed, and shall be submitted to the Engineer for his inspection. The Contractor shall obtain the consent of the Engineer as to their size, the referencing system, and other pertinent details.

Prior to the issue of any Taking Over Certificate, the Contractor shall submit to the Engineer one soft copy and four printed copies of the relevant "as-built drawings", and any further Construction and/or Manufacture Documents specified in the Employer's Requirements. The Works shall not be considered to be completed for the purposes of Taking Over under Sub-clause 9.1 until such documents have been submitted to the Engineer.

Operation and Maintenance Manuals **5.7**

Prior to commencement of the Tests on Completion, the Contractor shall prepare, and submit to the Engineer, Operation and Maintenance Manuals in accordance with the Employer's Requirements and in sufficient detail for the Employer to operate, maintain, dismantle, reassemble, adjust and repair the Works. The Works shall not be considered to be completed for the purposes of Taking Over under Sub-clause 9.1 until such Operation and Maintenance Manuals have been submitted to the Engineer and received his consent.

Intellectual Property Rights and Royalties **5.8**

The Contractor shall indemnify the Employer and the Engineer from and against all claims and proceedings on account of infringement (or alleged infringement) of any patent rights, registered designs, copyright, design, trademark, trade name, know-how or other Intellectual Property Rights in respect of the Works, Contractor's Equipment, machines, work method, or Plant, or Materials, or anything whatsoever required for the Works and from and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto. The Contractor shall pay all traffic surcharges and other royalties, licenses fees, rent and other payments or compensation, if any, for getting stone, sand, gravel, clay or other materials, machine, process, systems, work methods, or Contractor's Equipment required for the Works. The Contractor shall, in the event of infringement of Intellectual Property Rights, rectify, modify or replace at his own cost the Works, Plant or materials or anything whatsoever required for the Works so that infringement no more exist or in the alternative shall procure necessary rights/license so that there is no infringement of Intellectual Property Rights.

The Contractor shall be promptly notified of any claim under this Sub-Clause made against the Employer. The Contractor shall, at his cost, conduct negotiations for the settlement of such claim, and any litigation or arbitration that may arise from it. The Employer or the Engineer shall

not make any admission which might be prejudicial to the Contractor, unless the Contractor has failed to take over the conduct of the negotiations, litigation or arbitration within a reasonable time after having been so requested. In the event of Contractor failing to act at Engineer's notice, the Employer shall be at full liberty to deduct any such amount of pending claim from any amount due to the Contractor under this Contract or any other Contract.

Insofar as the patent, copyright or other intellectual property rights in any Plant, Design Data, plans, calculations, drawings, documents, Materials, know-how and information relating to the Works shall be vested in the Contractor, the Contractor shall grant to the Employer, his successors and assignees a royalty-free, non- exclusive and irrevocable licenses (carrying the right to grant sub-licenses) to use and reproduce any of the works, designs or inventions incorporated and referred to in such Plant, documents or Materials and any such know-how and information for all purposes relating to the Works (including without limitation the design, manufacture, installation, reconstruction, Testing, commissioning, completion, reinstatement, extension, repair and operation of the Works).

If any patent, registered design or software is developed by the Contractor specifically for the Works, the title thereto shall vest in the Employer and the Contractor shall grant to the Employer a non-exclusive irrevocable and royalty- free licenses (carrying the right to grant sub-license) to use, repair, copy, modify, enhance, adapt and translate in any form such Software for his own use.

If the Contractor uses proprietary software for the purpose of storing or utilizing records, the Contractor shall obtain at his own expense the grant of a licenses or sub-licenses to use such software in favors of the Employer and shall pay such licenses fee or other payment as the grantor of such licenses may require provided that the use of such software under the licenses may be restricted to use relating to the design, construction, reconstruction, manufacture, completion, reinstatement, extension, repair and operation of the Works or any part thereof.

The Contractor's permission referred to above shall be given, inter alia, to enable the Employer to disclose (under conditions of confidentiality satisfactory to the Contractor) programmes and documentation for a third Party to undertake the performance of services for the Employer in respect of such programmes and documentation.

If any software is developed under the Contract or used by the Contractor for the purposes of storing or utilizing records over which the Contractor or a third Party holds title or other rights, the Contractor shall permit or obtain for the Employer (as the case may require) the right to use and apply that Software free of additional charge (together with any modifications, improvements and developments thereof) for the purpose of the design, manufacture, installation, reconstruction, testing, commissioning, completion, reinstatement, extension, repair, modification or operation of the Works, or any part thereof, or for the purpose of any Dispute.

The Employer reserves the right to use other Software on or in connection with the Works.

6 STAFF AND LABOUR

Engagement of Staff and Labour **6.1** The Contractor shall make his own arrangements for the engagement of staff and labour at his own cost.

Rates of Wages and Conditions of Labour **6.2** Full compliance of statutory requirements apart, the Contractor shall pay rates of wages and observe conditions of labour not less favourable than those fixed by appropriate Government for the industry.

The Contractor shall make himself aware of all labour regulations and their impact on the cost and build up the same in the Contract Price. During the Contract Period, no extra amount in this regard shall be payable to the Contractor, for whatsoever reason including any revision of rates payable to the labour due to revision of rates payable in Minimum Wages Act.

Labour provided by the Contractor, either directly or through Sub-contractors, for the exclusive use of the Employer or the Engineer, shall, for the purpose of this Sub-clause, be deemed to be employed by the Contractor.

In the event of default being made in the payment of any money in respect of wages of any person employed by the Contractor or any of its Sub-contractors of any tier in and for carrying out of this Contract and if a claim therefore is filed in the office of the Labour Authorities/Court and proof thereof is furnished to the satisfaction of the Labour Authority/Court, the Employer may, failing payment of the said money by the Contractor, make payment of such claim on behalf of the Contractor to the said Labour Authorities/Court and any sums so paid shall be recoverable by the Employer from the Contractor.

Persons in the service/ retired of Employer/ Engineer **6.3** a. The Contractor shall not recruit or attempt to recruit, staff and labour from amongst the Employer and the Engineer's personnel.

b. The Contractor either at the tendering stage or during construction stage will not employ any retired employee of Employer or Engineer of the Employer in any capacity unless such employee has completed at least two years post retirement period or has obtained the no-objection certificate from Employer for being employed with the Contractor. It will be responsibility of the Contractor to collect the Employer's no objection certification from such retired employee and submit the same back to the Employer.

In case of non-compliance of above, in addition to any or several of the courses, referred in Sub-clauses 13.2 being adopted by the Employer, the Contractor on Termination of the Contract for the aforesaid reasons will have no claim whatsoever against the Employer except for actual value of the Work executed till the time of Termination**.**

Labour Laws **6.4** a. In dealing with labour and employees, the Contractor and his Sub-contractors (including piece rate and petty Contractors) shall comply fully with all laws and statutory regulations pertaining to engagement, payment and upkeep of the labour in India.

b. The Contractor shall have a Labour Welfare Organization which shall be responsible for labour welfare and compliance with prevalent labour laws, statutes and guidelines. The Labour Welfare Organization of Contractor shall comprise of such competent officials having requisite qualification as prescribed in Conditions of Contract on Safety & Health and Environment. In no case, an under qualified person may be

appointed in Labour Welfare Organization of Contractor. In this context the Contractor is also required to familiarize himself with NMRC's Labour Welfare Fund Rules as specified in Special Conditions of Contract or elsewhere in the Contract and comply with the same.

c. The Labour Welfare Organization of Contractor shall prepare and submit a monthly compliance/Status Report of adherence to labour laws to the Engineer.

d. The Contractor will ensure to open bank accounts for each worker employed by him and his Sub-contractors and all the payments to workers will be released through bank accounts.

e. The violation of Labour Laws viz. Contractor Labour (Regulation & Abolition) Act, 1970 & Central Rules, 1971 made thereunder or other applicable Labour Laws under the jurisdiction shall attract following penalties in addition to the penalties imposed by Statutory Authorities in terms of applicable Act/Rules:-

ɛnt of dues to any workmen	ɔer workman
e(s) of any other provision of labour laws, l out by Employer/Engineer or their ɛntative	each non-compliance ɛd in writing, under the ɛt

The decision of Engineer with regard to the merits of imposition of penalty, determination of non-compliance and amount of penalty shall be final and binding on Contractor. The 'Contract' under this Sub-clause shall include any workmen employed by Contractor working within premises of Works at Employer's establishment whether directly or through Sub-contractor etc.

f. The Contractor shall ensure the registration of all his eligible workers inclusive of Sub-contractor and Petty Contractors with BOCW (Building and Other Construction Workers) Board.

Working Hours **6.5** The Contractor, if required, shall carry out work during night hours or in shifts, unless specifically provided otherwise in the Contract. No increase in rates or extra payments shall be admissible for night work.

The Contractor shall provide adequate lighting and safety arrangements. The Contractor shall also provide rest room if the work is being carried out in night shift.

Facilities for Staff and Labour **6.6** The Contractor shall provide and maintain at his own expense, all necessary accommodation and welfare facilities as per prevailing labour & welfare laws for his (and his Sub- contractor's) staff and labour. This includes good practices like provision of temporary crèche (Bal Mandir) where 50 or more women are employed at a time. All accommodation shall be maintained in a clean and sanitary condition, by the Contractor at his own cost. Separate rest room, toilets needs to be provided for female workers.

Health and Safety **6.7** Precaution shall be taken by the Contractor to ensure the health and safety of his staff and labour. The Contractor shall, in collaboration with and to the requirements of the local health authorities, ensure that medical staff, first aid facilities, sick bay and ambulance service are available at the accommodation and on the Site at all times, and that suitable arrangements are made for all necessary welfare and hygiene requirements and for the prevention of epidemics. The Contractor shall

maintain records and make reports concerning health, safety and welfare of persons, and damage to property, as per the Engineer's requirement and will ensure complete compliance with relevant clauses of Employer's Health, Safety and Environment Manual (SHE Manual) Conditions of Contract on Safety & Health and Environment.

The Contractor's Site Safety Plan shall be developed from his Outline Safety Plan as per Employer's Requirements and Conditions of Contract on Safety & Health and Environment SHE Manual of the Employer.

The Contractor shall appoint a member of his staff at the Site to be responsible for maintaining the safety, and protection against accidents, of personnel on the Site. This person shall be qualified for the work and shall have the authority to issue instructions and take protective measures to prevent accidents.

Contractor's Superintendence **6.8** The Contractor shall provide all necessary superintendence during the design and execution of the Works, and as long thereafter as the Engineer may consider necessary for the proper fulfilling of the Contractor's obligations under the Contract. Such superintendence shall be provided by sufficient persons having adequate knowledge of the operations to be carried out (including the methods and techniques required, the hazards likely to be encountered and methods of preventing accidents) for the satisfactory and safe execution of the Works.

Provision of Efficient and Competent Staff **6.9** The Contractor shall employ (or cause to be employed) only persons who are careful and appropriately qualified, skilled and experienced in their respective trades or occupations. The Engineer may require the Contractor to remove (or cause to be removed) any person employed on the Site or Works, including the Contractor's Representative, who in the opinion of the Engineer:

a. persists in any misconduct,

b. is incompetent or negligent in the performance of his duties,

c. fails to confirm with any provisions of the Contract, or persists in any conduct which is prejudicial to safety, health of workers, or the protection of the environment.

Preservation of Peace and orderly conduct **6.10**

6.10.1 The Contractor shall be responsible for preservation of peace and orderly conduct at the site and its neighborhood by Contractor's employees, Representatives, petty Contractors, Sub-contractors etc. In case, deployment of a Special Police Force becomes necessary at or near Site, during the tenure of Works, the expenses for the same shall be borne by the Contractor.

6.10.2 The Contractor shall at all times take all reasonable precautions which will include that no labour or employee is permitted to work at site in an intoxicated state or under influence of drugs, to prevent any unlawful, riotous or disorderly conduct by or amongst his staff and labour, and to preserve peace and protection of persons and property in the neighborhood of the Works against such conduct.

Labour to be Contractor's Employee **6.11** If, the Contractor directly or through petty Contractors or Sub-contractors supplies any labour to be used wholly or partly under the direct orders and control of the Engineer or the Employer, whether in connection with

any Work being executed by the Contractor or otherwise for the purposes of the Employer, such labour shall, for the purpose of this clause, be deemed to be persons employed by the Contractor.

Report of Accidents to Labour **6.12** The Contractor shall be responsible for safety of all employees, employed by him on Works, directly or through petty Contractors or Sub-contractors, and shall report accidents relating to any of them, however, and wherever occurring on Works, to the Engineer or the Engineer's Representative and shall make every arrangement to render all possible assistance and to provide prompt and proper medical attention. The compensation for affected workers or their relatives shall be paid by the Contractor in such cases with utmost expeditiously in accordance with the Workmen's Compensation Act or ESI Act as applicable.

Claim` on account of violation of Labour laws **6.13** The Contractor shall be solely accountable for violation of any labour law by it, its petty Contractors or Sub-contractors and will pay any such claim/damage to the authorities forthwith on demand. If any money shall, as a result of any instructions, directions or decisions from the Authorities/Court or claim or application made under any of the labour laws or regulations, be directed to be paid by the Employer, such money shall be deemed to be money payable to the Employer by the Contractor and he will pay the same to the Employer forthwith on demand, without demur and without asking for any reasons/explanations from the Employer. On failure of the Contractor to repay the Employer any money paid or to be paid by it as aforesaid within seven days after the same shall been demanded, the Employer shall be entitled to recover the amount from any money due or accruing to the Contractor under this or any other Contract with the Employer.

Maintenance of Records **6.14** The Contractor shall maintain all records pertaining to labour as mandated by the law of the land and shall keep it preserved at least for three years after the completion of the Project.

7 QUALITY CONTROL

Manner of Execution **7.1** All Plant, goods, and Materials to be supplied shall be manufactured, and all Work to be done shall be executed, in the manner set out in the Contract. Where the manner of manufacture and execution is not set out in the Contract, the work shall be executed in a proper, workman like and careful manner, with properly equipped facilities and non-hazardous Materials, and in accordance with modern recognized good practice.

Source of Materials **7.2** Sources of Materials being supplied shall be intimated to the Engineer and are subject to his approval. Materials that are not specified in the Contract document shall conform to the relevant Indian Standards or in their absence, shall conform to any International Standard approved by the Engineer.

Save as otherwise expressly provided in the Contract, samples shall be supplied by the Contractor at his own cost.

Delivery to Site **7.3** The Contractor shall be responsible for procurement, transport, receiving, unloading and safe keeping of all Plant, Rolling Stock, and Construction, Materials, Contractor's Equipment and other things required for the completion of the Works.

Inspection **7.4** The Employer and the Engineer shall at all reasonable times

a. have full access to all parts of the Site and to all places from which natural materials are being obtained, and

b. during production, manufacture, fabrication and construction (at the site and elsewhere) be entitled to inspect, examine, measure and test the materials and workmanship, and to check the progress of manufacture, of all Plant, goods, construction and Materials to be supplied under the Contract.

The Contractor shall give the Engineer full opportunity to carry out these activities including providing access, facilities, permissions and safety equipments. No such activity/inspection shall relieve the Contractor from any obligation or responsibility.

Testing **7.5** This sub clause shall apply to all tests specified in the Contract, other than the Tests after Completion.

The Contractor shall provide all documents and other information necessary for all types of testing and such assistance, labour, materials, electricity, fuel, stores, apparatus and instruments as are necessary to carry out such tests efficiently.

The Contractor shall agree, with the Engineer, the time and place for the testing of any Plant, goods, Materials and other parts of the Works as specified in the Contract. The Employer/Engineer may instruct the Contractor for any additional test, at Employer's cost.

The Engineer shall give the Contractor not less than 24 hours' notice of his intention to attend the tests.

If the Engineer does not attend at the time and place agreed, or if the Contractor and the Engineer agree that the Engineer shall not attend, the Contractor may proceed with the tests, unless the Engineer instructs the Contractor otherwise. Such tests shall be deemed to have been made in the Engineer's presence.

The Contractor shall promptly forward to the Engineer duly certified reports of the tests. If the Engineer has not attended the tests, he shall accept the readings as accurate. When the specified tests have been passed, the Engineer shall endorse the Contractor's test certificate, or issue a certificate to him, to that effect.

The expense of conducting such Tests shall be borne by the Contractor. No such testing shall relieve the Contractor from any obligation or responsibility.

Rejection **7.6** i. If, as a result of inspection, examination or testing, any Plant, goods, Material, design or workmanship is found to be defective or otherwise not in accordance with the Contract, the Engineer may reject the same duly giving notice to the Contractor with reasons. The Contractor shall then promptly make good the defect and ensure that the rejected item after rectification complies with the Contract.

i. If the Engineer requires such Plant, Goods, Material, Design or Workmanship to be retested, the tests shall be repeated under the same terms and conditions. If such rejection and retesting cause the Employer to incur additional costs, such costs shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any sumdue, or to become due, to the Contractor.

i. Notwithstanding any previous Test or certification, the Engineer shall have the authority to instruct the Contractor:-

a. To remove from the Site and replace any plant or

Materials which is not in accordance with the Contract.

b. To remove and re-execute any other work which is not in accordance with the Contract.

/. Execute any work which is urgently required for the safety of the Works, whether because of an accident, unforeseeable event or otherwise.

/. In case of default on the part of the Contractor in carrying out such order, the Employer shall be entitled to employ and pay other Parties, to carry out the same, and all expenses consequent thereof or incidental thereto, shall be recoverable from the Contractor or may be deducted by the Employer from any sum which may be due to the Contractor.

Liability after Inspection and Testing **7.7** The Contractor shall not be released from any liability or obligation under the Contract by reason of any such inspection or testing or witnessing of testing, or by the submission of reports of inspection or testing to the Engineer.

Ownership of Plant and Materials **7.8** Each item of Plant, goods, and Material shall become the property of the Employer, when it is delivered to Site or payment thereof, either in part or full, has been made. The Contractor shall however continue to bear the risk in respect of such items which continue to remain in his custody.

Cost of Employer's Attendance Including Travel **7.9** The Employer shall bear the costs of attendance including travel by the Employer or his Representative for the purposes of Sub-clauses 7.4 and 7.5 above. The cost of attendance including travel by the Employer, Engineer or his Representative for the purpose of Sub-clause 7.6 shall be borne by the Contractor.

Covering up of Works **7.10**

Examination of Work before covering up **7.10.1** No Work or part of Work shall be covered up or put out of view, without the prior approval of the Engineer or the Engineer's Representative.

Cost of uncovering the Work already covered up **7.10.2** The Contractor shall uncover any part or parts of the Works, or make openings in or through the same, as the Engineer may from time to time direct, and shall reinstate and make good such part or parts, to the satisfaction of the Engineer. If any such part or parts have been covered up, or put out of view after compliance with the requirement of Sub-clause 7.11.4and the Works are found to be executed in accordance with the Contract, the expenses of uncovering, making openings in or through, reinstating and making good the same, shall be borne by the Employer, but if the Works are found to be defective, costs shall be borne by the Contractor.

In case after completion of a part of the Work, the part of Work is not fully consistent with the Employer's Requirements and there is no way to change the same, in that case, the same (provided it has no implication on safety and operation) shall be accepted only at a Contractor's deemed variation at lower negotiated price.

The decision of the Engineer in this regard shall be final and binding on the Contractor.

Tests after Completion **7.11**

Contractor's Obligations **7.11.1** The Contractor shall carry out the Tests on Completion at his own cost in accordance with the Contract after providing the documents in

accordance with Sub-clauses 5.4 and 5.5. The Contractor shall give, to the Engineer, 21 days' notice of the date after which the Contractor will be ready to carry out the Tests on Completion. Unless otherwise agreed, such Tests shall be carried out within 14 days after this date, on such day or days as the Engineer shall instruct.

Unless otherwise stated in Special Conditions of Contract, the Tests on Completion shall be carried out in the following sequence

a. pre-commissioning test, which shall include appropriate instructions and ("dry" or "cold") functional tests to demonstrate that each item of the Plant, goods and Work can safely undertake the next stage

b. Commissioning Test shall include the specified operational tests to demonstrate that Works or Sections can be operated safely and as specified under all available operating condition

c. trial operation which shall demonstrate that the Works or Section perform reliably and in accordance with the Contract

The Contractor at his cost shall arrange all tools, equipments, gadgets, facilities or as deemed necessary by the Engineer for such tests, In considering the results of the Tests on Completion, the Engineer shall make allowances for the effect of any use of the Works by the Employer on the performance or other characteristics of the Works. As soon as the Works, or a Section, have passed the Tests on Completion described in sub-paragraphs (a), (b) or (c), the Contractor shall provide the Engineer and the Employer with a certified report of the results of all such Tests

Delayed Tests **7.11.2** If the Engineer opines that Tests on Completion are being unduly delayed by the Contractor, the Engineer may by notice require the Contractor to carry out such Tests within 21 days after the receipt of the notice. The Contractor shall carry out such Tests on such day or days as the Contractor may fix and of which he shall give notice to the Engineer.

If the Contractor fails to carry out the Tests on Completion within 21 days, the Engineer may proceed with such Tests at the risk and cost of the Contractor. The Tests on Completion then shall be deemed to have been carried out in the presence of the Contractor and the results of such Tests shall be accepted as accurate.

Retesting **7.11.3** If the Works, or a part thereof, or a Section, fail to pass the Tests on Completion, Sub-clause 7.6 "Rejection" shall apply, and the Engineer or the Employer may require such failed Tests, and the Tests on Completion on any related work, to be repeated under the same terms and conditions.

Failure to Pass Tests on Completion **7.11.4** If the Works, or a part thereof, or a Section, fail to pass the Tests on Completion, repeated under Sub-clause 7.11.3, the Engineer shall be entitled to:

a. order further repetition of Tests on Completion under Sub-clause 7.11.3; or

b. reject the Works, or a part thereof, or a Section (as the case may be), in which event the Employer shall have the same remedies against the Contractor as are provided under Clause 13; or

c. issue a Taking Over Certificate, if the Employer so requires. The Contract Price shall then be reduced by such amount as determined by the Engineer and as shall be appropriate to cover the

reduced value to the Employer as a result of this failure. The Contractor shall then proceed in accordance with his other obligations under the Contract.

Integrated testing and system commissioning **7.12**

Integrated Testing **7.12.1** Tests on Completion shall also include Integrated Testing where applicable as per the Contract conditions. The Contractor shall, following satisfactory completion of tests on his Works, equipment, sub-systems or system, perform, at the direction of the Engineer, programme of tests to verify and confirm the compatibility and complete performance of his Works, equipment, sub-systems or system with the Works, equipment, sub-systems or system provided by others.

Compilation of Test Results **7.12.2** The results of the Integrated Testing and Commissioning shall be compiled and evaluated by the Engineer and the Contractor.

Retesting **7.12.3** If the Works, or a part thereof, or a Section, fail to pass the Integrated Testing and Commissioning, the Engineer shall require such failed Tests, to be repeated under the same terms and conditions. If such failure and retesting result from a default of the Contractor and cause the Employer to incur additional costs, the same shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any money due, or to become due, to the Contractor.

Failure to Pass Test **7.12.4** If the Works, or a part thereof, or a Section, fail to pass Integrated Testing and Commissioning and the Contractor in consequence proposes to make any adjustment or modification to the Works or a part thereof, or a section, the Engineer may, with the approval of the Employer, instruct the Contractor to carry out such adjustment or modification, at his own cost and to satisfy the requirements of Integrated Testing and Commissioning within such time as the Employer / Engineer may deem to be reasonable.

Statutory Requirements **7.12.5** The Contractor along with others shall carry out all statutory tests and trials, under the supervision of the Engineer, necessary for obtaining sanction of the competent authority for opening the system for public carriage of passengers.

8 TIME MANAGEMENT

Commencement of Works **8.1** The Contractor shall commence the Works on the date specified in the Letter of Acceptance or if no date is specified in the Letter of Acceptance, on the date specified in an instruction in writing to that effect from the Engineer (Notice to Proceed). Thereafter the Contractor shall proceed with due diligence, without delay, and in accordance with the programme or any revised or modified programme of the Works. Time will be the essence of Contract and time for Completion shall reckon from the date the Contractor is required to commence the Works under this Clause.

The Contractor shall not commence the construction, manufacture or installation of the Works or of any part of the Works unless and until the Engineer has endorsed the relevant Working Drawings in accordance with the Employer's Requirements.

Time for Completion **8.2** Time is the essence of Contract and will remain so at all times during the pendency of the Contract including the extended period of Contract. The Contractor shall ensure defect free completion and passing of tests on

the completion, including integrated testing wherever provided in the scope of Work and commissioning of the whole of the Works and/or parts thereof before the same is taken over by the Employer.

Delay **8.3** In case of delay on the part of the Contractor, the Contractor shall be liable to pay Liquidated Damages and any other compensation for the damages suffered by the Employer as per clause 8.5. This is without prejudice to the right of the Employer to rescind the Contract.

Failure or delay by the Employer or the Engineer, to hand over to the Contractor the Site necessary for execution of Works, or any part of the Works, or to give necessary notice to commence the Works, or to provide necessary Drawings or instructions or clarifications or to supply any material, Plant or Machinery, which under the Contract, is the responsibility of the Employer, shall in no way affect or vitiate the Contract or alter the character thereof; or entitle the Contractor to damages or compensation thereof but in any such case, the Engineer shall extend the time period for the completion of the Contract, as in his opinion is/are reasonable.

Extension of Time for Completion **8.4**

Extension of Time **8.4.1** The Contractor may apply for an extension of the Time for Completion if the Work is or will be delayed either before or after the Time for Completion by any of the following causes:

a. "Force Majeure" referred to in Clause 16

b. The Contractor's work held up for not being given possession of or access to the Site in accordance with the Contract

c. Instruction of the Engineer to suspend the Works and the Contractor not being in default as to reasons of suspension.

d. Acts or omissions of other Designated Contractors in executing Work not forming part of this Contract and on whose performance, the performance of the Contractor necessarily depends.

e. Any act of prevention or Breach of Contract by the Employer and not mentioned in this Clause

f. Any order of Court restraining the performance of the Contract in full or in any part thereof

g. Any other event or occurrence which, according to the Employer is not due to the Contractor's failure or fault, and is beyond his control without Employer being responsible for the same.

h. An Employer's Variation

However, the Contractor shall not be entitled to any extension of time where the instructions or acts of the Employer or the Engineer are necessitated by or intended to cure any default of or breach of Contract by the Contractor or where any delay is due to

a. the failure of Sub-contractor, to commence or to carry out Work in due time,

b. non-availability, or shortage of Contractor's equipment, labour, utility services, Plant and Materials,

c. inclement weather conditions, and

d. the Contractor not fulfilling his obligations under Sub-clause 4.4.

If the Contractor considers himself to be entitled to an extension of time for Completion, he shall give notice to the Engineer of such intention as soon as possible and in any event within 28 days of the start of the event giving rise to the delay and full and final supporting details of his application within 21 days of the last day of delay, together with any notice required by the Contract and relevant to such Clause.

The Engineer shall proceed in accordance with Sub-clause 3.5 to agree or determine either prospectively or retrospectively such extension of the Time for Completion as may be due. The Engineer shall notify the Contractor accordingly. The extension of time including that of key date shall not entitle the Contractor to retain the Advances which shall be governed by Clause 11.2.

Extension of time for completion for other reasons **8.4.2** The Contractor shall not be entitled to an extension of time by reason of any delay to any activity in carrying out of the Works unless in the opinion of the Engineer such delay results in or may be expected to result in a delay to completion of the Works, or achievement of any Stage by the relevant Key Date. Whether or not the Contractor fails to achieve any Milestone by reason of any delay shall not by itself be material to the Contractor's entitlement to an extension of time.

Any extension to a Key Date shall not by itself entitle the Contractor to an extension to any other Key Date.

Extension of time for delays due to Contractor **8.4.3** If the delay in the completion of the whole Works or in achieving Key Date for stages of Work defined in Contract, for which an earlier completion period is stipulated, is due to the Contractor’s failure or fault, and the Engineer is of the view that the remaining Works or subsequent linked Key Date for remaining stages of Work can be completed by the Contractor in a reasonable and acceptable short time, then, the Engineer may allow the Contractor extension or further extension of time at its discretion with or without Liquidated Damages, or with or without freezing of escalation indices in Price Variation formula, for completion, as he may decide.

Liquidated Damages for Delay **8.5** Time is the essence of the Contract. Appendix-1 to the Form of Tender shall include in respect of the Works and in respect of any Stage, a percentage of the total Contract value which will be recoverable from the Contractor as Liquidated Damages for delay in completion of the Works or in achievement of a stage by a particular Key Date. The total amount of Liquidated Damages in respect of the Works in all stages shall, however, not exceed the limit of Liquidated Damages stated in the Appendix to the Form of Tender. The aforesaid Liquidated Damages do not, however, include the sums payable by the Employer to Designated Contractors on account of delay caused by the Contractor to Designated Contractors. Such sums shall be recoverable from the Contractor in addition to any Liquidated Damages payable under this clause, the total ceiling limit of which is 15% of the Contract value including Liquidated Damages levied under the provision of Appendix 1 to the Form of Tender.

The Liquidated Damages are recovered by the Employer from the Contractor for delay and not as penalty. The Parties agree that amount of Liquidated Damages leviable under the Contract are the genuine pre-estimate of the loss suffered by the Employer because of which the Liquidated Damages have been levied on the Contractor. The Liquidated Damages may be recovered from any amount of money due from the

Contractor under the Contract or any other Contract which the Contractor has with the Employer. The Liquidated Damages may also be recovered from the amount of Performance Security Bank Guarantee and in that case the Contractor would be liable to replenish the amount of Performance Security Bank Guarantee.

The Employer may, without prejudice to any other method of recovery, deduct the amount of such damages from any sum due, or to become due, to the Contractor. In the event of an extension of time being granted under Sub- Clause 8.3 and the amount due under this Sub-clause shall be recalculated accordingly, if excess recovery has been done, same will be refunded. The payment or deduction of such damages shall not relieve the Contractor from his obligations to complete the Works, or from any other of his duties, obligations or responsibilities under the Contract.

The Contractor shall use and continue to use his best endeavors to avoid or reduce further delay to the Works, or any relevant Stages.

At any time after the Employer has become entitled to Liquidated Damages, the Engineer may give notice to the Contractor under Sub-clause 13.1, requiring the Contractor to complete the Works within a specified reasonable time. Such action shall not prejudice the Employer's entitlements to recovery of Liquidated Damages, under this Sub-clause and to terminate under Sub-clause 13.2.

The decision of the Engineer as to the Liquidated Damages payable by the Contractor under this Clause shall be final and binding.

Rate of Progress **8.6**

If for any reason which does not entitle the Contractor to an extension of time, the rate of progress of the Works is at any time, in the opinion of the Engineer, too slow to ensure timely completion of the Works or achievement of any Stage by the relevant Key Date, the Engineer may so notify the Contractor in writing. The Contractor shall thereupon take such steps as are necessary, or in default of taking such steps, shall take such steps as the Engineer may reasonably instruct in writing, to expedite progress so as to complete the Works or any Section in time or achieve any Stage by the relevant Key Date. The Contractor shall not be entitled to any additional payment for taking such steps.

If any steps taken by the Contractor in meeting his obligations under this Sub- Clause cause the Employer to incur additional costs, such costs shall be recoverable from the Contractor by the Employer, and shall be deducted by the Employer from any sum due, or to become due, to the Contractor.

If, in the opinion of the Engineer, the steps taken by the Contractor to expedite the progress are not adequate, the Engineer may take a recourse as per Clause 13.2.4 of this GCC.

Suspension of Work **8.7**

The Engineer may at any time instruct the Contractor to suspend progress of part or all of the Works. During suspension, the Contractor shall protect, store and secure such part or whole of the Works against any deterioration, loss or damage.

Consequences of Suspension **8.8**

The Contractor shall not be entitled to extra cost (if any), incurred by him, during the period of suspension of Work., if such suspension is

a. provided for in the Contract, or

b. necessary for proper execution of Woks or by reasons of weather condition or by some default on the part of the Contractor, or

c. necessary for the safety of Works or any part thereof or

d. necessary for the safety of adjoining public or other property or safety of the public or workmen or those who have to be at the site or

e. to ensure safety and to avoid disruption of traffic and utilities, as also to permit fast repairs and restoration of any damaged utilities, or

f. due to instructions of NGT/ EPCA or any other statutory authority on account of high pollution.

If suspension is ordered by the Engineer for reasons other than those mentioned in Sub-clause 8.8 then the Contractor's entitlement are in the table below:

Suspension Period	Extension of Time	Compensation for the suspension period	Remarks
Upto 14 days	No	No	Engineer may, at his sole discretion, give extension of time in exceptional circumstances.
15-30 days	Yes	No	Extension of time as considered proper by the Engineer
Above 30 days	Yes	• As per Daily rate of wages for idle labour/employees • 70% of the rate for hire charges/ equivalent hire charges for idle plant and machinery hired/owned (excluding cost of fuel and lubricants) • 15% above all these items to cover overhead costs.	Compensation as assessed by the Engineer for entire suspension period on submission of documentary proof by the contractor to Engineer's satisfaction.
Above 90 days If contractor asks for fore closure	No	As per Clause 13.3.4	Contractor may ask for closure of the Contract, or deletion from the Contract of that part of Works which has been suspended.

Resumption of Work **8.9** After receipt of permission or of an instruction to proceed, the Contractor shall, after notice to the Engineer, and together with the Engineer, examine the Works, Plant, Rolling Stock and Materials affected by the suspension. The Contractor shall make good any deterioration or defect in or loss of the Works, Plant, Rolling Stock and Materials, which has occurred during the suspension.

9)YER'S TAKING OVER

Taking Over **9.1** The Works shall be taken over by the Employer when they have been

Certificate

completed in accordance with the Contract, have passed the Tests on Completion, including Integrated Testing and Commissioning wherever applicable as per the Contract, and a Taking Over Certificate for the Works shall be issued. If the Works are divided into Sections, the Contractor shall be entitled to apply for a Taking Over Certificate for each Section.

The Contractor may apply by notice to the Engineer for a Taking-Over-Certificate not earlier than 14 days before the Works or Section (as the case may be) will, in the Contractor's opinion, be complete and ready for Taking Over. The Engineer shall, within 28 days after the receipt of the Contractor's application shall conduct a complete joint survey of the Works including carrying out any tests prescribed in the Contract and prepare a list of defects and outstanding Works and :

a. issue the Taking Over Certificate to the Contractor, stating the date on which the Works or Section were completed, including the Tests on Completion and Integrated Testing and Commissioning wherever applicable as per the Contract in accordance with the Contract if defects and/or outstanding Works are minor that does not affect the use and safety of the Works or Section for their intended purposes. The list of such Works alongwith the target date of completion for each Work shall be enclosed with the Taking Over Certificate and completion of all these Works / Rectification of defects within the stipulated time shall be the responsibility of the Contractor and any failure in it may be considered a reason by the Engineer to cancel the Taking Over Certificate issued earlier; or

b. reject the application, giving his reasons and specifying the Work required to be done by the Contractor to enable the Taking Over Certificate to be issued. The Contractor shall then complete such Work before issuing a further notice under this Sub-clause.

c. Issue of Taking Over Certificate by the Employer would not absolve Contractor from any liability under the Law and Contract, arising from any hidden / latent defect in the Works / Section executed under the Contract by the Contractor. The Employer would be entitled to recover from the Contractor any compensation / damages / loss arising from such hidden / latent defect in the Works executed by the Contractor.

Taking over of Parts of the Works **9.2** The Engineer may, at the sole discretion of the Employer issue a Taking Over Certificate for any part of the Permanent Works by following the procedure stipulated in Clause 9.1 above if:.

a. the Employer uses thatpart of the Works for revenue service before the Taking Over Certificate is issued for the entire Work.

b. the balance part is not completed, not due to the fault of the Contractor and contractual date of completion for the completed part is over.

10 DEFECTS LIABILITY

Completion of Outstanding Work and Remedying Defects **10.1** "Defects Liability Period" shall mean the Defects Liability Period stated in the Special Conditions of Contract calculated from the date of taking over of the Works. Provided that, if any part of the Works or sub-systems or component of that part has been replaced, renewed or repaired except minor repair, the "Defects Liability Period" in respect of that part or sub-system or components of that part shall start from the date such

replacement, renewal or repair has been completed to the satisfaction of the Engineer.

The expiry of Defect Liability Period would not absolve the Contractor from any liability under the Law and Contract arising from any hidden / latent defect in the Works / Section executed under the Contract by the Contractor. The Employer would be entitled to recover from the Contractor any compensation / damages / loss arising from such hidden / latent defect in the Works executed by the Contractor.

In order that the Construction and/or Manufacture Documents and the Works shall be in the condition required by the Contract (fair wear and tear excepted) at, or as soon as practicable after the expiry of the Contract Period, the Contractor shall execute all such Work of amendment, reconstruction, and remedying defects or damage, as may be instructed in writing by the Employer or the Engineer during the Defect Liability Period.

Cost of Remedying Defects **10.2**

All Work referred to in Sub-clause 10.1 shall be executed by the Contractor at his own cost, if the necessity for such Work is due to:

a. the design of the Works;

b. Plant, Rolling Stock, Materials or workmanship not being in accordance with the Contract; or

c. failure by the Contractor to comply with any of his other obligations.

If in the opinion of the Engineer, such necessity is due to any other cause, he shall determine an adjustment to the Contract Price, with the approval of the Employer, and shall notify the Contractor accordingly. In this event, Sub-clause 12.3 shall apply to such Work.

Extension of Contract Period **10.3**

The Contract Period shall be extended by a period, after the Works are taken over, during which the Works or any Section or item of Plant, Rolling Stock, cannot be used, for the purposes for which they are intended, by reason of a defect or damage.

When delivery of Plant, Rolling Stock, and/or Materials, or erection of Plant, or installation of Materials, has been suspended under Sub-clause 8.7, the Contractor's obligations under this Sub-clause shall not apply to any defects or damage occurring more than three years after the Plant, Rolling Stock and/or Materials would otherwise have been delivered, erected and taken over.

Failure to Remedy Defects **10.4**

If the Contractor fails to remedy any defect or damage within such time as the Employer / Engineer may deem to be reasonable, the Employer or the Engineer may fix a date on or by which to remedy the defect or damage, and give the Contractor reasonable notice of such date. If the Contractor fails to remedy the defect or damage by such date and the necessity for such Work is due to a cause stated in Sub-clause 10.2(a), (b) or (c), the Employer may (at his sole discretion):

a. carry out the Work himself or by others, in a reasonable manner and at the Contractor's risk and cost, but the Contractor shall have no responsibility for such Work: the costs incurred by the Employer in remedying the defect or damage shall be recoverable from the Contractor by the Employer;

b. require the Engineer to determine and certify a reasonable reduction in the Contract Price; or

c. if the defect or damage is such that the Employer has been deprived of substantially the whole of the benefit of the Works or parts of the Works, terminate the Contract in respect of such parts of the Works as cannot be put to the intended use, the Employer shall then be entitled to recover all sums paid for such parts of the Works together with the cost of dismantling the same, clearing the Site and returning Plant, Rolling Stock and Materials to the Contractor, and Sub-clause 13 shall not apply.

Notwithstanding anything contained herein the Employer would be entitled in urgent and critical situation(s)/events to remedy the defects in the Work by himself or through others, at the Contractor's risk and cost. The cost incurred by the Employer in remedying the defect or damage shall be recoverable from the Contractor by the Employer.

Removal of Defective Work **10.5** If the defect or damage is such that it cannot be remedied expeditiously on the Site and if the Employer gives consent, the Contractor may, remove from the Site for the purposes of repair any part of the Works**,** which is defective or damaged. This consent may require the Contractor to increase the amount of Performance Security by the full replacement cost of these items or to provide other appropriate Security acceptable to the Employer.

Further Tests **10.6** If the remedying of any defect or damage is such that it may affect the performance of the Works, the Engineer may require that Tests on Completion, including Integrated Testing, be repeated to the extent necessary. The requirement shall be made by notice within 28 days after the defect or damage is remedied. Such Tests shall be carried out in accordance with Clause 7.11

Right of Access **10.7** Until the Performance Certificate has been issued, the Contractor shall have the right of access to all parts of the Works and to records of the working and performance of the Works, except as may be inconsistent with any reasonable security restrictions by the organization responsible for operating the Works.

Contractor to Search **10.8** The Contractor shall, if required by the Engineer, search for the cause of any defect, under the direction of the Engineer. Unless the defect is one for which the Contractor is liable, the Cost of such search shall be added to the Contract Price.

Performance Certificate **10.9** The Contract shall not be considered to be completed until the Performance Certificate has been signed by the Engineer or authorized official of the Employer and delivered to the Contractor at the end of 'Defect Liability Period, stating the date on which the Contractor completed his obligations related to completion of works and rectification of defects during Defect Liability Period to the Engineer's satisfaction. Only the Performance Certificate shall be deemed to constitute approval of the Works.

Notwithstanding anything contained herein the Contractor would continue to remain liable to the Employer for any cost, loss, damage or compensation which arises from hidden or latent defect in the work executed by the Contractor under the Contract, even if such hidden and latent defects arise after the expiry of Defect Liability period or grant of Performance Certificate by the Employer under the Contract to the Contractor.

Unfulfilled Obligations **10.10** After the Performance Certificate has been issued, the Contractor and the Employer shall remain liable for the fulfillment of any obligation,

which remains unperformed at that lime. For the purposes of determining the nature and extent of any such obligation, the Contract shall be deemed to remain in force.

Emergency defect rectification **10.11** If any defect or damage is one requiring immediate attention from safety, environmental or operational viewpoint, the Engineer has the authority to proceed with rectification in any manner suitable and deduct such sums from the Contract Price.

11 CONTRACT PRICE AND PAYMENT

The Contract Price Inclusions/ Exclusions **11.1**

11.1.1 (i) Unless otherwise stated in the Special Conditions of Contract, the Contract Price, subject to any adjustment thereto in accordance with the Contract, shall be all inclusive (including all taxes, duties, royalties etc.)

(ii) Nothing extra shall be payable over the quoted rates, notwithstanding any provision to the contrary in any law for the time being in force, save and except what is specifically provided in General or Special Conditions of Contract.

(iii) The reimbursement (as per this Sub-clause) of whatsoever nature shall be provided only for Permanent Works. No reimbursement (as per this Sub-clause) shall be provided for Temporary Works and fuel.

Maintaining Records and Availing Exemptions **11.1.2** (i) In the event of exemption of custom duties, GST (CGST/IGST/SGST etc.) or any other cess/levy being granted by the Government in respect of the Works, the benefit of the same shall be passed on to Employer. The Contractor shall therefore maintain meticulous records of all the taxes and duties paid and provide the same as and when required by the Employer, so that the Employer is able to avail the reimbursement for which NMRC may issue a procedure order separately. Alternatively, the Employer may direct the Contractor to get the reimbursements based on exemption certificates / government's order and it shall be obligatory on part of the Contractor to get the reimbursements from the statutory authorities and pass on the benefit to NMRC.

(ii) In case of Contractor's failure in availing the exemptions as stipulated above, the recovery of equivalent amount will be made from Contractor's dues.

Adjust in Contract Price **11.1.3** Adjustment in Contract price shall be done if a "Price Variation Formula" is given in the Special Conditions Of Contract otherwise it will be a fixed price contract.

Change in Taxes/Duty **11.1.4** The Contract Price shall not be adjusted to take into account any increase or decrease in cost resulting from any change in taxes, duties, levies from the last date of submission of the Tender to the completion date including the date of the extended period of Contract unless a contrary provision exists in Special Conditions of Contract.

Advances **11.2**

Mobilization Advance **11.2.1** a. Mobilization Advance shall be generally limited to 5% of Original Contract Value payable in two equal installments or as mentioned in the Special Conditions of Contract. The first installment shall be paid after mobilization has started and next installment shall be paid after satisfactory utilization of earlier installment.

b. Mobilization Advance shall be paid interest free against acceptable Bank Guarantee from a scheduled commercial bank in India. The value of Bank Guarantee taken towards security of "Mobilization Advance" shall be 110% of the Advance taken by the Contractor. The Contractor, once the 50% of Mobilization Advance has been recovered, shall have a one-time option to reduce the Bank Guarantee for the Mobilization Advance by the amount recovered.

Advance against Plant and Machinery **11.2.2** Plant and Machinery Advance shall generally be limited to 5% of Original Contract Value or as specified in Special Conditions of Contract. This Advance shall be paid interest free against acceptable Bank Guarantee from a scheduled commercial bank in India. The value of Bank Guarantee taken towards Security of "Plant & Machinery Advance" shall be 110% of the Advance taken by the Contractor. The Contractor, once the 50% of Plant & Machinery Advance has been recovered, shall have a one-time option to reduce the Bank Guarantee for the Plant & Machinery Advance by the amount recovered. This Advance is payable against Plant, Equipment and Machinery, provided the same have reached the site or in the case of new items meant specifically for the work, firm purchase order has been placed and the invoices received. The Advance will be given only if the Plant / Machinery has been purchased for this Contract and not for those which are already in the books of the Contractor. The Plant and Machinery shall be valued by the Engineer as follows:

(i) New Items : 80% of purchase price

(ii) Second hand items in working order : 80% of the depreciated value as assessed by the Engineer

(iii) Items valued at less than Rs. 1 lakh per unit : Not to be considered

Written Request for Advances **11.2.3** a. All Advances as admissible, shall be payable only on Contractor's written request to the Employer.

b. No advance shall be given after 40% of the original Contract amount has been paid.

Recovery of Advances **11.2.4** a. The recovery of Advances shall commence when 20% of the Original Contract Value of the Work has been paid and it will be completed by the time, 85% of the Original Contract Value has been paid or the original completion date whichever is earlier. As far as possible, the recovery of Advances shall be limited to 30% of on-account bill.

b. The Contractor shall always have the option to have the recoveries commenced and/or completed earlier, and/or to have recoveries affected in installments of higher amount and also to repay part or whole of the Advance by direct payment rather than through on-account Bills.

c. In case the Contract is terminated due to default of the Contractor or rescinded / foreclosed, due to any other reason, the Contractor shall return the unrecovered amount of all Advances within 15 days of issue of notice of termination / rescission / foreclosure of the Contract and if the Contractor fails to do so due to any reason whatsoever, then interest at rate equal to State Bank of India's Marginal Cost of fund based Lending Rate (MCLR) applicable for the tenure of 01 year prevailing on the date of issue of notice of termination / rescission /

foreclosure plus 3% Penal Interest per annum shall be charged on the unrecovered amount of such Advances from 16th day onwards compounded quarterly till the same is returned by the Contractor.

Interest in Case of Delay in Repayment of Advances

11.2.5 Should there be delay in the progress and completion of Work, as a result of which it is not possible to recover the Advances and interest thereon, before the date of completion stipulated in the Contract, then the interest to be charged from the Contractor on the remaining portion of the Advances beyond the original completion date specified in the Contract, shall be equal to State Bank of India's Marginal Cost of fund based Lending Rate (MCLR) applicable for the tenure of 01 year prevailing on the original completion date specified in the Contract plus 3% Penal Interest per annum.

Advances to be Used only for this Work.

11.2.6 The Advances shall be used by the Contractor strictly for the purpose of the Contract, and for the purpose for which they are paid. Under no circumstances, shall the Advances be diverted for other purposes. Any such diversion shall be construed as a breach of the Contract and the Contractor shall be asked to return the Advances at once and pay interest at 15% per annum till the Advances are recovered back from him. The Contractor shall return the Advances and pay the interest in one go without demur.

Employer retains the right for any other remedy prescribed for breach of Contract in this regard.

The Contractor, if required by the Engineer shall provide the details of utilization of Mobilization Advance.

Provisional Payment Against Material at Site

11.3

11.3.1 A provisional payment on account of main construction materials required for the Permanent Works, shall be paid on request of the Contractor after these materials are brought to Site, against an Indemnity Bond in a form acceptable to Employer is duly executed. The payment shall be limited to 80% of the actual value or assessed value of these materials and the total of such provisional payment on account of construction materials at a time shall be limited to three percent of Original Contract Value or likely average consumption of such materials for three months, whichever is less and at any time the total outstanding provisional payment against material at site shall not exceed four percent of the Original Contract Value. The valuation of the average consumption of such main construction materials shall be approved by the Engineer, whose decision shall be final. Materials which are of perishable nature should be adequately insured.

Written Request for Advances/ Provisional Payment against Material at Site

11.3.2 The provisional payments as admissible, shall be payable only on Contractor's written request to the Employer/Engineer.

Recovery of Advances/ Provisional Payment against Material at Site

11.3.3 In case of provisional payment against Materials, the amount consumed every month shall be recovered from the next month's on-account bill and the recovery to be completed in 3 monthly installments. In case recovery could not be made due to any reason, interest will be charged at the rate equal to State Bank of India's Marginal Cost of fund based Lending Rate (MCLR) applicable for tenure of 01 year prevailing on the

due date of recovery..

Application for Interim Payment Certificates **11.4**

11.4.1 In case of 'Lump Sum' Contract with cost centre and Milestone payment, the fixed Lump Sum Price shall be apportioned by the Contractor amongst the various Cost Centers. The amount thus apportioned under each Cost Centre will be further apportioned amongst various Milestones with the approval of the Employer. The Contractor shall be entitled to submit to the Engineer requests for interim payments only upon the achievement of one or more of the Milestones described in the Cost Centre.

At the beginning of each month, the Engineer shall issue to the Contractor certificate in respect of each Milestone due to be achieved in the preceding month stating:

(i) the date on which the Milestone was achieved; or

(ii)the non-achievement of the Milestone.

The Contractor shall submit a statement in three copies to the Engineer at the beginning of each month, in a form approved by the Engineer, showing the amounts to which the Contractor is entitled, together with supporting documents, including Milestone Certificates. The statement shall include the following items, as applicable, which shall be expressed in the various currencies in which the Contract Price is payable, in the sequence listed:

a. the amount due in respect of Milestones is certified by the Engineer as achieved under each Cost Centre;

b. any amounts to be added and deducted for the Advance payments and recovery thereof;

c. any other additions or deductions is due and approved by the Engineer in accordance with the Contract; and

d. the deduction of the amounts certified in all previous Interim Payment Certificates.

The Contractor shall not submit more than one request for interim payment per month.

If any Milestone is not achieved by the end of the month in which it is scheduled to be achieved, the Engineer shall suspend the payment relating to the Cost Centre in which the Milestone is included.

Payments suspended under this Clause shall be resumed by being included in the next application for interim payment made after the Milestone is achieved.

11.4.2 In case of 'Lump Sum' or Item rate' Contracts with payment schedule, the Contractor shall be entitled to be paid from time to time, normally once in a calendar month, by way of 'on-account' bill as per the payment schedule indicated in Bill of Quantity(BOQ) or as finally approved by the Engineer.

Issue of Interim Payment Certificates **11.5** No amount will be certified or paid until the Employer has received, and approved, the Performance Security and the Parent Company Undertakings and Guarantees in accordance with Sub-clause 4.2 and signing of the Contract Agreement. Thereafter, the Engineer shall, within 21 days of receiving a statement and supporting documents, deliver to

the Employer, with a copy to the Contractor, an Interim Payment Certificate showing the amount which the Engineer considers to be due; if no payment is considered to be due, the Engineer shall promptly notify the Contractor accordingly.

Where only a part of the payment applied for is disputed, payment certificate shall be issued for the undisputed amount.

The Engineer shall have the power to omit from any of the Contractor's requests for payment, the value of any Work executed or Materials supplied or Services rendered, with which he may for the time being be dissatisfied and for that purpose and for any other reason which to him may seem proper, may delete, correct or modify the sum(s) previously certified by him as being due to the Contractor.

Payment- Interim and Final **11.6**

Unless otherwise stated in Special Conditions of Contract,

a. After preliminary scrutiny and certification by the Engineer, payment of 80% of the certified interim amount shall be made by the Employer within 07 days. The amount certified shall account for all deductions, including statutory deductions, recoveries for Advances and any amounts due from the Contractor. The balance 20% shall be paid within 28 days, from the date of the preliminary certification of the bill by the Engineer.

b. Next 80% interim payment shall be made only after 100% payment of preceding interim payment certified has been completed.

c. Any such payment made to Contractor by Employer, shall not constitute any acceptance of the measurements or bill of quantities by the Employer and the Employer shall have the right to alter, modify, reduce or diminish the quantities or classification entered in the measurement books or bills. The Employer shall have right to recover any excess payment made in either 80% interim payment of bill or earlier bill from balance 20% bill or subsequent bill respectively. However, if such excess payment exceeds the balance 20% bill or subsequent bill respectively, the Contractor shall on demand from the Engineer or Employer immediately refund the extra amount to the Employer within 7 days, failing which the Contractor shall have to pay interest at the rate equal to State Bank of India's Marginal Cost of fund based Lending Rate (MCLR) applicable for the tenure of 01 year prevailing on date plus 3% Penal interest per annum with monthly rest till the said extra amount is paid back by the Contractor.

d. The Employer shall pay the amount certified in the final payment certificate within 56 days from the date of issue of certificate.

Payments shall be made into a bank account, nominated by the Contractor in Indian rupees in a bank in India unless otherwise permitted in Special Conditions of Contract. If payments are to be made in more than one currency, separate bank accounts may be nominated by the contractor for each currency, and payment shall be made by the Employer accordingly.

Statement at Completion **11.7**

Not later than 60 days after the issue of the Taking Over Certificate for the whole of Works, the Contractor shall submit, to the Engineer, three copies of a statement at completion with supporting documents, showing in detail, in the form approved by the Engineer under Sub-clause 11.4.:

a. the final value of all Work done in accordance with the Contract,

up to the date stated in such Taking Over Certificate,

b. any further sums which the Contractor considers to be due, and

c. an estimate of amounts which the Contractor considers will become due to him under the Contract.

The estimated amounts shall be shown separately in such statement at completion. The Engineer shall certify payment under Sub-clause 11.5.

Application for Final Payment Certificate **11.8** Not later than 56 days after the issue of the Performance Certificate, the Contractor shall submit to the Engineer three copies of a draft final statement with supporting documents showing in detail, in a form approved by the Engineer:

a. the value of all Work done in accordance with the Contract, and

b. any further sums which the Contractor considers to be due to him under the Contract or otherwise.

If the Engineer disagrees with or cannot verify any part of the draft final statement, the Contractor shall submit such further information as the Engineer may reasonably require and shall make changes in the draft as may be agreed between them. The Contractor shall then prepare and submit to the Engineer the Final Statement as agreed.

If, following discussions between the Engineer and the Contractor and any changes to the draft final statement which may be agreed between them, it becomes evident that a dispute exists, the Employer shall pay those parts of the draft final statement as certified by the Engineer as not being in dispute. The remainder of the dispute may then be resolved under Clause 17, in which case the Contractor shall then prepare and submit to the Engineer a Final Statement in accordance with the outcome of the dispute.

Discharge **11.9** When submitting the final statement, the Contractor shall submit a written discharge which confirms that the total of the Final Statement represents full and final settlement of all monies due to the Contractor under the Contract. Such discharge may state that it shall become effective only after payment due under the Final Payment Certificate has been made and the Performance Security referred to in Sub-clause 4.2 has been returned to the Contractor.

Issue of Final Payment Certificate **11.10** The Engineer shall issue to the Employer, with a copy to the Contractor, the Final Payment Certificate within 28 days after receiving the Final Statement and written discharge in accordance with Sub-clause 11.8 and 11.9 respectively, stating:

a. the amount which is finally due, and

b. after giving credit to the Employer for all amounts previously paid by the Employer and for all sums to which the Employer is entitled, the balance, if any, due from the Employer to the Contractor or from the Contractor to the Employer, as the case may be.

If the Contractor has not applied for a Final Payment Certificate in accordance with Sub-clauses 11.8 and 11.9, the Engineer shall request the Contractor to do so. If the Contractor fails to make such an application within a period of 28 days, the Engineer shall issue the Final Payment Certificate for such amount as he considers to be due.

Notwithstanding anything contained herein the issue of Final Payment

Certificate would not restrict/hinder the right of the Employer in Law/under the Contract to recover from the Contractor in loss, damage, compensation arising out of fraudulent practice/corrupt practices indulged into by the Contractor prior to the execution of the Contract, during the execution of the Contract and after the completion of the Contract.

Notwithstanding anything contained herein, the issue of Final Payment Certificate would not absolve the Contractor from any liability/loss/damage/ compensation towards the Employer in Law and/or under the Contract arising out of latent and hidden defects in the Works executed by the Contractor under the Contract.

Cessation of Employer's Liability **11.11** In respect of any matter or thing arising out of (or in connection with) the Contract or execution of the Works before the issue of the Taking Over Certificate for the whole of the Works, the Employer shall not be liable to the Contractor unless the Contractor shall have included a claim for it in his Statement at Completion described in Sub-clause 11.7. For any such matter or thing arising after the issue of the Taking Over Certificate for the whole of the Works, the Employer shall not be liable to the Contractor unless the Contractor shall have included a claim for it in his Final Statement.

Calculation of Payments in Foreign Currency **11.12** All payments made by the Employer pursuant to the terms of the Contract shall be in the currency or currencies specified in the Contract. Wherever any sum in a foreign currency has to be converted into Indian Rupees for any purpose, the exchange rate to be employed for such conversion shall be the selling rate of exchange at the close of business of the State Bank of India, 28 days before the latest date of submission of Tenders.

Round off **11.13** In every payment to the Contractor, sums of less than fifty paise shall be omitted and sums of fifty paise and more up to one rupee shall be reckoned as one rupee.

Payment By Cheque and E-Payment **11.14** All payments to the Contractor will be made by cheque or “E-Payment” as desired by the Employer.

Tax Deduction at Source **11.15** Tax deductions will be made at source as per statutory requirement from every payment made to the Contractor at rates notified from time to time.

Production of Vouchers **11.16** i. The Contractor shall, whenever required by the Engineer, produce or cause to be produced for examination by the Engineer, any quotation, invoice, cost or other account books, vouchers, receipts, letters, memoranda or any copy of or extract from any such documents and also furnish information and returns, as may be required, relating to the execution of this Contract or relevant for verifying or ascertaining the cost of execution of this Contract or ascertaining the Materials supplied by the Contractor are in accordance with the Specifications laid down in the Contract. The Engineer’s decision on the question of relevancy of any documents, information or returns shall be final and binding on the Parties.

i. If any part or item of the Work is allowed to be carried out by a Sub-contractor, assignee or any subsidiary or allied Firm, the Engineer shall have power to secure the books of such Sub-contractor, assignee or any subsidiary or allied Firm through the Contractor, and shall have power to examine and inspect the same. The above obligations are without

prejudice to the obligations of the Contractor under any statute, rules or orders.

Withholding and Lien for Sums Claimed **11.17**

i. The Employer shall have lien over all or any moneys that may become due and payable to the Contractor under the Contract, and/or over the deposit of Performance Security or other amount or amounts made under the Contract and which may become payable to the Contractor.

i. And further, unless the Contractor pays and clears immediately on demand any claim of the Employer, the Employer shall at all times be entitled to deduct the amount of the said claim from the moneys, securities and / or deposits which may have become or will become payable to the Contractor under the presents, or under any other Contract or transaction whatsoever between the Employer and the Contractor even if the matter stands referred to Arbitration. The Contractor shall have no claim for any interest or damage whatsoever in respect of any amounts withheld or treated as withheld under the lien referred to above and duly notified as such to the Contractor.

Signature on Receipts for Payments **11.18**

Every receipt of payment to Contractor including refund of the Performance Security shall be signed by the person authorized to do so on his behalf. In the event of death of any of the Contractor's partners in case the Contractor is a partnership firm, during the currency of the Contract, it is hereby expressly agreed that every receipt by any one of surviving Contractor's partners, shall, if so signed as aforesaid, be a good and sufficient discharge as aforesaid, provided that nothing in this Clause shall be deemed to prejudice or affect any claim, which the Employer may hereafter have against the legal representatives of any Contractor's partner so dying, for or in respect of breach of any of the conditions of the Contract. Provided also that nothing contained in this clause shall be deemed to prejudice or affect the respective rights and obligations of the Contractor's partners, or of the legal heirs / representatives of any deceased Contractor / partner interse.

Post Payment Audit **11.19**

It is an agreed term of the Contract, that the Employer reserves to himself the right to carry out a post payment audit and / or technical examination of the Works, and the Final bill including all supporting vouchers, abstracts, etc., and to make a claim on the Contractor for the refund of any excess amount paid to him, if as a result of such examination, any over-payment to him is discovered to have been made in respect of any Work done or alleged to have been done by the Contractor, under the Contract. If any under-payment is discovered, the same shall be paid by the Employer to the Contractor. Such payments or recoveries, however, shall not carry any interest.

Recovery of money due to the Employer **11.20**

All damages (including, without limitation, Liquidated Damages), costs, charges, expenses, debts, or sums for which the Contractor is liable to the Employer under any provision of the Contract may be deducted by the Employer from monies due to the Contractor under the Contract (including, without limitation, Liquidated Damages) and the Employer shall have the power to recover any balance not so deducted from monies due to the Contractor under any other Contract between the Employer and the Contractor.

When the Contractor has as per the provision of the Contract assigned to a third Party the right to receive monies due, or, to become due, under the Contract to the Contractor or charged such monies in favour of a third Party, the Employer's right to deduct damages (including without

limitation Liquidated Damages), costs, charges, expenses, debts or sums for which the Contractor is liable to the Employer from monies due to the Contractor under the Contract shall be limited to the right expressed above.

12 /ARIATIONS

Right to Vary **12.1** All Variations shall be recorded in a written instruction from the Engineer either as a Contractor's Variation or as an Employer's Variation, and shall not be implemented by the Contractor without such an instruction in writing from the Engineer. No Variation shall in any way vitiate or invalidate the Contract. The Contractor shall not make any alteration and/or modification of the Works, unless and until the Engineer instructs or gives consent to a Variation. If the Construction and/or Manufacture Documents or Works are not in accordance with the Contract, the rectification shall not constitute a Variation.

Contractor's Variations **12.2**

Variation Proposals **12.2.1** The Contractor may submit to the Employer, in writing at its own cost, any engineering proposal as Contractor's Variation for modifying the Employer's Requirements, provision of additional land, access or feasibility over and above that is provided in the Contract for the purpose of saving in time, construction or manufacture costs. Such Variation proposal shall not impair the essential character, functions or characteristics or the Work, including Service life, economy of operation, ease of maintenance, desired appearance, or design and safety standards.

The Contractor shall provide his Variation proposal in a time limit prescribed by the Engineer. The Engineer's decision in this regard shall be communicated to the Contractor within a reasonable period of time. If by any reason, the time limit specified by the Engineer is exceeded, the proposal may not be considered.

sion of the Engineer in this regard shall be final and binding.

Contents of Variation **12.2.2** If the Employer requires or accepts it, and if the Contractor wants to proceed with the proposal, the Contractor must provide (at no cost to the Employer) a detailed report prepared by a Consultant acceptable to the Employer and which shall include:

a. a general description of the original Contract requirements for the Works and the proposed changes

b. a detail of all the proposed modifications to the drawings and specifications

c. a detail of all Work and goods affected by the value engineering proposal

d. a detailed estimate of the construction cost based on the original Contract requirements and based on the proposed changes

e. any resultant time extensions or reductions for the Contract

f. statement to the extent of minimum saving expected. The Contractor's cost of preparing the Variation proposal shall be excluded in determining the estimated net savings in construction costs.

Employer Review **12.2.3** The Employer may in his sole discretion, accept or reject the Contractor's Variation or any part thereof and determine the estimated net saving in the construction cost. The Employer shall not be liable for

delays or damages to the Contractor due to any failure of the Employer to accept or act upon any such Variation proposal submitted pursuant to this Clause.

Once, the Employer or the Engineer rejects the Contractor's Variation during proposition due to any reason, it shall not be pursued by Contractor in any other form.

Amendments-Employer Issuance **12.2.4** If the Variation proposal is acceptable to the Employer/Engineer in whole or in parts, it will be accepted by execution of an amendment or by communication in writing. Such amendment/communication in writing shall identify all the changes in the specifications, Contract Period etc. and shall specify net savings on construction costs which shall be adjusted in the Contract value by the Employer.

Contractor's Acceptance and Payment **12.2.5** The Contractor shall either accept or reject any proposed amendment/communication in writing executed by the Engineer pursuant to this section within 5 working days of its receipt date from the Employer. If the Contractor does not reject the same in the period stipulated above, the amendments /communication in writing shall be deemed to be accepted by the Contractor and shall become a Variation to the Contract. The Contractor's acceptance shall be unconditional and the Contract value / price shall be adjusted by the amount of saving due to the Variation.

Employer's Variations **12.3** If the Engineer requests a proposal, prior to instructing a Variation which may be for additional work or alteration in the work on deletion / reduction in the scope of work, the Contractor shall submit at his own cost within 14 days or such period as the Engineer may allow of the receipt of such request of the Engineer

a. a description of the proposed design and/or work to be performed and a programme for its execution,

b. the Contractor's proposal for any necessary modifications to the programme according to Sub-clause 4.13, and

c. the Contractor's proposal for adjustment to the Contract Price, Time for Completion and/or modifications to the Contract.

Variation Procedure **12.4** The Engineer shall, as soon as practicable after receipt of proposals under sub- clauses 12.2 and / or 12.3, respond with approval, rejection or comments.

If the Engineer instructs or approves a Variation, he shall proceed in accordance with Sub-clause 3.5 to agree or determine adjustments to the Contract Price, Time for Completion and Schedule of Payments.

After receipt of proposal, it will be the prerogative of the Employer, whether to Instruct and proceed ahead with the Variation or drop the proposal in part or full. In that case, no cost of preparing and submitting the proposal will be payable to Contractor. In case, the design part of Variation has been completed on submission of same to the Engineer, the Employer decides to abandon the Variation, only cost for design to the extent of work done will be paid to the Contractor.

Variation in the Bill of Quantities **12.5** Clause 12.5 - Variation in the Bill of Quantities

A. This sub clause shall be applicable to Schedules of measurement Contracts. This clause shall also be applicable to item rates / Provisional Sum Schedules of Lump-Sum Contracts

ties of items and /or Provisional Sum, shown in different Schedules of Q are approximate, and liable to vary during the actual execution of the rk. Some items may have to be added or deleted. The Contractor shall be ınd to carry out and complete the stipulated Work as instructed by the gineer, irrespective of the magnitude of variations including additions or etion in the Bill of Quantities. Variations shall be paid as follows:

i. Schedules having items rates with quantities :

a. At the accepted rates of the Contract for Positive variation in quantities of items to the extent of 25%. In case of variation in quantities on minus side, Contract rates will be payable at the accepted rates of the Contract for the executed quantities.

b. In case the Variation in individual items (except for items under Para c), d) & e) below) as stipulated above: is more than 25% on plus side, the rate for the varied quantity beyond 25% shall benegotiated between the Engineer and the Contractor and mutually agreed rates arrived at before execution of the extra quantity.

c. In case of earth work, the aforesaid Variation limit of 25% shall apply to the gross quantity of earth work and Variation in the quantity of individual classifications of soil will not be subject to this limit where any Variation can take place.

d. In case of foundation work, no Variation limit applies and Contractor shall carry out the Work, at the accepted rates of the Contract irrespective of any Variation.

e. Variation in the quantity of items individually costing upto 1% of total Original Contract Value or `50 lakh, whichever is less, shall be payable at the accepted rates of the Contract, till the value of such individual item on account of Variation reaches upto 2% of the total Original Contract Value or `1 crore, whichever is less. Negotiation of rates for such items shall be conducted only for the exceeded quantity beyond 2% of the Original Contract Value or `1 crore, whichever is less.

i. Schedules having Provisional Sum (containing only rates of items but without quantities) / Items having Provisional Sum (e.g. referring to Standard Schedules of Rates etc.):

a. At the accepted rates of the Contract for Positive Variation in Provisional Sum to the extent of 25%. In case of Variation in Provisional Sum on minus side, Contract rates will be payable at the accepted rates of the Contract for the executed quantities.

b. In case the Variation in Provisional Sum as stipulated above: is more than 25% on plus side, the rate for works under item A.(ii) beyond 25% Variation in Provisional Sum shall be negotiated between the Engineer and the Contractor and mutually agreed rates arrived at, before its execution.

B. Deriving Rates For New Items / Negotiation

is Sub-clause shall be applicable to all Schedules of BOQ including Lump-Sum Schedule.

i. In case Engineer introduces an item for which the Contract does not contain any rates or prices applicable to the varied Works, the rate of such items shall be derived, wherever possible, from rate for similar items available in the Bill of Quantities of the accepted Tender. In case

this is not possible, the rate may be decided on the following basis:

a. Cost of Materials at current market price, as actually utilized in the final finished Permanent Works, including a reasonable percentage for wastage and transportation.

b. Cost of enabling works if any (unless provided for separately) worked out on the above basis but with less stringent quality. Specifications minus salvage value of serviceable material released after completion of Work and cost of material released as scrap.

c. Cost of labour actually used at the site of Work at rates under Payment of Minimum Wages Act for the area of Work for each category of worker, further enhanced by a percentage of 10% of the aforesaid rates to account for labour not directly utilized at Site and other ancillary and incidental expenses on labour.

d. Hire charges for Plant & Machinery, scaffolding, shuttering, forms, etc., required to be used at the site of the work. The tools used by the various trades shall not be counted as Plant & Machinery for this purpose.

e. An amount of 20% of items B.(i) a), b), c) and d) above to allow for Contractor's overheads including water/electricity charges and labour cess etc., profits and corporate taxes etc. No such percentage shall be applicable to the estimated cost of Materials supplied free of cost to the Contractor.

f. In all cases where extra items of Work are involved, for which there are no rates in the accepted Bill of Quantities, the Contractor shall give a notice to the Engineer, of at least 7 days before the need for its execution arises.

In the event of disagreement in respect of items A (i) b), A (i) e), A (ii) b) and B (i) above, the Engineer shall fix such rates of price as are, in his opinion appropriate and shall notify the Contractor accordingly, with a copy to the Employer. Until such time as rates or prices are agreed or fixed, the Engineer shall determine provisional rates or prices to enable on-account payments to the Contractor. Alternatively, in the event of disagreement, the Contractor shall have no claim to execute extra quantities/new items and the Engineer shall be free to get such additional quantities beyond 25%/new items executed through any other Agency. However, if the Engineer or the Employer so directs the Contractor shall be bound to carry out any such additional quantities beyond the limits stated above original quantities and/or new items and the disagreement or the difference regarding rates to be paid for the same shall be settled in the manner laid down under the conditions for the settlement of dispute.

Payment in Applicable Currencies

12.6 If the Contract provides for payment of the Contract Price in more than one currency, and an adjustment is agreed or fixed as stated above, the amount payable in each of the applicable currencies shall be specified when the adjustment is agreed or fixed. In specifying the amount in each currency, the Contractor and the Engineer (or, failing agreement, the Engineer) shall take account of the actual or expected currency proportions of the Cost of the varied Work, without being bound by the proportions of various currencies specified for payment of the Contract Price.

13 TERMINATION OF THE CONTRACT

Notice to Contractor

13.1 If the Contractor fails to carry out any of his obligations, or if the Contractor is not executing the Works in accordance with the Contract, the Engineer may give notice to the Contractor requiring him to make good such failure and remedy the same within such time as the Employer / Engineer may deem to be reasonable.

Termination of Contract Due to Contractor's Default

13.2

Conditions Leading to termination of Contract

13.2.1 The Employer shall be entitled to terminate the Contract if the Contractor or any one of its constituents,

a. fails to comply with a notice under Sub-clause 13.1

b. abandons or repudiates the Contract

c. without reasonable excuse acceptable to the Engineer, fails to commence the Works in accordance with the Contract

d. Sub-contracts the whole of the Works or assigns the Contract without approval of the Employer

e. becomes bankrupt or insolvent or goes into liquidation except voluntary liquidation for the purpose of amalgamation or reconstruction

f. persistently disregards instructions of the Engineer or contravenes any provisions of the Contract, or

g. fails to adhere to the agreed programme of work by margin of 10% of the stipulated period or 21 days, whichever is earlier, or fails to complete the Works or parts of the Works within the stipulated or extended period of completion, or is unlikely to complete the whole Work or part thereof within time because of poor record of progress; or

h. fails to remove materials from the Site, or pull down and replace Work, after receiving notice from the Engineer to the effect that the said materials or Works have been condemned or rejected, or

i. fails to take steps to employ competent and/or additional staff and labour, or

j. fails to afford the Engineer or his Representative proper facilities for inspecting the Works or any part thereof, or

k. indulges in corrupt or fraudulent practices as explained in Clause 4.33

13.2.2 In any one of these events or circumstances, the Employer may upon giving 14 days notice to the Contractor, terminate the Contract and expel the Contractor from the Site. However, in case of sub-paragraph (e) or (k), the Employer may by notice of 7 days to the Contractor, terminate the Contract immediately.

13.2.3 For the purpose of sub-para (c) above, of this clause, reasonable excuse shall be the one, which in the opinion of the Engineer has resulted from, any circumstance which

- is beyond the Employer's or Contractor's control and
- made the failure unavoidable and it is evidenced by the Contractor to the satisfaction of the Engineer that the failure was remedied without unreasonable delay once that obstacle was out of the way.

13.2.4 In case of Sub-para(g), the Engineer at its sole discretion may terminate

only part of the Contract also by taking out some part of the total scope of Work and may get it completed or arranged from any other entity through the process of Open/Limited/Single Tender or by calling quotations, to do so at the risk and cost of the Contractor.

13.2.5 The Employer's decision to terminate the Contract shall not prejudice any other rights of the Employer under the Contract.

13.2.6 On termination of Contract due to Contractor's default, the Performance Security shall be forfeited by encashing the Bank Guarantee and the balance Work shall be got done independently without risk and cost of the failed Contractor. The failed Contractor shall be debarred from participating in the Tender for executing the balance Work. If the failed Contractor is a JV/Consortium or a partnership Firm, then every member/partner of such JV/Consortium or partnership Firm shall be debarred from participating in the Tender for the balance Work either in his/her individual capacity or as a partner of any other JV/Consortium or partnership Firm.

13.2.7 The Engineer shall not make a claim under the Performance Security except for amounts to which the NMRC is entitled under the Contract (Not withstanding and/or without prejudice to any other provisions in the Contract Agreement) in the event of:

i. Failure by the Contractor to extend the validity of the Performance Security as described herein above, in which event the Engineer may claim the full amount of the Performance Security.

i. Failure by the Contractor to pay NMRC any amount due, either as agreed by the Contractor or determined under any or the Clauses/Conditions of the Agreement, within 30 days of the service of notice to this effect by Engineer.

i. The Contractor being determined or rescinded under provision of the GCC in which event, the Performance Security shall be forfeited in full and shall be absolutely at the disposal of the NMRC.

Valuation at the date of Termination

13.2.8 The Engineer shall, as soon as possible after termination under Sub-clause 13.2.1, determine and advise the Contractor of the value of the Construction and/or Manufacture Documents, Plant, Rolling Stock, Materials, Contractor's Equipment and Works and all sums then due to the Contractor as at the date of termination.

Payment after Termination

13.2.9 After termination under Sub-clause 13.2.1, the Employer shall not be liable to make any further payments to the Contractor until the costs of design, manufacture, execution, completion and remedying of any defects, damages for delay in completion (if any), and all other costs incurred by the Employer, have been established and recovered..

The Employer shall be entitled to recover from the Contractor the extra costs, if any, of completing the Works after allowing for any sum due to the Contractor under Sub-clause 13.2.8. If there are no such extra costs, the Employer shall pay any balance to the Contractor.

Non-exercise of power not to constitute waiver

13.2.10 Provided always that in case any of the powers conferred upon the Employer by Sub-clause 13.1 and Sub-clause 13.2.1 above, shall have become exercisable, and the same may not have been exercised, the non-exercise thereof shall not constitute waiver of any of the conditions thereof.

Default of **13.3**

Employer

Notice by Contractor **13.3.1** In the event of the Employer:

a. failing to pay the Contractor, without reasonable cause, the certified amount due under any certificate of the Engineer within 56 days after the expiry of the time stated in Sub-clause 11.56 within which payment has to be made, subject to any deduction that the Employer is entitled to make under the Contract, or

b. becoming bankrupt or, being a Company, going into liquidation, other than for the purpose of a scheme of reconstruction or amalgamation,

then, the Contractor may give notice requiring the Employer to remedy the default within 28 days after receipt of the notice. If the Employer fails to remedy the default or fails to propose steps reasonably acceptable to the Contractor to do so and in that case, the Contractor may terminate the Contract after issue of 14 days notice to the Employer with a copy to the Engineer. In this case, the Contractor shall be compensated as per Sub clause 13.3.4

The Engineer's decision on the certified amount payable on this account shall be final and binding.

Contractor's Entitlement to Suspend the Work **13.3.2** The Contractor may, if the Employer fails to pay the Contractor the certified amount due under any certificate of the Engineer within 56 days after the expiry of the time stated in Sub-clause 11.6, within which payment is to be made, subject to any deduction that the Employer is entitled to make under the Contract, after giving 28 days' prior notice to the Employer, with a copy to the Engineer, suspend Work or reduce the rate of progress of Work.

If the Contractor suspends Work or reduces the rate of progress of Work in accordance with the provisions of this Sub-clause and thereby suffers delay or incurs costs the Engineer shall, after due consultation with the Employer and the Contractor, determine:

a. any extension of time to which the Contractor is entitled under Sub-clause 8.4, and

b. the amount of such costs, which shall be added to the Contract Price, and shall notify the Contractor accordingly, with a copy to the Employer.

Cessation of Work by Contractor **13.3.3** After termination under Sub-clause 13.3.1, the Contractor shall:

a. cease all further Work, except for such Work as may be necessary and instructed by the Engineer for the purpose of making safe or protecting those parts of the Works already executed, and any Work required to leave the Site in a clean and safe condition,

b. hand over all Construction and/or Manufacture Documents, Plant, Rolling stock, and Materials for which the Contractor has received payment,

c. hand over those parts of other Works executed by the Contractor up to the date of termination, and

d. remove all Contractor's Equipment if not required by the Employer which is on the Site and repatriate all his staff and labour from the Site.

Any such termination shall be without prejudice to any other right of the

Contractor under the Contract.

Payment on Termination

13.3.4 After termination under Sub-clause 13.3.1, the Employer shall return the Performance Security, if not invoked and shall pay the Contractor an amount calculated and certified in accordance with the following conditions:.

a. The value of approved materials actually brought to the site and reasonably required to execute the Works during next three months, as per approved Programme, and

b. Value of Work completed up to date by the Contractor at rates specified in the Contract, after taking into account any deductions, retentions, setoff, damages, compensation, loss payable to Employer etc.

c. In addition, a sum not exceeding 2% (two percent) of the value of the work remaining incomplete on the date of Termination notice taking effect.

The payment as above shall be the full compensation for termination under this Clause and the Contractor shall have no claim for damages or other entitlements whether under the Contract or otherwise.

13.3.5 In case termination/foreclosure of the Contract under whatsoever circumstances, any remaining Tools, Plants, Equipments and surplus materials of Employer with Contractor will be returned to the Employer in good condition at Employer's depot at Contractor's cost. In case of the failure of the Contractor to do so, the Employer will be entitled to recover their cost from the Contractor from the amount becoming due to the Contractor or from any other money due in any other Contracts. The decision of the Engineer of the amount to be recovered will be final and full credit at rates initially charged to the Contractor shall be allowed for such materials. Similarly the Employer shall be entitled to recover the cost of the unreturned material, Plant, Equipment and Tools from the Contractor where such material have been supplied free of cost or on lease basis to the Contractor as stipulated in the Conditions of Contract.

14 RISK AND RESPONSIBILITY

Indemnity

14.1 The Contractor shall indemnify and hold harmless the Employer, the Engineer, the Designated Contractors, Representatives and employees from and against all actions, suits, proceedings, claims, damages, losses**,** expenses and demands of every nature and description**,** by reasons of any act or omissions of the Contractor, his Representative or his employees in the execution of the Works, including professional services provided by the Contractor or in the guarding the same.

These indemnification obligations shall include but not be limited to claims, damages, losses, damage proceedings, charges and expenses which are attributable to:

a. sickness, or disease, or death of, or injury to any person; and

b. loss of, or damage to, or destruction of any property (other than the Works) including consequential loss of use; and

c. loss, damage or costs arising from the carriage of Plant, Rolling Stock and Materials and/or ownership or chartering of marine vessels by the Contractor, or any Sub-contractor of any tier.

The Contractor shall also indemnify and save harmless the Employer

from and against all claims and proceedings on account of infringements of patents rights, design, trademark name etc as detailed out in clause 5.8.

All sums payable by way of compensation under these conditions shall be considered reasonable compensation payable to the Employer, without reference to the actual loss or damage sustained, and whether or not any damage shall have been sustained. The decision of the Engineer as to compensation claimed shall be final and binding.

Contractor's Care of the Works **14.2**

The Contractor shall take full responsibility for the care of the Works, or any part thereof, including full responsibility for the care of any Work being manufactured, or stored off-Site for inclusion in the Works, or in the course of transportation to the Site, and for the care of Contractor's Equipment, Temporary Works, Plant, Rolling Stock, and any other Material, whatsoever, on the Site or delivered to or placed on the Site in connection with, or for the purpose of the Works.

The Contractor shall take this responsibility from the Commencement Date until the date of issue of the Taking Over Certificate, when responsibility shall pass to the Employer. If the Engineer issues a Taking Over Certificate for any Section or part of the Works, the Contractor shall cease to be responsible for the care of that Section or part from the date of issue of such Taking Over Certificate when responsibility shall pass to the Employer.

The Contractor shall take responsibility for the care of any outstanding Work which is required to be completed prior to the expiry of the Contract Period, until the Engineer confirms in writing that such outstanding Work has been completed.

If any loss or damage happens to the Works, any other property or person, arising from any cause other than the Employer's risks listed in Sub-clause 14.3, during the period for which the Contractor is responsible, the Contractor shall rectify such loss or damage, at his cost, so that the Works conform with the Contract or at the option of the Employer, will pay or allow to the Employer the cost of rectifying such loss or damage. Notwithstanding such loss or damage, the Contractor shall proceed with the execution of Works in all respects in accordance with the Contract and the Engineer's instructions. The Contractor shall also be liable for any loss or damage to the Works caused by any operations carried out by the Contractor after the date of issue of the Taking Over Certificate.

Employer's Risks **14.3**

The Employer's risks of loss or damage to physical property in India and of death and personal injury occurring in India in consequence of the performance of obligations under the Contract are:

a. war, hostilities (whether war be declared or not), invasion, act of foreign enemies,

b. rebellion, revolution, insurrection, or military or usurped power, or civil war, within India,

c. riot, commotion or disorder by persons unless solely restricted to or caused by employees of Contractor or of Sub-contractors currently or formerly engaged in the Works,

d. Ionizing radiations, or contamination by radio-activity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosive, or other hazardous properties of any

explosive nuclear assembly or nuclear component of such an assembly, except to the extent to which the Contractor may be responsible for the use of any radio-active material,

e. pressure waves caused by aircraft or other aerial devices travelling at sonic or supersonic speeds, and

f. use or occupation by the Employer of any part of the Works, except as may be specified in the Contract.

Consequences of Employer's Risks **14.4** If an Employer's risk results in loss or damage, the Contractor shall promptly notify the Engineer and shall rectify this loss or damage to the extent required by the Engineer.

If the Contractor suffers delay and/or incurs cost from rectifying this loss or damage, the Contractor shall give notice to the Engineer and shall be entitled to claim:

a. extension of time for any such delay, if completion is or will be delayed, under Sub-clause 8.4, and

b. amount of such cost, amount of such cost, which shall be included in the Contract Price.

Contractor's Risks **14.5** The Contractor's risks are all risks other than the Employer's risks given in Sub- clause14.3.

Limitation of Liability **14.6** Except as provided otherwise in these Conditions, neither Party shall be liable to the other Party for loss of use of any Works, loss of profit, loss of any Contract or any other indirect or consequential loss or damage which may be suffered by the other Party in connection with the Contract. The total liability of the Contractor to the Employer under the Contract shall not exceed the Contract Price. Except that this Sub-clause shall not limit the liability of the Contractor:

a. under Sub-clauses 4.18, 4.19, 5.7, 8.6, and Clauses 7.10 and 7.11

b. under any other provisions of the Contract which expressly impose a greater liability,

c. in cases of fraud, willful misconduct or illegal or unlawful acts, or

d. in cases of acts or omissions of the Contractor which are contrary to the most elementary rules of diligence which a conscientious Contractor would have followed in similar circumstances.

15 NSURANCE

Professional Indemnity Insurance **15.1** The Contractor shall effect and maintain Professional Indemnity Insurance, preferably in the name of NMRC, for the amount in Indian Rupees stipulated in Appendix to the Form of Tender in respect of any design of the Works to be carried out by, or on behalf of the Contractor. This insurance, which shall ensure the Contractor's liability by reason of professional negligence and errors in the design of the Works, shall be valid from the date of commencement of Works, until 5 years after the date of issue of Performance Certificate. Alternatively the Contractor shall renew the insurance before the expiry of the Yearly Insurance in such a way that the entire validity period is covered**.**

The Engineer will not issue Final Payment Certificate until the Contractor has produced evidence that coverage of the Professional Indemnity Insurance has been provided for the aforesaid period.

Insurance for **15.2** The Contractor shall insure the Plant, Rolling stock, Materials and Works

Works and Contractor's Equipment

in the joint names of the Employer, the Contractor and Sub-contractors (wherever applicable) against all loss or damage. This insurance shall cover loss or damage from any cause other than the Employer's risks listed in Sub-clause 14.3 sub paragraphs (a), (b), (d) and (e). Such insurance shall be for a limit of not less than the full replacement cost (including profit) and shall also cover the costs of demolition and removal of debris. Such insurance shall be in such a manner that the Employer and the Contractor are covered from the commencement date until the date of issue of the Taking Over Certificate for the whole of Works. However for the Works having multiple Sections / Parts in one Contract, such insurance shall be in such a manner that the Employer and the Contractor are covered from the commencement date until the date of issue of the Taking over Certificate for respective Part of Works. The Contractor shall extend such insurance to provide cover until the date of issue of the Performance Certificate, for loss or damage for which the Contractor is liable arising from a cause occurring prior to the issue of the Taking Over Certificate, and for loss or damage occasioned by the Contractor or Sub-contractors in the course of any other operations (including Clauses 7.10, 7.11and 10).

The Contractor shall insure the Contractor's Equipment against all risks in the joint names of the Employer, the Contractor and Sub-contractors, (wherever applicable) against all loss or damage. This insurance shall cover loss or damage from any cause other than the Employer's risks listed in Sub-clause 14.3 sub- paragraphs (a), (b), (d) and (e). Such insurance shall be for a limit of not less than the full replacement value (including delivery to Site). Such insurance shall be in such a manner that each item of equipment is insured while it is being transported to the Site and throughout the period it is on or near the Site.

Insurance against injury to Persons and Damage to Property **15.3**

The Contractor shall insure against liability to third Parties in the joint names of the Employer, the Contractor and Sub-contractors, (wherever applicable) for any loss, damage, death or bodily injury which may occur to any physical property (except things insured under Sub-clause 15.2) or to any person (except persons insured under Sub-clause 15.4), which may arise out of the performance of the Contract and occurring before the issue of the Performance Certificate. Such insurance shall be at least for the amount specified in the Appendix to Form of Tender. The contractor would obtain waiver of right of subrogation from the insurer on the aforesaid policies of insurance.

Insurance for Workers **15.4**

The Contractor shall effect and maintain insurance against losses and claims arising from the death or injury to any person employed by the Contractor or any Sub-contractor (wherever applicable) in such a manner that the Employer and the Engineer are indemnified under the policy of insurance. For Sub-contractor's employees (wherever applicable), such insurance may be effected by the Sub- contractor, but the Contractor shall be responsible for compliance with this Clause.

General Requirements for Insurances **15.5**

The Contractor shall, within the respective periods stated in the Appendix to Form of Tender (calculated from the Commencement Date), submit to the Employer:

a. evidence that the insurances described in this Clause have been effected, with an Indian Insurance Company and

b. copies of the policies for the insurances described in Sub-clause

15.2, 15.3 and 15.4.

When each premium has been paid, the Contractor shall submit copy of receipts to the Employer. The Contractor shall also, when providing such evidence, policies and receipts to the Employer, notify the Engineer of so doing.

The Contractor shall effect all insurances for which he is responsible with insurers and in terms approved by the Employer. The Contractor would obtain waiver of right of subrogation from the insurer on the aforesaid policies of insurance. Each Policy insuring against loss or damage shall provide for payments to be made in the currencies required to rectify such loss or damage. Payments received from insurers shall be used for the rectification of such loss or damage.

The Contractor (and, if appropriate, the Employer) shall comply with the conditions stipulated in each of the Insurance Policies. The Contractor shall make no material alteration to the terms of any insurance without the prior approval of the Employer. If an insurer makes (or purports to make) any such alteration, the Contractor shall notify the Employer immediately.

If the Contractor fails to effect and keep in force any of the insurances required under the Contract, or fails to provide satisfactory evidence, policies and receipts in accordance with this Sub-clause, the Employer may, without prejudice to any other right or remedy, effect insurance for the coverage relevant to such default, and pay the premiums due. In such cases the premium paid by the Employer plus overheads (equal to 50% of the premium paid) shall be recoverable from the Contractor by the Employer, and may be deducted by the Employer from any monies due, or to become due, to the Contractor or recover the same as debt due from the Contractor. The Contractor shall not dispute the amount of premium paid by the Employer or the overhead charges thereon.

Nothing in this clause limits the obligations, liabilities or responsibilities of the Contractor or the Employer, under the other terms of the Contract or otherwise. Any amount not insured or not recovered from the insurers shall be borne by the Contractor.

The Contractor shall submit to the Engineer, the details of all claims made with the insurer and claims accepted by the insurer or any other details as required by the Engineer on monthly basis.

The Employer would be entitled to deduct from the Contract price, the premium of Insurance Policies which have not been paid or the premium of the Insurance Policies which have not been taken by the Contractor, in breach of the Contract conditions.

16 FORCE MAJEURE

Definition of Force Majeure

16.1 In this Clause, "Force Majeure" " means an event beyond the control of the Employer and the Contractor, which makes it impossible or illegal for a Party to perform, including but not limited to:

a. act ofGod;

b. war, hostilities (whether war be declared or not), invasion, act of foreign enemies, mobilization, requisition, or embargo;

c. rebellion, revolution, insurrection, or military or usurped power, or civil war;

d. contamination by radio-activity from any nuclear fuel, or from any nuclear waste from the combustion of nuclear fuel, radio-active toxic explosive, or other hazardous properties of any explosive nuclear assembly or nuclear component of such an assembly;

e. riot, commotion or disorder, unless solely restricted to employees of the Contractor or of his Sub-contractors currently or formerly engaged on the Works.

If a Party considers that it may be affected by Force Majeure, the party shall promptly notify the other Party and Engineer of such Force Majeure within 21 days of such occurrence. If neither Party issues any notice regarding the event within 21 days of its occurrence, the said event shall be deemed not to have occurred and the Contract shall continue to have no effect as such.

Effect of Force Majeure Event **16.2** Neither the Employer nor the Contractor shall be considered in default or in Contractual breach to the extent that performance of obligations is prevented by a Force Majeure event which arises after the date of Notice to Proceed. Upon the occurrence of such Force Majeure, the affected Party shall endeavour to continue to perform its obligations as far as reasonably practicable.

Contractor's Responsibility **16.3** If affected by such Force Majeure, the Contractor shall promptly notify the Engineer of any proposals for overcoming the consequences of the Force Majeure, including any reasonable alternative means for performance, but shall not carry out these proposals without the consent of the Engineer.

Employer's Responsibility **16.4** If affected by such Force Majeure, the Employer shall promptly notify the Engineer and the Contractor of any proposals for overcoming the consequences of the Force Majeure.

Payment to Contractor **16.5** If the Works shall suffer loss or damage due to such Force Majeure, the Contractor shall be entitled to have included, in an Interim Payment Certificate, the Cost of Work executed in accordance with the Contract.

Resumption of Work **16.6** The obligations under the Contract shall be resumed as soon as practicable after the event has come to an end or ceased to exist.

In case of doubt or dispute, whether a particular occurrence should be considered an "event" as defined under this Clause, the decision of the Engineer shall be final and binding.

Works that have already been measured shall be paid for by the Employer even if the same is subsequently destroyed or damaged as a result of the event. The cost of rebuilding or replacing any Work that has been measured shall be borne by the Employer.

Optional Termination, Payment and Release **16.7** Irrespective of any extension of time, if a Force Majeure occurs and it's effect continues for a period of 6 months, after notice has been given under Sub- clause 16.1, either Party may give to the other party a notice of termination of the Contract which shall take effect in 28 days after the notice is given. Unless at the end of 28 days period the effect of the Force Majeure has ceased, the Contract shall terminate upon that date. Otherwise, the Contract shall remain in effect.

The Contractor shall be paid fully for the Work done under the Contract, but not for any defective Work or Work done which has been destroyed

or damaged before its measurement. The Employer shall have the option to take over any Plant, Rolling Stock and Materials lying at site, at rates provided for in the Contract, failing that, as per rates, which are determined to be fair and reasonable by the Engineer.

Release from Performance Under the Law **16.8** If under the law of the Contract, the Employer and the Contractor are released from further performance, the sum payable by the Employer to the Contractor shall be the same as would have been payable under Sub-clause 16.7, if the Contract had been terminated under that Sub-clause.

17 CLAIMS, DISPUTES, CONCILIATION AND ARBITRATION

Procedure for Claims **17.1** **Procedure for Claims**

If the Contractor intends to claim any additional payment under any Clause of these Conditions or otherwise, the Contractor shall give notice to the Engineer as soon as possible and in any event within 28 days of the start of the event giving rise to the claim. The Contractor shall also submit any other notices which are required by the Contract, and supporting particulars for the claim, all as relevant to such event or circumstance.

The Contractor shall keep such contemporary records as may be necessary to substantiate any claim, either on the Site or at any other location acceptable to the Engineer. Without admitting the Employer's liability, the Engineer shall on receipt of such notice, inspect such records, monitor the record-keeping and/or may instruct the Contractor to keep further contemporary records. The Contractor shall permit the Engineer to inspect all such records, and shall (if instructed) submit copies to the Engineer.

Within 28 days of such notice, or such other time as may be agreed by the Engineer, the Contractor shall send to the Engineer a fully detailed claim which includes full supporting particulars of the basis of the claim and additional payment claimed. If the event or circumstance giving rise to the claim has a continuing effect:

a. this fully detailed claim shall be considered as interim;

b. the Contractor shall send further interim claims at monthly intervals, giving the accumulated amount claimed, and such further particulars as the Engineer may reasonably require; and

c. the Contractor shall send a final claim within 28 days after the end of the effects resulting from the event or circumstance, or within such other period as may be proposed by the Contractor and approved by the Engineer.

If the Contractor fails to comply with this Sub-clause, he shall not be entitled to claim any additional payment.

Payment for Claims **17.2** The Contractor shall be entitled to have included in any Interim Payment Certificate such amount for any claim as the Engineer considers due, after taking approval from the Employer. If the particulars supplied are insufficient to substantiate the whole of the claim, the Contractor shall be entitled to payment for such part of the claim as has been substantiated.

No legal action Till Dispute Settlement Procedure is **17.3** Any and all Disputes shall be settled in accordance with the provisions of Clause 17. No action at law concerning or arising out of any Dispute shall be commenced unless and until all applicable Dispute resolution procedures set out in Clause 17 shall have been finally exhausted in

Exhausted

relation to that Dispute or any Dispute out of which that Dispute shall have arisen with which it may be or may have been connected.

Notice of Dispute **17.4**

For the purpose of Sub-clause 17.5, a Dispute shall be deemed to arise when one Party serves on the other Party a notice in writing (hereinafter called a "Notice of Dispute") stating the nature of the Dispute provided that no such notice shall be served later than 28 days after the date of issue of Performance Certificate by the Engineer.

Two Stages for Dispute Resolution **17.5**

es shall be settled through two stages:

a. Conciliation procedures as established by "The Arbitration and Conciliation Act-1996" & amended by the Arbitration & Conciliation (Amendment) Act, 2019 and any statutory modification or re-enactment thereof and in accordance with this Clause. In the event, this procedure fails to resolve the Dispute then;

b. Arbitration procedures undertaken as provided by "The Arbitration and Conciliation Act -1996" & amended by the Arbitration & Conciliation (Amendment) Act, 2019 and any statutory modification or re-enactment thereof and in accordance with this Clause.

Conciliation **17.6**

Within 60 days of receipt of Notice of Dispute, either party shall refer the matter in dispute to Conciliation.

Conciliation proceedings shall be initiated within 30 days of one Party inviting the other in writing to Conciliation. Conciliation shall commence when the other Party accepts in writing this invitation. If the invitation is not accepted then Conciliation shall not take place. If the Party initiating Conciliation does not receive a reply within 30 days from the date on which he sends the invitation, he may elect to treat this as a rejection of the invitation to conciliate and inform the other Party accordingly.

The Conciliation shall be undertaken by one Conciliator selected from a panel of Conciliators maintained by the Employer. The Conciliator shall assist the Parties to reach an amicable settlement in an independent and impartial manner.

Conciliation Procedure **17.7**

The Employer shall maintain a panel of Conciliators, who shall be from serving or retired Engineers of Government Departments, or of Public Sector Undertakings. Out of this panel, a list of three Conciliators shall be sent to the Contractor who shall choose one of them to act as Conciliator and conduct Conciliation proceedings in accordance with "The Arbitration and Conciliation Act, 1996" of India & amended by the Arbitration & Conciliation (Amendment) Act, 2019 and any statutory modification or re-enactment thereof.

There will be no objection if Conciliator so nominated is a serving employee of NMRC who would be Deputy HOD level officer and above.

The Employer and the Contractor shall in good faith co-operate with the Conciliator and, in particular, shall endeavor to comply with requests by the Conciliator to submit written materials, provide evidence and attend meetings.

Each Party may, on his own initiative or at the invitation of the Conciliator, submit to the Conciliator suggestions for the settlement of the dispute.

When it appears to the Conciliator that there exist elements of a settlement which may be acceptable to the Parties, he shall formulate the terms of a possible settlement and submit them to the Parties for their observations. After receiving the observations of the Parties, the Conciliator may reformulate the terms of a possible settlement in the light

of such observations.

If the Parties reach agreement on a settlement of the dispute, they may draw up and sign a written settlement agreement. If requested by the Parties, the Conciliator may draw up, or assist the Parties in drawing up, the settlement agreement. When the Parties sign the Settlement Agreement, it shall be final and binding on the Parties and persons claiming under them respectively.

The Conciliator shall authenticate the Settlement Agreement and furnish a copy thereof to each of the Parties. As far as possible, the Conciliation proceedings should be completed within 60 days of the receipt of notice by the Conciliator.

The Parties shall not initiate, during the Conciliation proceedings, any arbitral or judicial proceedings in respect of a dispute that is the subject matter of the Conciliation proceedings.

Termination of Conciliation Proceedings **17.8** The Conciliation proceedings shall be terminated:

a. by the signing of the Settlement Agreement by the Parties on the date of agreement; or

b. by written declaration of the Conciliator, after consultation with the Parties, to the effect further efforts at Conciliation are no longer justified, on the date of declaration; or

c. by a written declaration of the Parties to the Conciliator to the effect that the Conciliation proceedings are terminated, on the date of declaration; or

d. by a written declaration of a Party to the other Party and the Conciliator, if appointed, to the effect that the Conciliation proceedings are terminated, on the date of declaration.

on termination of the Conciliation proceedings, the Conciliator shall fix the costs of the Conciliation and give written notice thereof to the Parties. The costs shall be borne equally by the Parties unless Settlement Agreement provides for a different apportionment. All other expenses incurred by a Party shall be borne by that Party.

Arbitration **17.9** If the efforts to resolve all or any of the disputes through Conciliation fails, then such disputes or differences, whatsoever arising between the Parties, arising out of touching or relating to construction/ manufacture, measuring operation or effect of the Contract or the breach thereof shall be referred to Arbitration in accordance with the following provisions:

a. Only such dispute(s) or difference(s) in respect of which notice has been made under Clause 17.1 but could not be settled through Conciliation, together with counter claims or set off, given by the Employer, shall be referred to Arbitration. Other matters shall not be included in the reference.

b. The Arbitration proceedings shall be assumed to have commenced from the day, a written and valid demand for Arbitration is received by Managing Director, Noida Metro Rail Corp. Rail Limited, Noida (MD/NMRC).

c. The disputes so referred to Arbitration shall be settled in accordance with the Indian Arbitration & Conciliation Act, 1996 & amended by the Arbitration & Conciliation (Amendment) Act, 2019 and any statutory modification or re-enactment thereof.

Further, it is agreed between the Parties as under:

17.9.1 of Arbitrators: The Arbitral Tribunal shall consist of:

i. Sole Arbitrator in cases where the total value of all claims in question added together does not exceed `2.00 crores;

i. 3 (Three) Arbitrators in all other cases.

17.9.2 Procedure for Appointment of Arbitrators: The Arbitrators shall be appointed as per following procedure:

i. In case of Sole Arbitrator: Within 60 days from the day when a written and valid demand for Arbitration is received by MD/NMRC, the Employer will forward a panel of 03 names to the Contractor. The Contractor shall have to choose one Arbitrator from the panel of three, to be appointed as Sole Arbitrator within 30 days of dispatch of the request by the Employer. In case the Contractor fails to choose one Arbitrator within 30 days of dispatch of the request of the Employer then MD/NMRC shall appoint any one Arbitrator from the panel of 03 Arbitrators, as sole Arbitrator.

i. In case of 3 Arbitrators:

a. Within 60 days from the day when a written and valid demand for Arbitration is received by MD/NMRC, the Employer will forward a panel of 5 names to the Contractor. The Contractor will then give his consent for any one name out of the panel to be appointed as one of the Arbitrators within 30 days of dispatch of the request by the Employer.

b. Employer will decide the second Arbitrator. MD/NMRC shall appoint the two Arbitrators, including the name of one Arbitrator for whom consent was given by the Contractor, within 30 days from the receipt of the consent for one name of the Arbitrator from the Contractor. In case the Contractor fails to give his consent within 30 days of dispatch of the request of the Employer then MD/NMRC shall nominate both the Arbitrators from the panel.

c. The third Arbitrator shall be chosen by the two Arbitrators so appointed by the Parties out of the panel of 05 Arbitrators provided to Contractor or from the larger panel of Arbitrators to be provided to them by Employer at the request of two appointed Arbitrators (if so desired by them) and who shall act as Presiding Arbitrator. In case of failure of the two appointed Arbitrators to reach upon consensus within a period of 30 days from their appointment date, then, upon the request of either or both Parties, the Presiding Arbitrator shall be appointed by the Managing Director / NMRC, NOIDA.

d. If one or more of the Arbitrators appointed as above refuses to act as Arbitrator, withdraws from his office as Arbitrator, or vacates his/their office/offices or is/are unable or unwilling to perform his functions as Arbitrator for any reason whatsoever or dies or in the opinion of the MD/NMRC fails to act without undue delay, the MD/NMRC shall appoint new Arbitrator /Arbitrators to act in his/their place except in case of new Presiding Arbitrator who shall be chosen following the same procedure as mentioned in para (ii)(c) above. Such re-constituted Tribunal may, at its discretion, proceed with the reference from the stage at which it was left by the previous Arbitrator(s).

e. The Employer at the time of offering the panel of Arbitrator(s) to be appointed as Arbitrator shall also supply the information with regard to the qualifications of the said Arbitrators nominated in the panel along with their professional experience, phone nos. and addresses to the Contractor.

17.9.3 Qualification and Experience of Arbitrators (to be appointed as per Sub-clause 17.9.2 above): The Arbitrators to be appointed shall have

minimum qualification and experience as under:

Arbitrator shall be;

a Working / Retired Officer (not below E-8 grade in a PSU with which NMRC has no business relationship) of any discipline of Engineering or Accounts / Finance department, having experience in Contract Management of Construction Contracts; or a Retired Officer (retired not below the SAG level in Railways) of any Engineering Services of Indian Railways or Indian Railway Accounts Service, having experience in Contract Management of Construction Contracts; or a Retired Officer who should have retired more than 3 years previously from the date of appointment as Arbitrator (retired not below E-8 grade in NMRC or a PSU with which NMRC has a business relationship) of any Engineering discipline or Accounts / Finance department, having experience in Contract Management of Construction Contracts or retired judge of any High Court or Supreme Court of India or reputed Chartered Accountant & should be member of ICAI, New Delhi. No person other than the persons appointed as per above procedure and having above qualification and experience shall act as Arbitrator.

17.9.4 No new claim shall be added during proceedings by either Party. However, a Party may amend or supplement the original claim or defence thereof during the course of Arbitration proceedings subject to acceptance by Tribunal including having due regard to the delay in making it.

17.9.5 Neither Party shall be limited in the proceedings before such Arbitrator(s) to the evidence nor did arguments put before the Engineer for the purpose of obtaining his decision. No decision given by the Engineer in accordance with the foregoing provisions shall disqualify him from being called as a witness and giving evidence before the Arbitrator(s) on any matter, whatsoever, relevant to dispute or difference referred to Arbitrator/s. Neither Party shall be limited in the proceedings before such Arbitrators to the evidence nor did arguments previously put before during settlement through Conciliation proceedings.

17.9.6 It is agreed by both the Parties that in the cases where Arbitral Tribunal is consist of Sole Arbitrator, their disputes shall be resolved by fast track procedure specified in sub-section (3) of 29B of the Arbitration and Conciliation (Amendment) Act , 2019 or as amended up to date.

17.9.7 If the Contractor(s) does/do not prefer his/their specific and final claims in writing, within a period of 90 days of receiving the intimation from the Employer/Engineer that the final bill is ready for signature of the Contractor(s), he/they will be deemed to have waived his/their claim(s) and the Employer shall be discharged and released of all liabilities under the Contract in respect of these claims.

17.9.8 Arbitration proceedings shall be held at NOIDA, UP, India and the language of the Arbitration proceedings and that of all documents and communications between the Parties shall be in English.

17.9.9 The Arbitral Tribunal should record day to day proceedings. The proceedings shall normally be conducted on the basis of documents and written statements. All Arbitration awards shall be in writing and shall state item wise, the sum and detailed reasons upon which it is based. A modelTime Schedule for conduct of Arbitration proceedings in a period of 180 days / 365 days will be made available to Arbitral Tribunal for their guidance. Both the Parties should endeavor to adhere to time schedule for early finalization of Award.

17.9.10 The award of the Sole Arbitrator or the award by majority of three Arbitrators as the case may be shall be binding on all Parties. Any ruling on award shall be made by a majority of members of Tribunal. In the absence of such a majority, the views of the Presiding Arbitrator shall prevail.

17.9.11 A Party may apply for correction of any computational errors, any typographical or clerical errors or any other error of similar nature occurring in the award of a Tribunal and interpretation of specific point of award to Tribunal within 60 days30 days of the receipt of award.

17.9.12 A Party may apply to Tribunal within 60 days30 days of receipt of award to make an additional award as to claims presented in the Arbitral proceedings but omitted from the Arbitral award.

Interest on Arbitration Award **17.10** Where the Arbitral award is for the payment of money, no interest shall be payable on whole or any part of the money for any period, till the date on which the award is made.

Cost of Conciliation/ Arbitration **17.11** The fees and other charges of the Conciliator / Arbitrators shall be as per the scales fixed by the Employer from time to time irrespective of the fact whether the Arbitrator(s) is / are appointed by the Employer or by the Court of law unless specifically directed by Hon'ble Court otherwise on the matter, and shall be shared equally by the Employer and the Contractor. However, the expenses incurred by each Party in connection with the preparation, presentation will be borne by itself.

Jurisdiction of Courts **17.12** Where recourse to a Court is to be made in respect of any matter, dispute, issue arising out of or under the Contract or connected with the Contract the Appropriate court at NOIDA/UP876809aZX shall have the exclusive jurisdiction to try all disputes issues, dispute arising out of or under the Contract or connected with the Contract between the Parties.

Suspension of Work on Account of Arbitration **17.13** The reference to Conciliation / Arbitration shall proceed not withstanding that the Works shall not then be or be alleged to be complete, provided always that the obligations of the Employer, Engineer and the Contractor shall not be altered by reasons of Arbitration being conducted during the progress of the Works. Neither Party shall be entitled to suspend the Work or part of the Work to which the dispute relates on account of Arbitration and payments to the Contractor shall continue to be made in terms of the Contract.

18 SERVICE OF NOTICES

Notice to Contractor **18.1** a. All notices to the Contractor shall be served by post or telex or telefax or e-mail or by hand to the Contractor or his authorized Representatives. In case of notices delivered by post, they will be deemed to have been delivered after 7 days of dispatch.

b. The Contractor shall, on award of the Contract, furnish to the Engineer, the name, designation, address and telephone, telex and telefax numbers and e-mail address of his representative referred to in Clause 4.3.

Notice to Employer and Engineer **18.2** All notices to the Employer or Engineer shall be served by post or telex or telefax, or by e-mail or by delivering by hand to the address nominated for the purpose.

Change of Address **18.3** Parties to the Contract may change the nominatedtheir address by Employer with a notice to all concerned.

NOIDA METRO RAIL CORPORATION (NMRC) LIMITED

CONTRACT NO: NGNC-01

E Tender No.: NMRC/Civil/NGNC/123/2020

TENDER DOCUMENTS

VOLUME 2

SPECIAL CONDITIONS OF CONTRACT (SCC)

Noida Metro Rail Corporation (NMRC) Limited
Block-III, 3rd Floor, Ganga Shopping Complex, Sector-29, Noida -201301,
District Gautam Budh Nagar, Uttar Pradesh, India

Table of Contents
Special Conditions of Contract (SCC)

1 Sub-Clause 1.4 Contract Agreement

The Form of Contract Agreement shall be in the format given in Schedule 2 to these Special Conditions of Contract.

2 Sub-Clause 3.2 Functions of Engineer

In addition to the duties mentioned in Clause 3.2 of General Conditions of Contract:

(i) shall watch and inspect the Works, monitor the test results and examine any material to be used and workmanship employed by the Contractor in connection with the Works;

(ii) shall carry out such duties and exercise such powers vested in the Engineer in accordance with the provisions of the Contract;

(iii) shall issue instructions which in his opinion are necessary for the execution of the Works; and

(iv) may issue any other instruction which in his opinion is desirable in connection with the Works.

In case The Engineer is employee of any agency hired by the Employer, the Engineer shall take the approval of the Employer for all technical and financial matters otherwise he shall be deemed to have taken the approval of the Employer.

3 Sub-Clause 4.2.4 Guarantees, Warranties and Undertakings

The forms of Contractor warranty shall be in the format given in the Schedule-1 of these Special Conditions of Contract.

4 Sub-Clause 4.5 Sub-Contractors

The sub-contracting, excluding design work shall be limited to 50% of the Contract Value. The value of a sub-contract, other than for Design work as when awarded, should be intimated by the Contractor to the Engineer and it should also be certified that the cumulative value of the sub-contracts awarded so far is within the aforesaid limit of 50%. A copy of the contract between the Contractor and Sub-Contractor shall be given to the Engineer within 15 days of signing and in any case 7 days before the Sub Contractor starts the Work and thereafter the Contractor shall not carry any modification without the consent in writing of the Engineer. The terms and conditions of sub-contracts and the payments that have to be made to the sub-contractors shall be the sole responsibility of the Contractor. Payments to be made to such sub-contractors will be deemed to have been included in the Contract price. However, for major sub-contracts (each costing over Rs. Five Million), it will be obligatory on the part of the Contractor to obtain consent of the

Employer. The Employer will give his consent after assessing and satisfying himself of the capability, experience and equipment resources of the sub-contractor. In case the Employer intends to withhold his consent, he should inform the Contractor within 15 days to enable him to make alternative arrangements to fulfil his programme.

The Contractor shall provide sufficient superintendence, whether on the site or elsewhere, to ensure that the work to be carried out by a sub-contractor complies with the requirements of the Contract.

In the case of sub-contracts for electrical and mechanical works, which the Contractor intends to procure on the basis of outline design, design briefs and performance specification, the Contractor shall, prior to inviting tenders from sub-contractors, submit such documents to the Engineer for review.

The proposed sub-contract terms and conditions shall impose on the sub-contractor such terms of the Contract as are applicable and appropriate to the part of the Works to be sub-contracted, to enable the Contractor to comply with his obligations under the Contract.

Notwithstanding any consent to sub-contract given by the Engineer, if in his opinion it is consider necessary, the Engineer shall have full authority to order the removal of any sub-contractor from the Site or off-Site place of manufacture or storage.

5 **Sub-Clause 4.9 Site Data**

The Geotechnical and other related data provided by the Employer are based on the investigation conducted by NMRC and are for reference purposes only. The Tenderer should satisfy himself with the data furnished and make his own investigations if required for submitting his offer. Any change in design or construction methodology later during execution on account of change will be borne by the Contractor.

The Contractor shall not be relieved from any risk or obligation imposed on or undertaken by him under the Contract on any such ground or on the ground that he did not or could not foresee any matter which may affect or have affected the execution of the Works, or compliance with his other obligations under the Contract.

6 **Sub-Clause 4.11 Access Route**

All operations for the execution of the Works shall be carried out so as not to interfere unnecessarily with the convenience of the public or the access to public or private roads or footpaths or properties owned by the Employer or by any other person.

The Contractor shall select routes, choose and use vehicles so that movement of Contractor's Equipment, Plant and Materials from and to the Site is limited so that traffic is not delayed and damage to highways and bridges is prevented. If there is any delay or damage or injury, the cost of rectification or reconstruction of highways or bridges shall be borne by the Contractor. The Contractor shall indemnify the Employer in respect of all claims, demands, proceedings, damages, costs, charges and expenses what so arising out of or in relation to any such matters.

If during the execution of the Works the Contractor shall receive any claim arising out of the execution of the Works in respect of damage to highways or bridges, he shall immediately report the facts to the Engineer. The Contractor shall negotiate a settlement in respect of such claims and indemnify the Employer in respect of all claims, proceedings, damages, costs, charges and expenses in relation thereto.

7 **Sub-Clauses 4.13 Programmes**

The Contractor shall prepare and submit his detailed Programme of Work so as to achieve key dates of various activities. The Contractor shall complete the work in a phased manner fixing priorities to the different stretches of the work to give access to other interfacing contracts as per the requirement of project from time to time.

The Engineer on receipt of a programme shall inform the Contractor in writing within 21 days after receipt of the above information;

(a) that the programme has received his consent; or

(b) that the programme is rejected, in which case reasons for such rejection shall be given; or

(c) that further information is required to clarify or substantiate the programme or to satisfy the Engineer as to its reasonableness, or

(d) that the programme has received his consent subject to incorporation of comments attached to the Notice of No Objection.

Provided that if none of the above actions is taken within the 30 day period, the Engineer shall be deemed to have given consent to the programme submitted.

The Contractor shall, within 21 days of receiving notification under sub-paragraphs (c) or (d) above, provide further information requested or the programme shall be deemed to have been rejected. The Engineer shall, within 21 days of receipt of such further information, either reject the programme or give his consent.

In the event of a programme being rejected, or deemed to have been rejected, the Contractor shall, within 21 days thereafter, submit a revised programme taking account of the reasons given for the rejection or incorporating further information requested by the Engineer, as the case may be.

The Contractor, following receipt of consent to the Works Programme, may at any time, submit to the Engineer an amended version. In the event that the Engineer grants an extension of time, instructs an Employer's Variation, or on the occurrence of any event or happening or situation, which could materially affect the progress of the Works, the Contractor shall submit a revised programme to the Engineer for his consent.

If the Engineer feels that there is a significant deviation between the actual or anticipated progress of the Works and the Works programme, the Engineer may require the Contractor to submit a revised/modified programme to ensure timely completion of Whole of Works or a Key Date or a milestone. The Contractor shall submit such revised programme within 14 days of the Employer's Representative's instruction or within such other time as the Employer's Representative will allow in writing.

Unless and until an amended version has the consent of the Engineer, the existing programme shall remain as the Works Programme for all purposes of the Contract.

Consent by the Engineer to a Works Programme shall not relieve the Contractor of any of his duties or responsibilities under the Contract, nor in the event that a Works Programme indicates that a Key Date has not or will not be met, constitute any form of acknowledgement that the Contractor is or may be entitled to an extension of time in relation to such Key Date or a Mile Stone.

Design Submission Programme

The Contractor shall submit to the Engineer, the Design Submission Programme and updated versions thereof in the form and content and at the times prescribed in the Contract, including the dates on which major decisions should be made.

In the second and subsequent submissions of the Design Submission Programme, the Contractor shall not, without the prior written consent of the Engineer:

(a) revise the description or content of any design package identified in the initial version of Design Submission Programme;

(b) reduce the periods provided for review by the Engineer of any submission of Design Data as set out in the initial version of the Design Submission Programme;

(c) revise the sequence of submissions of Design Data shown in the initial version of the Design Submission Programme.

Any amendment of the Design Submission Programme in breach of the above requirements shall have no effect whatsoever under the Contract.

Manufacture, Installation and Construction Methods

The Contractor shall submit complete documents and information pertaining to the methods of manufacture, installation and construction which the Contractor proposes to adopt or use, (and if applicable such calculations of stresses, strains and deflections and the like that will or may arise in the Works or to the other works comprising the Project or any parts thereof during installation from the use of such methods). The Engineer will then check to see whether, if such methods are adhered to, the Works can be executed in accordance with the Contract and without detriment to the Works (when completed) and to other works comprising the Project and in a manner which minimises disruption to road and pedestrian traffic.

The Engineer shall inform the Contractor in writing within 21 days after receipt of the above information;

(a) that the Contractor's proposed methods of manufacture, installation and construction have the consent of the Engineer; or

(b) in what respects, in the opinion of the Engineer the Contractor's proposed methods of manufacture, installation and construction:

  (i) fail to comply with the Employer's Requirements and/or the Definitive Design and/or the Final Design;

  (ii) would be detrimental to the Works and/or to the other works comprising the Project;

  (iii) do not comply with the other requirements of the Contract; or

(c) as to the further documents or information which are required to enable the Engineer to properly assess the proposed methods of manufacture, installation and construction.

In the event that the Engineer does not give his consent, the Contractor shall take such steps or make such changes in the said methods or supply such further documents or information as may be necessary to meet the Engineer’s requirements and to obtain his consent. The Contractor shall not change the methods of manufacture, installation and construction which have received the Engineer’s consent without further review and consent in writing of the Engineer.

Notwithstanding the foregoing provisions of this Clause, or that certain of the Contractor's proposed methods of manufacture, installation and construction may be the subject of the consent of the Engineer, the Contractor shall not be relieved of any liability

or obligation under the Contract.

8 Sub-Clauses 4.16 and 6.7 Safety Precautions

Within 8 weeks of the date of Notice to Proceed, the Contractor shall submit a detailed and comprehensive contract-specific Site Safety & Health Plan based on the Conditions of contract on Safety & Health and Environment. The Contractor is required to make himself aware of all the requirements of the Conditions of contract on Safety & Health and Environment in this regard and comply with them. The Site Safety & Health Plan shall include detailed policies, procedures and regulations which, when implemented, will ensure compliance with Sub-Clauses 4.16 and 6.7 of General Conditions of Contract.

The Contractor shall, from time to time and as necessary or required by the Engineer, produce supplements to the Site Safety & Health Plan such that it is at all times a detailed, comprehensive and contemporaneous statement by the Contractor of his site safety and health obligations, responsibilities, policies and procedures (under the laws of India) or as stated in the Contract or elsewhere relating to work on Site.

If at any time the Site Safety & Health Plan is, in the opinion of the Engineer, insufficient or requires revision or modification to ensure the security of the Works and the safety of all workmen upon, and visitors to the Site, the Engineer may instruct the Contractor to revise the Site Safety & Health Plan. The Contractor shall, within 14 days, submit the revised plan to the Engineer for review.

Any omission, inconsistency or error in the Site Safety & Health Plan or the Engineer concurrence or rejection of the Site Safety & Health Plan and/or supplements thereto shall be without prejudice to the Contractor's obligations with respect to site safety and health and shall not excuse any failure by the Contractor to adopt proper and recognised safety practices throughout the execution of the Works.

The Contractor shall adhere to the Site Safety & Health Plan and shall ensure, that all sub-contractors of all tiers have a copy of the Site Safety & Health Plan and comply with its provisions.

The obligations and requirements for safety and health under this Contract are entirely without prejudice to, and do not

derogate from, the Contractor's statutory obligations, with respect to safety and health.

9 Sub-Clause 4.17 Protection of the Environment

Outline Environmental Plan means the environmental plan forming part of the Tender, setting out, in summary form, the Contractor's proposed means of complying with his obligations in relation to environmental quality. Site Environmental Plan means the site environmental plan including all supplements thereto, or any amended or varied version thereof, as submitted by the Contractor in accordance with Conditions of contract on Safety & Health and Environment and which has received the Engineer's consent. The Site Environmental Plan shall include detailed policies, procedures and regulations which, when implemented, will ensure compliance with this Clause. The Contractor is required to make himself aware of all the requirements of the Conditions of contract on Safety & Health and Environment, in this regard and comply with them.

Within 8 weeks of the date of the Notice to Proceed, the Contractor shall submit a detailed and comprehensive Site Environmental Plan based on the Conditions of contract on Safety & Health and Environment , and shall include such further material, which the Contractor considers necessary and relevant.

Upon the Engineer notifying his consent to the Site Environmental Plan, or any supplemental part thereof, the Contractor shall adhere to the principles and procedures contained in such document save to the extent that the Engineer may give his consent to any amended or varied version thereof.

The Contractor shall provide all necessary access, assistance and facilities to enable the Engineer and the Employer to monitor and conduct tests to verify that the Site Environmental Plan is being properly and fully implemented.

10 Sub-Clause 4.19 Employer Supplied Machinery and Materials

The Employer will not provide any machinery or materials under the Contract.

11 Sub Clause 4.27 Security of the Site

The Contractor shall take all measures necessary to ensure such security, including exercising control over all persons and vehicles which are employed or engaged on the Site or in connection with the Works or the other works comprising the Project and with the security arrangements applicable to any other site within the Project.

The Contractor shall arrange the issue of passes for the admission of all persons and vehicles to the Site or to any part thereof and may refuse admission to or remove from the Site any person or vehicle failing to show an appropriate pass on demand to any duly authorised person.

If required by the Engineer, the Contractor shall submit a list identifying all persons to whom passes have been issued together with two photographs of each person and all entities to which a pass has been issued in respect of any vehicle and shall satisfy the Engineer of the bonafides of any such person or entity.

The Contractor shall not, without the written permission of the Engineer or otherwise in accordance with the Contract, allow access to the Site to any person unless the presence on Site of such person is necessary in connection with the execution of the Works or with the discharge of the duties of any relevant authority.

The Contractor, after obtaining any necessary consent from any relevant authority, shall submit to the Engineer proposals showing the layout of pedestrian routes, lighting, signs, and guarding any road opening or traffic diversion which may be required in connection with the execution of the Works and which the Contractor intends to construct. Any consent given by the Engineer to such proposals shall not relieve the Contractor of any obligation under the Contract or absolve the Contractor from any liability for or arising from such proposals or the implementation thereof.

All lights provided by the Contractor shall be so placed or screened as not to interfere with signs, signals or lights. The Contractor shall not in any way obscure or affect signs, signals or lights, in use by any relevant authority. In the event that the Contractor does so, the Contractor shall pay all costs associated with the re-setting, re-instating or provision of alternatives for any sign, signal or light, obscured or affected.

For the purposes of this Clause only, "Site" shall include off-Site places of manufacture or storage and the Contractor's Work Areas and shall include, areas provided to the Contractor by others.

12 Sub- Clause 5.1 Special Requirements

The Design and Construction Standards shall be in conformity with the requirements of "Rules for Opening of a Railway or a

Section of a Railway for Public Carriage of Passengers" and "Rules for Introduction of New Type of Rolling Stock" and to the satisfaction of the Commissioner of Metro Railway Safety whose sanction is mandatory for commissioning of the System.

Technology Transfer

The Contractor shall provide the Transfer of Technology as stipulated in tender document. The Contractor shall use indigenous Materials to the maximum extent and shall use non-Indian substitutes only if Indian materials do not fit the requirements and/or are costlier.

13 Sub-Clause 5.3 Submission of Documents (Other than Design Data)

The Contractor shall submit drawings and documents, as required by the Contract, to the Engineer in accordance with any submittal schedule agreed with the Engineer. This submittal shall be made sufficiently before the Works are to be carried out to give the Engineer and the Employer reasonable time to examine the drawings or other documents, to prepare comments and for any changes to be accommodated by the Contractor.

Where the consent of the Engineer is required, the Engineer shall notify the Contractor in writing of his decision either within such period as may expressly be stipulated in the Contract or otherwise within a reasonable time.

If the Engineer has reasonable cause for being dissatisfied with the proposals set out in the Contractor's drawings or documents, the Engineer shall, within a period of 28 days from the date of submittal, require the Contractor in writing to make such amendments thereto as the Engineer may consider necessary. The Contractor shall make and be bound by such amendments at no additional expense to the Employer and shall resubmit the amended drawings or documents for Engineer's consent.

Within 14 days of notification of the Engineer's consent the Contractor shall provide the Engineer with the type and number of sets of the relevant drawings or documents as stipulated in the Employer's Requirement.

Should it be found at any time after notification of consent that the relevant drawings or documents do not comply with the Contract or do not agree with drawings or documents in relation to which the Engineer has previously notified his consent, the Contractor shall, at his own expense, make such alterations or additions as, in the opinion of the Engineer, are necessary to remedy such non-compliance or non-agreement and shall submit all such varied or amended drawings or documents for the consent of the Engineer.

No examination by the Engineer of the drawings or documents submitted by the Contractor, nor any consent of the Engineer in

relation to the same, with or without amendment, shall absolve the Contractor from any of his obligations under the Contract or any liability for or arising from such drawings or documents.

The Operation and Maintenance Manuals and drawings submitted by the Contractor shall, if required, be updated by him during the Defects Liability Period and re-submitted for review by the Employer's Representative.

Submission of Design Data

In the case of submissions subsequent to the Definitive Design, the Design Data shall be in accordance with Employer's Requirements and the Definitive Design.

The Contractor shall submit to the Engineer all Design Data, together with the relevant Design Certificates certified by the Contractor, on or before the respective dates for submission shown on the Design Submission Programme or, as the case may be, the Works Programme. In the event that a re-submission of Design Data is required, such re-submission shall be made as soon as practicable after the receipt of the relevant statement of objections.

All submissions of Design Data shall include the copies as stipulated in the Employer's Requirements.

Following receipt of a submission of Design Data the Engineer shall, within 28 days, return one copy of the Design Data to the Contractor, together with either a Notice of No Objection, or a statement of objections which shall identify the aspects of the Design Data which do not conform to the above requirements. If the Engineer returns any Design Data with a Notice of No Objection, the Contractor shall proceed with the Works in accordance with the Contract.

If the Engineer provides that revisions to a submission of Design Data are appropriate but that such revisions are of minor design significance, the Engineer may issue a Notice of No Objection subject to an appended schedule of comments identifying the relevant revisions. The Contractor shall revise such Design Data in accordance with such comments but shall not be obliged to re-submit such Design Data solely on account of such revisions.

If the Engineer returns any Design Data with a statement of objections the Contractor shall revise the Design Data to take account of the stated objections and re-submit such Design Data to the Engineer, together with new Design Certificates signed by the Designer and the Contractor.

The issue of a Notice of No Objection in relation to any submission of Design Data shall be entirely without prejudice to the review of subsequent submissions of Design Data or to any subsequent request for a Contractor's Variation, and shall not bind or fetter the Engineer in any manner whatsoever when

deciding whether or not to raise objections in relation to any subsequent submission of Design Data or when dealing with a subsequent request for a Contractor's Variation.

Neither an objection raised to the Design Data nor revisions of minor design significance under this Clause will, under any circumstances, constitute an Employer's Variation.

14 Sub-Clause 6 Staff and Labour

Training of contractor's Employees/Staff/Workers

As per Conditions of contract on Safety & Health and Environment .

15 Sub-Clause 6.7 Health and Safety

As per Conditions of contract on Safety & Health and Environment.

16 Sub-Clause 7 Quality Control

Within 28 days of the issue of the Notice to Proceed, the Contractor shall submit to the Engineer, for his consent, his proposed Site Quality Plan based on the Outline Quality Plan and the Employer's Requirements**.**

The quality manual should address the quality system as required by ISO 9001-2015. Any supplement to the Site Quality Plan shall be submitted at least 14 days before commencement of the relevant work.

Upon the Engineer notifying his consent to the Site Quality Plan, or any supplement thereto, the Contractor shall, adhere to the principles and procedures contained in such document, except where the Engineer gives his consent to any amended or varied version thereof. The Contractor shall cause any sub-contractors to adhere to this Plan.

The Contractor shall appoint a suitably qualified and experienced person, not otherwise engaged in the performance of the Contract, to act as manager of the quality assurance system and shall provide such other personnel and resources as required to ensure effective operation of the quality assurance system. The said manager shall carry out audits of the application of the quality assurance system, and ensure effective quality control and delivery of quality assurance.

The Contractor shall provide all necessary access, assistance and facilities to enable the Engineer to carry out surveillance visits both on and off the Site to verify that the quality assurance system is being properly and fully implemented. No extra

payment shall be made in this regard and the cost of the Work under this element shall be deemed to be included in the Contract Price.

17 Sub Clause 8.5 Liquidated damages for delay

The total contract value used in the GCC sub clause 8.5 for the purpose of levy of liquidated damages on failure to achieve key dates shall mean the 'Total Contract Price'**.**

18 Sub Clause 10.1 Defect liability period

The Defect liability period (DLP) shall be **52 weeks** after the date of issue of the latest Taking over Certificate for the whole of the works.

Work by persons other than the Contractor.

If by reason of any accident or failure or other event occurring to, in, or in connection with the Works any remedial or other work shall, in the opinion of the Engineer, be urgently necessary and the Contractor is unable or unwilling at once to do such remedial or other work, the Engineer may authorise the carrying out of such remedial or other work by a person other than the Contractor. If the remedial or other work so authorised by the Engineer is work, which, in the Engineer's opinion, the Contractor was liable to do under the defect liability period Contract, all expenses properly incurred in carrying out the same shall be recoverable by the Employer from the Contractor, provided that the Engineer shall, as soon after the occurrence of any such emergency as may be reasonably practicable, notify the Contractor thereof in writing.

19 Sub-Clause 11.1.3 Price Variation

The rates as per the accepted Bill of Quantities shall be applicable till the completion of the Work and will be varied only to the extent of permissible price variation under this Clause. However, this adjustment shall be to the extent that full compensation for any rise or fall in costs to the Contractor if not covered by the Price variation formula, the rates in the accepted Bill of Quantities shall be deemed to include amounts to cover the contingency of such rise or fall in costs.

The price variation will be payable only on the Indian currency component (no adjustment for Foreign currency component) of the Contract Price as per the follow price variation formula.

Payment as per the contract shall be subject to adjustment in accordance with the following Price Variation formula, and other terms given herein, to provide for variation in the market rates of inputs like labour, materials and fuel / energy during the currency

of the Contract:

V = Vl + Vs + Vc + Vf + Vm

Where,

V = Total adjustment on account of all factors

Vl = Adjustment on account of labour component

= p x R x (I – Io) / Io

Vs = Adjustment on account of Steel component

= q x R x (Ws – Wso) / Wso

Vc = Adjustment on account of Cement component

= r x R x (Wc – Wco) / Wco

Vf = Adjustment on account of Fuel/Lubricant component

= s x R x (Wf – Wfo) / Wfo

Vm = Adjustment on account of Machinery and Equipment

= t x R x (Wm – Wmo) / Wmo

p = Cost Coefficient of Labour to the Total Cost

= 0.22

q = Cost Coefficient of Steel to the Total Cost

= 0.25

r = Cost Coefficient of Cement to the Total Cost

= 0.15

s = Cost Coefficient of Fuel and Lubricant to the Total Cost

= 0.05

t = Cost Coefficient of other Machinery and Equipment to the Total Cost

= 0.18

Note : p+ q + r + s + t = 0.85, balance 0.15 shall be fixed component

R = Gross value of the work done by the Contractor for the period of work under consideration, after excluding there from the cost of any materials supplied free or at fixed rate to the Contractor.

Io = Consumer Price Index for Industrial workers, published by Labour Bureau, Govt. of India as applicable to NOIDA area for the previous month in which the tender was opened.

I = Average of monthly Consumer Price Index for Industrial workers published by Labour Bureau, Govt. of India as applicable to NOIDA area for the period of work under

consideration.

Wso = All India Price Index (with base Oct' 12=100) for Reinforcement bars (TMT-500) for primary manufacturers, issued by Central Public Works Department (CPWD) for the previous month in which the tender was opened.

Ws= All India Price Index (with base Oct' 12=100) for Reinforcement bars (TMT-500) for primary manufacturers, issued by Central Public Works Department (CPWD) for the period of work under consideration.

Wco= All India Price Index (with base Oct' 12=100) for Cement (OPC) issued by Central Public Works Department (CPWD) for the previous month in which the tender was opened.

Wc = All India Price Index (with base Oct' 12=100) for Cement (OPC) issued by Central Public Works Department (CPWD) for the period of work under consideration.

Wfo = Whole Sale Price Index (Averages) for Fuel & Power, as published in the RBI Bulletin for the previous month in which the tender was opened.

Wf= Wholesale Price Index (Averages) for Fuel & Power, as published in the RBI Bulletins for the period of work under consideration.

Wmo= Whole Sale Price Index (Averages) for Manufacture of Machinery and Equipment as published in the RBI Bulletin, for the previous month in which the tender was opened.

Wm = Wholesale Price Index (Averages) Manufacture of Machinery and Equipment as published in the RBI Bulletins for the period of work under consideration.

Note: the Wholesale Price indices as published by Economic Advisor, Ministry of Commerce and Industry are based on 2011-12 series.

Period of work under consideration will mean as under;

i. In the case of first "On- account Bill" the period from the month in which the tender was opened to the month of measurement of the first bill.

ii. In the case of second and subsequent "On-account" and Final bills, the period from the date of measurement for previous bill to the date of measurement of that bill.

Note: Responsibility of arranging the **published indices** desired by the Employer or the Engineer shall rest with the Contractor.

Procedure in case of Delay in Availability of Final Indices

Where the final Price Indices are not available, while making payment towards on-account bills, payment towards Price

Variation will be made on provisional basis based on the indices available, to be adjusted in subsequent bills as and when the final Indices figures become available.

20 Sub-Clause 11.1.4 Changes in Taxes/Duty:

(a) "Change in Taxes/Duties/Levies" means the occurrence or coming into force of the following, at any time after the date of submission of tender.

(i) any new tax which is imposed on Composite Works Contracts applicable on Metro Project.

(ii) Change in the rate of GST on Composite Works Contracts applicable on Metro Project as per GST Act.

(b) The Contract Price shall be adjusted due to any of the above two conditions. Adjustment in Contract Price will be applicable up to the stipulated date of completion of the Work including the extended period of completion where such extension has been granted under Sub-Clause 8.4.1 of GCC or it is specifically mentioned that extension is with adjustment for changes as stated above.

(c) If the extension of contract period is on account of contractor's fault under Sub-Clause 8.4.3 of GCC, no compensation shall be made towards upward revision towards "Change in Taxes and Duty" as mentioned at Sl. No. (a) (i) & (ii) above. Any benefit on account of downward revision towards "Change in Taxes and Duty" as mentioned at Sl. No. (a) (i) & (ii) above, during the original contract period or extended contract period shall be on employer's account.

(d) Any other changes (except on account of Clause (a)(i) & (ii) above) in existing taxes/new taxes on supply of materials/services/works etc. will not be considered and its impact shall be considered covered in the Price Variation Clause provided in the Contract and in Contract where Price Variation Clause is not provided, the impact on any other change (except on account of Clause (a)(i) & (ii) above) in existing taxes/new taxes on supply of materials/services/works etc. will be deemed to be included in the quoted contract price

(e) Also, the Contract price shall not be adjusted on account of fluctuations in the rates of exchange between the foreign currencies of the Contract and Indian Rupees from the last date of submission of tender.

20.1 Price Variation for Extra Items

Normally, no price variation clause shall be applicable to any extra item/new rates not originally included in the accepted Bill of Quantities and for which the rates are fixed separately under clause 12 of GCC.

It shall, however be open to the Engineer to accept price variation clause in such cases where the rates are not based on actual and work is likely to continue for more than one year.

20.2 Adjustment on Account of Price Variation

Adjustment on account of Price Variations may be positive (in which case extra amount shall be paid to the Contractor), or negative (in which case the amount of Price Variation shall be recovered from the Contractor). Adjustment on account of Price Variation shall be calculated separately, for each period, between two successive dates of measurements for bills and paid along with each bill or separately as claimed by the contractor.

After verifying the bill, the Engineer shall certify the adjustment amount and advise the same to the Employer along with the 'On Account' bill. Should any extra amount be due to Contractor, the Employer shall pay the same as far as possible within 28 days of certification by the Engineer. Any amount due from Contractor on account of negative adjustment shall be recovered from his pending or other bills at the earliest.

20.3 Price Variation during Extended Period of Completion

The price adjustment as worked out above i.e. either increase or decrease will be applicable up to the stipulated date of completion of the work including the extended period of completion where such extension has been granted under Sub-Clause 8.4.1 of GCC or it is specifically mentioned that extension is with price variation also.. However, where extension has been granted under Sub-Clause 8.4.3 of GCC, price adjustment will be due as follows:

In case the indices increase above the indices applicable to a bill made on the last date of original completion period or the extended period under Sub-Clauses 8.4.1of GCC, the price adjustment for the period of extension under Sub-Clause 8.4.3 of GCC will be limited to the amount payable as per the indices applicable to a bill made on the last date of the original completion period or the extended period under Sub-Clauses 8.4.1 of GCC as the case maybe.

In case the indices fall below the indices applicable to a bill made on the last date of the original or extended period of completion, then the lower indices will be adopted for Price Adjustment for the period of extension under Clause 8.4.3 of GCC unless the extension has been granted due to Contractor's fault.

21 Sub-Clause 12.0 Variations

Day work

For payment of extra items, the Engineer may decide to pay on the basis of 'Day Work' concept instead of paying as per clause no. 12.5 of GCC .In such a case the Engineer may, if in his opinion it is necessary or desirable issue an instruction that any varied work or new item of work shall be executed on a day work basis. The Contractor shall be then paid for such item based on the actual expenditure made on daily basis under the terms set out in day work schedule included in the Contract and at the rates and prices affixed by him in the tender.

The Contractor shall furnish such receipts or other vouchers as may be necessary to prove the amounts paid and before ordering Materials shall submit to the Engineer the quotations for the same for his approval The Contractor shall furnish to the Engineer or his representative, a daily list (with name, occupation and shift time) of all workmen deployed on the work, in duplicate for checking and approval. The Contractor shall submit to the Engineer a priced statement of labour, material, plant, etc., actually used on the work, together with the output of work at the end of each calendar month and / or as soon as the work is completed. The payment for the new item of work will be certified by the Engineer based on this submission of contractor.

23 Sub-Clause 12.3

"Employer's Variation" means a change in the Employer's Requirements which makes necessary alteration or modification of the Design, quality or scope of Works as described by or referred to in the Employer's Requirements. Changes to any sequence, method or timing of construction, manufacture or installation and changes to any part of the Site or the Works Areas or access thereto will not constitute Employer's Variation.

An Employer's Variation shall be requested and implemented in accordance with and subject to the following provisions:

(a) Within 14 days (or such other period as the Engineer may allow) of the Engineer informing the Contractor in writing of the intention to request an Employer's Variation, the Contractor shall notify the Engineer in writing whether in his opinion the Employer's Variation. would, if ordered:

(i) give rise to any entitlement to an extension of time; or

(ii) affect the achievement of any Milestone; or

(iii) give rise to any entitlement to additional payment; or

(iv) affect the warranties of the Contractor set out in Clause 3 of Special Conditions of Contract, and shall submit his proposals as to the terms upon which he would agree to implement the Employer's Variation.

(b) The Engineer shall determine the amount which should be added to or deducted from the fixed lump sum price as a result of the Variation and get it approved by the Employer. In assessing work covered by any sub-contract, the Engineer will have, where he deems necessary, access to the original sub-contract conditions, rates, prices and details of the variation claimed, to assist in evaluating any

Variations and the agreed rates if any of major items of work/ activities, labour, plant and machinery and where appropriate the local market rates for these items.

(c) If the Engineer withdraws the request for an Employer's Variation, the Contractor shall have no claim of any kind whatsoever arising out of the amount determined above. In case the Employer's Variation involves omission of part of the Works, the agreement shall address the issue of reduction in the Contract Price.

There shall be only deductions in the fixed lump price as a result of Contractor's variations. The Engineer shall take prior approval of the Employer to the aforesaid valuation. Any such amount determined by the Engineer shall be denominated in the same currency as the relevant parts of the fixed lump sum price.

In case of any variation, once the rates have been finalised by the Engineer and approved by the Employer, the contractor shall be bound to carry out with the same. No claims shall be entertained by the Employer in this regard.

Note: The Schedules attached to SCC may be modified as considered necessary at the time of finalisation of the contract.

24 Sub-Clause 17.9 Arbitration

Sub-Clause 17.9 b) "The Arbitration proceedings shall be assumed to have commenced from the day, a written and valid demand for arbitration is received by ED/NMRC on behalf of MD/NMRC" at following address:

Office of ED/NMRC,

Noida Metro Rail Corporation Ltd. Block-III, 3rd Floor, Ganga Shopping Complex, Sector-29, Noida-201301 Distt. Gautam Budh Nagar (U.P).

Tel: 0120-4344481/82/83/84

Sub-Clause 17.9.2 i) In case of Sole Arbitration: Within 60 days from the day when a written and valid demand for arbitration is received by ED/NMRC on behalf of MD/NMRC, the Employer will forward a panel of 03 names to the Contractor.

Sub-Clause 17.9.2(ii)(a) Within 60 days from the day when a written and valid demand for arbitration is received by ED/NMRC on behalf of MD/NMRC, the Employer will forward a panel of 05 names to the Contractor.

SCHEDULE- 1

CONTRACTOR'S WARRANTY

(Refer clause 3 of SCC and Sub-Clause 4.2.4 of GCC)

THIS AGREEMENT is made on the …… day of …… between:

(1) [……..……..] of [……...……..] [and [see Note 1]] ([Jointly] "the Contractor")

(2) [Noida Metro Rail Corporation Limited] [of]/[whose registered office is at] [Block-III, 3rd Floor, Ganga Shopping Complex, Sector-29, Noida-201301 Distt. Gautam Budh Nagar (U.P).] (together with its successors and assigns, "the Employer").

WHEREAS

(A) By a contract ____ dated [ ] ("the Contract") made between (1) the Noida Metro Rail Corporation Limited ("the Employer") and (2) the Contractor, the Contractor has agreed to design, execute, complete, test and commission (including Integrated Testing and Commissioning) and remedy any defect in the Works upon the terms and conditions contained in the Contract.

(B) [See Note 3].

(C) At the request of the Employer and pursuant to the terms of the Contract the Contractor has agreed to enter into this Warranty.

NOW IT IS AGREED AS FOLLOWS:

1. The Contractor hereby warrants and undertakes that:

   (a) He will design, execute, complete, test and commission (including Integrated Testing and Commissioning) and remedy any defect in the Works in accordance with the terms of the Contract; and

   (b) he owes a duty of care to the Employer in relation to the performance of its duties under the Contract; and

   (c) he will replace free of cost to the Employer any defect or failure of equipment provided in the Works for a period of _____ (as specified) months from the date of Taking Over of the last Section of the Works; and

   (d) he agrees that should any design modification be required to any section or component due to any defect, the period of _____ (as specified) months shall re-commence from the date when the modified part is commissioned into service, and such modification shall be carried out free of cost to the Employer in all sub-systems and systems for all sections; and

   (e) he shall maintain the manufacture or spare of replacement parts for at least 01 years.

2. The liability of [the companies comprising [see Note 3]] the Contractor under this Warranty [shall be joint and several and [see Note 3]] shall not be released, diminished or in any way affected by any independent inquiry or investigation into the Works or any matter related to the Contract whether carried out by or on behalf of the

Employer or any liability or right of action which may arise out of such inquiry or investigation.

3. Insofar as the copyright or other intellectual property rights in any plans, calculations, drawings, documents, materials, plant, know-how and other information relating to the Works shall be vested in the Contractor, the Contractor grants to the Employer his successors and assigns a royalty free, non-exclusive and irrevocable licence (carrying the right to grant sub-licences) to use and reproduce any of the works designs or inventions incorporated and referred to in such documents or materials and any such know-how and information for all purposes relating to the Works or the Mass Rapid Transport System – Phase-IV including without limitation the design, execute, complete, test and commission (including Integrated Testing and Commissioning) reinstatement, extension and the remedy of any defect in the Works. To the extent that beneficial ownership of any such copyright or other intellectual property rights is vested in anyone other than the Contractor, the Contractor shall use best endeavours to procure that the beneficial owner thereof shall grant a like licence to the Employer. For the avoidance of doubt, any such licence granted shall not be determined if the Contractor shall for any reason cease to be employed in connection with the Works.

4. The provisions of this Warranty shall be without prejudice to and shall not be deemed or construed so as to limit or exclude any rights or remedies which the Employer may have against the Contractor, whether in tort or otherwise.

5. Nothing contained in this Warranty shall vary or affect the Contractor's rights and obligations under the Contract.

6. The address for service of all documents arising out of or in connection with this Warranty shall be:-

   (a) upon the Employer at [ ] India. [Note 4]

   (b) upon the Contractor at [ ] India. [Note 4]

7. The Employer and the Contractor may change their respective nominated addresses to another address in India but only by prior written notice to each other. All notices must be in writing.

8. This Warranty shall be governed by and construed according to the laws for the time being in force in India.

9. (1) Any dispute or difference of any kind whatsoever between the Employer and the Contractor arising under out of or in connection with this Warranty shall be referred to arbitration in accordance with the Conciliation and Arbitration rules set out in the General Conditions of Contract. “Dispute” as defined in the Contract shall be deemed to include any such dispute or difference between the Employer and Contractor.

   (2) In the event that the Employer is of the opinion that the issues in such a dispute or difference will or may touch upon or concern a dispute or difference arising under out of or in connection with the Contract ("the Contract Dispute")

then provided that an arbitrator has not already been appointed pursuant to Clause 9(1), the Employer may by notice in writing to the Contractor require and the Contractor shall be deemed to have consented to the referral of such dispute or difference to the arbitrator to whom the Contract Dispute has been or will be referred.

(3) Save as expressly otherwise provided, the arbitrator shall have full power to open up, review and revise any decision, opinion, instruction, notice, order, direction, withholding of approval or consent, determination, certificate, statement of objections relating to the dispute.

(4) Subject to the foregoing provisions of this clause 9, the Employer and the Contractor shall submit to the jurisdiction of the Courts of India at **UP/ NOIDA.**

IN WITNESS whereof, this Warranty has been executed as a deed on the date written at the head hereof.

THE COMMON SEAL of

[…….]

was affixed hereto in the presence of:-

Notes (for preparation of and not inclusion in the engrossment of this Warranty)

(1) If the Contractor comprises more than one company, each such company shall be a party and liability under this warranty will be joint and several, with consequential grammatical changes.

(2) If Note 1 applies, that fact and the joint venture or other relevant agreement must be recited.

(3) Delete if Note 1 does not apply.

(4) The address for service shall be in India.

SCHEDULE 2

FORM OF CONTRACT AGREEMENT

(Refer Clause F4 of ITT)

This Agreement is made at NOIDA on the …….. day of …….. (month**) 2020** Between Noida Metro Rail Corporation Limited, 5th Floor, Block-III, 3rd Floor, Ganga Shopping Complex, Sector-29, Noida-201301 Distt. Gautam Budh Nagar (U.P). hereinafter called "the Employer" of the one part and ……..……..….. (Name & Address of Contractor) hereinafter called "the Contractor" of the other part. Whereas the Employer is desirous that (*** certain Goods and Services should be provided and) the Works should be executed, viz. ……..(Name of work as mentioned under Clause 1.1 of NIT) hereinafter called "the Works" and has accepted a Tender by the Contractor for the execution and completion of such works (*** as well as guarantee of such works) and the remedying of defects therein.

This agreement is signed between ……. (for and on behalf of the Employer) and ……. (for and on behalf of the Contractor).

NOW THIS AGREEMENT WITNESSETH as follows:

1. In this Agreement words and expression shall have the same meanings as are respectively assigned to them in the Conditions of Contract hereinafter referred to.
2. The following documents shall be deemed to form and be read and construed as part of this Agreement. These documents shall be signed by…….. (for and on behalf of the Employer) and …… (for and on behalf of the Contractor).
    a) Notice Inviting Tender (NIT)
    b) Instructions to Tenderers (ITT)(Including Annexures)
    c) Special Conditions of Contract (SCC)
    d) General Conditions of Contract (GCC)
    e) Conditions of contract on Safety & Health & Environment (SHE).
    f) Specifications
    g) Tender Drawings
    h) Bill of Quantities
    i) Form of Tender with Appendix
    j) Letter of acceptance (LOA)
    k) Contractor's proposal submitted along with the tender
    l) Any other item as applicable

The modifications to the tender documents communicated through the Addenda (……. Numbers) hosted on the e-tendering portal at the time of tender have been incorporated in the consolidated contract documents.

3. In consideration of the payments to be made by the Employer to the Contractor as hereinafter mentioned, the Contractor hereby covenants with the Employer to execute and complete the works by **…….. and remedy any defects therein in conformity in all respects with the provisions of the Contract.

4. The Employer hereby covenants to pay the Contractor in consideration of the execution and completion of the works and the remedying of defects therein, the Total Contract Price of **` …… being the sum stated in the letter of acceptance subject to such additions thereto or deductions there from as may be made under the provisions of the Contract at the times and in the manner prescribed by the Contract.

5. OBLIGATION OF THE CONTRACTOR

The contractor shall ensure full compliance with tax laws of India with regard to this contract and shall be solely responsible for the same. The contractor shall submit copies of acknowledgements evidencing filing of returns every year and shall keep the Employer fully indemnified against liability of tax, interest, penalty etc. of the contractor in respect thereof, which may arise.

6. JURISDICTION OF COURT

The Courts at UP/NOIDA shall have the exclusive jurisdiction to try all disputes arising out of this agreement between the parties.

IN WITNESS WHEREOF the parties hereto have caused their respective Common Seals to be hereunto affixed / (or have hereunto set their respective hands and seals) the day and year first above written.

For and on behalf of the Contractor	For and on behalf of the Employer
Signature of the authorized official	**Signature of the authorized official**
Name of the official	Name of the official
Stamp/Seal of the Contractor	Stamp/Seal of the Employer
SEALED, SIGNED & DELIVERED	
By the said ……..……(Name) on behalf of the Contractor in the presence of :	By the said ……..……(Name) on behalf of the Employer in the presence of :

Witness	Witness
Name : ……	Name : ……
Address : ……	Address : ……

Note :

* To be made out by the Employer at the time of finalization of the Form of Agreement.

** Blanks to be filled by the Employer at the time of finalization of the Form of Agreement.

*** To be deleted if not applicable

NOIDA METRO RAIL CORPORATION (NMRC) LIMITED

CONTRACT NO: NGNC-01

E Tender No.: NMRC/Civil/NGNC/123/2020

TENDER DOCUMENTS

SAFETY HEALTH AND ENVIRONMENTAL MANUAL

Policy and Procedures

VOLUME 2

SAFETY & HEALTH

PART - I

Noida Metro Rail Corporation (NMRC) Limited
Block-III, 3rd Floor, Ganga Shopping Complex, Sector-29, Noida -201301,
District Gautam Budh Nagar, Uttar Pradesh, India

CONTENTS

1.0 STATEMENT OF INTENT

It is the intention of the Noida Metro Rail Corporation to build the all phases of the Metro system for Noida in a way that will further raise the standards of health and safety on construction sites to a level that will be recognized as the best in India and comparable to the highest standards achieved worldwide.

This can only be achieved if there is a commitment from all parties involved in the construction and management of the Project, from the most senior level of managers within the NMRC and the Contractors, to the workers on the sites.

This document shall have the full support of all of the NMRC Project Team and any officer failing to give support to it shall be subject to internal discipline.

The Noida Metro Rail Corporation shall actively support the efforts and initiatives that are instigated by the Contractors and sub-contractors in their efforts for achieving high standards of health and safety on the Project.

The ingredients that are needed to make and achieve a high standard of health and safety, are well known to most of us, it is however the level of commitment that is demonstrated that shall determine whether or not we succeed.

This manual represents the minimum standards that the Noida Metro Rail Corporation will accept on matters of Safety and Health. The Corporation will use its best endeavours to ensure that all of the Contractors employed on the Project achieve these Standards

2.0 ReferencesandDistribution of this manual

2.1 References

2.1.1 The procedures in this manual should be read in conjunction with;

(a) The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996. Delhi Rules, 2002

(b) The Factories Act, 1948

(c) Other Laws of India, Regulations, Rules and Codes of Practice on Safety Health and the Environment that may be applicable.

(d) The Conditions of Contract in respect of Health and Safety, that apply to the specific Contract under which the Contractor is employed.

(e) The Employer's Requirements as given in the documents of the Contract for the work to which this manual is to be applied. (An example of which can be found in Schedule 1)

(f) The important Indian Standards and British Standards a list of which can be found in Schedule 2

2.2 Distribution of this Manual

2.2.1 Copies of this Project Health and Safety Manual are distributed to all Tenderers for Contracts where this has been shown as a reference document or a Contract document. It will also be issued to all appropriate staff of NMRC and all other persons who have need of it.

3.0 Definition of terms

3.1 Introduction

3.1.1 The following terms used in this manual are defined as follows and shall be construed accordingly.

(a) Safety means the freedom from unacceptable risks of personal harm, i.e. the avoidance of accidents and incidents.

(b) Health means the physical wellbeing of a person and the freedom from any illness caused working conditions.

(c) Hazard means a situation with the potential to cause harm including human injury, damage to property, plant or equipment, damage to the environment, or economic loss.

(d) Risk means the chance of something adverse happening and its severity. It is a combination of the probability, or frequency, of the occurrence of a defined hazard and the magnitude of the consequences of the occurrence.

(e) Foreseeable means that which is likely or possible.

(f) Chief Safety Officer means an officer nominated by NMRC as Chief Safety Officer

(g) Site Safety Plan means the contract specific safety plan that the Contractor has produced from his Outline Safety Plan.

(h) Outline Safety Plan means the contract specific outline safety plan that the Contractor will prepare as part of his tender submission.

(i) Reportable Accident / Incident means an Accident or Incident that is reportable to the Employer's Representative. It shall include all fatalities, major injury accidents, dangerous occurrences and all accidents, which result in incapacity for more than Forty Eight hours or more immediately following the accident.

(j) Major Injury Accident is defined as:

(1) any fracture, other than to the fingers or toes;

(2) any loss of a limb or part of a limb;

(3) dislocation of the shoulder, hip, knee or spine;

(4) loss of sight (whether temporary or permanent);

(5) penetrating injury to the eye; or

(6) any other injury that:

- leads to unconsciousness
- requires resuscitation;
- requires admittance to hospital for more than 24 hours;
- or which causes more than 10 days absence from work.

(k) Dangerous Occurrence is defined as:

(1) collapse or failure of lifting appliances or hoist or conveyors or other similar ;

(2) collapse or failure of a crane, derrick, winch, hoist or other appliance used in raising or lowering persons or goods or any part thereof (except the breakage of chain or rope slings), or the overturning of a crane;

(3) explosion or fire causing damage to the structure of any room or place in which persons are employed, or to any machine or plant, resulting in the complete suspension of ordinary work;

(4) electrical short circuit or failure of electrical machinery, plant or apparatus, attended by explosion or fire, causing structural damage involving its stoppage or disuse;

(5) explosion of a receiver or container used for the storage at a pressure greater than atmospheric pressure of any gas or gases (including air) or any liquid or solid resulting from the compression of gas;

(6) collapse in whole or part from any cause whatsoever of any roof, wall, floor, structure or foundation forming part of the construction site in which persons are employed;

(7) total or partial collapse of any overburden, face, tip or embankment on the construction site;

(8) the overturning of, or collision with any object by any bulldozer, dumper, excavator, grader, lorry or shovel loader, or any mobile machine used for the handling of any substance on the construction site.

4.0 General

4.1 Introduction

4.1.1 It is the objective of the NMRC to ensure that the Contract is completed on time, within budget, and to conforming standards of Health and Safety.

4.1.2 This manual has system wide application, and therefore not all of the sections will apply to all Contractors. Each Contractor shall develop his own contract specific Site Safety Plan, which will represent his approach to the management of safety on his work, sites under the Contract with NMRC.

4.1.3 It is the intention of NMRC to levy fines against contractors who do not comply with the requirements of this Manual. The fines levied will be donated to the NMRC Welfare Fund to assist those who have suffered as a result of this Project. The level of fines to be levied will set out in the General Conditions of Contract.

4.2 Purpose of the Manual

4.2.1 This manual has been produced in order to outline the minimum health and safety, standards that shall be required by NMRC during the second phase of construction of the Noida-Greater Noida Mass Rapid Transport System. Furthermore the manual has been developed to give guidance and assistance to the respective Contractors in the development and production of their Site Safety Plans, to satisfy the required health and safety standards established by the Contract Conditions and the Employer's Requirements. This manual represents the minimum standards required and each Contractor is encouraged to expand and improve upon it.

4.2.2 This manual is not intended to replace existing standards that are currently in force in India. However, it is intended to support the standards and to highlight to Contractors the areas of concern that shall be addressed in their respective Site Safety Plans in order to establish good health and safety practices.

4.2.3 This document is intended to supplement the Section on Safety Measures as is contained in the Employers Requirements.

4.2.4 The obligations and requirements for Health and Safety set out within this document are entirely without prejudice and do not derogate from the Contractor's obligations with respect to the Contract and his statutory obligations with respect to Health and Safety.

4.3 Scope of the Manual

4.3.1 The Contractor is fully responsible for the safety of the Works, his personnel, subcontractors' personnel, the public and all persons directly or indirectly associated with the Works or on or in the vicinity of the Site.

4.3.2 This manual provides relevant information and procedures to assist the Contractor to ensure that his employees and sub contractors work within a safety-conscious and safety-regulated environment. Compliance with the procedures set out in this manual shall not relieve the Contractor of any of his Statutory Duties or his responsibilities under the Contract.

4.4 Policy Objectives

4.4.1 Every Contract should aim at zero fatal accidents.

4.4.2 Every Contract should aim at zero dangerous occurrences (see section3.1.1.(i)for the definition of ‘dangerous occurrence’).

4.4.3 Every Contract should aim at an Accident Frequency Rate (AFR) of less than 0.5 per 100,000 hours worked on the Contract.

4.5 Implementation of Policy Objectives

4.5.1 The following general approach has been adopted by NMRC with a view to achieving the policy objectives set out above

(a) Secure a commitment to safe and healthy working practices by all parties involved in the construction process, including consultants, Contractors, sub-contractors, workers' unions, and utility providers.

(b) Develop contract provisions that require Contractors to prepare, implement and monitor safety plans, and ensure that sub-contractors are also obliged to comply with the same. (Copies of the provisions relating to Health and Safety are contained in the Conditions of Contract, and the Employer’s Requirements, are reproduced in Schedule 1 of this Manual.)

(c) Arrange accident prevention, safety management training for all site staff supervising Contracts.

(d) Establish Site Safety Management Committees to monitor the implementation of safety plans and keep a record of the Meetings of the Committees.

(e) Build up a database of accidents and dangerous occurrences, as defined in Section 9 of this manual, for the purpose of monitoring trends, analyzing data, and formulating measures for accident prevention.

(f) Publish this Manual to assist in the administration of construction safety matters of the Employer's contracts.

(g) Oversee the safety performance of the Contractors and sub-contractors to ensure that their duties and responsibilities on health and safety under the Contract, this Manual, and other relevant Employer and Government requirements are fully discharged.

(h) To publish and issue any further instruction / appendices needed for any specific requirement of the Contract

4.6 Responsibility for the Manual

4.6.1 The Directors Electrical and Projects are responsible for ensuring that the contents of this Manual continue to meet the requirements of the NMRC and that they are implemented rigorously.

5.0General Duties of Contractors and Others

5.1 Introduction

5.1.1 Securing safe, healthy places of work requires the full co-operation of Contractors and sub-contractors and the persons employed by them. It is imperative that there is no ambiguity with regard to the responsibilities of any individuals in connection with duties relating to health and safety.

5.1.2 The responsibilities shall be clearly detailed in the Site Safety Plan from the level of the most Senior Manager downwards, these duties shall be explained to the individuals concerned in order to ensure that they clearly and concisely understand them.

5.1.3 Responsibilities for safety, health and the environment shall be allocated amongst others to the following personnel of the contractors and sub-contractors:

(a) CEO / Managing Director:

(b): Project Manager:

(b) Site Agent/Manager:

(c) Engineers:

(d) Safety Officer:

(e) Supervisors:

(f) General Workers

5.2 General Duties of Persons Employed

5.2.1 Every person employed by Contractors and sub-contractors on construction sites are obliged to comply with the general duties imposed on them under the Contract. Every person employed should, not only avoid careless or reckless behaviour, but should also take positive steps to understand workplace hazards. They must follow all necessary safety and environment rules and procedures, and ensure that their acts or omissions at work do not put the health and safety of self or others at risk.

5.3 Contractors and Sub-contractors: Responsibilities

5.3.1 Contractors and sub-contractors are responsible for complying with all statutory and contractual requirements on construction safety, health and environment including the general duties imposed on them under the Laws and Regulations of the Government of India, Government of the UP and other relevant authorities.

5.3.2 The NMRC shall only deal with health and safety matters through the Contractor and shall hold the Contractor responsible for all his, and his Sub-contractors, actions. All Sub-contractors shall be responsible to the Contractor.

5.3.3 For the guidance of Contractors, a list of some of applicable Legislation and Codes of Practices in India is contained in Schedule 2. Contractors should however note that the purpose of the list is for guidance only and it is not exhaustive. This list shall not relieve the Contractor in whole or in part of his contractual or legal liabilities.

5.3.4 All Contractors and Sub-contractors shall ensure that an adequate level of competent supervision is maintained at the workplace at all times with all supervisory staff having the relevant knowledge, training, and experience to enable them to supervise the work in a proper manner.

5.3.5 Contractors shall ensure that all sub-contractors are able to demonstrate a successful track record with regard to the management of health and safety. The type of information that shall be requested from the sub-contractors during the tendering process in order to determine their suitability shall include amongst other things the following information relating to their activities over the last five years

(a) Fatal accidents

(b) Major lost time accidents

(c) Accidents involving members of the public

(d) Dangerous Occurrences

5.3.6 Contractors and sub-contractors are responsible for submitting written statements on their policies relating to construction safety within fourteen days of a requirement to do so by NMRC.

5.3.7 Contractors and sub-contractors are responsible for providing comprehensive safety and environment plans for the review by NMRC, and for subsequent implementation of the measures detailed in the safety and environment plans.

5.3.8 Contractors and sub-contractors are responsible for the provision of suitably trained and qualified safety staff to carry out regular safety inspections, safety promotion, and safety audits and for retention of records of all such activities for inspection by NMRC.

5.3.9 Contractors and sub-contractors are responsible for providing safety and environment training to all workers and supervisors on site, and for retention of records of such activities for inspection by the NMRC.

5.3.10 Contractors and sub-contractors are responsible for organizing site safety committees which shall meet at least monthly.

5.3.11 Contractors and sub-contractors are responsible for reporting dangerous occurrences and accidents to the Employers Representative by the quickest practicable means.

5.4 Discipline

5.4.1 Any major breaches of the Site Safety Plan, relevant Statutory Provisions and Safety Codes, or any other blatant disregard for the health and safety by any person directly or indirectly associated with the works may result in the NMRC exercising their authority in requiring the removal from the Site of the Contractor’s Site Manager and/or other personnel.

5.4.2 The Contractors shall develop a system of disciplinary measures and procedures, which shall be implemented immediately that the site activities commence. These measures and procedures should include amongst other things:

(a) The issue of Warning Notices.

(b) The removal from site of personnel who disregard safety instructions.

5.4.3 Any person who is removed from the site for breach of safety measures shall not be allowed to be re-employed on any other NMRC worksite.

6.0 Safety Training and Safety Promotion

6.1 Safety Training

6.1.1 Safety Training is an important factor in managing safety on construction sites. All contractors shall provide as a minimum the following types of training:

6.1.2 Induction Training shall be given to all persons prior to permitting them to go to the worksite. The workers ID Card should not be issued until this training has been given. This training should include at least the following:

(a) General safety awareness

(b) First aid

(c) Emergency procedures

(d) Use of personal protective equipment

(e) Specific site hazards

6.1.3 Refresher Training shall be conducted at least every three months to ensure that all workers on site are kept up to date with safety requirements on site.

6.1.4 Specific Training shall be provided to persons with safety related tasks, such as Crane Operators, Banksmen, Slingers and Plant Operators etc.

6.1.5 Toolbox Talks shall be conducted so that every worker on site receives at least two toolbox talks every week. These talks should be designed to highlight relevant safety and industrial health issues to the workforce on a regular basis in order to raise their level of awareness. These should be prepared so that they can be presented by the Site Supervisors. Examples of Toolbox Talks are given in Schedule 4 of this Manual.

6.1.6 All training that is carried out shall be formally recorded on dated and signed attendance records, with copies of the records being kept on the sites for inspection by the Employer's Representative. Details of the respective training course programmes shall be produced, on demand or as per intervals prescribed, which include the following information:

(a) Course Title.

(b) Course Duration.

(c) Course Content.

(d) Target Audience.

(e) Actual Audience with record of attendance. (Use form SAF 031)

6.1.7 The Contractor shall keep detailed records of all training undertaken, and shall keep such records available for inspection by the Employer's Representative.

6.2 Safety Promotion

6.2.1 The Contractors at each of their sites in the interests of promoting safety awareness amongst the workforce shall devise and implement practical Safety Promotion schemes. The objective of these schemes should be to recognize and reward individuals who continually endeavour to work in a safe manner.

6.2.2 Suggestions for such promotions may include such items as the issue of the following as rewards to individuals for good safety performance:

(a) Key Rings.

(b) T-Shirts

(c) Holdall Bags

6.2.3 Other safety award and safety incentive schemes should be considered

6.2.4 Regular Safety and Industrial Health Poster Campaigns / Billboards / Banners / Glowsigns should be devised, with posters displaying safety and industrial health related issues being displayed around the worksites as part of the effort to raise Safety Awareness amongst the workforce. Posters should be in Hindi, English and other suitable language deemed appropriate. Posters / Billboards / Banners / Glowsigns should be changed at least once a month to maintain their impact.

7.0 Safety Inspections and follow up action

7.1 Inspections by Contractor's Safety Supervisory Staff

7.1.1 The Contractor's Project Manager and supervisory staff are required to carry out weekly site safety inspections and prepare reports of such inspections. Copies of the completed inspection reports shall be kept on site and available for inspection by the Employer's Representative.

7.1.2 The frequency of the inspections shall be determined by site activities and general conditions. However the inspections should be conducted at a minimum of once a week. Where high-risk activities are being carried out inspections should be carried at least once daily.

7.1.3 The inspection reports should be discussed with the relevant Site Managers. These shall also be discussed with the sub-contractors and other levels of site management in the Site Safety Meetings as detailed in Section 8 of this Manual.

7.1.4 For each Contract the Contractor shall prepare a comprehensive safety inspection checklist, as a requirement of the Safety Plan. This check-list can then be used for:

(a) inspections by the Contractor's Safety Officers;

(b) monitoring of the Contractors' safety inspections by the Site Safety Management Committee.

7.1.5 The Employer's Representative Staff may carry out site safety inspections, which shall be attended by the Contractors' Site Manager and Safety Manager.

7.1.6 In relation to Works Contracts, the insurers providing insurance cover for Contractor's All Risks and Third Party liability may visit the sites with a view to checking whether the Contractors have taken adequate safety precautions against damage to the works.

7.2 Follow up actions

7.2.1 Remedial action to rectify any deficiency identified or unsafe practices discovered during the safety inspections should be implemented immediately. Until the remedial action is taken the task may be discontinued.

7.2.2 In cases where the Employer's Representative believe that the Contractor's or sub-contractors' workmen are using unsafe working methods, the Contractor's Representative should be informed by them as soon as possible. If the unsafe activity continues, it shall be reported to the Employer's Chief Safety Officer.

7.2.3 If the Contractor's working method is deemed so unsafe as to represent a risk to life, the Employer's Representative may require specific actions by the Contractor, such as proposals on preventive/remedial measures, or suspension of relevant portions of the works, and introduction of measures deemed necessary. All such instructions shall be confirmed in writing and shall include a proviso that the issue of the instruction shall not relieve the Contractor of his responsibilities under the Contract or Statutory obligations. The Employer's Representative may also invoke a fine on the Contractor in accordance with Section 4.1.3.

8.0 Contactor's Site Safety Committees

8.1 General

8.1.1 All employees should be able to participate in the making and monitoring of arrangements for safety and health at their place of work. The establishment of site safety committees in which employees and Contractor and sub-contractor management are represented can increase the involvement and commitment of employees. The Contractor shall set up such site safety committees to promote and monitor safety and health on their worksites. A copy of the agenda shall be forwarded to the Employer's Representative seven days prior to the meeting date, in order that they can decide if it is necessary for them to attend.

8.2 Composition and Functions of Contractor's Safety Committees

8.2.1 The Contractor should form a safety committee for each contract, however should the situation require more than one committee, or the Employer's Representative so requires, additional committees shall be created.

8.2.2 The Terms of Reference for the committee should be as follows;

(a) to monitor the adequacy of the Contractor's Site Safety Plan and ensure its implementation;

(b) to monitor safety inspection reports;

(c) to study accident and incident reports;

(d) to study accident statistics and trends so as to identify unsafe practices and conditions;

(e) to review the emergency and rescue procedures;

(f) to review site safety training;

(g) to promote safety and industrial health on site;

(h) to discuss the Contractor's monthly safety report;

(i) to take follow up actions on minutes of meeting.

8.2.3 The Membership of the committee should be as follows;

Chairman: The Contractor's most Senior Manager for the Contract.
Secretary: The Contractor's Safety Officer
Members: Contractor's and Sub-contractors management representatives and safety staff.
In attendance as and when they wish,
Representatives of the Employer and the Employer's Representative

8.2.3 Meetings should be held at least once every month

8.2.4 Minutes of the Site Safety Committee shall be sent to all members within two working days of the meeting. Copies of the minutes should be displayed on notice boards so that employees are kept informed of the Site Safety Committee's activities and decisions.

9.0 Reporting of Accidentsand Dangerous Occurrences

9.1 Contractors Responsibility

9.1.1 All accidents and dangerous occurrences shall be recorded, regardless of whether or not personnel injury occurs.

9.1.2 The Employer and the Employer's Representative shall be notified by the quickest possible means, for example by telephone of the following classifications of accidents and incidents and by subsequent written notification within twenty four hours on the Contractors Accident and Incident Reporting Form (for example of form see Schedule 3) :

(a) Fatal Accident

(b) Major Injury Accident (see definition in 3.1.1)

(c) Dangerous Occurrence (see definition in 3.1.1)

(d) Any Incident Involving A Member Of The Public

9.1.3 The Site Safety Officer shall conduct in depth investigations into all fatal accidents, major injury accidents, incidents involving a member of the public, dangerous occurrences, and selected over three-day lost time injury accidents. Copies of these investigations shall be forwarded to the Employer's Representative within seven days of the incident.

9.1.4 The Contractor shall report immediately, orally and in writing, all fatal accidents, and other occurrences requiring reporting, to the police, at the police station in whose jurisdiction the accident occurred.

9.2 Reportable Accidents

9.2.1 An accident shall also become reportable to the Employer's Representative if it causes incapacity for more than three days excluding the day of the accident. The Contractor must submit a report on form SAF 001 to the Employer's Representative within seven days of the incident.

9.2.2 The following information is required in reporting an accident to the Employer's Representative.

(a) particulars of the Contractor or Sub-contractor employing the injured person;

(b) particulars of the deceased or injured person: name, address, occupation, sex, and age;

(c) the date, cause or circumstances of the accident; and

(d) the nature of the injury, stating whether death or incapacity was caused by the injury.

9.3 Dangerous Occurrences

9..3.1 The Employer's Representative requires that all dangerous occurrences on site must be reported in writing to him within 24 hours, irrespective of whether there are casualties or not. The following information has to be provided:

(a) the time of the occurrence;

(b) damage to any building, machinery or plant; and

(c) the circumstances in which the accident occurred.

A copy of the standard 'Dangerous Occurrence Report form' SAF 001(as attached to this Manual) may be used.

9.3.2 If no one is injured, the above notification is sufficient. In the case of death or serious injury, the accident reporting procedure outlined in Section 9.1.2 must also be followed.

9.4 Reporting of Fires by Contractor

9.4.1 The Contractor shall report to the Employer's Representative all fires which occur on site including any fires that have been extinguished by the Contractor himself, and the Employer's Representative may send staff to investigate such fires. The following information should be provided:

(a) time of fire;

(b) location of fire;

(c) means of extinguishing the fire;

(d) injury to any person/damage to any property; and

(e) the probable cause of fire.

This action is in addition to reporting the incident to the Chief Fire Officer UP, and Police in accordance with local regulations.

9.5 Reporting to the Employer's Representative

9.5.1 The Contractor shall duly complete standard forms on dangerous occurrences and accidents as required by the Employer's Representative to enable the Employer's Representative to prepare a database on accident statistics. The Contractor shall deliver to the Employer's Representative a copy of any statutory reports he submits to the Relevant Authorities.

9.5.2 The Contractor shall send a monthly report to the Employer's Representative of all accidents and dangerous occurrences whether they are of a serious nature or not.

10.0 Accident Investigation

10.1 General

10.1.1 Investigations should be conducted in an open and positive atmosphere that encourages the witnesses to talk freely. The primary objective is to ascertain the facts with a view to prevent future and possibly more serious occurrences. Accidents are rarely just the fault of the worker. If the worker has not been trained, instructed or properly supervised then the fault may well lie with management.

10.1.2 Accidents and Dangerous Occurrences which result in death, serious injury or serious damage must be investigated by the Contractor immediately to find out the cause of the accident/occurrence so that measures can be formulated to prevent any recurrence. (Refer to the advice contained in 10.2.1 below.)

10.1.3 Near misses and minor accidents should also be recorded and investigated by the Contractor as soon as possible as they are signals that there are inadequacies in the safety management system.

10.2 Recommended actions in incident investigation

10.2.1 It is important after any Accident or Dangerous Occurrence that information relating to the incident is gathered in an organized way. The following steps are recommended;

(a) take photographs and make sketches

(b) examine involved equipment, work piece or material and the environmental conditions

(c) interview the injured, eye-witnesses and other involved parties

(d) consult expert opinion where necessary

(e) identify the specific Contractor or Sub-contractor involved.

10.2.2 Having gathered information, it is then necessary to make an Analysis of Incident

(a) establish the chain of events leading to the accident or incident

(b) find out at what stage the accident took place

(c) consider all possible causes and the interaction of different factors that led up to the accident, and identify the most probable cause

Note: The cause of an accident should never be classified as carelessness. The specific act or omission that caused the accident must be identified.

10.2.3 The next stage is to proceed with the Follow-up Action

(a) report on the findings and conclusions

(b) formulate preventive measures to avoid recurrence

(c) publicize the findings and the remedial actions taken

11.0 Accident Statistics

11.1 Introduction

11.1.1 Accident data, if properly collected and analyzed, indicates trends, and can show where and how problems arise. Comprehensive accident information enables accident prevention efforts to be targeted at problem areas.

11.2 Collection of Accident Statistics

11.2.1 The procedures that apply for the reporting and collation of data in respect of accident statistics are set out below.

11.2.2 The Contractors' safety officers are required to send duly completed Report Forms (Refer to Schedule 3 – SAF 002 and SAF 003), to the Employer's Representativewithin five days after the end of each month. The Construction Accident Statistics Monthly Report Form must be submitted even if there are no injuries or dangerous occurrences within the current month.

11.2.3 Man-hours' is defined as the man-hours worked by all persons employed on site. (including site supervisory staff, management staff and clerical staff).

11.2.4 'Man-days' is defined as the man-days worked by all persons employed on site. **(**including site supervisory staff, management staff and clerical staff).

11.3 Calculation of man-days lost - Construction Accident Statistics

11.3.1 When calculating the man-days lost for the Construction Accident Statistics Summary Sheet, the following applies:
The number of man-days lost refers to the total number of man-days lost during the reported month due to :

(a) non-fatal reportable accidents which happened within the reported month

(b) non-fatal reportable accidents which occurred in previous months.

the day on which the reportable accident occurred should be excluded in calculating man-days lost but public holidays within the injured period should be counted.

11.4 Calculation of Accident Frequency Rate (AFR)

The Accident Frequency Rate (AFR) per 100,000 man-hours worked shall be calculated using the following formula

$$\left\{\frac{\text{No. of reportable accidents}}{\text{Man-hours worked}}\right\} \times 100,000$$

A reportable accident is a Fatality, a Major Injury Accident as defined in 9.4.1, and reportable accidents as defined in 9.2.1

12.0 Hazard Identification and Risk Assessment

12.1 General

12.1.1 The purpose of Hazard Identification and Risk Assessment is to identify all the significant hazards, which may occur during the construction phase, and to rank them according to their severity. Having ranked the risks by severity the Contractor shall then introduce measures to mitigate the effects of that risk.

12.1.2 Prior to the commencement of any potential High-Risk operations the Contractor shall conduct a detailed hazard analysis and risk assessment of the task and shall record his findings on appropriate worksheets. Examples of worksheets SAF 020 may be found in Schedule 3.

12.1.3 The worksheets should then show what measures the Contractor is going to take to reduce the level of risk to acceptable levels.

12.2 Method Statements

12.2.1 As a result of the Hazard Identification and Risk Assessment detailed method statements shall need to be produced for medium and high risk activities including amongst others the following:

(a) Craneage of items in excess of 1 tonne

(b) Erection of steel structures.

(c) Excavations deeper than 2m.

(d) Erection and loading of formwork

(e) Demolition.

(f) Tunnelling operations.

(g) Inflammable materials – the use and storage

(h) Use and storage of explosives

A component part of the detailed method statement shall be the inclusion of the completed Hazard and Risk Worksheet as discussed in Section 12.1 above.

12.2.2 Method Statements will usually be attached to Design Submissions but should be cross-referenced to the Contractor's Site Safety Plan.

12.2.3 A method statement should contain sufficient information to enable the task to be undertaken safely and should contain as a minimum the following information

(a) Introduction – A brief outline of the Task

(b) Details of the Risks involved

(c) A step by step description of how the task is to be undertaken detailing

- what needs to be done;
- the order in which the task will be carried out;
- what plant or equipment is required;
- who the task will be done by;
- who will supervise the task;
- where will the task take place;
- when will the task take place;
- the precautions which must be taken before the task is undertaken;

- what to do if things go wrong;

12.3 Permits to Work

12.3.1 The Contractor shall develop a permit-to-work system, which is a formal written system used to control certain types of work that are potentially hazardous. A permit-to-work is a document, which specifies the work to be done, and the precautions to be taken. Permits-to-work form an essential part of safe systems of work for many construction activities. They allow work to start only after safe procedures have been defined and they provide a clear record that all foreseeable hazards have been considered. Permits to Work are usually required in high-risk areas as identified by the Risk Assessments.

12.3.2 A permit is needed when construction work can only be carried out if normal safeguards are dropped or when new hazards are introduced by the work. Examples of high risk activities include but are not limited to:

(a) Work close to 25kV overhead Catenary

(b) Entry into Confined Spaces. (SAF 010)

(c) Work In Close Proximity to Overhead Power lines and Telecommunication Cables.

(d) Hot Work. (SAF 012)

(e) To Dig—where underground services may be located.

(f) Work with moving construction locomotives.

(g) Working On Electrical Apparatus. (SAF 011)

(h) Work with Radioactive isotopes.

12.3.3 The permit-to-work system should be fully documented, laying down:

(a) how the system works;

(b) the jobs it is to be used for;

(c) the responsibilities and training of those involved; and

(d) how to check its operation;

12.3.4 The permit-to-work form must help communication between everyone involved. It should be designed by the Contractor issuing the permit, taking into account individual site conditions and requirements. Separate permit forms may be required for different tasks, such as hot work and entry into confined spaces, so that sufficient emphasis can be given to the particular hazards present and precautions required.

12.3.5 The permit to work form should contain:

(a) clear identification of who may authorize particular jobs (and any limits to their authority);

(b) clear identification of who is responsible for specifying the necessary precautions (e.g. isolation, emergency arrangements, etc);

(c) a detailed description of the task clearly identifying the work to be done and the associated hazards;

(d) plans and diagrams be used if appropriate to assist in the description of the work to be done, its location and limitations;

(e) identity of the hazards and the precautions to be taken;

(f) clear rules about how the job should be controlled or abandoned in the case of an emergency;

(g) the time limitations should be stated;

(h) job specific toolbox talk conducted by the supervisor

12.3.6 A Permit To Work authorization form shall be completed with the maximum duration period not exceeding twenty four hours (for example of a Permit To Work authorization form see Schedule 3)

12.3.7 A copy of each Permit To Work shall be displayed, during its validity, in a conspicuous location in close proximity to the actual works location to which it applies.

12.3.8 A pre-permit activation job specific toolbox talk shall be conducted by the supervisor including amongst others the following.

(a) All identified hazards are explained;

(b) Risk mitigation process clarified;

(c) Method of work explained stressing points (a) and (b) above;

(d) Emergency response procedure is clarified and persons assigned tasks in the event of an emergency;

(e) PPE requirements including PPE serviceability checks and training if required;

All workers and supervision shall attend the toolbox talk and sign the toolbox attendance register. Any person/s coming late to the work site shall be given the toolbox talk and sign the attendance register

A copy of the toolbox talk and attendance register shall be displayed as per section 12.3.7 of this manual.

13.0 Emergency Preparedness Plans

13.1 Emergency Situations

13.1.1 Every Contractor shall formulate an Emergency Preparedness Plan for each of his sites. These plans will address foreseeable emergencies that may arise during the construction activities. Examples of activities for which plans should be prepared include amongst other things:

(a) AnAccident Which Results In Death or Major Injury. (Major Injury as defined in Section 9.1.7)

(b) A Serious Fire That Threatens Life.

(c) A Flood That Threatens Life.

(d) Leakage of Any Dangerous Materials or Chemicals.

(e) Leakage / Short Circuit of any Electrical supply.

(f) Major Engineering Failures such as:

- collapse of tunnels or structures
- major utility collapse
- unintended explosions
- subsidence causing damage to structures or services

13.1.2 An Emergency Preparedness plan should include details of the following;

(a) The name, location and phone number of the Emergency Co-ordinator;

(b) Designated Personnel with locations and phone numbers;

(c) Details of the Emergency Response Team with locations and phone numbers;

(d) Functions of the Emergency response Team;

(e) The means of Escape;

(f) Communication with the Emergency Services;

- Police
- Fire Services
- Ambulance and Hospital Services

(g) First-Aid Facilities;

(h) Site plans;

(i) Suppliers of emergency equipment such as sump pumps, lighting, craneage, etc.

13.1.3 Copies of the emergency procedures and the Contractor's rescue organization (reviewed without objection by the Employer’s Representative) should be displayed at each place of work and notice boards. This information should be reviewed and updated as often as is required, but at least once annually. Drills should be arranged to test the efficiency in mobilizing the necessary personnel and equipment. These Drills should be carried out at least every three months.

13.1.4 Regular joint exercises between the Contractor's rescue teams and the Fire and Emergency Services should also be carried out for the major contracts.

14.0 Safety Signage

14.1 Safety Signs

14.1.1 All safety signage that is displayed in and around the sites shall be in both Hindi and English, examples of signs that shall be required shall include amongst others the following:

(a) Wear Safety Helmets.

(b) Permit to Work areas

(c) Wear Safety Footwear.

(d) Wear Hearing Protection.

(e) Wear Eye Protection.

(f) Danger Electricity.

(g) Danger Crane Overhead.

(h) Stop Look and Listen

(i) No Smoking.

(j) First Aid.

(k) No Entry signs

(l) Fire precautions.

(m) Emergency Exit from underground works

14.1.2 All safety signs shall comply with the Internationally recognized Safety Colours as indicated below:

- Blue - Mandatory.
- Yellow- Danger.
- Red- Prohibition.
- Green- Safe Condition.

14.2 References

IndianStandards

IS 9457 Standard for colours of Safety Signs

IS 12349 : 1988 Fire Protection - Safety Signs

15.0 Industrial Healthand welfare

15.1 Introduction

15.1.1 Hazards to Health on a construction site can arise from the use of a number of materials, substances and processes if they are not properly controlled. Some of the more serious risks are caused by the inhalation of dusts, fibres, toxic fumes, by the misuse of chemicals, lasers and radioactive isotopes. Excessive vibration and excessive noise can also cause ill health. Many man-days are lost as a result of dermatitis, tenosynovitis, bronchitis and rheumatism.

15.1.2 The Contractor shall be responsible for maintaining healthy working conditions for all his, and his sub-contractors, workers. In particular he shall pay attention to the effects of noise, dust, air pollution and the use of chemicals. If it is not possible to remove the cause of harm then suitable and sufficient Personal Protective Equipment (PPE) should be provided to those workers who could be affected.

15.1.3 If the use of PPE is the only means of providing protection the Contractor shall ensure that all the workers affected are properly trained in the use of the PPE and that adequate supervision is provided to ensure its proper use.

15.2 Hazardous Substances

15.2.1 The Contractor shall obtain Material Safety Data Sheets (MSDS) for all substances that are deemed to be hazardous to be used on site. An inventory shall be kept of all such materials with the relevant MSDS and shall be available for inspection by the Employer's Representative who may require further MSDS's to be obtained.

15.2.2 The Contractor shall conduct an assessment of the substance in relation to its intended usage on site. Particular attention must be given to the actual location of usage as a substance, which is safe for use in the open air, may be extremely hazardous in a confined space. The results of all assessments shall be recorded and method statements produced.(For an example of a Hazardous Substance Assessment Form see Schedule 3)

15.2.3 The objective of the assessment is to establish what precautions and control measures shall be implemented in order that a safe system of work can be established for the use of the substance on site.

15.3 Noise

15.3.1 Industrial deafness is caused by over exposure to high levels of noise from plant, machinery or construction processes. Once a part of a persons hearing has been lost it can never be recovered. Deafness can also lead to further accidents on site with workers being unable to hear warnings and other instructions.

15.3.2 For continuous exposure, i.e. for eight hours in any one-day, the sound level should not exceed 90dB(A). For non-continuous exposure a calculated equivalent continuous sound level (Leq) should not exceed 90dB(A). Workers should not be exposed to sound levels exceeding 90dB(A) unless they are wearing suitable hearing protectors, which effectively reduce the sound level at the user's ear to, or below, 90dB(A).

15.3.3 If Peak noise levels exceed 120dB(A) then the wearing of suitable hearing protectors shall be Mandatory.

15.3.4 The Contractor shall carry out noise assessments to establish what noise levels his

workers are being exposed to. If excessive noise levels above 90dB(A) are found then the contractor shall introduce a noise control programme to protect his workers.

15.3.5 Consideration should always be given first to reducing the noise level at source. Examples of noise reduction methods include;

(a) More efficient silencers on compressors and maintenance of exhaust systems;

(b) Fitting acoustic lining to machinery panels;

(c) Use of Acoustic screens and sheds to protect other workers;

(d) Using noise reduced tools;

(e) Sighting of noisy plant away from the workplace

15.3.6 Where it is not possible to reduce the noise level to which the worker is exposed the Contractor shall provide the workers with suitable and sufficient hearing protection to protect them. The Contractor shall ensure that all the workers affected are properly trained in the use of the Hearing Protection and that adequate supervision is provided to ensure its proper use.

15.4 Ventilation in Shafts and Tunnels

15.4.1 The contractor shall assign a Competent Person to perform all air monitoring required to determine proper ventilation and quantitative measurement of potentially hazardous gases. The atmosphere in all underground areas shall be tested quantitatively by the contractor for toxic gases, dust, vapour, mist, and fumes as often as necessary to ensure that prescribed limits given at 15.4.3 below are met. Quantitative tests for methane shall also be performed in order to determine whether an operation is potentially hazardous. For every test carried out the contractor shall maintain a record of the air quality the location, date, time, substances and amount monitored. These records shall be made available to the Employer's Representative on demand.

15.4.2 The ventilation system shall be adequate to maintain circulation of air in all parts of tunnels and shafts and following conditions shall be taken care of:

15.4.3 Air shall be considered unfit for workmen to breathe if it contains any of the following :

(a) Less than 19.5% oxygen by volume.

(b) More than 0.005% carbon dioxide by volume.

(c) More than 0.01% carbon monoxide by volume.

(d) More than 0.001% hydrogen sulphide by volume.

(e) More than 0.005% oxides of nitrogen.

(f) More than 0.5% of methane at any place in the tunnel.

(g) More than 0.0002% of aldehyde.

(h) Any other poisonous gas in harmful amounts**.**

In addition to the requirements given above, 2 m^3 of fresh air per minute shall be furnished for each brake horsepower of diesel engine used in the tunnel.

15.4.4 The Contractor will ensure the supply of fresh air to all underground work areas in sufficient amount to prevent any harmful accumulation of dust, vapour or gases. The contractor shall provide at least 4.25 m^3 of fresh air per minute per employee underground.

15.4.5 No inflammable materials or oil and grease shall be stored inside or near the tunnels or shafts and all combustible rubbish from the tunnel or shaft shall be promptly removed. A

regular analysis of the gases inside the tunnel should be done with advance of the tunnel.

15.4.6 Tools made of light alloys (such as Al and Mg) are not to be used inside the tunnel. They may cause sparks.

15.4.7 Regular checking of gas (referred at 15.4.3) at the faces shall be done before each shift. This should be carried out using a multi gas detector.

15.4.8 Motive power other than electric, shall not be used without prior authorization from the employer's representative. No petrol engines shall be used underground. Diesel locomotives shall only be used with the prior consent of the Employer's Representative. Diesel engines shall not be used underground unless equipped with a filter that will remove all carbon monoxide and oxides of nitrogen. Such filters shall be tested by the Contractor's chief mechanic and more frequently by the plant operator.

15.5 Toilets

15.5.1 The Contractors shall ensure that an adequate number of toilets are made available at the work sites with the ratio being no less than one toilet for every 50 workers or part thereof. The toilets shall be located so that persons do not have to walk more than five hundred meters to use them.

15.5.2 The toilets shall have adequate water supply and be kept in a clean and tidy condition at all times.

15.6 Drinking Water

15.6.1 The Contractors shall ensure that effective arrangements are made to provide and maintain at suitable points a sufficient supply of wholesome drinking water.

15.6.2 All such points shall be legibly marked "Drinking Water" in Hindi and English and no such point shall be situated within six meters of any washing place, urinal or latrine.

15.7 Lifting and Carrying of Excessive Weights

15.7.1 All contractors shall ensure that no worker lifts by hand or carries overhead or over his back or shoulders any material, article, tool or appliances exceeding in weight the maximum limits set out below unless aided by another worker or a mechanical device.

Adult – man	55kg
Adult – female	30kg

15.8 References

The Delhi Building And Other Construction Workers (Regulation of Employment and Conditions of Service) **Rules 2002**

Indian Standards

IS 4756 : 1978 Safety Code for Tunnelling works

IS 1179 : 1967 Specification for equipment for eye and face protection during welding

IS 2925 : 1984 Specification for Industrial Safety Helmets

British Standards

BS EN 352: Hearing protectors. Safety requirements and testing

352-1: 1993: Ear muffs

352-2: 1993: Ear plugs

352-3: 1997: Earmuffs attached to an industrial safety helmet.

16.0 Working at height

16.1 General

16.1.1 Working at height is the largest single cause of serious accidents in the construction industry and therefore the Contractor shall carry out risk assessments for all work where workers or materials can fall more than two meters.

16.1.2 Where work is being carried out above areas where there is public access such as roads footpaths etc. particular care must be taken to ensure that no materials can fall from the working area.

16.1.3 Edge protection shall be provided at all leading edges or openings where workers or materials can fall more than two meters. Edge protection shall meet the minimum standard of; a) a main guardrail at least 1 meter above the edge

b) a toe board at least 200 mm high; and

c) an intermediate guard rail or other barrier so that there is no gap more than 470 mm.

16.2 Use of Scaffolds

16.2.1 All scaffolds should be erected and dismantled by workmen who are thoroughly experienced in the erection and dismantling of scaffolding.

16.2.2 All scaffolds should be inspected by a competent person at least every three days after erection and the results of inspections recorded and the records shall be kept available for checking by the Employer's Representative.

16.2.3 Tags shall be fitted to all scaffolds to show whether they are safe for use or not. All Safe for Use tags shall be signed by a senior site engineer from the contractor.

16.2.4 All scaffolds shall be constructed of sound materials free from patent defect.

16.2.5 The following measures shall be taken;

(a) the scaffold shall be constructed for the correct use (Light or Heavy Duty)

(b) securely fixed to existing structures or adequately buttressed;

(c) the use of barrels, boxes, loose tiles or other unsuitable material shall not be used as supports for working platforms;

(d) all working platforms shall be fully boarded;

(e) all working platforms shall have guard rails at one metre height and shall also have an intermediate rail at half height;

(f) all working platforms shall be provided with toe boards;

(g) all working platforms shall be kept free of unnecessary obstruction or rubbish

(h) secure ladder access shall be provided;

16.3 Use of Ladders

16.3.1 All ladders shall be of sound construction and shall be free from patent defect.

16.3.2 Ladders should be checked weekly and defective ladders shall be promptly and properly repaired or replaced.

16.3.3 Ladders shall not be used as working platforms but may be used for work of short duration of up to thirty minutes.

16.3.4 Metal ladders shall not be used near or adjacent to overhead power lines unless they

have been certified dead under a permit to work system.

16.3.5 Ladders shall;

(a) be secured at the top or footed at the bottom to prevent slippage;

(b) not be used if any rung is missing;

(c) not be used for any other purpose than to provide access;

(d) be set at an angle of seventy five degrees unless designed for vertical access;

(e) all vertical ladders shall be fitted with hoops to prevent falls;

16.4 Safety Harnesses / Fall Arresters

Where it is not possible to provide a safe working platform then the use of safety harnesses may be considered. If safety harnesses are used they should be of the full body type and secure anchorage points shall be provided and used. Workers must be instructed in the proper use of harnesses.

16.5 References

The Delhi Building And Other Construction Workers **(**Regulation of Employment and Conditions of Service) Rules 2002

Chapters: XV and XIX

Indian Standards;

IS 3696 (Part 1) : 1987 Safety Code for Scaffolds and Ladders, Part 1, Scaffolds

IS 3696 (Part 2) : 1991 Safety Code for Scaffolds and Ladders, Part 2, Ladders

IS 13416 (Part 1):1992 Recommendations for preventive measures against hazards in the workplace, Part 1, Falling material hazards protection

IS 13416 (Part 2):1992 Recommendations for preventive measures against hazards in the workplace, Part 2, Fall protection

British Standards

BS EN 354: 1993: Personal protective equipment against falls from a height. Lanyards

BS EN 355: 1993: Personal protective equipment against falls from a height. Energy absorbers

BS EN 358: 1993: Personal equipment for work positioning and prevention of falls from a height. Work positioning systems

BS EN 360: 1993: Personal protective equipment against falls from a height. Retractable type fall arresters

BS EN 361: 1993: Personal protective equipment against falls from a height. Full body harnesses

BS EN 362: 1993: Personal protective equipment against falls from a height. Connectors

BS EN 363: 1993: Personal protective equipment against falls from a height. Fall arrest systems

BS EN 364: 1993: Personal protective equipment against falls from a height. Test methods

BS EN 365: 1993: Personal protective equipment against falls from a height. General requirements for instructions for use and for marking

BS EN 795: 1997: Protection against falls from a height. Anchor devices. Requirement and testing

17.0 Excavations

17.1 General

17.1.1 Excavation is one of the important phases of any construction activity. Due to insufficient attention to the safety aspects it frequently becomes the cause of many accidents. Contractors are therefore required to plan and execute all excavations in a safe manner.

17.1.2 The contractor shall ensure that all excavations are supervised by workers with thorough knowledge and experience of excavation work.

17.1.3 The integrity of the excavation and the support system shall be inspected prior to the commencement of any works on a daily basis with the results of the inspections being formally recorded. All such records shall be kept available for inspection by the Employer's Representative.

17.1.4 Where there is the possibility of any ingress of water then pumping sumps shall be established with pumps being readily available for use and additional ladders placed for use in the event of an emergency evacuation.

17.2 Planning

17.2.1 The correct planning of excavations is essential for safety and before digging any excavations Contractors should plan against the following;

(a) collapse of the sides;

(b) materials falling onto people working in the excavation;

(c) people and vehicles falling into the excavation;

(d) people being struck by plant;

(e) undermining nearby structures;

(f) contact with underground services;.

(g) fumes; and

(h) Make sure the necessary equipment needed such as trench sheets, props, etc, are available on site before work starts.

17.3 General Precautions

17.3.1 The following precautions should be observed;

(a) Prevent the sides and the ends from collapsing by battering them to a safe angle or supporting them with timber, sheeting or proprietary support systems.

(b) Do not go into unsupported excavations.

(c) Never work ahead of the support.

(d) Remember that even work in shallow trenches can be dangerous. You may need to provide support if the work involves bending or kneeling in the trench.

(e) Prevention of materials falling into excavations

(f) Do not store spoil or other materials within one meter of the sides of excavations. The spoil may fall into the excavation and the extra loading will make the sides more prone tocollapse.

(g) Make sure the edges of the excavation are protected against falling materials.Provide toe boards where necessary.

(h) Wear a hard hat when working in excavations.

(i) Take steps to prevent people falling into excavations. If the excavation is 2 m or

more deep, provide substantial barriers, e.g. guard rails and toe boards.

(j) Keep vehicles away from excavations wherever possible. Use brightly painted baulks or barriers where necessary.

(k) Where vehicles have to tip materials into excavations, use stop blocks to prevent them from over-running. Remember that the sides of the excavation may need extra support.

17.4 Undermining nearby structures

17.4.1 The following precautions should be taken to prevent the undermining of nearby structures;

(a) Make sure excavations do not affect the footings of scaffolds or the foundations of nearby structures. Walls may have very shallow foundations, which can be undermined by even small trenches.

(b) Decide if the structure needs temporary support before digging starts. Surveys of the foundations and the advice of a structural engineer may be needed.

17.5 Avoiding underground services

17.5.1 The following precautions should be taken to avoid underground services;

(a) Look around for obvious signs of underground services, e.g. valve covers or patching of the road surface.

(b) Use locators to trace any services. Mark the ground accordingly.

(c) Make sure that the person supervising excavation work has service plans and knows how to use them. Everyone carrying out the work should know about safe digging practices and emergency procedures**.**

(d) Operate a “Permit to Dig” system.

17.6 References

The Delhi Building And Other Construction Workers (Regulation of Employment and Conditions of Service) **Rules 2002**
Chapter: XIII
Indian Standards
IS 3764 : 1992 Excavation Work – Code of Safety
IS 13430 : 1992 Safety during additional construction to existing buildings – Code of Practice.
IS 2314 : 1986 Steel Sheet Piling sections
IS 5121 : 1969 Safety Code for Piling and Other Deep Foundations

18.0 Lifting Operations

18.1 Lifting Appliances:

18.1.1 The Contractor shall ensure that all lifting appliances, including synchronized mobile jacks, pit jacks, mobile cranes, tower cranes, gantry cranes, launching beams and lorry mounted cranes, prior to being allowed to work on site shall have available for inspection by the Employer's Representative a current Certificate of Inspection issued by a Competent Person approved by NMRC.

18.1.2 All lifting appliances with a lifting capacity of more than one tonne shall, where practicable, be fitted with Automatic Safe Load Indicators and Audible Warning Devices which shall be kept in an operable condition at all times the lifting appliance is in use. Checks should be made to ensure that the Automatic Safe Load Indicator is properly calibrated and is functioning properly.

18.1.3 All lifting appliances shall be maintained in accordance with the manufacturer's instructions and shall be subject to a regular preventative maintenance programme.

18.1.4 All lifting appliances shall be inspected every three months by a third party competent person approved by NMRC. Certificates of Inspection shall be available with the lifting appliance and a copy shall also be sent to the Employers Representative.

18.1.5 The operators of lifting appliances shall conduct daily inspections of their respective lifting appliances with the results of the inspections being recorded and kept available for inspection by the Employer's Representative.

18.1.6 The Contractor shall ensure that only thoroughly trained and experienced persons aged twenty-one years and over are allowed to operate lifting appliances.

18.2 Lifting Gear:

18.2.1 Lifting Gear includes chain slings, rope slings, or similar gear and a ring, link, hook, plate clamp, shackle, swivel or eye bolt.

18.2.2 The Contractor shall ensure that all lifting gear shall be in good condition and shall be tested and certified every six months, with the Safe Working Load being stamped or clearly displayed upon it. Records of test shall be kept available for inspection by the Employer's Representative.

18.2.3 All lifting gear shall be visually inspected before any use and if any defects are found then it shall be removed from site or dismantled / disabled in order to ensure that it is not used in a defective state.

18.2.4 All lifting gear shall be properly stored and not left lying on the ground where it could be damaged or used in an unsafe manner.

18.3 Lifting Operations:

18.3.1 The Contractor shall ensure that during the course of any lifting operations the following minimum requirements shall be followed:

(a) All lifting operations shall be under the control of a competent "Lifting Supervisor" appointed by the contractor.

(b) Only thoroughly trained and experienced crane drivers shall be allowed to operate cranes.

(c) Only thoroughly trained and experienced slingers and riggers shall be allowed to sling loads and give directions to crane operators.

(d) A standard code of hand signals shall be adopted for controlling the movements of

the crane and both the driver and the signaller shall be thoroughly familiar with the signals.

(e) The driver of the crane shall respond to signals from only the appointed signaller but shall obey the stop signal at any time no matter who gives it.

(f) Before commencing any lifting operations the ground conditions on which the crane is to stand shall be investigated in order to ensure that the load bearing capabilities are adequate.

(g) The weight of the load must be known to the crane driver and the slinger/rigger before lifting commences.

(h) No loads are to be slewed over public areas without stopping pedestrians and vehicles first.

(i) No unauthorized persons are allowed into the lifting zone.

(j) No person is allowed to ride the hook of the crane or the loads being lifted.

(k) Any areas where a minimum clearance of six hundred millimeters from the rear of the slewing kentledge of the crane cannot be achieved and where persons could be trapped against obstacles then a fence shall be erected to prevent access.

(l) All crane hooks shall be fitted with an operable safety catch.

(m) Wherever practicable all loads shall have tag-lines attached in order to ensure that the load can be controlled at all times.

(n) Provision shall be made to ensure that the lifting slings or chains can be safely removed from the loads once they have been landed.

(o) All lifted loads and stacked materials shall be left in a secure and stable condition at all times.

(p) Whenever working close to isolated overhead power-lines the lifting appliances shall be grounded to earth as a secondary precaution against accidental energisation.

(q) No close working to any live overhead power-lines is permitted without the operation of a strict Permit to Work system being in place.

18.3 References

The Delhi Building And Other Construction Workers (Regulation of Employment and Conditions of Service) **Rules 2002**

Chapter: VII

Indian Standards

IS 807 : 1976 Code of Practice for the design, manufacture and testing of cranes

IS 7293 : 1974Safety Code for working with Construction Machinery

IS 13583 : 1993Code of Practice for training of Crane Drivers Part 1 General

British Standards

BS 7121: Code of practice for safe use of cranes

BS 7262: 1990: Specification for automatic safe load indicators

19.0 Work in Confined Spaces

19.1 General

19,1.1 The term 'confined space' has two defining features. Firstly, it is a place which is substantially (though not always entirely) enclosed and, secondly, there will be a reasonably foreseeable risk of serious injury from hazardous substances or conditions within the space or nearby.

19.1.2 Some confined spaces are fairly easy to identify, for example, closed tanks and sewers. Others are less obvious but may be equally dangerous, for example closed and unventilated or inadequately ventilated rooms and silos, ducts, culverts, tunnels, boreholes, bored piles, manholes, shafts, excavations, sumps, inspection pits, cofferdams ,and building voids.

19.2 The hazards

19.2.1 The most likely hazards are as follows:

(a) Flammable Substances and Oxygen Enrichment;

(b) Toxic Gas, Fume or Vapour;

(c) Oxygen deficiency;

(d) The Ingress or Presence of Liquids;

(e) Presence of Excessive Heat,

(f) Excessive Humidity.

19.2 Entry Procedures

19.2.1 Contractors will ensure that no work will be undertaken in Confined Spaces unless a Permit to Work, see Section 12.3, has been prepared and issued.

19.2.2 Only persons who have been thoroughly trained, experienced and are physically fit shall be allowed to work in Confined Spaces.

19.2.3 Persons with any of the following medical conditions shall not be allowed to work in confined spaces:

(a) a history of fits, blackouts or fainting attacks,

(b) a history of heart disease or disorder,

(c) high blood pressure,

(d) asthma bronchitis, or shortness of breath on exertion,

(e) deafness

(f) meniers disease or disease involving giddiness or loss of balance,

(g) claustrophobia or nervous or mental disorder,

(h) back pain or joint trouble that would limit mobility in confined spaces,

(i) deformity or disease of the lower limbs limiting movement.

(j) Chronic skin disease,

(k) Serious defects in eye sight or lack of sense of smell

19.2.4 No smoking shall be allowed in or within 2 meters of the opening to any confined space and suitable warning signs shall be positioned.

19.2.5 Before any confined space work commences the following equipment shall be available for use:

(a) Multi Gas Monitor; or other suitable gas monitoring equipment.

(b) Sufficient sets of Self Contained Breathing Apparatus to enable rescue to be carried out;

(c) Full Body Type Harness for each worker;

(d) Tripod and Lifeline Hoist Rope; for work in situations were a vertical exit from the confined space is required.

(e) Flame-proof lighting. (Hand lamps not more than 24 volts.);

(f) Resuscitation Equipment;

(g) Ventilation Equipment.

The persons involved in the confined space working operations shall need to be thoroughly trained and certified as being competent in the use of the above detailed item of equipment.

19.3 References

The Delhi Building And Other Construction Workers (Regulation of Employment and Conditions of Service) **Rules 2002**

Chapter: XIII

Indian Standards

IS 11972 : 1987	Code of Practice for safety precautions to be taken when entering a sewerage system

20.0 Site electricity

20.1 General

20.1.1 The Contractor shall nominate a representative whose name and qualifications shall be submitted in writing to the Employer's Representative for review not later than 4 weeks before the appointment and who shall be solely responsible for ensuring the safety of all temporary electrical equipment on Site. The Contractor shall not install or operate any temporary Site electrical systems until this representative is appointed and has commenced duties.

20.1.2 The name and contact telephone number of the representative having been reviewed without objection by the Employer's Representative shall be displayed at the main distribution board for the temporary electrical supply so that he can becontacted in case of an emergency.

20.1.3 The Contractor shall submit schematic diagrams and the details of the equipment for all temporary electrical installations, and these diagrams together with the temporary electrical equipment shall be submitted to the Employer's Representative for review.

20.1.4 All electrical installation work on Site shall be carried out in accordance with the requirements laid down in the Specification. All work shall be supervised or executed by qualified and suitably categorized electricians.

20.1.5 All Temporary Electrical Site installations and distribution systems shall as a minimum meet IP44 standards and be in accordance with:-

(a) Indian Electrical Regulations;

(b) The Power Companies' Supply Rules;

(c) BS 7671 Requirements for electrical installation, the IEE Wiring Regulations (16th Edition);

(d) BS 7375 Distribution of Electricity on Construction and Building Sites;

(e) BS 4363 Distribution Assemblies for Electricity Supplies for Construction and Building Sites; and

(f) BS 6164 Safety in Tunnelling in the Construction Industry.

20.2 Design Considerations

20.2.1 Distribution equipment utilized within the temporary electrical distribution system shall incorporate the following features:-

(a) flexibility in application for repeated use;

(b) suitability for transport and storage;

(c) robust construction to resist moisture and damage; and

(d) safety in use**.**

20.2.2 All cabling shall be run at high level whenever possible and firmly secured to ensure it does not present a hazard or obstruction to people and equipment.

20.2.3 The installation on Site shall allow convenient access to authorized and competent operatives to work on the apparatus contained within.

20.3 Distribution of supply

20.3.1 The Site mains voltage shall be as the Electricity Utility supplies, 415V 3-phase 4-wire system.

(a) Single-phase voltage shall be as the Electricity Utility supplies, 240V supply.
(b)Reduced voltages shall conform to BS 7375.

20.3.2 The following voltages shall be adhered to for typical applications throughout the distribution systems:

(a) fixed plant - 415V 3 phase;

(b) movable plant fed by trailing cable - 415V 3 phase;

(c) installations in Site buildings - 240V 1 phase;

(d) fixed flood lighting - 240V 1 phase;

(e) portable and hand held tools - 110V 1 phase;

(f) Site lighting (other than flood lighting) - 110V 1 phase; and

(g) portable hand-lamps (general use) - 110V 1 phase.

20.3.3 When the low voltage supply is energized via the Employer's transformer, any power utilized from that source shall be either 415V 3 phase or / 240V. 1phase as appropriate. The Contractor shall carry out any conversion that may be necessary to enable him to use power from that source.

20.3.4 Protection shall be provided for all main and sub-circuits against excess current, residual current and earth faults. The protective devices shall be capable of interrupting (without damage to any equipment or the mains or sub-circuits) any short circuit current that may occur.

20.3.5 Earthing and bonding shall be provided for all electrical installations and equipment to prevent the possibility of dangerous voltage rises and to ensure that faults are rapidly cleared by installed circuit protection.

20.3.6 Only plugs and fittings of the weatherproof type shall be used and they should be colour coded in accordance with the Internationally recognized standards for example as detailed as follows:

(a) 110 volts Yellow.
(b) 240 volts Blue.
(c) 415 volts Red.

20.4 Cables

20.4.1 Cables shall be selected after full consideration of the conditions to which they will be exposed and the duties for which they are required. For supply cables up to 3.3kV the cable armouring shall be used as the earth return in conditions where the cable is continuously extended and not subject to continuous movement after installation.

20.4.2 For supplies to mobile or transportable equipment where operation of the equipment subjects the cable to flexing, the cable shall conform to one of the following specifications appropriate to the duties imposed on it:

(a) BS 6708 flexible cables for use at mines and quarries;

(b) BS 6007 rubber insulated cables for electric power and lighting; and

(c) BS 6500 insulated flexible cords and cables

20.5 Maintenance

20.5.1 Strict maintenance and weekly checks of control apparatus and wiring distribution systems shall be carried out by an electrician (duly qualified to carry out the said checks) to ensure safe and efficient operation of the systems. The Contractor shall submit for review by the Employer's Representative details of his maintenance schedule and maintenance works record.

20.5.2 All portable electrical appliances shall be permanently numbered (scarf tag labels or similar) and a record kept of the date of issue, date of the last inspection carried out and the recommended inspection period.

20.6 References

The Delhi Building And Other Construction Workers (Regulation of Employment and Conditions of Service) **Rules 2002**
Chapter: VI

(a) Indian Electrical Regulations;

(b) BS EN 60529 Degrees of protection provided by enclosures (IP Code)

(c) The Power Companies' Supply Rules;

(d) BS 7671 Requirements for electrical installation the IEE Wiring Regulations (16th Edition);

(e) BS 7375 Distribution of Electricity on Construction and Building Sites;

(f) BS 4363 Distribution Assemblies for Electricity Supplies for Construction and Building Sites; and

(g) BS 6164 Safety in Tunnelling in the Construction Industry.

21.0 Welding andCutting

21.1 General

21.1.1 Contractors shall ensure that all welding, cutting and gouging is carried out so that the risks are kept at a minimum. There will be some circumstances when Permits to Work will need to be issued, such as

(a) working in tunnels;

(b) welding over areas where others are working;

(c) working in areas with increased fire risks or hazardous environments;

21.1.2 All equipment must be in good condition, properly installed and routinely inspected by a competent person, and records must be kept available for inspection by the Employer's Representative.

21.1.3 Flexible hoses, cables and connections must be free from damage or risk of damage in service. Cables and hoses shall have adequate carrying capacity.

21.1.4 Welders shall wear the correct personal protective equipment which includes the following;

(a) face and eye protection with correct grade of shield;

(b) gauntlet gloves;

(c) safety footwear

(d) welders apron or fire retardant overalls;

(e) The atmosphere in the vicinity of work must be known to be safe to breathe and free from flammable gases.

21.1.5 Adequate ventilation and fume extraction must be provided and used as required by the risk assessment and especially in enclosed areas and pits.

21.1.6 Surfaces to be heated by the process must be cleaned of contaminants that may be degraded by heat or give off noxious fumes (e.g. paints, plastics, zinc coating).

21.1.7 Naked flames or high temperature surfaces must not be allowed in the vicinity of volatile solvents.

21.1.8 All moveable flammable materials must be removed from the vicinity of work and fireproof covers placed over all flammable materials that cannot be removed.

21.1.9 During all welding the work piece and any access equipment must be safely secured.

21.2 Oxy-fuel Gas Processes

21.2.1 Handle cylinders carefully, keep outside enclosed areas and secure in an upright position. Keep oxygen cylinders away from fuel gas cylinders where possible.

21.2.2 Flash back arresters shall be fitted to both the fuel gas and oxygen cylinders;

21.2.3 Non return valves shall be fitted to the torch or cutting torch;

21.2.4 Ensure screwed fittings and hoses are correct and keep screwed and sealed surfaces free of contaminants, such as oil and grease.

21.2.5 Close cylinder valves when flame is extinguished.

21.2.6 Ensure any vessel, drum or tank that has contained flammable or toxic substances has been properly cleaned and inspected before subjecting it to hot work.

21.2.7 Checks for gas leaks should carried out using soapy water.

21.2.8 Remove all torches from enclosed areas when not in use.

21.2.9 Suitable fire extinguisher to be available at all places where hot work is being carried out.

21.2.10 Use firewatchers if there is a possibility of ignition unobserved by the operator (e.g. on the other side of bulkheads).

21.3 Arc Cutting, Gouging and Welding Processes

21.3.1 Connect the welding current return cable to the work piece close to the arc point or to a well electrically conductive support structure in good contact with the work piece. Also, connect the work piece or the support structure to a separate earth terminal.

21.3.2 Take precautions against the risk of increased fume hazards when welding with chrome containing fluxed consumables or high current metal inert gas (MIG) or tungsten inert gas (TIG) processes.

21.3.3 Avoid being in contact with water or wet floors when welding. Use duckboards or rubber protection.

21.3.4 Provide screens to limit exposure of others to glare from arcs.

21.3.5 Use the correct eye and face protection with the correct filter glass.

21.3.6 Use a low voltage open circuit relay device if welding with alternating current in constricted or damp places.

21.4 References

Indian Standards.

IS 818 : 1961 Code of Practice for safety and health requirements in electric, gas welding and cutting operations.

IS 1179 : 1967Specification for equipment for eye and face protection during welding

IS 5983 : 1967Specification for protective filters for welding, cutting and similar operations.

IS 13416 (Part 5) : 1994 Preventative measures against hazards at workplaces – Recommendations Part 5 Fire Protection

British Standards

BS EN 166: 1996: Personal eye-protection. Specifications

BS EN 169: 1992: Specification for filters for personal eye protection equipment used in welding and similar operations

BS EN 175: 1997: Personal protection. Equipment for eye and face protection during welding and allied processes

22.0 compressed Gases

22.1 Storage

22.1.1 The Contractor shall ensure that all compressed gases, such as oxygen and fuel gases, are stored in a safe manner in keeping with the following requirements.

22.1.2 When not in use compressed gas cylinders should preferably be stored in the open air in a well ventilated area at ground level on a firm level surface at least 3m away from any cellars, drains, excavations or other hollows where vapour may collect. There should be good access to the area, which should be kept clean and clear of combustible material, including wood, packing materials and vegetation. If any protection is provided to prevent cylinders being exposed to the weather, it should be of non-combustible material and should not inhibit ventilation. The area should not be close to any source of heat.

22.1.3 If storage in the open air is not reasonably practicable, compressed cylinders must be stored in adequately ventilated storerooms. The storeroom must be constructed of non-combustible material

22.1.4 Liquefied Petroleum Gas (LPG) cylinders should be stored separately from oxygen cylinders, other flammable liquids, oxidizing materials such as sodium chlorate, and toxic or corrosive substances. Such materials should be kept at least 3 meters away from LPG cylinders.

22.1.5 It is important that the valves of so-called `empty' cylinders are kept closed as well as those of full cylinders and that plugs, shrouds and caps are kept in place on all cylinders. This is necessary not only to prevent the escape of any residual compressed gas into the atmosphere but also to ensure that air is not sucked into the cylinder to form an explosive mixture inside it. All cylinders should be stored with their valves uppermost. Storage of LPG cylinders on their sides is particularly hazardous as in the event of a leaking or inadequately closed valve there is the possibility of leakage of liquid and a consequential release into the atmosphere of far greater quantities of flammable vapour.

22.1.6 The storage area should be enclosed by a fence approximately 2 meters in height. The fence should be made of non-combustible material and should not inhibit natural ventilation, particularly at low level - a wire mesh fence is particularly suitable for this purpose. The fence should have at least two means of exit, which should not be adjacent to each other. The gates should open outwards and not be self-locking. Both exits should be unlocked when persons are within the storage compound. At all times when the site is unattended the storage area should be secured.

22.1.7 On sites where only small quantities of compressed gas are stored (i.e. less than 300 kg) and it is practicable neither to provide an open air storage compound as described in para 21.1.6 nor a properly constructed storage building cylinders may be kept in a lockable wire cage in a safe place in the open air. Only one exit will be necessary providing there is no risk of a person being trapped in the enclosure. The cage should be clearly marked "Highly Flammable and notices prohibiting smoking and naked lights should be displayed.

22.1.8 Suitable portable first aid fire extinguishers shall be positioned in close proximity to the storage area for use in an emergency.

22.2 Handling Compressed Gas cylinders

22.2.1 Cylinders should be handled with care and wherever practicable moved on specially

designed trolleys. The valve on a cylinder should not be used for lifting or to lever the cylinder into position. Damage to the valve can result in highly dangerous situations following the escape of gas. For the same reason throwing or dropping cylinders should be prohibited as in such circumstances damage to the valve is even more likely.

22.2.2 Before connecting any cylinder or container of compressed gas to equipment it is essential that all fires, flames or other sources of ignition in the vicinity, including cigarettes and pilot lights, are extinguished. Where practicable cylinders should be changed in the open air. The cylinder should be examined and any damaged or faulty cylinder should NOT be used. No attempt should be made to rectify any fault or damage. The cylinder should be put in a safe place away from other cylinders or combustible materials until returned to the supplier.

22.2.3 If a cylinder is found to be leaking and the leak cannot be stopped, the cylinder should be carefully removed to a well-ventilated open space free from sources of ignition. It should be left with the leak, usually at the valve, uppermost, marked faulty and notices displayed prohibiting smoking or other naked lights. General access should be prevented by barriers or otherwise. The supplier of the cylinder should be informed immediately. Under no circumstances should users attempt to dismantle or repair defective cylinders.

22.3 Regulators

22.3.1 Regulators should be suitable for the gas and pressure in use. Checks for leaks at the regulator nuts should be made only by using soapy water. In the event of a defect or of any damage to a regulator, no attempt should be made to repair it. Such repairs should only be carried out by specialists.

22.4 Hoses

22.4.1 Flexible tubing should only be used for final connections to appliances. Flexible hoses should comply with BS 3212, BS 5120 or other nationally recognized standard. They should be additionally protected or of steel braid reinforced construction wherever they might be subject to damage by abrasion and so sited that they are not exposed to excessive heat. The length of hoses should be kept as short as practicable

22.5 Training and Instruction

22.5.1 Many accidents involving compressed gas are due to ignorance of simple basic precautions. It is essential that all persons using compressed gas are suitably instructed about the hazards and the precautions to be taken in its use

22.6 References

The Delhi Building And Other Construction Workers (Regulation of Employment and Conditions of Service) **Rules 2002**
Chapter: VI
Indian Standards: IS 2190 : 1979 Code of Practice for the selection installation and maintenance of portable first aid fire extinguishers.

23.0 Machinery

23.1 Machinery Fencing

23.1.1 The Contractor shall ensure that all gears, revolving shafts, flywheels, couplings and other dangerous parts of machinery shall be effectively guarded unless they are so constructed, installed or placed as to be safe as if they were guarded.

23.1.2 Fencing of dangerous parts of machinery shall not be removed while the machinery is in use or in motion. If the fencing is required to be removed for maintenance purposes it shall be replaced before the machine is taken into use.

23.2 Maintenance

23.2.1 The Contractor shall ensure that all machinery used on site is in safe condition and is properly maintained and repaired by duly authorized, thoroughly trained and experienced persons.

23.2.2 No repair to machinery shall be carried out whilst it is in motion unless it is unavoidable.

23.2.3 Maintenance records shall be kept available for inspection by the Employer's Representative.

23.3 Air Receivers

23.3.1 All Air receivers shall be fitted with a pressure relief valve and shall have the safe working pressure clearly marked upon them.

23.3.2 Every air receiver shall be subject to an annual test, which shall be carried out by a duly authorized person. The results of all tests shall be recorded and the records shall be kept available for inspection by the Employer's Representative.

23.3.3 The connection couplers on compressed airlines shall be securely fixed together and have safety chains or be wired at the joints in order to ensure that the joints do not come apart when charged with compressed air.

23.4 Woodworking Machines

23.4.1 All woodworking machines shall be fitted with the following guards and devices;

(a) Top Guard;

(b) Riving Knife;

(c) Guards to protect all drive belts etc.;

(d) An emergency stop switch easily accessible by the operator;

(e) A push stick;

23.4.2 Woodworking machines shall be operated only by thoroughly trained and experienced operators.

23.5 Abrasive Wheels

23.5.1 All Abrasive wheel machines shall be fitted with appropriate guards which shall be kept in place at all times the machine is in use.

23.5.2 All abrasive wheel machines shall have the spindle speed clearly marked upon them in revolutions per minute.

23.5.3 Only thoroughly trained and experienced persons are allowed to change the wheels on the machines. Wheels must inspected and ring tested before mounting to ensure that wheels are free from cracks or defects.

23.5.4 Safety Goggles or Face shields must be worn when grinding or cutting with abrasive

wheels.

23.6 References

The Delhi Building And Other Construction Workers (Regulation of Employment and Conditions of Service) **Rules 2002**

Chapter: X

Indian Standards

IS 7293 :. 1974 Safety Code for Working with Construction Machinery

24.0 Heavy Plant Operations

24.1 General

24.1.1 The contractor shall ensure that only safe and well-maintained plant and equipment shall be allowed to operate on any of the sites.

24.1.2 All operators of heavy plant such as, earth movers, piling rigs, etc. shall be medically fit, over eighteen years of age and be thoroughly trained and experienced to operate the equipment.

24.1.3 No unauthorized person shall be permitted to ride on plant.

24.1.4 The operators shall conduct daily inspections of their respective items of plant with the results of these inspections being recorded and the records kept available for inspection by the Employer's Representative.

24.1.5 All mobile heavy plant shall be equipped with at least one 5kg Dry Powder Fire Extinguisher, carried at a suitable position so as to ensure its easy availability.

24.1.6 Whenever heavy plant is operating in congested areas, thoroughly trained and experienced banksmen shall be deployed to control the plant and personnel movement and interface.

24.1.7 Any waste engine oil and filters following any on site servicing and maintenance shall be removed from the sites and disposed of in an environmentally conscious manner at authorized disposal locations.

24.1.8 All drums of fuel oil shall be stored on drip trays or the fuel shall be kept in bunded bulk storage fuel tanks, with quantities stored being kept to a minimum.

24.1.9 The storage areas shall have dry powder fire extinguishers positioned in close proximity to their location for use in an emergency.

24.2 References

The Delhi Building And Other Construction Workers (Regulation of Employment and Conditions of Service) **Rules 2002**

Chapter: X

Indian Standards

IS 7293 : 1974Safety Code for Working with Construction Machinery

IS 2190 : 1979Code of Practice for the selection, installation and maintenance of portable first aid fire extinguishers.

25.0 Tunnelling operations

25.1 Procedures

25.1.1 The Contractor shall develop safety procedures and methods of working to be adopted during the course of tunnelling operations. These procedures shall include but not be limited to;

(a) Shafts and Tunnels Entry Procedure. (Including visitors.)

(b) Blasting operations.

(c) Atmosphere Monitoring.(Oxygen Levels, Explosive Gases, Carbon Monoxide, Hydrogen Sulphide, Oxides of Nitrogen, temperature , humidity, dust etc.) See also Section 15.4 of this Manual.

(d) Portal Gantry Crane Operating Procedures.

(e) Emergency Preparedness Plan for the Shaft and Tunnels. (Including liaison with the Emergency Services.)

(f) Work Train Operating Procedure.

(g) Tunnel Boring Machine Cutter Head Chamber Entry procedure.

A detailed method statement as outlined in Section 12.2 METHOD STATEMENTS must be produced by the Contractor, and approved by the Employer's Representative before the commencement of any tunnelling operations.

25.2 Sanitation and Drinking Water

25.2.1 Unless the worksite is within 500 meters of the portal of the tunnel, sanitation facilities shall be provided. Suitable toilets shall be provided on the scale of one unit for every 50 men on the shift. Toilets shall be effectively and regularly cleaned and disinfectants provided.

25.2.2 At least 5 litres of clean drinking water shall be provided per person employed on the shift. The water shall be sited near the portal and also inside tunnels over 500 meters in length. The water shall be contained in a clean container with a tight fitting lid.

25.2.3 Washing and cleaning facilities shall be provided for all workers near the portal.

25.3 Lighting

25.3.1 The Contractor shall provide adequate lighting at the face and at any other point where work is in progress. A minimum of 50 lux shall be provided at the face, walkways and similar work areas. When mucking is done by tipping wagons running on trolley tracks a minimum of 30 lux shall be maintained. In all other areas the level of lighting shall not be less than 10 lux.

25.3.2 Emergency lighting shall be installed at the working faces and at 100m intervals along the tunnel to help escape workmen in case of accidents.

25.4 Ventilation

25.4.1 The Contractor shall make provision for adequate ventilation of all shafts and tunnels. The ventilation shall be sufficient to ensure proper dispersal of any dust or fume.(see also Section 15.4)

25.5 Protection Against Fire

25.5.1 As far as practicable, combustible materials shall not be used in the construction of any room or recess containing electrical apparatus.

25.5.2 No flammable material shall be stored in any part of the tunnel unless it is contained in suitable flameproof containers.

25.5.3An adequate supply of suitable first aid fire fighting equipment shall be kept at convenient

locations throughout the tunnel. This equipment shall tested at least once a month and records kept available for inspection by the Employer's Representative.

25.6 Warning Signals

25.6.1 The contractor shall install a suitable system of warning signals for the movement of plant and materials within shafts and tunnels.

25.6.2 The system shall be checked daily immediately prior to the commencement of tunnelling work under the supervision of a responsible person.

25.6.3 The Contractor shall make detailed emergency warning signals for cases of fire, tunnel collapse etc.

25.7 References

The Delhi Building And Other Construction Workers (Regulation of Employment and Conditions of Service) **Rules 2002**

Chapter: XIII

Indian Standards

IS 4756 : 1978Safety Code for Tunnelling Work.

IS 2190 : 1979Code of Practice for the selection, installation and maintenance of portable first aid fire extinguishers.

British Standard

BS 6164 : 2001 Code of Practice for safety in tunnelling in the construction industry

26.0 Blasting operations

26.1 Authorization for Blasting

26.1.1 The Contractor shall ensure that all blasting operations will only be permitted following consultations with the relevant authorities and subsequent issuing of the permission to blast permits. The Employer's Representative must also give his consent in writing before any blasting operations take place.

26.1.2 All blasting shall be conducted under the direct supervision of a Licensed Shotfirer.

26.2 Risk Assessment and Method Statements

26.2.1 The Contractor shall produce a detailed hazard and risk assessment and an in depth method statement for amongst others the following elements:

(a) Type of explosives to be used.

(b) Anticipated effects of vibration on nearby structures.

(c) Blasting patterns.

(d) Delivery of the explosives.

(e) Transportation and storage of explosives on site.

(f) Drilling and charging of holes.

(g) Warning sirens.

(h) Measurement of Vibration

(i) Provision of sentries.

(j) Use of blast screens.

(k) ALL CLEAR.

(l) Ventilation following blasting.

(m) Atmosphere monitoring.

(n) Procedure for miss-fires.

26.3 References

The Delhi Building And Other Construction Workers (Regulation of Employment and Conditions of Service) **Rules 2002**

Indian Standards

IS 4081 : 1986Safety Code for Blasting and related Drilling Operations

British Standards

BS 5607 : 1988 Code of Practice for the safe use of explosives in the construction industry.

27.0 Demolition

27.1 General

27.1.1 The Contractor shall ensure that all demolition works shall be carried out in a controlled manner under the management of experienced and competent supervision.

27.1.2 Prior to any demolition commencing, a survey shall be conducted to identify if there are any hazardous materials present, for example the presence of materials such as asbestos and lead.

27.1.3 If any hazardous materials are found, then consideration shall be given as to whether they shall need to be removed by a Specialist Agency or Sub-contractor prior to the main demolition works commencing.

27.1.4 Before the demolition commences all relevant notifications will need to be given to the local authorities and media.

27.1.5 Measures for protection to the public shall be required to be put into place in order to give protection from any possible falling debris and dust generation.

27.1.6 All power supplies and services shall be disconnected before any demolition work commences.

27.2 References

The Delhi Building And Other Construction Workers (Regulation of Employment and Conditions of Service) **Rules 2002**
Chapter: XII

Indian Standards

IS 4130 : 1991	Demolition of Buildings – Code of Safety
IS 13416 (Part 3):1994	Recommendations for preventive measures against hazards in the workplace, Part 3, Disposal of Debris

28.0 Falsework / Formwork

28.1 General

28.1.1 The contractor shall ensure that all falsework / formwork has been properly designed and is suitable for the purpose.

28.1.2 All designed falsework / formwork shall be erected in strict accordance to the design.

28.1.3 Prior to the loading and subsequent striking of falsework / formwork, permission shall be obtained from the Contractor's Designer and Engineer who shall both inspect and sign off on the structure in person.

28.1.4 Adequate provision shall be made on the working platforms for the concrete placement operations, these shall include locations for vibrators and the unobstructed movement of personnel controlling the rubber hose during the concrete pumping operations or the concrete skip during any skipping operations.

28.1.5 The Contractor should use the following checklist to check that falsework / formwork is being used safely;

(a) have the design and the supports for shuttering and falsework / formwork been checked?

(b) is it being erected safely from steps or proper platforms?

(c) are the props plumb and properly set out?

(d) are the bases and ground conditions adequate for the loads?

(e) are the correct pins used in the props?

(f) are the timbers in good condition?

(g) is it inspected by a competent person against the agreed design before permission is given to pour concrete?

References

The Delhi Building And Other Construction Workers (Regulation of Employment and Conditions of Service) **Rules 2002**
Chapter: XVII

29.0 Piling and diaphragm Walls

29.1 General

29.1.1 The contractor shall prepare safe systems of work and method statements for all work concerned with piling and diaphragm walls. He shall take the following points into consideration.

29.1.2 Any excavated piles or panels shall not be left unattended, unless they are adequately fenced around to prevent accidental entry into the immediate vicinity of the pile or panel.

29.1.3 Because of the use of heavy plant and equipment in generally congested work areas then trained banksmen shall be deployed to control the movement of the plant and personnel interface.

29.1.4 All lifting operations shall be conducted in accordance with the requirements as detailed in Section 18 Lifting Operations.

29.1.5 Calcium Oxide shall not be used for stabilizing the excavated spoil as it is an acute irritant, unless an agreed method statement has been produced.

29.1.6 A method statement shall be produced by the Contractor, which details the process for grab retrieval in the event of a grab becoming detached during the course of a pile or panel excavation.

29.1.7 A method statement shall be produced by the Contractor, which details the process for stop end recovery.

29.1.8 Wheel washing facilities shall be available on the sites for washing down the spoil removal trucks and the concrete delivery vehicles.

29.1.9 Bentonite and polymer storage tanks shall be bunded around to retain any unintentional and uncontrolled spillage.

29.1.10 The contractor shall submit to the Employer's Representative, for approval, proposals for the treatment of Bentonite slurry and its subsequent disposal.

29.1.11 No Bentonite spillage shall be allowed on any roads.

29.1.12 Regular site cleaning shall be carried out at all work-sites.

29.1.13 The Contractor as part of his Emergency Plans shall develop procedures for the collapse of piles and diaphragm walls.

29.2 References

The Delhi Building And Other Construction Workers (Regulation of Employment and Conditions of Service) **Rules 2002**
Chapter: XXIII and XI
Indian Standards
IS 5121 : 1969Safety Code for Piling and other Deep Foundations
IS 8989 : 1978Safety Code for the Erection of Concrete Framed Structures

30.0Work adjacent to live railways

30.1 General

30.1.1 Whenever work is to be conducted in close proximity to the live railways then the following measures shall need to be addressed:

(a) The rules provided for in the Railway's manual shall be followed.

(b) No persons are allowed to encroach onto the railway unless specific authority has been given by the owner.

(c) Adequate protection in accordance with the railway owner's requirements shall be followed. (Provision of Block Inspectors, Flagmen and Lookouts.)

(d) All persons shall wear high visibility clothing at all times.

(e) Any induction training requirements of the railway owner shall be strictly observed

31.0Work adjacent to live roadways

31.1 General

31.1.1 Whenever working adjacent to any live roadways then the following aspects shall be considered.

(a) Close liaison with the Police and Municipal Authorities.

(b) Production of an agreed traffic management scheme in accordance with the local traffic laws. (Barriers, signs, lights and road markings.) this shall include adequate provision for pedestrians.

(c) The provision and wearing of high visibility clothing by all personnel engaged in the activities.

(d) Traffic Marshals shall be appointed and deployed to ensure that all road movement is carried out safely.

32.0 Personal protective equipment

32.1 General

32.1.1 The Contractor shall at all times keep and maintain an adequate supply of suitable personnel protective equipment which shall be readily available for use at all times on the sites, and would include amongst others the following items:

(a) Safety Helmets.

(b) Hearing Protection.

(c) Respiratory Protection.

(d) Eye Protection.

(e) Protective Gloves.

(f) Safety Footwear.

(g) High Visibility Clothing to BS EN 471 Class 3 standard

32.1.2 All sites shall be designated as HARD HAT and SAFETY BOOTS SITES and as such an adequate supply of safety helmets and safety boots shall be kept available for use by all staff, workers and authorised visitors to the sites.

32.1.3 The Contractor shall remove from the site any worker who consistently refuses to wear the appropriate personal protective equipment.

32.2 References

The Delhi Building And Other Construction Workers (Regulation of Employment and Conditions of Service) **Rules 2002**
Chapter: VI

Indian Standards

IS 2925 : 1984 Specification for Industrial Safety Helmets.
IS 1179 : 1967 Specification for equipment for eye and face protection during welding.
IS 6994 Standard for Industrial Gloves

British Standards

BS EN 166:1996: Personal eye-protection. Specifications
BS EN 169:1992: Specification for filters for personal eye protection equipment used in welding and similar operations
BS EN 175:1997: Personal protection. Equipment for eye and face protection during welding and allied processes
BS EN 352: Hearing protectors. Safety requirements and testing
352-1: 1993: Ear muffs
352-2: 1993: Ear plugs
352-3: 1997: Earmuffs attached to an industrial safety helmet
BS EN 345: Safety footwear for professional use
BS EN 471 High visibility clothing

33.0 First Aid

33.1 First Aid Bases

33.1.1 The Contractor shall establish a First Aid Base, in accordance with the Employer's Requirements, at each of his principal work areas. If during the life of the contract the Contractor's principal work area moves from one location to another, the Contractor shall be required to move his First Aid Base.

33.1.2 If the Contractor operates more than one principal work area he will be required to have a First Aid Base at each of his principal work areas.

33.1.3 The First Aid Base shall consist of as a minimum;

(a) A treatment room fitted with two treatment couches,
(b) A hand wash basin with running water;
(c) Lockable cupboards to contain sufficient medical supplies;
(d) Bed.
(e) Six Chairs with footrests
(f) Desk and chair.
(g) Six Stretchers (Which can be lifted and lowered by a crane.)
(h) Pillows and blankets.
(i) Refuse containers.
(j) Medical dressings. (Bandages, plasters, antiseptic wipes.)
(k) Eye irrigation sterile solution.
(l) Paper towels.
(m) Disposable gloves.

33.1.2 The first-aid unit shall be provided with air conditioning and shall be kept in a clean and tidy state at all times.

33.2 Medical Staff

33.2.1 A qualified Doctor, Nurse and assistant Nurse shall be in attendance at the first aid base during all times when work is being undertaken on the site.

33.3 Ambulance

33.3.1 A fully equipped ambulance and driver shall be provided at the first aid base during all working hours. The ambulance shall be equipped with emergency life support equipment suitable for application in construction site accidents.

33.4 First Aid Boxes

33.4.1 Portable first aid boxes will be maintained fully equipped at each local site offices and work locations where 20 or more persons work at a time.

33.4.2 In each site office and location one employee, suitably trained in first aid, should be available at all working hours for the purpose of attending to emergencies.

33.5 References

The Delhi Building And Other Construction Workers (Regulation of Employment and Conditions of Service) **Rules 2002**
Chapter XXIV

34.0Fire precautions

34.1 General

34.1.1 The Contractor shall be responsible for supplying and maintaining adequate fire precaution facilities on all his sites. The following minimum standards should be adhered to.

34.1.2 The Contractor shall ensure that specially trained personnel are available to deal with fires due to electrical causes, gas explosions etc.

34.1.3 A good standard of housekeeping shall be maintained at all times on the sites.

34.1.4 No accumulations of rubbish shall be allowed to gather.

34.1.5 Combustible scrap and other construction debris should be disposed off site on a regular basis. If scrap is to be burnt on site, the burning site should be specified and located at a distance no less than 12 meters from any construction work or any other combustible material.

34.1.6 Signage shall be erected at prominent positions showing the correct use of portable first aid fire extinguishers.

34.1.7 Emergency plans and Fire Evacuation plans shall be prepared and issued . Mock drills should be held on a regular basis to ensure the effectiveness of the arrangements.

34.2 Fire Fighting Equipment

34.2.1 At various locations around the site clearly visible fire points shall be established for use in an emergency and each fire point should have available as a minimum the following type of equipment:

(a) Dry Powder Extinguisher.

(b) Water Type Extinguisher.

(c) Bucket of Sand.

34.2.2 Recharging of fire extinguishers and their proper maintenance should be ensured and as a minimum should meet Indian National Standards

34.2.3 Water supply for fire fighting purposes should be provided at the construction site. This may be in the form of static water tank of adequate capacity or a hydrant line with adequate water pressure at outlet points.

34.2.4 Sufficient number of fire hoses with branch pipes should be provided at site so that the fire can be controlled until the arrival the arrival of the Fire Brigade.

34.2.5 The contractor shall need to give consideration to the provision of adequate fire fighting arrangements within the underground and tunnelling operations including the provision of Fire Service compatible hose connections and emergency lighting

34.2.6 The Telephone Number of the local fire brigade should be prominently displayed near each telephone on site.

34.2.7 Supervisors and workmen at the site should be trained in the use of fire fighting equipment provided at the site.

34.3 Storage of Flammable Liquids

34.3.1 All flammable liquids shall be kept in a secure fire resistant store protected from electrical sparks welding sparks open flames and smoking.

34.3.2 Only such amounts of flammable liquids should be issued as are required for immediate

use. Cans for carrying flammable liquids should be leakproof and properly stoppered and clearly marked “FLAMMABLE LIQUID”.

34.3.3 Rags soaked in paints, kerosene and other flammable liquids should be disposed of daily under supervision. Large quantities of such rags should not be allowed to accumulate.

34.3.4 All Diesel fuel storage tanks shall be bunded around in order to control any spillage or leakage that may occur.

34.3.5 “NO SMOKING” signs shall be prominently displayed at all areas where flammable materials are stored.

34.4 References

The Delhi Building And Other Construction Workers (Regulation of Employment and Conditions of Service) **Rules 2002**

Chapter VI

Indian Standards

IS 13416 (Part 5) : 1994Preventative measures against hazards at workplaces – Recommendations Part 5 Fire Protection

IS 1646 : 1982Code of Practice for fire safety of buildings (general) : Electrical Installations

IS 2190 : 1979Code of practice for selection installation and maintenance of portable first aid fire extinguishers

IS 12349 : 1988 Fire Protection – Safety Signs

Also Part IV of National Building Code of India : 1983

35.0 Site Perimeter Hoarding

35.1 General

35.1.1 The Contractor is required to keep the site as safe and secure as possible at all times, this includes the erection of site perimeter Hoarding which shall also deter trespassers both adult and children alike.

35.1.2 The Contractor shall provide a solid two meter high securely erected fence be installed around the perimeter of the site, with agreed and guarded access and egress points for both personnel and vehicles.

35.1.3 The Site Perimeter Fencing shall be constructed in accordance with the Specification attached as Appendix xx

35.1.4 At each entrance to the site the Contractor shall erect a large billboard warning all persons who enter the site that they are required to wear the appropriate Personal Protective Clothing and that no unauthorized access is allowed.

35.1.5 Wherever the fence runs adjacent to the highway with no buffer-zones then the fence shall have traffic warning lights duly affixed to it.

35.1.6 Wherever the fence borders on pedestrian footpaths lighting shall be provided to illuminate the pedestrian routes. The positioning of the fence-line shall not reduce the width of the pedestrian footpath to less than 900 mm in order to be able to accommodate disabled persons in wheelchairs.

35.1.7 Site perimeter fencing shall be washed at least once a month and repainted at least annually.

35.1.8 The site fencing shall need to be inspected on a regular basis in order to ensure that the integrity of the fencing is maintained at all times as far as is practicable.

35.2 References

Indian Standards

IS 13430 : 1992	Safety During Additional Construction and Alteration to Existing Buildings - Code of Practice
IS 9457	Standard for colours of safety signs

36.0 Traffic management

36.1 General

36.1.1 The contractor shall ensure that all traffic management schemes shall be in accordance with the agreed schemes following consultation with the Local Traffic Police and the Metropolitan and other Authorities in charge of the area.

36.1.2 Adequate and clear warning signs shall be displayed at appropriate distances before the commencement of the site workings. In addition prior warning shall be given concerning the location of the approaching site entry and exit points.

36.1.3 All traffic signs, barriers, cones and lighting shall be kept maintained and clean at all times.

36.1.4 Site vehicles exiting the site shall observe caution at all times, if the vehicles are exiting directly onto the live carriageway then they shall be directed by an identifiable Traffic Controller.

36.1.5 Regular inspections of the traffic management schemes shall be conducted by the Contractors in both the daytime and night time hours with the results of these inspections being recorded. These records shall be kept available for inspection by the Employer's Representative.

36.2 Vehicle Control

36.2.1 Traffic Controllers shall be available for directing vehicles that are exiting the sites directly onto the live carriageways. Any vehicles entering the sites that are required to execute reversing manoeuvres shall do so under the strict control of a trained and designated banksman.

36.3 Spoil Removal

36.3.1 Only well maintained and licensed vehicles shall be allowed to be used for the removal of excavated spoil from the sites.

36.3.2 All drivers shall be medically fit and in possession of a valid and current driving licence.

36.3.3 No vehicles, which are overloaded, shall be allowed to leave the site.

36.3.4 Any vehicles leaving the sites carrying loads which are liable to produce airborne contaminants shall prior to leaving the site securely sheet the load over in order to effectively contain any dispersement during transportation on the public highway.

36.3.5 Vehicles exiting the site directly onto the live carriageway shall do so under the control of the clearly identified Traffic Controller.

36.3.6 Any vehicles that are required to reverse whilst on the site shall do so under the control of a trained banksman.

36.3.7 Any vehicles prior to leaving the site shall have their wheels washed and any loose material removed.

36.3.8 Any spoil that is removed from the work-sites shall be disposed of only at authorized dumping sites.

36.4 References

Indian standards

IS 4130 : 1991Demolition of Buildings – Code of Safety

IS 13416 (Part 3):1994Recommendations for preventive measures against hazards in theworkplace, Part 3, Disposal of Debr

37.0 Visitors to site

37.1 General

37.1.1 All visitors to site shall report to the Contractors site offices where they shall be issued with appropriate Personal Protective Equipment if they are to go out onto the site work areas. Any visitors going out to the site work areas shall be accompanied at all times by a member of the site personnel.

List of Schedules

The following Schedules are given to assist the Contractor's understanding of the Hierarchy of Safety adopted by NMRC and to give additional advice in support of this Manual.

Schedule 1 Examples of Contract Conditions and Employer's Requirements relating to Safety and Industrial Health

Schedule 2 List of Relevant Indian and British Standards

Schedule 3 Sample Safety Forms:

Schedule 4 Example of Toolbox Talks

Schedule 5 Hierarchy of Safety and Industrial Health for NMRC Contracts

SCHEDULE 1

SAMPLE SAFETY FORMS

The purpose of this schedule is to provide a set of standardized forms for the Contractor to use when reporting information to the Employer's Representative. The Contractor is free to adapt the forms for his own use, however when the form is being used to transmit information to the Employer's Representative it must contain, as a minimum, the information shown on the following forms.

List of Forms:

SAF 001	Accident / Incident / Dangerous Occurrence Report Form
SAF 002	Accident Report - Injury Analysis Form
SAF 003	Accident Statistics – Monthly Report Form
SAF 004	Contractor's Monthly Safety Report
SAF 010	Permit to Work – Confined Spaces
SAF 011	Permit to Work – Electrical
SAF 012	Permit to Work – Hot Work
SAF 020	Risk Assessment Work Sheet
SAF 021	Hazardous Substance Assessment Sheet
SAF 030	Site Safety and Emergency Standby List
SAF 031	Safety Training Attendance Record
SAF 032	Weekly Fire Fighting Equipment Check List
SAF 033	Scaffold Inspection Checklist
SAF 040	Contractor's Application for Approval of Safety Manager

NOIDA METRO RAIL CORPORATION	SAMPLE SAFETY FORM **REFERENCE** :	**SAF - 001**
ACCIDENT/DANGEROUS OCCURRENCE REPORT FORM		**Accident No.**
Name of Contractor		**Contract No.**

Instructions : 1. A copy of this form shall be completed for every Accident and Dangerous Occurrence.
2. It must be signed by a senior site management representative.
3. A copy shall be sent to the Employer's Representative within 24 hours of the Accident.

Part A : Details of Injured Person

Name : _____ *Date of Birth* : _____ *Male* ☐ *Female* ☐

Address : _____

_____

Job Title : _____ *Name of Employer* : _____

Part B : Details of The Accident

Date : _____ *Time :* _____ *Location :* _____

- *Describe the task the injured person was doing at the time of the accident:*
- *Describe in details how the accident happened (Attach, sketch, plan photographs etc.):*
- *Was any plant or machinery involved yes/no : if yes give details:*
- *Name of any Witnesses:*

Part C : Details of the Inquiry

What was the Injury ? (eg. Fracture, Lacerations)
What part of the body was injured?
Was the injury : Fatal ☐ *Major Injury* ☐ *Minor Injury* ☐
Was the injured person sent to ; First Aid ☐ *Doctor* ☐ *Hospital* ☐ *Home* ☐

Part D : Certification

I have checked the above information and can confirm that it is a true record of the accident
Signed _____ ***Safety Officer*** ***Date*** _____
Signed _____ *Project Manager* *Date* _____

NOIDA METRO RAIL CORPORATION	**SAMPLE SAFETY FORM REFERENCE:**	**SAF 002**
ACCIDENT REPORT – INJURY ANALYSIS FORM		ACCIDENT No ……..
NAME OF CONTRACTOR	**CONTRACT NO**	

Name of Injured Employer _____ Date of Birth __ / __ / __ Male ☐ Female ☐
Address: _____-_____
Job Title: _____ Name of Employer: _____
Date of Accident: __ / __ / __ Time: _____ hrs. Location: _____

Cause of Accident
☐ 01 Machinery ☐ 05 Falling objects ☐ 08 Hot or corrosive substances ☐ 11 Handling goods or
☐ 02 Electricity ☐ 06 Stepping on or Striking ☐ 09 Gassing poisoning & other equipment
☐ 03 Hand Tool against objects toxic substances ☐ 12 Transport
☐ 04 Foreign Body in eye ☐ 07 Falls of person ☐ 10 Explosions or fires ☐ 13 Miscellaneous

Severity of Injury
☐ 01 First Aid ☐ 02 Medical Aid ☐ 03 Three days or less ☐ 04 Over or three days ☐ 05 Discharged
☐ 06 Detained ☐ 07 Fatal ☐ 08 Days Lost

Nature of Injury ***ENTER IN ORDER OF SERIOUSNESS***
☐ 01 Amputation ☐ 05 Crush / Compression ☐ 09 Foreign Body (eye ☐ 13Sprain/Strain
☐ 02 Cut ☐ 06 Contusion / Bruise ☐ 10 Foreign Body (other) ☐ 14
Inhalation / Ingestion ☐ 03 Location ☐ 07 Fracture ☐ 11
Puncture ☐ 15 Concussion
☐ 04 Abrasion ☐ 08 Dislocation ☐ 12 Scald / Burn ☐ 16 Others

Part of Body Injured ***ENTER IN ORDER OF SERIOUSNESS***

HEAD AND SHOULDER TRUNK UPPER EXTREMITIES LOWER EXTREMITIES

☐ 01 Skull ☐☐☐ 11 Back ☐☐☐ 18 Shoulder ☐☐☐ 26 Hip / Buttock ☐☐
☐ 02 Scalp & Forehead ☐☐☐ 12 Chest ☐☐☐ 19 Upper arm ☐☐☐ 27 Thigh ☐☐
☐ 03 Eye ☐☐☐ 13 Abdomen ☐☐☐ 20 Elbow ☐☐☐ 28 Knee ☐☐
☐ 04 Ear ☐☐☐ 14 Groin ☐☐☐ 21 Forearm ☐☐☐ 29 Shank ☐☐
☐ 05 Nose ☐☐☐ 15 Respiratory System- ☐☐☐ 22 Wrist ☐☐
☐ 30 Ankle ☐☐

☐ 06 Mouth, teeth, jaw ☐☐☐ 16 Digestive System ☐☐☐ 23 Hand & Figures ☐☐☐ 31 Heel/sole/instep ☐☐
☐ 07 Face & Cheek ☐☐☐ 17 Others ☐☐☐ 24 Thumb ☐☐☐ 32 Toes ☐☐
☐ 08 Neck & Shoulder ☐☐☐ 25 Others ☐☐☐ 33 Others ☐☐
☐ 09 Brain ☐☐☐ 10 Others ☐ ☐☐

Unsafe Conditions
☐ 01 Rough Slippery ☐ 06 Improper dress ☐ 11 Inadequate procedure ☐ 14Unsafe process or
☐ 02 Design effect ☐ 07 Improper guard ☐ 12 Inadequate aisle space job methods
☐ 03 Worn frayed ☐ 08 Improper ventilation exists etc., ☐ 15 Overloading
☐ 04 No protective gear ☐ 09Improper illumination ☐ 13 Unsafe planning & / or layout. ☐ 16 Poor House Keeping
☐ 05 Defective protective gear ☐ 10 Improper procedure of job traffic or process operation etc. ☐ 17 No unsafe conditions

Personal Factor
☐ 01 Attitude ☐ 03 Physical Defects ☐ 04Unsafe Act by another ☐ 05 No unsafe personal factor
☐ 02 Knowledge or skill person

Unsafe Act
☐ 01 Operating without authority ☐ 06 Taking unsafe position or ☐ 09 Failure to use safe attire or
☐ 02 Failure to secure or warn/ hands instead of posture personal protective equipment
☐ 03 Making safety devices equipment / or equipment ☐ 07 Operating or working at ☐ 10Horseplay
☐ 04 Working on moving or unsafely ☐ 08 Unsafe loading, placing, ☐ 11No unsafe act dangerous Equipment
mixing
☐ 05 Using unsafe equipment

How would a similar accident be avoided?
What has been done to prevent similar accidents?
Comments:

Safety Officer Sign: Name: Date: / /

Project ManagerSign: Name:_____ Date: / /

NOIDA METRO RAIL CORPORATION	SAMPLE SAFETY FORM REFERENCE:	**SAF- 003**
CONTRACTORS MONTHLY ACCIDENT STATISTICS REPORT		

NAME OF CONTRACTOR		**CONTRACT NO**	
REPORT FOR MONTH ENDING: COMMENCEMENT DATE: ..... SCHEDULED COMPLETION DATE:			
	ACCIDENT STATISTICS SUMMARY	**FOR MONTH**	**CUMULATIVE**
1.	**Number of Man-hours Worked**		
2.	*Number of Mandays Worked*		
3.	*Number of Reportable Fatal Accidents*		
4.	*Number of Reportable Non-Fatal Accidents*		
5.	*Number of Dangerous Occurrences*		
6.	*Number of Man-hours Lost*		
7.	*Number of Mandays Lost*		
8.	*Number of Reportable Accidents per 100,000 Man-hours Worked* $= \left\{ \frac{[(3) + (4)]}{(1)} \times 100{,}000 \right\}$ = *Accident Frequency Rate*		
9.	*Average Number of Worker Daily*		
REMARKS:			
Signed:	Safety Officer:	Date: / /	
Signed:	Project Manager:	Date: / /	
NOTE: This form must be completed and returned to the Employer's Representative within 5 days after the end of each month.			

NOIDA METRO RAIL CORPORATION	**SAMPLE SAFETY FORM REFERENCE:**	**SAF - 004**
CONTRACTORS MONTHLY SAFETY REPORT		
NAME OF CONTRACTOR		**CONTRACT NO.**

This report which shall be submitted to the Employer's Representative within five days of the end of each month consists of two sections; Part A. and Part B.

PART A Accident Statistics

1. Accident Statistics which shall be presented in the format shown on the Accident Statistics Monthly Report Form (SAF 003)
2. Highlights of serious accidents which have occurred during the Month.
3. Details of any Fires which have occurred during the Month.

PART B Safety Activities

1. Safety Committee. An extract of the salient points of the last month's meeting and any action taken.
2. Details of Tool Box Talks held during the month to include:
   - numbers up to date,
   - total number of workers attending each talk,
   - the safety topics covered,
3. Details of any other training provided either on site or by attendance to outside courses such as First-Aid, Crane Operator, Singer/Rigger's Etc.
4. Safety promotion undertaken during the month, poster campaigns, competitions, etc.
5. Details of Safety Inspections carried out during the month. This information should show internal inspections and inspections by any outside bodies.
6. Details of Emergency Evacuation drills or exercises carried out during the month including the involvement, if any, of outside bodies.
7. Any other relevant information.

NOIDA METRO RAIL CORPORATION	SAMPLE SAFETY FORM REFERENCE :	SAF - 005

PERMIT TO WORK – CONFINED SPACES

NAME OF CONTRACTOR	**CONTRACT NO**
PERMIT NO. CF …..	DATE / /

PART 1. ISSUE

Issue to (Name of Person) _____ Section _____

Details of Confined Space _____

Location _____

Work to be carried out _____

Results of Confined Space Testing: _____

Oxygen Content _____ Explosive Gas _____

LEL

Toxic Gas 1: _____ Toxic Gas 2: _____

Date and Time Tests Conducted _____

Type and Model of Equipment used _____

Precautions Required _____

I hereby declare that the above Confined Space is safe to enter without the use of breathing apparatus, provided the conditions of this permit and the requirements of the Company Safety Rules and observed.

THIS PERMIT ONLY VALID FOR THE PERIOD SPECIFIED, WHICH MUST NOT EXCEED 24 HOURS

Date: Time of Issue: Date: Time of Expiry

Signed Being the Authorized Person (Confined Spaces)

PART 2. RECEIPT

I hereby declare that work by myself, or by any person under my control in the above Confined Space shall be carried out in accordance with the conditions of this permit and the requirements of the company Safety Rules. All persons permitted to enter the Confined Space have been or will be informed of when the safe period for entry will expire.

Signed Time Date

Being the Competent Person (Confined Spaces)

PART 3. CLEARANCE CERTIFICATE

I declare that all persons under my charge have been withdrawn and warned that it is no longer safe to work in the Confined Space deatiled above, and that all gear, tools and other equipment have been removed.

Signed Time Date

Being the Competent Person (Confined Spaces)

PART 4. CANCELLATION

I acknowledge receipt of the clearance of the Permit

THIS PERMIT IS NOW CANCELLED

SignedBeing the Authorized Person (Confined Spaces)

Time Date

NOIDA METRO RAIL CORPORATION	**SAMPLE SAFETY FORM REFERENCE** :	**SAF – 006**

PERMIT TO WORK – ELECTRICAL

Name of Contractor	**Contract No.**

PERMIT NO. E: _____ ***Date*** _____

Part 1 : Issue

Issue to

_____

I hereby declare that it is safe to work on the

_____

Following apparatus which is dead, is isolated

_____

From all live conductors and is connected to earth

_____

The apparatus is efficiently connected to earth

_____

At the following points

_____

All other apparatus is dangerous

The following is the work to be carried out on the

_____

Apparatus.

_____

Caution Notices are posted at

_____

Special Keys required for access to enclosures

Special Precautions to be taken

_____

This permit is valid only for the specified period which must not exceed 24 hours

Signed _____ being an Authorized Person

Possessing authority to issue a Permit for the work specified above.

Time of issue _____ Date _____ Time of Enquiry _____

Part 2 : Receipt

I hereby declare that I accept responsibility for carrying out the work on the apparatus detailed on this permit, and that no attempt will be made by me, or by the men under my control, to carry out work on any other aparatus.

Signed _____ Time _____ Date _____

Part 3 : Clearance Certificate

I hereby declare that the work for which this permit was issued is now suspended/completed and that all men under my charge have been withdrawn, and warned that it is no longer safe to work on the apparatus specified on this permit and that gear, tools and temporary earthing connections are all clear.

I acknowlede return of authorised Key Nos

_____

Signature of person responsible for issue of permit

_____

Time _____ Date _____

NOIDA METRO RAIL CORPORATION	**SAMPLE SAFETY FORM REFERENCE:**	**SAF - 007**

PERMIT TO WORK – HOTWORK

NAME OF CONTRACTOR	**CONTRACT NO**

PERMIT NO. HW: _____ Date _____

Part 1: Issue

Issue to (Name of person) Section

Details of Hot Work _____ _____

Location _____

_____

Work to be carried out _____

I hereby declare that the above Hot Work is safe to carry out and that all appropriate fire precautions are in place including the issue of additional 5 kg Dry Powder Extinguisher on site and that all Company Safety Rules have been observed.

Date: Time of Issue Time of Expiry

This permit is valid only for the period specified which must not exceed 24 hours

Signed Time Date

Being the Authorized Person (Hot Work)

_____ _____ _____

Part 2 : Receipt

I hereby declare that the work by myself, or by any person under my control or the above Hot Work shall be carried out in accordance with the conditions of this certificate and the requirements of the company Safety rules. All persons permitted to work on this Hot Work have been or will be informed of when the safe period for entry will expire.

Signed Time Date

Being the Competent (Hot Work) _____ _____

Part 3: Clearance

I declare that all Hot Work under my control has now been stopped and the area has been checked out found clear of any risk of fire and that all tools and other equipment have been removed.

Signed _____ Time _____ Date _____

Being the Competent (Hot Work)

Part 4 : Cancellation

I acknowledge receipt of the clearance of this Certificate.

This certificate is now cancelled

Signed _____

Being the Authorized Person (Hot Work)

Time _____ Date

_____

NOIDA METRO RAIL CORPORATION			SAMPLE SAFETY FORM REFERENCE:	SAF - 008
NAME OF CONTRACTOR	CONTRACT No.	HAZARD / RISK ASSESSMENT SHEET	DATE:	
OPERATION:		METHOD STATEMENT Ref:	PAGE: OF	
HAZARDS RISKS		DEGREE	CONTROL	MONITORING

NOIDA METRO RAIL CORPORATION	**SAMPLE SAFETY FORM REFERENCE:**	**SAF - 009**

HAZARDOUS SUBSTANCES TO BE USED ON SITE

NAME OF CONTRACTOR **CONTRACT No.**

To be completed at Commencement and Revised Periodically and Updated as required

Generally Assessed (For use outside or in well ventilated areas)	Others Specific assessments required

						SPECIFY:	
1	☐	Cement	24	☐	Epoxy Cleaners	47	☐ _____
2	☐	Lime	25	☐	Butyl Mastic Sealants	48	☐ _____
3	☐	Plaster	26	☐	Acrylic Sealants	49	☐ _____
4	☐	Artex	27	☐	Mastic Primers	50	☐ _____
5	☐	Sand	28	☐	Mastic Solvents	51	☐ _____
6	☐	Aggregates	29	☐	Elastomeric Sealants	52	☐ _____
7	☐	Plasticisers	30	☐	Elastomeric Primers	53	☐ _____
8	☐	Retarders	31	☐	Elastomeric Solvents	54	☐ _____
9	☐	Rapid Hardeners	32	☐	Hot Mastic Sealants	55	☐ _____
10	☐	Colouring / Mortar	33	☐	Bitumastics	56	☐ _____
11	☐	Curing Agents	34	☐	Coated Road Stone	57	☐ _____
12	☐	Rapid	35	☐	Contact Adhesives	58	☐ _____
13	☐	Diesel / Gas Oil	36	☐	Contact Solvents	59	☐ _____
14	☐	Engine Oils	37	☐	Softwoods	60	☐ _____
15	☐	Hydraulic Oils	38	☐	Hardwoods		
16	☐	Shutter Oils	39	☐	Fibreboards		
17	☐	Greases	40	☐	Paints / Primers		
18	☐	Pipe Lubricants	41	☐	Paint Solvents		
19	☐	Epoxy Mortars	42	☐	Brush Cleaners		
20	☐	Epoxy Adhesives	43	☐	Bleaches		
21	☐	Epoxy Sealands	44	☐	Brick Cleaner		
22	☐	Epoxy Primers	45	☐	Concrete Cleaner		
23	☐	Epoxy Solvents	46	☐	Liquified Petroleum Gas		

Completed by: Sign: Name: Title: Date: / /

(☐ - TICK AS APPLICABLE)

NOIDA METRO RAIL CORPORATION	**SAMPLE SAFETY FORM REFERENCE :**	**SAF - 010**

SITE SAFETY AND EMERGENCY STAND BY NAME LIST

Name of Contractor	**Contract No.**

The following persons have been appointed to be our representatives on site for all site safety emergencies.

Name of Representative	***Position***	***Office Tel. No.***	***Home Tel. No.***	***Mobile No.***

Project Manager Name

Signature Date

NOIDA METRO RAIL CORPORATION	**SAMPLE SAFETY FORM REFERENCE:**	**SAF - 011**

SAFETY TRAINING ATTENDANCE RECORD

NAME OF CONTRACTOR | CONTRACT No.

Title of Course Date / / Course Reference No.

Duration Name of Trainer (s)

No.	**Name**	**Section / Sub-Contractor**	**Signature**
1.			
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
12.			
13.			
14.			
15.			
16.			
17.			
18.			
19.			
20.			
21.			
22.			
23.			
24.			

CONFIRMED AS CORRECT BY:

SIGNATURE:_____SAFETY MANAGER DATE / /

SIGNATURE:_____PROJECT MANAGER DATE / /

NOIDA METRO RAIL CORPORATION	**SAMPLE SAFETY FORM REFERENCE:**	**SAF - 012**

WEEKLY FIRE FIGHTING EQUIPMENT CHECK

NAME OF CONTRACTOR **CONTRACT NO**

SITE / LOCATION DATE OF CHECK / /

FIRE POINT NUMBER	EXTINGUISHERS IN GOOD ORDER		ACCESS TO EXTINGUISHERS		SIGNAGE	
	YES	NO	CLEAR	OBSTRUCTED	CORRECT	INCORRECT

COMMENTS:

CHECK CARRIED OUT BY:

NAME : SIGNATURE POSITION

DATE: / /

NOIDA METRO RAIL CORPORATION		SAMPLE SAFETY FORM REFERENCE :	SAF - 013
SCAFFOLD INSPECTION CHECKLIST			
NAME OF CONTRACTOR:	CONTRACT No.	DATE: / /	

Work commencement – Date _____/_____/_____

Location and description of scaffold, etc. and other plant or equipment inspected 1 2	Date of Inspection	Result of inspection State whether in good order 3	Signature of person who made the inspection 4

SHORT CHECK LIST – ATTACH INSPECTION CHECK THAT YOUR SCAFFOLDING DOES NOT HAVE FAULTS

		Week 1	2	3	4		Week 1	2	3	4		Week 1	2	3	4
FOOTING	uneven					RACING	Some missing				TILES	Some missing			
	No base					FAÇADE &	Loose					Loose			
	No sole boards					LEDGER	Wrong Fittings				BOARDING	Bad boards			
	Undermined					PUTLOGS	Wrongly Spaced					Trap Boards			
STANDARDS	Not plumb					AND	Loose					Incomplete			
	Jointed at same Height					TRANSOMS	Wrongly Supported					Insufficient			
	Wrong Spacing					COUPLINGS	Wrong fitting					Supports			
	Damaged						Loose				GUARDS	Wrong Height			
	Not level						Damaged				RAILS &	Loose			
	Joint in same bays						No check couplers				TOE BOARDS	Some Missing			
	Loose						Wrong Spacing				LADDERS	Damaged			
	Damaged						Wrong couplings					Insufficient Length			
							Weak Support					Not tied			

SIGNATURE _____ NAME _____ DATE / /

NOIDA METRO RAIL CORPORATION	**SAMPLE SAFETY FORM REFERENCE:**	**SAF - 014**
CONTRACTOR'S APPLICATION FOR SAFETY OFFICERTO WORK *FOR CONTRACT.....*		
NAME OF CONTRACTOR	**CONTRACT No.**	

GENERAL PARTICULARS

Name :_____
(In Block Capitals)

Date of Birth

SCHEDULE 2

EXAMPLES OF TOOL BOX TALKS

The purpose of the following Toolbox Talks is give guidance on the subject matter to be covered during the talk. The talk should be given to groups of workers no greater than twenty in number by their supervisor. Each talk should last between ten and fifteen minutes. An attendance sheet of each talk should be kept showing who presented the session, the workers who attended, and the duration. Form SAF 031 Safety Training Attendance Record should be used for this purpose.

The following list shows the subjects covered:

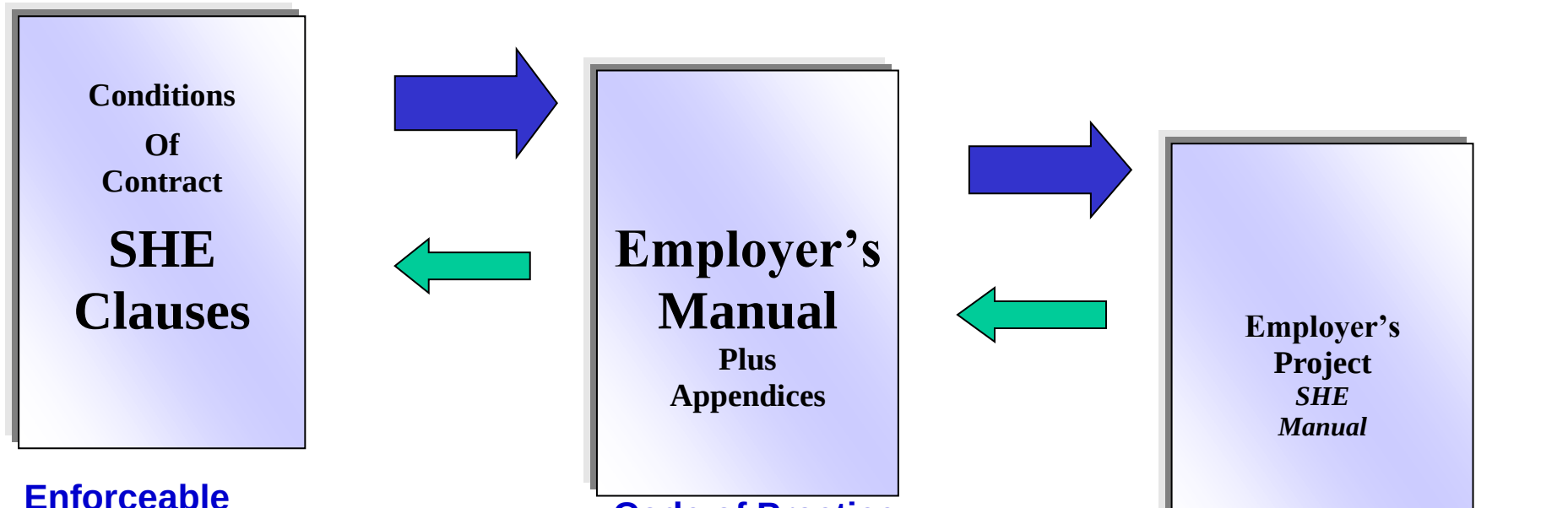
1. Personal Points – Example inserted
2. Manual Handling
3. Hand Tools
4. Woodworking Machinery
5. Ladders
6. Cartridge Tools
7. Compressed Air
8. Oxygen
9. Compressed gas Cylinders
10. Drilling Machines
11. Pre-permit activation job specific toolbox talk

NOIDA METRO RAIL CORPORATION	**TOOL BOXTALK No 1**
PERSONAL POINTS	

- Never take chances.
- Carry out the instructions you have been given.
- If you do not know or understand - Ask.
- If you see on unsafe condition - Rectify it or report it.
- If you have an accident make sure you report it and get it properly attended to.
- Obey all safety signs and rules.
- Do not distract others or “horseplay” around
- Only operate plant and equipment that you are authorized to.
- Never operate machinery unless all the guards are in place.
- Always wear the protective clothing and equipment that you have been provided with.
- Keep your work place clean and tidy.
- Look after your tools, don’t leave them on the ground where they can be damaged or where people can fall over them.

SCHEDULE 3

HIERARCY OF SAFETY HEALTH & ENVIRONMENTAL FOR NMRC CONTRACTORS



Enforceable
With Financial Implications

Code of Practice
Enforceable through Conditions of Contract

Guidance
For - Contractors and Employer's Rep.

NOIDA METRO RAIL CORPORATION (NMRC) LIMITED

CONTRACT NO: NGNC-01

E Tender No.: NMRC/Civil/NGNC/123/2020

TENDER DOCUMENTS

VOLUME 2

ENVIRONMENTAL MANAGEMENT MANUAL

PART - II

Noida Metro Rail Corporation (NMRC) Limited
Block-III, 3rd Floor, Ganga Shopping Complex, Sector-29, Noida -201301,
District Gautam Budh Nagar, Uttar Pradesh, India

STATEMENT OF INTENT

The Noida Metro Rail Corporation firmly believes in a “development which meets the needs of the present without compromising the ability of future generations to meet their own needs”. This commitment towards sustainable development is manifested clearly in our corporate culture, even as we continue to build a world-class metro.

Major portions of Phase – I have been certified to ISO 14001 Environmental Management System during Construction of Line 1 and Line 2. This achievement has propelled NMRC to incorporate ISO 14001 standards in its future construction such as that for Phase –II. This commitment entails aggressive employment of methods and strategies during construction that maximize energy efficiency, use cleaner technologies, reuse and or recycle materials and similar other efforts that help to prevent and reduce environmental degradation.

It is the intent of NMRC to demonstrate continual improvement in its environmental management system during construction of Phase –II.

This manual represents the minimum standards that the Noida Metro Rail Corporation will accept on matters of Environment. It lays down the guidance for environmental protection measures to be adopted as part of mitigation strategy for overcoming adverse environmental impacts during construction. It suggests environmental friendly construction practices that the contractors are encouraged to adopt in order to contain various types of pollutants that may be generated due to construction activities.

The Noida Metro Rail Corporation actively supports the efforts and initiatives that are instigated by the Contractors and sub-contractors in their efforts for achieving good standards of Environment on the project. The Corporation will use its best endeavors to ensure that all of the Contractors employed on the Project achieve these Standards.

TABLE OF CONTENTS

ENVIRONMENTAL MANAGEMENT MANUAL
(Refer Employer's Requirements on Environment)

1.0 INTRODUCTION

1.1 This Environmental Management Manual (EMM) forms an essential part of the overall Environmental protection system employed by NMRC for the construction of Noida MRTS project.

1.2 This manual has been prepared to facilitate construction progress while ensuring fulfillment of environmental commitments. It provides systematic procedures for monitoring and minimizing environmental impacts that may arise from the construction activities.

1.3 This manual will apply to all construction works in Phase – II of Noida Metro Rail Corporation for surface, elevated and underground corridors carried out by the Contractors and Sub-contractors.

1.4 The primary reason for adopting the Manual approach is to make the Contractor aware of his environmental responsibilities and to ensure his commitment to achieving the specified standards.

1.5 The NMRC Environmental Manual is meant to be a living document that will be updated as design and construction progresses and when further environmental issues are identified.

1.6 Periodic reviews of the plan and procedures will be performed to ensure continual improvement of the Plan's adequacy and it will be expanded and updated during the project duration.

1.7 Because the work potentially involves design-bid-build and design/build contracts, this Manual is intended to be flexible and tailored to match highly variable construction activities and locations throughout the project.

1.8 This manual is set out as follows:

- Section 2 highlights the purpose and scope of this Manual
- Section 3 outlines the objectives of the manual which will form a basis for Environmental Management System
- Section 4 lists the definitions and abbreviation of terms used in the manual
- Section 5 sets out the responsibilities for application of the procedures
- Section 6 provides guidance to the Contractor for preparation of his contract specific Site Environmental Plan
- Section 7 commits the Contractor's Method Statement to incorporate Environmental issues during execution of works
- Section 8 focuses on the Environmental Performance Review of Contractor's activities through Environmental Audits

- Section 9 details measures to contain Air, Water, and Noise Pollution and management of Waste through Environmental Friendly Construction Practices
- Section 10 specifies good Housekeeping measures
- Section 11 is on Landscape and Aesthetics
- Section 12 suggests measures to conserve energy through effective Energy Management
- Section 13 deals with Traffic Management
- Section 14 focuses on requirements that the Contractor shall have to meet in case Archaeological and Historic Resources are encountered
- Section 15 on Environmental Monitoring lists the relevant monitoring equipment, compliance criteria and monitoring programme to be undertaken by the Contractor during construction
- Section 16 details requirements for impact monitoring for air quality including Air Monitoring and Control Plan
- Section 17 details requirements for impact monitoring for noise including Noise Monitoring and Control Plan
- Section 18 describes the Environmental Site Inspection process to be implemented by the Contractor
- Section 19 details the Environmental Audits which the employer may undertake as part of environmental performance review
- Section 20 details the Reporting requirement as related to submission of Contractor's Monthly Environmental Management Report under this manual
- Section 21 sets out the Complaint response process and finally,
- Section 22 mentions the requirements of Completion of the EMM programme

2.0 PURPOSE & SCOPE

2.1 The purpose of this Environmental Management Manual (EMM) is to make the Contractors
aware of the environmental concerns of NMRC, and to establish guidelines for the application of environmental controls during the construction of the phase – II of the project.

2.2 This manual is intended to translate into practice, three important principles of NMRC's mandate – that construction activities should not:

- Inconvenience or endanger public
- Create a permanent visual eyesore
- Result in unmitigated ecological or environmental degradation

2.3 This manual is intended to guide and assist the Contractors in exploring all reasonable and feasible means for reducing construction related environmental impacts as they prepare and produce contract-specific Site Environmental Plans as required by the Contract.

2.4 This manual stipulates environmental controls that, in lieu of alternative controls specified by
the contractor, must be applied.

2.5 Environmental controls adopted by the individual contractors as an alternative to the measures identified herein must be as protective of the environment.

2.6 The scope of this manual is to establish procedures to :

- Supervise Contractor's compliance with defined environmental control criteria by carrying out reviews of monitored impact data
- Oversee the procedure for identification of mitigation measures, their design and implementation
- Carry out environmental monitoring emissions during construction through an impact monitoring programme
- Undertake additional ad hoc monitoring if required to address specific instances

3.0 OBJECTIVE

3.1 The various components included in this manual along with the Employer's requirement on Environment will form the basis of an Environmental Management System to be implemented by NMRC, which will enable it to manage the environmental challenges and resolve environmental issues posed during construction of phase –II of MRTS, Noida.

3.2 The main objectives are to:

- Provide database from which environmental impacts of the project can be determined.
- Provide timely indication if any environmental control measure fails to achieve desired results.
- Monitor effectiveness of environmental mitigation measures
- Initiate remedial action if unacceptable impacts arise.
- Determine contractor's compliance with statutory and legal requirements.

4.0 DEFINITION & ABBREVIATIONS

4.1 **Air Monitoring and Control Plan** is abbreviated as AMCP.

4.2 **Auditor:** Person with the competence to conduct an audit.

4.3 **A – weighted** Noise levels in Decibels (referenced to 20 micro-Pascal) as measured with A-
weighting network of standard sound level meter, abbreviated dB (A).

4.4 **Central Pollution Control Board**, New Delhi is abbreviated as CPCB.

4.5 **Continual improvement:** Recurring process or enhancing the environmental management system in order to achieve improvements in overall environmental performance consistent with the organization's environmental policy.

4.6 **Corrective action:** Action to eliminate the cause of a detected nonconformity.

4.7 **Decibel** is measure on a logarithmic scale of the magnitude of a particular quantity (such as sound pressure, sound power) with respect to a standardized reference quantity.

4.8 **Document:** Information and its supporting medium.

4.9 **Energy Equivalent Level (L_{eq})** is the level of a steady noise which has the same energy as the fluctuating noise level integrated over the period of measurement. L_{max} is the maximum Noise Level during the period of measurement. L_{10} and L_{90} are the are the percentile exceeding levels of sound which are exceeded 10% and 90% of the time of measurement.

4.10 **Environmental Pollutant** means any solid, liquid or gaseous substance present in such concentration as may be or tend to be injurious to environment.

4.11 **Environmental Pollution** means the presence in the environment of any environmental pollutant.

4.12 **Environment:** Surroundings in which an organization operates, including air, water, land, natural resources, flora, fauna, humans, and their interrelation.

4.13 **Environmental Aspect**: Element of an organization's activities or products or services that can interact with the environment.

4.14 **Environmental Impact**: Any change to the environment whether adverse or beneficial, wholly or partially resulting from an organization's environmental aspects.

4.15 **Environmental Management Manual** is abbreviated as EMM.

4.16 **Environmental Management System**: Part of an organization's management system used to develop and implement its environmental policy and manage its environmental aspects.

4.17 **Environmental Objective**: Overall environmental goal, consistent with the environmental policy that an organization sets itself to achieve.

4.18 **Environmental Performance**: Measurable results of an organization's management of its environment aspects.

4.19 **Environmental Policy**: Overall intentions and direction of an organization related to its environmental performance as formally expressed by top management, under signature.

4.20 **Environmental Target**: Detailed performance requirement applicable to the organization or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives.

4.21 **Interested Party**: Person or group concerned with or affected by the environmental performance of an organization.

4.22 **Internal audit:** Systematic, independent and documented process for obtaining audit evaluating it objectively to determine the extent to which the environmental management system audit criteria set by the organization are fulfilled.

4.23 **Ministry of Environment and Forest**, Government of India is abbreviated as MOEF.

4.24 **Monitoring** is the use of direct or indirect reading field instrumentation to provide information regarding the levels of pollutants released during construction.

4.25 **Noise** is any unwanted sound disturbance of the environment around the area of construction operations.

4.26 **Noise Monitoring and Control Plan** is abbreviated as NMCP.

4.27 **Nonconformity**: Non-fulfillment of a requirement.

4.28 **Nuisance** is annoyance, which results from any construction activity that affects the material comfort and quality of life of the inhabitants of the area surrounding the construction site.

4.29 **Organization**: Company, corporation, firm, enterprise, authority or institution, or part or combination thereof, whether incorporated or not, public or private, that has its own functions and administration. It also includes the contractor executing the NMRC contract for Phase – II of Noida MRTS.

4.30 **Preventive Action**: Action to eliminate the cause of a potential nonconformity.

4.31 **Prevention of pollution**: Use processes, practices, techniques, materials, products, services or energy to avoid, reduce or control the creation, emission or discharge of any type of pollutant or waste, in order to reduce adverse environmental impacts.

4.32 **Procedure**: Specified way to carry out an activity or a process.

4.33 **Record**: Document stating results achieved or providing evidence of activities performed.

4.34 **Respirable Particulate Matter** is abbreviated as RPM and is particulate matter with size less than 10 µm and is measured in $\mu g/m^3$(microgram per cubic meter)

4.35 **Suspended Particulate Matter** is abbreviated as SPM and measured in $\mu g/m^3$(microgram per cubic meter)

4.36 **Site Environmental Plan**: A document prepared by the contractor that contains detailed procedures on implementing the Employer's requirement on Environment.

4.37 **Usage factor**: Expressed as the percent of time that the equipment is operated at full power while on site.

4.38 **Waste** is unwanted surplus substance arising from the application of all construction operations and any substance or articles, which is required to be disposed.

5.0 RESPONSIBILITIES

5.1 The contractor shall set up an environmental team to execute the environmental requirements.

5.2 The duties of the Contractor's Environmental Team will include (but not limited to):

- To monitor the various environmental parameters as required by the Manual
- To inspect, investigate and audit the work methodology with respect to environmental mitigation and control
- To anticipate environmental issues before they arise and plan for their mitigation
- To audit and prepare audit reports, weekly/monthly reports on site environmental conditions for submission to the employer

5.3 Reporting to the Employer, the Contractor shall:

- Work within the scope of contract and other tender condition.
- Operate and strictly adhere to the requirements of his contract specific-SEP
- Undertake any corrective actions as instructed by his Environmental Manager

5.4 To lead his Environmental team, the Contractor shall deploy an Environment Manager who shall be responsible for environmental control, pollution monitoring, and record keeping and be available to the Employer for resolution of environmental issues.

6.0 SITE ENVIRONMENTAL PLAN

6.1 To effectively implement monitoring, mitigation and remedial requirements, an appropriate contractual and supervisory framework needs to be established.

6.2 The basis of framework within which implementation will be managed is through the preparation of contract-specific Site Environmental Plan by the Contractor. The Employer will audit this contract-specific plan and advise the necessary remedial actions required through contractual means.

6.3 The Site Environmental Plan shall provide details of the means by which the Contractor (and all subcontractors working for the Contractor) will implement the recommended mitigation measures and achieve the environmental performance standards defined both in Indian environmental legislation and in the Employer's Requirements.

6.4 Based on Environmental Management Plan outline given in this document, as Appendix – I
each Tenderer shall prepare an outline Environmental Plan for submission as part of the tender process.

6.5 The outline Environmental Plan shall demonstrate the determination and commitment of Contractor's organization towards environment and indicate how the environmental performance requirements laid out in the Employer's requirements will be met and, where appropriate exceeded.

6.6 Within two months of the date of Notice to Proceed, Contractor shall submit a draft contract – specific Site Environmental Plan for the approval of the Employer and a final version prior to the commencement of the works. (Refer clause 12 (a) of Employer's Requirement on Environment).

6.7 The contract-specific Site Environmental Plan will contain description of all procedures developed to meet the requirement defined in 2.0, 3.0 and 7.0 above, to control environmental pollution. Elements of the plan must address the management of pollution, the monitoring programme, and the reporting requirements.

7.0 CONTRACTOR'S METHOD STATEMENT

7.1 It is common practice for the Contractor to prepare method Statement in advancement of actual works, for the approval of the Employer.

7.2 The Contractor's Environmental Manager will be one of the signatories to the Method Statement, after assessing and verifying the environmental impact of the prepared construction activity and ensuring that effective control measures will be in place, timely.

8.0 ENVIRONMENTAL PERFORMANCE REVIEWS

8.1 Environmental Performance Reviews, through an Environmental Audit Programme, may be carried out quarterly by the employer to assess the effectiveness of the Site Environmental Plan, and that the required mitigation measures are routinely implemented and environmental standards are maintained.

8.2 The preliminary objective of the audit programme will be to assess the effectiveness of management systems established by the Contractor to implement the environmental mitigation measures.

8.3 The reviews by Employer shall focus on the effectiveness of the implemented measures to achieve the purpose not simply the fact that a measure has been implemented.

8.4 In such reviews, demonstrable evidence on the part of the environmental requirements will be sought.

8.5 The Contractor shall carry out daily, environment inspection of his works and submit a weekly report as per format for reporting is suggested as Appendix – II.

8.6 The Contractor shall ensure that his weekly/monthly environmental reports and mandating audits are linked to respective previous submission. The Employer will ensure that this procedure is followed by the institution of a monitoring and reporting system that provides information about the environmental performance of the construction contractor throughout the duration of the contract.

8.7 The Employer will monitor Contractor's performance of tasks specified, and will inspect necessary records, reports and procedures as defined in this manual.

9.0 ENVIRONMENTAL FRIENDLY CONSTRUCTION PRACTICES

9.1 Containment of Air Pollution

9.1.1 During Transport of Material

(a) The Contractor shall take precautions to minimize visible particulate matter from being deposited upon public roadways as a direct result of his operations. Precautions include removal of particulate matter from equipment before movement to paved streets or prompt removal of material from paved streets onto which such material has been dropped.

(b) All construction equipment should be washed clean of visible dirt/mud before exiting the construction sites. Any deposition of material on public streets by construction equipment should be removed by manual sweeping, or by deploying electro – mechanical devices.

(c) The Contractor shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from work sites such as construction depots and batching plants. At such facility, high-pressure water jets will be directed at the wheels of vehicles to remove all spoil and dirt. Water shall be pumped through an electrically operated pump set, to hydrants attached with rubber hoses, by activation of push button located at the hydrant, allowing for upto 10 minutes of wash time.

(d) Wheel washing facilities will be provided with efficient drainage, incorporating silt traps to prevent any excessive build up of water. These facilities could include water re-circulation apparatus to minimize water consumption. At the wheel wash facility, water, dirt, gravel etc. shall be drained into precast trench drains with removable grated cover. This dirty water shall flow, through a piping, into solids separator and from there to oil separator before final discharge.

(e) Where wheel-washing facility is not possible, the contractor shall ensure manual cleaning of wheels by wire brushes or similar suitable means.

(f) The Contractor shall ensure that vehicles with an open load carrying area used for moving potentially dust-producing materials shall have properly fitting side and tailboards. Materials having the potential to create dust shall not be loaded to a level higher than the side and tail boards, and shall be carried in vehicles fitted with covers.

9.1.2 At Dumping Sites

(a) The Contractor shall place excavated materials in the dumping/disposal areas designated in the drawings.

(b) The Contractor shall place material in a manner that will minimize dust production. Material shall be stabilized each day by watering or other accepted dust suppression techniques.

(c) The heights from which materials are dropped shall be the minimum practical height to limit fugitive dust generation.

(d) The Contractor shall stockpile material in the designated locations by the Employer with suitable slopes. Access to the site shall be regulated for entry of men, material and machine.

(e) During dry weather, dust control methods such as water sprinkling must be used daily especially on windy, dry day to prevent any dust from blowing. During rains, the stockpile may be covered with tarpaulin or similar material to prevent run off.

(f) The Contractor shall provide water sprinkling at any time that it is required for dust control use.

(g) Sufficient equipment, water, and personnel shall be available on dumping sites at all time to minimize dust formation and movements to prevent nuisance.

(h) Dust control activities shall continue even during work stoppages.

9.1.3 At Construction Site

(a) At each construction site, the Contractor shall provide storage facilities for dust generating materials and shall be closed containers/bins or wind protected shelters or mat covering or walled or any combination of the above to the satisfaction of the Employer. The Contractor shall spray water at construction sites as required to suppress dust, during handling of excavation soil or debris or during demolition.

(b) Stockpiles of sand and aggregate greater than $20m^3$ for use in concrete manufacture shall be enclosed on three sides, with walls extending above the stockpile and two (2) meters beyond the front of the stockpile.

(c) Effective water sprays shall be used during the delivery and handling of all raw sand and aggregate and other similar materials, when dust is likely to be created and to dampen all stored materials during dry and windy weather.

(d) Areas within the Site such as construction depots and batching plants, where there is a regular movement of vehicles shall have an approved hard surface that is kept clear of loose surface material.

(e) Unless the Employer has given consent otherwise, the Contractor shall restrict all motorized vehicles on the Site to a maximum speed of 15 kilometers per hour and confine haulage and delivery vehicles to the designated roadways inside the site.

(f) At the Batching plant the following additional conditions shall be complied with:

- The Contractor shall undertake at all times the prevention of dust nuisance as a result of his activities.
- The Contractor shall frequently clean and water the concrete batching plant and crushing plant sites and ancillary areas to minimize any dust emission.

(g) The Contractor shall erect hoardings as specified in Employer's Requirements – Construction, securely around all construction work sites during the main construction activity, to contain dust within the site area and also to reduce air turbulence caused by passing traffic. The hoarding shall be safely secured to the ground to prevent from toppling with minimum gap between the base of hoarding and ground surface.

9.1.4 During Drilling and Blasting

(a) Water spray should be used to control dust during breaking of rock/concrete.

(b) During blasting operations, appropriate precautions should be taken to minimize dust such as the use of blast nets, canvas covers and watering.

(c) Wire mesh made of heavy-duty tyres or sand bags should be used over blast area on each shot to prevent flying rock and reduce dust.

(d) Blasting technique should be consistent not only with nature and quantity of rock to be blasted but also the location of blasting.

(e) The contractor shall give due preference to explosives with better environmental characteristics.

(f) Vibration shall be monitored during blasting and values shall not exceed as those given in this Environmental Management Manual

9.2 Containment of Water Pollution

(a) At construction depots and batching plants temporary drainage works should be maintained, removed and reinstated as necessary and all other necessary precautions should be taken for avoidance of damage by flooding and silt.

(b) Sedimentation tanks or other acceptable measures, of sufficient capacity to trap silt-laden water before discharge into the outlet drain should be provided. The system should be flexible and be able to handle multiple inputs from a variety of sources.

(c) Temporary open storage of excavated materials from cut and cover-tunneling work used for backfill on site should be covered with tarpaulin or similar fabric during rainy

season or at any time of the year when rainstorms are likely. Washout of construction or excavated materials should be diverted to drainage system through appropriate sediment traps.

(d) Bentonite slurries or other grouts used in diaphragm wall construction piling and other concrete works should be collected in a separate slurry collection system. If reuse is not practicable then it should be disposed off at nearest landfill site after obtaining permission from agency owning the landfill and under the conditions imposed by the agency concerned, or to a different disposal location as advised by the Employer.

(e) The Contractor shall discharge wastewater arising from site offices, canteens or toilet facilities constructed by him into sewers after obtaining prior approval of agency controlling the system. A wastewater drainage system shall be provided by the Contractor to drain wastewater into the sewerage system.

(f) Oil separator/interceptors shall be provided at Batching Plant and construction depot location for vehicle maintenance to prevent the release of oils and grease into the drainage system. These shall be cleaned on a regular basis.

(g) A Spill Prevention and Control Procedure shall be prepared to identify project components such as storage areas, storage tanks that could allow discharge of oil grease or hazardous materials to the drainage system or ultimately in any water body during spillage. The volume of spill should be calculated as well as storage volume to contain spill within the materials storage containment areas. The procedure shall include measures to contain and mitigate transportation of oil, grease or hazardous materials to the drainage system or any water body.

(h) Surface run-off from construction depots and batching plants should be discharged into storm drains via adequately designed sand/silt removal facilities such as sand traps silt traps or sediment basins.

(i) Perimeter channels/drains should be constructed in advance of site formation works and earthworks. Silt removal facilities, channels and manholes should be maintained and the deposited silt and grit should be removed regularly, to ensure that these facilities are functioning properly at all times.

(j) Construction works should be programmed to minimize soil excavation works in rainy seasons (July to September). If excavation in soil could not be avoided in these months or at any time of year when rain are likely, for the purpose of preventing soil erosion, temporarily exposed slope surfaces should be covered e.g. by tarpaulin, and temporary access roads should be protected by crushed stone or gravel, as excavation proceeds. Arrangement should always be in place to ensure that adequate surface protection measures can be safely carried out well before the arrival of rains.

(k) Measures should be taken to minimize the ingress of rainwater into trenches. If excavation of trenches in wet seasons is necessary, they should be dug and backfilled in short sections. Rainwater pumped out from trenches or foundation excavation should be discharged into storm drains via silt removal facilities.

(l) Open stockpiles of construction materials (e.g. aggregates, sand and fill material) on sites should be covered with tarpaulin or similar fabric during rainstorms. Measures should be taken to prevent the washing away of construction materials, soil, silt or debris into any drainage system.

(m) Manholes (including newly constructed ones) should always be adequately covered and temporarily sealed so as to prevent silt, construction materials or debris from getting into the drainage system, and to prevent storm run-off from getting into sewers. Discharge of surface run-off into sewers must always be prevented in order not to unduly overload the sewerage system.

(n) Groundwater pumped out of wells, etc. for the lowering of ground water level in basement of foundation construction, and groundwater seepage pumped out of tunnels under construction should be discharged into storm drains after the removal of silt in silt removal facilities.

(o) Wastewater from Concrete Batching & Precast Concrete Casting and that generated from the washing down of mixer trucks and drum mixers and similar equipment should wherever practicable be recycled. The discharge of waste water should be kept to a minimum.

(p) The section of construction road between the wheel washing bay and the public road should be paved to reduce vehicle tracking of soil and to prevent site run-off from entering public road drains.

(q) Surface run-off should be segregated from the concrete batching plant and casting yard area as much as possible and diverted to the storm water drainage system. Surface run-off contaminated by materials in a concrete batching plant or casting yard should be adequately treated before disposal into storm water drains.

9.3 Containment of Noise

(a) Construction of facilities and structures would require the use of equipment, which may generate high noise levels and adversely affect noise sensitive receivers.

(b) In assessing the impact of construction noise and hence its containment, the nature and level of activities that generate noise, the pathway through which noise travels, the sensitivity of the receptor, and the period of exposure should all considered.

(c) Environmental noise is measured in decibels (dB). To better approximate the range of sensitivity of the human ear to sounds of different frequencies, the A-weighted decibel scale (dBA) was devised. As the human ear is less sensitive to low frequency sounds, the A-scale de-emphasizes these frequencies by incorporating frequency weighting of the sound signal. When the A-scale is used, the decibel levels are represented by dBA.

(d) On this scale, the range of human hearing extends from about 3 dBA to about 140 dBA. A 10-dBA increase is judged by most people as a doubling of the sound level.

(e) To the extent required to meet the noise limits the Contractor shall use reasonable efforts to include noise reduction measures listed below to minimize construction noise emission levels. Noise reduction measures – include, but not limited to the following:

(i) Minimize the use of impact devices, such as jackhammers, and pavement breakers. Where possible, use concrete crushers or pavement saws for tasks such as concrete deck removal and retaining wall demolition.

(ii) Equip noise producing equipment such as jackhammers and pavement breakers with acoustically attenuating shields or shrouds recommended by the manufacturers thereof, to meet relevant noise limitations.

(iii) Pneumatic impact tools and equipment used at the construction site shall have intake and exhaust mufflers recommended by the manufacturers thereof, to meet relevant noise limitations.

(iv) Provide mufflers or shield paneling for other equipment, including internal combustion engines, recommended by manufacturers thereof.

(v) Employ prefabricated structures instead of assembling on-site.

(vi) Use construction equipment manufactured or modified to dampen noise and vibration emissions, such as:

- Use electric instead of diesel-powered equipment.
- Use hydraulic tools instead of pneumatic impact tools.

(f) Maximize physical separation, as far as practicable, between noise generators and noise receptors. Separation includes following measures:

- Provide enclosures for stationary items of equipment and barriers around particularly noisy areas on site.
- Locating stationary equipment so as to minimize noise and vibration impact on community.

(g) To the extent feasible, configure the construction site in a manner that keeps noisier equipment and activities as far as possible from noise sensitive locations and nearby buildings. Plant and equipment known to emit noise strongly in one direction should where possible, be oriented in a direction away from noise sensitive receptor and reduce the number of plant and equipment operating in critical areas close to noise sensitive receptors.

(h) Scheduling truck loading, unloading, and hauling operations so as to minimize noise impact near noise sensitive locations and surrounding communities.

(i) Minimize noise intrusive impacts during most noise sensitive hours.

- Plan noisier operations during times of highest ambient noise levels.

- Keep noise levels relatively uniform; avoid excessive and impulse noises.

(j) Equipment and plant are not to be kept idling when not in use.

(k) Use only well maintained plant at site, which should be serviced regularly.

(l) Maintain equipment such that parts of vehicles and loads are secure against vibrations and rattling.

(m) Grading of surfaced irregularities on construction sites to prevent the generation of impact noise and ground vibrations by passing vehicles.

(n) Schedule work to avoid simultaneous activities that both generate high noise levels.

(o) The construction of temporary physical noise barriers.

(p) If back-up alarms are used on construction equipment, their noise emission level near noise sensitive receptors such as residences, schools, hospitals and similar areas where quiet is essential, should be regulated, especially at night time.

(q) Select truck routes for muck disposal so that noise from heavy-duty trucks will have minimal impact on sensitive land uses (e.g., residential) and submit to the Employer for approval:

- Conduct truck loading, unloading and hauling operations in a manner such that noise and vibration are kept to a minimum.

- Route construction equipment and vehicles carrying soil, concrete or other materials over streets and routes that will cause least disturbance to residents in vicinity of work.

- Avoid operating truck on streets that pass by schools during school hours.

(r) The maximum permissible sound pressure level for new generator sets (upto 1000 KVA) run on diesel, shall be 75 dB(A) at one meter from the enclosure surface.

(s) For existing diesel generator sets, the noise from the DG set shall be controlled by providing an acoustic enclosure or acoustic treatment of the room for DG sets. Such acoustic enclosures/acoustically treated rooms, shall be so designed for minimum 25 dB(A) insertion loss or for meeting the ambient noise standards, whichever is on higher side.

9.4 Containment of Waste

(a) Careful design, planning and good site management can minimize waste of materials such as concrete, mortars and cement grouts. The contractor shall ensure regular maintenance and cleaning of the waste storage areas.

(b) Construction activities are expected to generate a variety of waste such as:

(i) General refuse
(ii) Construction Waste including waste from excavated material
(iii) Chemical waste and
(iv) Hazardous waste

(c) Handling and disposal of such waste may cause environmental degradation and nuisance. To prevent it, such waste has to be handled and disposed properly. As such, transportation and disposal of all waste shall be strictly managed.

(d) General Refuse

(i) Each worksite would generate general refuse including paper and food waste. There is likely to be a concentration of such waste at batching plants on major worksite. The storage of general refuse has the potential to give rise to negative environmental impacts.

(ii) Handling and disposal of general refuse should cope with the peak construction workforce during the construction period. Provided the refuse is stored and transported in accordance with good practice and disposed at licensed landfills, the negative environmental impacts would be minimal.

(iii) General refuse should be stored in enclosed bins or units separate from construction and chemical wastes. An authorized waste collector should be employed by the contractor to remove general refuse from the site, on a daily basis to minimize odour, pest and litter impacts.

(iv) Office waste can be reduced through recycling of paper if volumes are large enough to warrant collection.

(e) Construction Waste

(i) Construction Waste would mainly arise from the project construction activities and from the demolition of existing structures where necessitated. It includes unwanted materials generated during construction, rejected structures and materials, materials that have been over-ordered and materials, which have been used and discarded such as:

- Material and equipment wrapping packaging material
- Unusable/surplus concrete/grouting mixes
- Damaged/contaminated/surplus construction materials; and
- Wood from formwork and false work.

(ii) Also, demolition of buildings and houses to accommodate station buildings and construction depots will generate concrete rubble, plastics, metal, glass, asphalt from surfaces, wood and refuse.

(iii) Waste from excavation would comprise soil, rubble, sand, rock, brick etc.

(iv) It is estimated that construction activities used generate 2.5mm^3 of soil, majority of which will be used for filling purpose.

(f) Chemical Waste

(i) Chemical waste is likely to be generated by construction activities. For those processes, which generate chemical waste, it may be possible to find alternatives, which generate reduced quantities or even no chemical waste, or less dangerous types of chemical waste.

(ii) The contractor should explore the possibilities given in (I) above and produce evidence of the same to the Employer.

(iii) Containers used for the storage of chemical waste should:

- Be suitable for the substances they are holding, resistant to corrosion, maintained in good condition, and securely closed.
- Be of adequate capacity and
- Display a label in English and Hindi as to the contents, quantity and safe method of disposal in accordance with instructions contained in MSDS.

(iv) The storage area for chemical waste should:

- Be clearly labeled and used solely for the storage of chemical waste;
- Be enclosed on at least three sides;
- Have an impermeable floor and bunding, of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the chemical waste stored in that area, whichever is the greatest;
- Have adequate ventilation;
- Be covered to prevent rainfall entering and
- Be arranged so that incompatible materials are adequately separated.

(iv) Disposal of chemical waste should be via a licensed waste collector; duly authorized by MOEF or State Pollution Control Board as the case may be. License of the waste collector shall be shown to the employer on demand.

(v) The contractor should maintain an inventory of chemicals, solvents and adhesives. He should minimize disposal of excess material, reuse when applicable and dispose of chemical waste properly. He should prepare a plan that identifies proper ventilation, protected clothing and personal protective equipment.

(vi) The Contractor should have a point of contract that will maintain the above information and conduct periodic inspections.

(vii) The Contractor should have application matter in place that will ensure high transfer efficiency that reduces over spray or excess application.

(g) Hazardous Waste

(i) Classification of waste as Hazardous shall be in accordance with Hazards Waste (Management & Handing) Rules 1989, and 2003 or its latest amendment.

(ii) The contractor shall identify all the hazardous waste generated as a result of his activities. If such waste is generated then the contractor shall apply to State Pollution Control Board for 'authorization' according to Form 1 of the Hazardous rules and dispose the same only to currently authorized recyclers(a list of which can be obtained from state pollution control board) under intimation to the Employer.

(iii) The Rules given in (I) above shall govern the Classification, Handling, Storage and disposal of such Hazardous Waste.

(iv) Hazardous waste would mainly arise from the maintenance of equipment. These may include, but not be limited to, the following:

- Used engine oils, hydraulic fluids and waste fuel;
- Spent mineral oils/cleaning fluids from mechanical machinery;
- Scrap batteries or spent acid/alkali; and
- Spent solvents/solutions, some of which may be derived, from equipment cleaning activities.

(iv) For disposal of waste requiring special attention and hazardous waste the contractor shall enter into agreement with authorized agencies dealing with the same.

(v) The environmentally hazardous waste shall be stored on an impermeable surface with containment bunding to retain leaks, spills and ruptures.

(vi) Waste oil and chemical containers shall be delivered to the Contractor's Storage yard. The Contractor is responsible for the correct storage and handling of waste oil/waste chemical containers unit such a time that they are transported to the chosen disposal area or waste oil containers.

(vii) All waste collection containers shall be of appropriate size with a closed lid. Each container will be clearly labeled both with a color code system and labeled in Hindi and English. Original labels of empty containers should be completely covered over and the contents of the type of waste stored in the used containers clearly indicated.

(g) Storage and Segregation of Waste

(i) Disposal and collection points should be established around all construction work sites. The waste containers should be at least 50L/100L

(ii) The burning of refuse at construction sites is not permitted.

(iii) The contractor shall enter into a contract with Municipal Corporation of Noida to collect waste from Construction depots, Labour Colony etc. and dispose it at their landfill as per existing norms.

(iv) The contractor is responsible for the separation of construction and demolition material into re-usable and non-reusable materials, and transfer of these materials to low laying areas or landfills, depending on the type of material and the percentage of inert material.

(v) Segregation of Waste should be done on site. All construction waste including debris should be sorted on site into inert and non-inert components as given in Table - I. Different areas of the worksites should be designated for such segregation and storage wherever site conditions permit.

Table –1
Storage of Waste

Waste Container	Colour Code	Sign
Landfill / Biodegradable	Green	Waste
Recyclable	Blue	Paper & Plastic
Burning / Combustible	Red	Burning
Scrap Metal	Brown	Metal

(vii) On-site measures promoting proper segregation and disposal of construction waste should be implemented e.g. provide separate containers for inert (rubber, sand, stone etc.) and non-inert (wood, organics etc.) wastes. The inert waste should be used on site before disposed of at filling area and the non-inert waste should be sorted for re-use or recycling before being transported to landfills.

(viii) Non-inert materials such as wood, glass and plastic are acceptable for disposal to a landfill as a last resort if these can no longer be reused or recycled.

(ix) Inert materials such as excavated materials comprising soil, rubble, sand, rock, brick and concrete should be separated and broken down to size suitable for subsequent filling in low lying areas, if it is determined that such material can no longer be reused at the site itself.

(h) Reuse and Recycle

(i) Some good quality reusable topsoil is expected from site clearance works across agricultural land over the banks of Yamuna River. This can be locally stockpiled and used later in final landscaping works, thus saving on costs for such works and transportation and environmental impacts of disposal.

(ii) The design of formwork should maximize use of wooden panels so that high reuse levels can be achieved. Alternatives such as steel formwork should be considered to increase the potential for reuse.

(iii) The contractor should recycle as much of the construction waste as possible on-site. Proper segregation of waste types on site will increase the feasibility of certain components of the waste stream by recycling contractors.

(iv) Excavated materials are usually inert such as soil and rock, and can normally be reused on site or in public filling areas. The excavated material may have to be temporarily stockpiled on-site for subsequent re-use.

(v) Steel and other metals should be recovered from the construction waste and recycled as far as practical. If possible, scrap steel mills can use steel bars.

(k) Transportation of Waste

(i) The transportation of construction spoil shall be allowed only to officially designated dumpsites after obtaining necessary permission from appropriate authority.

(ii) A procedure to facilitate tracking of loads should be developed to prevent illegal disposal of waste. This procedure should include, inter alia, the name of driver, vehicle registration number, type and quantity of waste, place and time of origin, place of disposal and route of haulage.

(iii) In orders to avoid dust or odour impacts, vehicles leaving a site carrying excavate should have their load covered. Vehicles should be routed as far as possible to avoid sensitive receivers in the area.

(iv) Contractors who produce significant quantities of scrap are obliged to enter into agreement with authorized dealers of scrap for its disposal. Copies of such agreements shall be shown to the Employer on request.

(l) Training

(i) The Contractor's Environmental Department is responsible for training of workers and personnel involved in generation of waste.

(ii) The contractor shall provide training for workers about the concepts of site cleanliness and appropriate waste management procedure, including waste separation, reduction, reuse and recycling. Failure to do so would result in poorly separated waste, resulting in difficulties in treating the waste correctly and/or a bad market for reuse /recycling.

(iii) The awareness will be created through briefings and toolbox talks. The personnel/workers should be trained in waste classification and separation. The training should include:

- Organic waste
- Combustible waste
- Hazardous waste
- Minimization of waste

(iv) Separation awareness training shall be given to employees responsible for the separation of the waste and information regarding waste separation shall be posted at appropriate locations around the site.

10.0 HOUSEKEEPING

10.1 The Contractor shall constitute a special group of house keeping personnel in charge of each work section. Senior engineer of each section shall be responsible for house keeping at their respective sites.

10.2 Each section of work site shall maintain the site reasonably clean, keep free from obstruction and properly store any construction equipment, tools, and materials. Any

wreckage, rubbish shall be temporarily stored in wreckage and rubbish bins. These wreckage and rubbish bins shall be cleaned at frequent intervals. Special house keeping group will ensure daily cleaning work at the site and its surrounding areas.

10.3 General House keeping shall be carried out and ensured at all times at work sites, Labour Camps, Stores and Offices.

10.4 Full height fence, barriers etc. will be installed at the site in order to preserve the surrounding area from excavated soil, rubbish etc which may cause inconvenience to public.

10.5 The Contractor will ensure that all sub-contractors maintain the site reasonably clean through the sub-contract's provision related to house keeping.

10.6 The Contractor's designated department will, through daily pre-work meeting (tool box talk), safety meeting etc. will impart the necessary introduction and education to labor on house keeping. This will be done through toolbox talks. Other staff such as supervisors and engineers working at the site will also be educated on the necessity of good house keeping.

10.7 Every individual would be responsible for house keeping in his area i.e.

- At Work Site: All workers should clean their work place after completion of their job. Supervisor should ensure good house keeping of their respective work area through their workers. Section Managers shall ensure house keeping in their area through their supervisors. Contractor's designate department will monitor this activity through section manager as well as site supervisor.
- At Labour Camp: All workers should be responsible to maintain good house keeping and hygienic condition in their respective rooms/dormitories. The Contractor should ensure the availability of dustbins at required place and regular cleaning of rooms, kitchens, toilet blocks and dustbins. Safe disposal of all waste materials, should also be ensured. Arrangement for regular fumigation should be made by the contractor.
- At Store: Proper access and stacking shall be ensured at the Stores. A list will display daily stock of materials. All work material should be stored in clearly marked containers or at designated storage area.
- At Office: Every one is responsible to maintain house keeping of their work station. Disposal of waste materials (i.e. stationary, cigarette buts, tea bags etc.) must be in dustbin only.

10.8 Avoidance of Nuisance

(a) The Contractor shall take all precautions to avoid any nuisance arising from his operations. This shall be accomplished, wherever possible by suppression of nuisance at source rather than abatement of the nuisance once generated.

(b) Following site clearing and before construction, the Contractor shall remove all trash, debris and other weeds.

(c) The Contractor shall ensure that the work place is free of trash, garbage, debris and weeds.

(d) The Contractor shall provide at site, metal or heavy-duty plastic 'Refuse Containers' with tight fitting lids for disposal of all garbage or trash associated with food. The containers shall not have openings that allow access by rodents.

(e) To keep the area free of litter and garbage, specific locations shall be designated for consuming food and snacks to prevent random disposal of waste. All waste shall be deposited in the refuse containers. Suitable all weather signage shall be prominently displayed for compliance of these requirements.

(f) The refuse containers shall be kept upright with their lids shut. These containers shall be emptied at least once daily by the Contractor to maintain site sanitation. There shall be different containers for bio-degradable/recyclable and hazardous (flammable) wastes.

(g) All plants/equipment/machinery shall be well maintained by regular servicing and kept free from oil/grease dripping. Drip pans of suitable size shall be used to collect oil leakages and spills. The area shall be cleaned after completion of maintenance/repair and generated waste disposed off in approved manner.

(h) The contractor shall make available Material Supply Data Sheet (MSDS) for material/chemicals/substances used, for which these are available to the Employer when requested.

(i) Such material/chemicals/substances used shall be treated, handled, stored, transported and disposed off, by the contractor, in a manner specified in the MSDS.

10.9 Prevention of Mosquito Breeding

(a) Measures shall be taken to prevent mosquito breeding at site. The measures to be taken shall include, but not limited to, the following:
   (i) Construction run of shall not be allowed to stagnate at work sites specially at construction depots and batching plant locations, by executing and efficient drainage system and/ or leveling off low lying areas;
   (ii) Empty cans, oil drums, packing and other receptacles which may retain water shall be deposited at a central collection point and shall be removed from the Site regularly;
   (iii) Still waters shall be treated at least once every week with oil in order to prevent mosquito breading;
   (iv) Contractor's Equipment and other items on the Site, which may retain water, shall be stored, covered or treated in such a manner that water could not be retained.

(b) Posters in both Hindi and English which draw attention to the dangers of permitting mosquito breeding shall be displayed prominently on the site.

11.0 LANDSACPE AND AESTHETICS

11.1 The Contractor should be able to demonstrate evidence that the landscape and aesthetics quality during construction have been considered and appropriate actions have seen taken to mitigate negative impacts due to construction.

11.2 The construction of metro system will have negative but temporary impacts on the landscape and aesthetics due to loss of amenities and tress. Large-scale construction activity will impact negatively on roadside areas and residential communities immediately adjacent to the construction sites.

11.3 However, transplanting, replanting of trees and additional landscape treatment is likely to result in long-term beneficial impacts. Some such species are give in Table – 2 for guidance.

Table – 2
Recommended species for Plantation and Landscaping

S.No.	Botanical Name	Common Name
A.	**TREES**	
1.	Bambosa goldiana	Golden Bamboo
2.	Bauhinia blackiana	Kachnar
3.	Cassia renigera	Pink Cassia
4.	Ficus regionald (Topiart)	RegionalD
5.	Ficus retusa	Retusa
B.	**PALMS**	
1.	Areca leutescens	Areca Palm
2.	Cycus Revoluta	Cycus
3.	Oreodoxa Regia	Royal Palm/Bottle Palm
4.	Phoenix palm	Date Palm
5.	Rhapihis palm	Rhaphis Palm
C.	**GROUND COVER**	
1.	Asparagu sprengeril	Asparagus
2.	Chlorophytum comosum	Chlorophythum
3.	Duranta goldeana	Golden Duranta
4.	Iresin herbestii	Lal Sag
5.	Lantana alba	White Lanta

11.4 Light used for construction lighting can illuminate adjacent areas in undesired ways. Such lighting and glare shall be prevented from striking adjacent areas, where feasible, through directional shielding.

11.5 The other measures include but not limited to:

(a) Erection of decorative screen hoarding prominently displaying the logo of Noida Metro Rail Corporation.
(b) Minimising height of temporary buildings.
(c) Careful positioning of construction equipment.
(d) Eliminating the possibility of stockpiles of material from being visible to public.
(e) Strategically placing hi visibility site markings at construction sites indicating facilities, offices and stores.
(f) Adequate and properly managed parking of vehicles at construction depots and batching plants.

11.6 Consent for height of stacks of Diesel Engines with rating more than 800 KV shall be obtained by the Contractor from statutory Government agency. Where the calculated height of stack is obtrusive and does not blend with the neighborhood, the contractor will provide either alternative sucrose of power or provide a solution that is

acceptable to the employer. This may include but not limited to providing appropriate cladding for the stack.

12.0 ENERGY MANAGEMENT

12.1 By using energy efficiently, the same services can be delivered with less energy, which helps protect the environment by preventing pollution.

12.2 Most of the energy including electrical, required during construction, would be generated by burning fossil fuels. When we use less energy, fewer fossil fuels are consumed which means less pollution. Thirty percent of energy consumed in buildings is used unnecessarily or inefficiently according to ENERGY STAR.

12.3 The contractor should optimize the use of tools and plants and equipment to perform tasks with correct power. Optimizing cable sizes and joints can control voltage drops.

12.4 The contractor should use energy efficient pumps (at least 80% efficiency) and motors (95% efficiency or more). The efficiency should be measured during installation and also periodically.

12.5 The contractor should use Diesel Generating sets that have specific fuel consumption of at least 3.5 units per litre of diesel. The contractor should rigorously follow the maintenance regime of his DG sets.

12.6 The contractor should maximize the use of energy efficient luminaries such as CFLs and T5 florescent tubes, metal halide lamps and similar and ensure optimum illumination levels to save energy. The contractor shall make provision of Earth Leakage Circuit Breakers (ELCBS) to prevent loss of excessive earth currents which are unsafe.

12.7 The contractor should plan in advance and select locations to receive and store material such that these are at the least distance from place of use. Such an approach will result in less energy being consumed since optimum energy will be expended for transport of material.

12.8 The contractor should plan works in a manner as to avoid reworking especially during meeting the interface requirements of systems contractor.

13.0 TRAFFIC MANAGEMENT

13.1 Traffic Management for the project includes public roadways and sidewalks and the maintenance of access to residence, business and public services throughout the construction area. Traffic delays and reduction in roadways capacity are anticipated during aspects of the construction of the metro rail.

13.2 Even though vehicular, pedestrian and surface transit traffic will be impacted at a few locations, the contractor should minimize such impacts through the development of

Traffic Management Plans, which will be submitted in advance to the Employer for his approval. These plans will provide specific guidance on traffic management for various portions of construction zones and staging.

13.3 The types of mitigation measures to be implemented by the contractors will be on a site-specific basis and will include

- Signage and barriers for protecting and guiding pedestrians
- Detour signs placed at strategic locations
- Relocation of bus stops at construction sites
- Provision of side walks of least 2m where feasible
- Physical separation between construction zone and side walks of concrete barriers or wood fencing or mesh fencing

13.4 Wherever heavy equipment like cranes or dozers have to be moved on public roads and the normal moving dimensions are infringed, these shall be moved under advice to traffic police, and with adequate precautions and at low speed.

14.0 ARCHAEOLOGICAL AND HISTORIC RESOURCES

14.1 During the construction period, archaeological or historic resources may potentially be affected by direct or indirect construction activity. At least one structure, Qutub Minar, is adjacent to the alignment with likelihood of project construction activity potentially requiring special measures to be initiated at this stretch with the approval of the employer.

14.2 Prior to the initiation of construction NMRC intends to review without objection a resource protection plan for historic structures where it appears they may be affected by the project. This plan will be developed by the civil contractor in consultation with The Archaeological Survey of India (ASI).

14.3 The plan will identify the sensitive resources as well as specify the construction monitoring requirements. These requirements may include ground vibration monitoring and recording any components inadvertently subjected to impact.

14.4 In the event the project will affect a previously unidentified historic property, work in the area of discovery shall cease until actions that will take into account the effect of the undertaking on the property can be implemented. The Ministry of Environment and NMRC shall determine how to proceed.

15.0 ENVIRONMENTAL MONITORING - GENERAL

15.1 The Contractor's Environmental Team shall carry out the monitoring of environmental impacts during construction. Representative sensitive receivers in the vicinity of the works shall be monitored for noise and air quality impacts.

15.2 For carrying out impact monitoring for noise and air, equipment shall be provided, operated and maintained by the Contractor. The equipment shall be kept in a good state of repair in accordance with the manufacturer's recommendations and

maintained in proper working order with sufficient spare equipment available in the event of breakdown to maintain the planned monitoring programme.

15.3 The calibration of monitoring instruments and their respective calibrators shall be carried out in accordance with the manufacturer's requirement to ensure they perform to the same level of accuracy as stated in the manufacturer's specifications.

15.4 Suspended Particulate Matter (SPM) levels shall be measured by following the standard high volume sampling method as set out in High Volume Method for Suspended Particulate, BIS: 5182-1981. Respirable Particulate Matter (RPM) shall be measured in underground station and tunnels in accordance with BIS 5182 Part 4, on the direction of Employer.

15.5 24-hour average SPM concentration shall be measured by drawing air through a High Volume Sampler (HVS) fitted with pre-weighted Glass Fiber filter paper at an average flow rate not less than $1.1m^3$ per minute. Similarly for RPM, respirable dust sampler, fitted with pre-weighted Glass Fiber and average flow site of not less than $1.1m^3$/min shall be used. The duration of monitoring of RPM shall be 24 hrs.

15.6 The minimum requirements to the specifications of sound level meter are given in IS: 9779-1981.

15.7 Employer will undertake baseline monitoring to establish background levels. Action Level of the Contractor shall be based on the results of baseline monitoring programme, which will be made available to him.

15.8 The Contractor's monitoring programme is summarized in Table –3.

Table –3
Summary of contractor's Environmental Monitoring Programme

Parameter	Noise	Air	
Sampling	Day Time (6 AM – 10PM) L_{max}, L_{eq}, L_{10}, L_{90} Night Time (10PM – 6AM) L_{max}, L_{eq}, L_{10}, L_{90}	SPM 24 hour	RPM 24 hour
Frequency at each location	Once a week (when noise-generating activities are underway.	Two 24 hours samples every fifteen days.	One 24 hours sample every 15 days
Locations and number	To be determined, by the Contractor and approved by the employer based on noise sensitive receptors, but at least at all metro station sites, Batching Plant and sensitive sites such as school, hospital archeological sites etc.	To be determined by the Contractor and approved by the employer, based on air sensitive receptors, but at least all metro station sites, Batching Plant and sensitive location	Inside tunnel and station box as directed by Employer

		like school hospital archeological site etc.	
Duration of Monitoring by Contractor	During Civil Construction	During Civil Construction	
Additional Monitoring	As directed by the Employer	As directed by the employer.	

16.0 AIR MONITORING

16.1 Construction activities that will generate dust impacts include excavation, material handling and stockpiling, vehicular movement, and wind erosion of unpaved work areas.

16.2 The impact of fugitive dust on ambient air pollution depends on the quantity generated, as well as the drift potential of the dust particles injected into the atmosphere. Large dust particles will settle out near the source and smaller particles are likely to undergo dispersal over greater distance from the sources and impeded setting. SPM and RPM levels will be monitored to evaluate the dust impact during the construction phase of the Project.

16.3 The Air Quality Monitoring and Control Plan (AMCP) in contract-specific Site Environmental Plan prepared by the Contractor shall establish procedures to monitor impact air quality and measures to control air pollution including dust suppression due to construction activities at work sites. This plan shall contain description of activities that will cause degradation in air quality, environmental procedures to manage pollutants, monitoring programme record keeping and reporting.

16.4 The Employer shall monitor Contractor's performance of tasks specified and will inspect necessary records, reports and procedures related to the control of air quality given in AMCP.

16.5 Information gathered during the AMCP will be catalogued and maintained by the Contractor and shall be available for review by the Employer.

16.6 The exact location of the air monitoring stations located near air sensitive receptors adjoining the construction sites, such as residences, schools, and hospitals and placement of monitoring equipment thereat shall be agreed with the Employer prior to commencement of air monitoring programme.

16.7 Impact monitoring during the course of the Works shall be carried out at the monitoring stations for two days (continuous twenty-four hours) every fifteen days and where there is a perceived air quality problem.

16.8 The Contractor should construct suitable fence, lockable gate, 220V AC power point and suitable access at each air monitoring station. Monitoring stations should be free from local obstructions or sheltering.

16.9 Should impact monitoring record dust levels which are:

- Indicative of a deteriorating situation such that closer monitoring is reasonably indicated, or
- When in the opinion of the Employer additional measurements are required in view of deteriorating air quality;

Then, the Employer's Representative may require the Contractor to increase the frequency of impact monitoring at any one or more of the monitoring stations until the results indicate an improving and acceptable level of air quality.

16.10 The Contractor shall keep records of air quality monitoring (including location, date, time). The Contractor shall submit a copy of monitoring results to the Employer. The results should represent a statistical evaluation of data by calculating maximum, minimum, mean, for valuation of trends, and comparison with emission standards.

16.11 The National Ambient Air Quality Standards given in Air (Prevention and Control of Pollution) Act, 1981 may be referred by the Contractor for Limit Levels of SPM and RPM in ambient air which may be followed in estimating the pollution level caused by Contractor's activities.

16.12 Where the Employer determines that the recorded SPM level is significantly greater than the Limit levels, the Employer may direct the Contractor to take effective remedial measures including, but not limited to, reviewing dust sources and modifying working procedures.

16.13 Where the recorded baseline levels exceed the ambient air quality standards, then at such locations the limit level is the recorded base line. Contractor shall take all effective remedial measures to contain the levels to their baseline value as a result of his activities. The action level may be varied by and at the sole discretion of the Employer.

16.14 The Contractor should inform the Employer of all steps taken to investigate cause of exceedance and immediate action taken to avoid further exceedance through written reports and proposals for action.

17.0 NOISE MONITORING

17.1 The activities which are expected to cause noise during the construction of MRTS, Noida include noise from construction equipment, construction activities such as portal construction, earthwork excavation, concreting, viaduct construction and removal of spoil and movement of construction vehicles and delivery vehicles traveling to and from the construction and disposal sites.

17.2 The level of impact of these noise sources depends upon the noise characteristics of the equipment and activities involved, the construction schedule, and the distance from noise sensitive receptors.

17.3 The Noise Monitoring and Control Plan (NMCP) in contract specific site Environmental Management Plan prepared by the Contractor shall establish procedures to monitor construction noise and determine when to apply measures to control noise pollution due to construction activities at works site.

17.4 The NMCP will provide site description, define acceptable noise monitoring equipment, provide siting and operating procedures for noise equipment, indicate reports and record keeping on noise monitoring data.

17.5 The NMCP will provide guidance for construction activity. It shall also address noise performance criteria used in the selection of construction equipment. In defining the requirements of the NMCP, available measures for noise control, such as, the use of equipment with special exhaust silencers or enclosures, and the construction of temporary enclosures or noise barriers around specific construction site activity areas shall be considered.

17.6 The NMCP will be reviewed on a regular basis and updated as necessary to assure current construction activities are addressed.

17.7 The Employer shall monitor Contractor's performance of tasks specified, and will inspect necessary records, report and procedures related to the control of noise.

17.8 Noise monitoring shall be carried out at noise sensitive receptor locations within 200 feet of the construction site once each week and after a change in construction activity. Construction noise measurements shall coincide with daytime and nighttime periods of maximum noise generating construction activities.

17.9 The appropriate parameter for measuring construction noise impacts shall be the equivalent A-weighted sound pressure level (Leq) measured in decibels (dB). The two statistical sound levels L_{10} and L_{90}; the level exceeded for 10 and 90 percent of the time respectively, shall also be recorded during monitoring. The L90 may be considered as the ambient level into which the L_{10} as average peak level intrudes. The L_{max}, L_{eq}, L_{10} and L_{90} values will be reported in the noise measurement form along with allowable noise limit. The duration of monitoring shall be for a minimum of 30 minutes.

17.10 In no case shall the Contractor expose the public to construction noise levels exceeding 90dBA(slow) or to impulsive noise levels with a peak sound pressure level exceeding 140dB as measured on an impulse sound level meter.

17.11 Limit for construction noise is based on the existing ambient noise levels in areas adjoining the construction sites. If the measured noise levels exceed the noise limits, the noise levels shall be reduced by appropriate abatement measures.

17.12 The noise levels emanating from any source during construction, shall not exceed 10 dB (A) or more above existing ambient pre-construction noise levels when measured at a point outside the premises of the location of source. The same may be varied from time to time by and at the sole discretion of the Employer.

17.13 Where there are no ambient noise measurements, the construction activities shall be limited to levels measured at a distance of 200 feet from the construction limits or at the nearest affected building, whichever is closer, as given in **Table - 4**.

Table- 4
Allowable construction noise

LAND USE	MAXIMUM NOISE LEVELS – L_{max} dB (A)	
Residential	Day Time	Night Time
	75	65
	At all Times	
Commercial	85	
Industrial	90	

17.14 The ground borne noise levels within building structures due to tunnel boring machine and any other underground and tunneling construction activities shall not cause interior noise levels to exceed the levels given below as measured in the inside of the affected noise sensitive structure:

Residential: L_{max} 55dB(A)
Commercial: L_{max} 60dB(A)

17.14 At the surface of the construction site during nighttime hours, the Contractor shall use only equipment that operating under full load meets the noise limits specified in **Table-5**, if a sensitive receptor would be affected.

17.15 The adjustments for close in equipment noise measurement shall be made in accordance with **Table - 6**.

17.16 Should the impact monitoring record noise levels which are:

- indicative of a deteriorating situation such that closer monitoring is reasonably indicated, or
- when in the opinion of the Employer additional measurements are required in view of deteriorating noise environment,

then, the Employer may require the Contractor to increase the frequency of impact monitoring at any one or more of the monitoring stations until the results indicate an improving and acceptable level of noise.

Table - 5
Noise emission limits for construction equipment measured at 50 feet from construction equipment*

Equipment Category	L_{max} Level dB(A)
Backhoe	80
Bar Bender	75
Chain Saw	81

Compactor	80
Compressor	80
Concrete Mixer	85
Concrete Pump	82
Crane	85
Dozer	85
Front End Loader	80
Generator	82
Gradall	85
Grader	85
Paver	85
Pneumatic Tools	85
Scraper	85
Tractor	84

Table – 6
Adjustments for close-in equipment noise measurements
(Measurement Values to be subtracted from Measured Sound)

Distance (Feet)	Level to Estimate Sound Level at 50 Feet dB (A)
19-21	8
22-23	7
24-26	6
27-29	5
30-33	4
34-37	3
38-42	2
43-47	1
48-50	0

17.17 The Contractor shall inform the Employer of all steps taken to investigate cause of exceedance and immediate action taken to avoid further exceedance through written reports and proposals for action.

17.18 The Contractor shall submit a copy of monitoring results. The results should represent a statistical evaluation of data for evaluation of trends and comparison with noise emission standards.

17.19 Where the Employer determines that the recorded Noise level is significantly greater than the acceptable levels, the Employer may direct the Contractor to take effective remedial measures including, but not limited to, reviewing noise sources and modifying working procedures.

17.20 Protection against the effects of occupational noise exposure should be provided when the sound levels exceed those shown in Table No. 6 below when measured on the A-scale of a standard sound level meter at slow response.

17.21 When employees are subjected to sound levels exceeding those listed in the Table No. 7 feasible administrative or engineering controls should be utilized.

17.22 If such controls fail to reduce sound levels within the levels of the table, personal protective equipment shall be provide and used to reduce sound levels within the levels of the table.

Table - 7
Permissible Noise Exposures

Duration per day, Hours	Sound level (slow Response)
8	90
6	92
4	95
3	97
2	100
1 ½	102
1	105
½	110
¼ or less	115

17.23 When the daily noise exposure is composed of two or more periods of noise exposure of different levels, their combined effect should be considered, rather than the individual effect of each. Exposure to different levels for various periods of time shall be computed according to the formula as given below.

$F_e = (T_1/L_1) + (T_2/T_2) + \ldots + (T_n/L_n)$ where:

F_e= The equivalent nose exposure factor.

T= The period of noise exposure at any essentially constant level.

L = The duration of the permissible noise exposure at the constant level (from Table)

If the value of f exceeds unity (1) the exposure exceeds permissible levels.

17.24 A sample computation showing an application of the above formula is as follows. An employee is exposed at these levels of these periods:

11db A 1/4 hour.
100 db A1/2 hour.
90 db A 1/2 hours.

Then,

Fe = (1/41/2) +(1/2/2) +(1 1/2/8)
Fe = 0.500 +0.25 +0.188
Fe = 0.938

Since the value of Fe does not exceed unity, the exposure is within permissible limits.

17.25 The vibration level limits at work sites adjacent to the alignment shall conform to permit values of peak particle velocity as give in Table No. 8.

Table 8
Permitted Values of PPV

Sl. No.	Condition of Structure	Max. PPV in mm/sec
1.	Most structures in “good condition”	25
2.	Most structures in “fair condition”	12
3.	Most structures in “poor condition”	5
4.	Water supply structures	5
5.	Heritage structures/bridge structures	5

17.26 When Diesel Generator (DG) Sets are used for operation of equipment and machinery, then Ministry of Environment and Forest notification dated 17th May 2002, issued under Environment Protection Act (Protection) Rules, 1986, on noise limits shall apply.

18.0 ENVIRONMENTAL SITE INSPECTION

18.1 Site inspection shall be undertaken by the Contractor’s staff to inspect the construction activities in order to ensure that appropriate environmental protection and pollution control measures are properly followed and implemented. The frequency of site inspection shall be at least once a week.

18.2 The Contractor shall prepare an ‘Environmental Inspection and Action Reporting System’, submit to the Employer for approval and make amendments as suggested. It shall contain a contract specific comprehensive Environment Inspection checklist as requirement of Site Environmental Plan.

18.3 The area of inspection shall not be limited to environmental compliance within the site but areas outside the site which are likely to be affected, directly or indirectly by activities at site.

18.4 Results of inspection shall be discussed with Employer and his recommendations on better environmental protection shall be notified to the Contractor for taking immediate action and rapid resolution of identified non-compliance.

18.5 If significant environmental problems are identified or if there is an environmental complaint or as a part of investigation work, then the Employer shall also carry out Ad hoc site inspection which shall be attended by Contractor’s Representative.

19.0 ENVIRONMENTAL AUDITS

19.1 As indicated earlier in this Manual, the Employer may undertake regular audits at quarterly intervals, of the Contractor’s onsite practices and procedures as a means of assessing the ongoing performance of the Contractor.

19.2 A checklist of environmental requirements will be prepared and amended as necessary, throughout the construction phase to focus on areas of frequent non-

compliance and to reflect the potential impacts associated with specific activities within the construction programme

19.3 The criteria against which the review will be undertaken will be derived from (but not be limited to):

(a) The approaches, procedures and commitments given by the Contractor in the 'Site Environmental Plan'
(b) The clauses contained within the Employer's Requirement on Environment.
(c) The allocation of responsibility for fulfilling environmental requirements and the effective lines of communication with regard to environmental issues;
(d) Compliance with procedures established to enable and effective response to environmental incident, exceedance or non-compliance;
(e) The extent and accuracy of record-keeping related to environmental performance indicators;
(f) The effectiveness of ensuring high levels of awareness with regard to environmental requirements; and
(g) The effectiveness of environmental management activities, including the speed and effectiveness of responses to complaints.

19.4 The likely protocol will include (but not limited), the auditing of the following activities.

- The allocation of responsibility for fulfilling environmental requirements and effectiveness of lines of communication.
- Compliance with procedures established to enable effective response to environmental issues.
- The extent and accuracy of record keeping related to environment.
- The effectiveness of staff training ensuring high levels of awareness with regard to environmental requirements.
- The speed and effectiveness of responses to complaints.

19.5 The criteria against which the audits will be undertaken shall be derived from the clauses within the Employer's Requirements contract-specific Site Environmental Plan and previous site inspection results.

20.0 REPORTING SYSTEM

20.1 Reporting under the Environmental Management System will contain results of monitoring and inspection programmes.

20.2 In Site Environmental Plan, the Contractor shall prepare and submit monthly Environmental Management Reports in accordance with Employer's Requirements.

20.3 The monthly report shall include (but not limited to) the following:

- Executive Summary
- Brief mention of construction activities
- Monitoring results under AMCP, and NMCP
- Interpretation of monitoring results, significance and influencing factors
- Graphical representation of monitored results over past four reporting periods.

- Details on Fly ash consumption as given in Appendix-III.
- Raw material consumption details such as electricity, diesel, water
- Generation of scrap during the month and sold to authorized recyclers
- Generation of other type of waste and sold to respected authorized buyers.
- Measures to control spills
- Action taken on recommendation under site inspection programme or specific directions.
- Summary of complaints, results of investigations and follow-up action
- Future key issues.

21.0 COMPLAINT RESPONSE PROCESS

21.1 Enquiries, complaints and requests for information can be expected from a wide range of individuals and organizations both private and government. The majority of complaints is likely to be received by NMRC, although the site offices are also likely to be contacted.

21.2 The objective of complaint process is to ensure that public and agency complaints are addressed and resolved consistently and expeditiously.

21.3 The Contractor's Site Manager will be notified immediately on receipt of complaint that may relate to environmental impacts. The Site Manager will immediately inform the Employer.

21.4 Field investigation should determine whether the complaint has merit, and if so action should be taken to address the impact.

21.5 The outcome of the investigation and the action taken shall be documented on a complaint Performa prepared by the Contractor and approved by the Employer in advance of the works.

21.6 Where possible, a formal response to each complaint received shall be prepared by the Contractor within seven days in order to notify the concerned person(s) that action has been taken.

22.0 COMPLETION OF THE EMM PROGRAMME

22.1 The construction of Noida MRTS will be undertaken as a series of individual construction contracts with necessarily different construction programme and completion dates.

22.2 The Employer shall maintain an overview of the 'impact causing potential' of each site, monitoring parameter or contract with a view to maintaining the most cost effective use of the environmental resources dedicated to the Project.

22.3 For release of final bill the contractor shall ensure

(i) Closure of all non-conformance reports

(ii) Submittal of all environment related documents and records pertaining to monitoring and trend analysis on key parameters such as but not limited to consumption/efficient use of resources such as energy, water material such as cement, fly ash, iron and steel, recycle/reuse of waste etc that shall demonstrate continual improvement in the implementation of Environmental Management System

Appendix –I SITE ENVIRONMENTAL PLAN OUTLINE

S.No.	SITE ENVIRONMENTAL PLAN OUTLINE
1	**GENERAL**
(i)	The Environmental Policy of the Contractor is clearly defined in the Site Environmental Plan, which, inter-alia, commits the Contractor to follow national and state environmental legislation and regulations.
(ii)	The Contractor is committed to NMRC's Environmental Management System and shall provide desired manpower and financial resources for its success
(iii)	The person responsible for day-to-day environmental matters is identified and vested with authority to execute the Site Environmental Plan. The Contractor has environmental lines of communication.
(iv)	
(v)	Procedure is available for Contractor's system of enforcing good environmental practices of its Sub-contractor.
(vi)	The Site Environmental Plan contains procedures for screening material used in the contract, for their environmental friendliness.
2	**ENVIRONMENTAL FRIENDLY CONSTRUCTION PRACTICES**
	The Site Environmental Plan must contain specific procedures for achieving environmental performance requirements as given in the Employer's requirement on Environment and NMRC Environmental Management Manual.
(i)	Procedures for carrying out Aspect/Impact analysis of contractor's proposed works and their affect on environment.
(ii)	Procedures for setting up Objectives and Targets commensurate with Employer's requirement on Environment and NMRC Environmental Management Manual and how these shall be met.
(iii)	Procedures for formulating Environmental Management Plans and Operational Control Procedures to meet contractual requirements.
(iv)	Procedures for offering environmental training and methods for promoting environmental awareness amongst his employees.
(v)	The SEP must contain details on Air Monitoring and Control Plan which details Mitigation measures / Corrective Action / Preventive Action and Monitoring Schedule.
(vi)	The SEP must contain details on Noise Monitoring and Control Plan which details Mitigation measures / Corrective Action / Preventive Action and Monitoring Schedule.
(vii)	The SEP must contain procedures on prevention and control of water pollution from sanitary surface runoff and process wastewater.
(viii)	The SEP must contain details on procedures for Storage, handling and disposal of waste including, municipal, construction, chemical and hazardous wastes.
(ix)	The SEP must contain procedures for reuse/recycle of waste, selling to authorized recyclers and records thereof.
(x)	The SEP must contain procedures for preservation of landscape disturbed due to construction, house keeping and traffic management as required under the contract.
(xi)	The SEP must contain procedures for dealing with unforeseen environmental situations under Environmental Emergency.
3	**MONITORING, AUDITS AND RECORDS**
(i)	The Contractor keeps records of environmental monitoring and the SEP contains provision for reporting results of environmental monitoring in a manner as specified in the contract.
(ii)	The Contractor carries out weekly inspection under the 'Environmental Inspection and Action Reporting System' through Environmental Inspection checklist and submits to the Employer.
(iii)	The SEP contains procedures for mandatory audits by the contractor as given in the contract.
(iv)	The SEP contains provisions for submitting monthly Environmental Quality Management reports.
(v)	The SEP contain procedures for recording environmental complaints and response process.

Appendix – II Weekly Environmental Inspection Checklist

Weekly Environmental Inspection

SUMMARY SHEET

1. Major issues of non-conformity in the past week are:

	Issue	Reason
(i)	Air (Specify)	
(ii)	Water (Specify)	
(iii)	Noise (Specify)	
(iv)	Waste (Specify)	
(v)	Storage (Specify)	
(vi)	Housekeeping (Specify)	
(vii)	Roads (Specify)	

2. Over the last week have been able to implement environmental management requirements as per contract

☐ Yes ☐ No if not yes reasons are
(i)
(ii)
(iii)

3. Following issues have not been resolved for more than past two weeks
(i)
(ii)
(iii)

4. Support/Clarification from NMRC required in the following:
(i)
(ii)
(iii)

5. Complaints received in the past week.

	From	Action Taken	Reasons for Delay
(i)			
(ii)	Public		
(iii)	Client		
(iv)	Statutory Agency		

Auditor: Project Manager

Contract Number: Contractor:

Report No.:	**Inspection Date:**	**Inspected by :**
Inspection Area:		
Participants:		

SL. NO.	**ITEM**	**OBSERVATION**	**REMARKS**	**ACTION**	
1.0	**AIR POLLUTION**			**By Date**	**By whom**
1.1	Dust (approach roads, adjacent roads, working area, cement handling etc.)	□ Site Satisfactory □ Site Dusty □ Sprinkling carried out as required □ Excavate removal within 2 days □			
1.2	**Generators**	□ Satisfactory □ Maintenance regime followed □ Black smoke □ Leaking oil □ Drip Pans not available □			
1.3	**Vehicles**	□ Satisfactory □ PUC certificate available □ Black smoke □ Wheel Washed /Cleaned □ Leaking oil □ Side of vehicle clear of mud □ Material transported in closed manner □			
1.4	**Air Monitoring**	□ Carried out as per contract □ Results reported as per contract □ Remedial measures in place where required□			
2.0	**WATER POLLUTION**				
2.1	**Site Drains**	□ Drainage system functional □ No Contamination □Not blocked by debris/ garbage □ No indications of Oil spilled in drains □ Storage of chemical waste not nearby			
2.1	**Site Drains**	□ storage of refuse/ excavate muck not near the drains			

2.2	**Adjacent Drains**	□ Not damaged □ No signs of pouring bentonite □ No signs of pouring Chemicals □ Signs of discharging Silt/ debris			
2.3	**Separator Tanks**	□Tank not full of silt □ Tank regularly emptied □			
3.0	**NOISE POLLUTION**				
3.1	**Noise control measures**	□ All powered mechanical equipments are sound reduced □ Acoustic / enclosures constructed in areas of excessive noise □ Equipment located and directed away from noise receptors □			
3.2	**Generators Provided with acoustic enclosures**	□ Effective □ Not effective □ Not provided □			
3.3	**Noise Monitoring**	□ Carried out as per contract □ Not exceeded baseline values □ Remedial measures in place □ Results evaluated statistically for inclusion in Monthly repot □			
4.0	**WASTE MANAGEMENT**				
4.1	**Waste Identified**	□ Chemical Flammable Corrosive Construction related/ oil/ Filters/ Batteries □ Hazardous □ Other (Specify) □			
4.2	**Storage Containers & Bins**	□ Adequate number and properly place □ Proper quality □ Emptied regularly □ Labeling proper □ No spillage on container surface noticed			

4.2	**Storage Containers & Bins**	□ Pollutants (e.g. waste chemical), not dumped in bins □ Recyclable (e.g. metal) not dumped in garbage bins □			
4.3	**Oil Waste**	□ Drip pans available □ No oil stains on ground □ Spill absorption material available □ Waste oil poured in to designated waste drums □ Used oil filters not dumped in garbage bins □			
4.4	**Excavate/Muck**	□ Storage satisfactory/ properly secured □ Dumping in authorized areas □ No interference with nearby drainage			
5.0	**STORAGE**				
5.1	**Diesel Storage**	□ Extensive diesel spillage on ground not visible □ Drip pans used when pumping diesel □ Pipes / connectors/ pumps not leaking □ Not located close to storm water drains □ transfer arrangement satisfactory			
6.	**AESTHETICS & CLEANLINESS**				
6.1	**Housekeeping & Hygiene**	□ Designated storage area for materials □ Scraps/brickbats/rubbish scattered at site □ Proper space for handling waste □ Area Clean and dry □ Stagnant water treated weekly □ Proper stacking of drums □ Barricades are clean, in line, firmly secured and proper earthling □ Water not allowed to accumulate in work area for any reason □			
7.0	**ROADS**				

7.1	Access Roads	□ Satisfactory Maintenance □ In urgent need of Maintenance □			
7.2	Public Roads used by Contractor	□ Satisfactory maintenance □ Repair not carried out □			

WEEKLY ENVIRONMENTAL AUDIT		
AUDIT No. :		**WEEK ENDING :**
PROGRESS IN THE LAST WEEK:		
PLANNING /GOALS FOR THE NEXT WEEK:		
Environmental Manager	**Project Director**	**Document No.:**

APPENDIX - III-DETAILS ON FLY ASH

The Employer shall give his consent to the civil contractor for using Fly Ash in concrete or brick works. The contractor shall record all relevant details on the consumption of Fly Ash from the data of initial consumption to date of final use.

The details on Fly Ash consumption shall be reported on a monthly basis in the contractor's monthly Environmental Management Report required to be submitted to the Employer.

The details on Fly Ash shall be reported in groups and sub groups as noted below: -

F1 Data required from the Concrete Production Contractor

F1.1 Concrete Production
- Daily records of concrete production
- Mix Design

F1.2 Material consumption from Daily production Records:
- Cement delivery records
- Fly ash delivery records

F1.3 Transportation Cement
- Load capacity of cement delivery vehicles (tons)
- Distance of batching plants to cement plant (km)
- Fuel consumption of delivery vehicles (km/l)

F1.4 Transportation (Fly Ash)
- Load capacity of fly ash delivery vehicles (tons)
- Distance of batching plants to fly ash source (km)
- Fuel consumption of delivery vehicles (km/l)

F2 Data required from Cement Manufacturer(to be obtained by the contractor and submitted to the Employer, on a monthly basis)

F2.1 Process Emission from daily production records
- Quantity of calicareous raw material (limestone etc.) consumed
- % of CaO in raw material
- % of MgO in raw material
- % of CaO in clinker
- % of MgO in clinker
- Quantity of clinker produced

F2.2 Kiln fuel emissions from Monthly Consumption Records
- Quantity of each type of fuel used in the kiln
- CO2 Emission factor (tons CO2/MJ) and specific heat for each fuel type (MJ/Kg) Or % carbon and density (if liquid) for each fuel type

F2.3 Non- Kiln Fuel emission from Monthly consumption records

- Quantity and specific uses for each type of non-kiln fuel used
- CO2 emissions factor (tons CO2/MJ) and specific heat for each fuel (MJ/kg) Or % carbon and density (if liquid) for each fuel type

F2.4 Emission from Electricity consumption in clinker production from Monthly electricity consumption records

- Electricity consumption of equipment related to cement production (kWh)
- Grid electricity supplier
- Quantity of electricity drawn from grid
- Quantity of electricity self generated
- Fuel consumption of generating plant
- Waste heat capture from kiln

F2.5 Additives from daily production records

- Quantities of all additives blended with clinker at cement plant

F2.6 Cement Delivery

Monthly records of cement delivery to batching plants