

GENERAL CONDITIONS OF CONTRACT

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 Works and Contractor's Equipment

15.2

The Contractor shall insure the Plant, Rolling stock, Materials and Works 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, 7.11 and 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.

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

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GENERAL CONDITIONS OF CONTRACT

General Requirements for Insurances

15.5

the Contractor shall be responsible for compliance with this Clause.

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.

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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 of God
- 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.

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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.

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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

17.2

The Contractor shall be entitled to have included in any Interim Payment

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		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 Exhausted	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 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	Disputes shall be settled through two stages: <ul style="list-style-type: none"> 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

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GENERAL CONDITIONS OF CONTRACT

Conciliator and, in particular, shall endeavour 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.
- e. Upon 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

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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 Number 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;
- ii. 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.

ii. 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

GENERAL CONDITIONS OF CONTRACT

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 District GautamBudhNagar, Uttar Pradesh, India and the language of the Arbitration proceedings and that

GENERAL CONDITIONS OF CONTRACT

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 model Time 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 days/30 days of the receipt of award.

17.9.12 A Party may apply to Tribunal within 60 days/30 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 District Gautam Budh Nagar, Uttar Pradesh 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 notwithstanding 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

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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 nominated their address by Employer with a notice to all concerned.

[Handwritten signatures in blue ink]

Part Design & Construction of Elevated Viaduct and 10 nos. of Elevated Stations for Extension Projects of NMRC's Aqua Line from Botanical Garden to Noida Sec-142 (from Chainage (-) 383.959 to 12130.143) and from Depot Station to Boraki MMTH (Chainage 28678.253 to 31263.482).



NOIDA METRO RAIL CORPORATION (NMRC) LIMITED

CONTRACT NO: NGNECC-01

Part Design & Construction of Elevated Viaduct and 10 nos. of Elevated Stations for Extension Projects of NMRC's Aqua Line from Botanical Garden to Noida Sec-142 (from Chainage (-) 383.959 to 12130.143) and from Depot Station to Boraki MMTH (Chainage 28678.253 to 31263.482).

E Tender No.: NMRC/Projects/NGNECC/2026/457

TENDER DOCUMENTS

VOLUME 2

Special Conditions of Contract (SCC)

Noida Metro Rail Corporation (NMRC) Limited

**Block-III, 3rdFloor, Ganga Shopping Complex, Sector-29, Noida -201301,
District Gautam Budh Nagar, Uttar Pradesh, India**

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1 Sub-Clause 1.1.1.20 Special Condition of Contract

Following is added to GCC clause no. 1.1.1.20:

The special conditions of contract shall supplement the GCC. Wherever there is a conflict, the provisions herein shall prevail over those in the GCC.

2 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.

3 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.

4 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.

5 Sub-Clause 4.5 Sub-Contractors

The sub-contracting, excluding design work of Viaduct 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.

6 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.

7 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.

8 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.

**9 Sub-Clauses 4.16 Safety Precautions
and 6.7**

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.

10 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.

11 Sub-Clause 4.19 Employer Supplied Machinery and Materials

The Employer will not provide any machinery or materials under the Contract.

12 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.

13 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.

14 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.

15 Sub-Clause 6

Staff and Labour

Training of contractor's Employees/Staff/Workers

As per Conditions of contract on Safety & Health and Environment.

16 Sub-Clause 6.7

Health and Safety

As per Conditions of contract on Safety & Health and Environment.

17 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.

18 Sub Clause 7.6

Rejection

Any rejected/non-conforming material shall be removed from site within 72 hours by the Contractor provided no retesting of material has been permitted by the Engineer

19 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'.

20 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.

21 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 shall be payable upto a capped limit of 20% of the Contract Value under this contract.

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:

$$V = VI + Vs + Vc + Vf + Vm$$

Where,

V = Total adjustment on account of all factors

VI = Adjustment on account of labour component

$$= p \times R \times (l - lo) / lo$$

Vs = Adjustment on account of Steel component

$$= q \times R \times (Ws - Wso) / Wso$$

Vc = Adjustment on account of Cement component

$$= r \times R \times (Wc - Wco) / Wco$$

Vf = Adjustment on account of Fuel/Lubricant component

$$= s \times R \times (Wf - Wfo) / Wfo$$

Vm = Adjustment on account of Machinery and Equipment

$$= t \times R \times (Wm - Wmo) / Wmo$$

Part Design & Construction of Elevated Viaduct and 10 nos. of Elevated Stations for Extension Projects of NMRC's Aqua Line from Botanical Garden to Noida Sec-142 (from Chainage (-) 383.959 to 12130.143) and from Depot Station to Boraki MMTH (Chainage 28678.253 to 31263.482).

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/ Minimum wages** desired by the Employer or the Engineer shall rest with the Contractor.

I. 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.

II. 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.

III. 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.

Normally, the de-escalation bill on account of negative price variation shall be submitted by the Contractor along with normal RA bills. In case of delay in submission of de-escalation bill by Contractor leading to delay in making recovery, interest rate of State Bank of India's Marginal Cost Based Fund Lending Rate (MCLR) applicable for tenure of 01-year prevailing on the date of recovery plus 3% penal interest per annum shall be charged. The interest will be charged from the date of submission of normal RA bill of the month plus one month or date of payment of normal RA bill whichever is earlier.

IV. 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:

- i. 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 8.4.1 of 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.
- ii. In case the indices fall below 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, then the lower indices will be adopted for Price Adjustment for the period of extension under Clause 8.4.3 of GCC.

22 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.

22.1

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.

22.2

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.

22.3

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 8.4.1 of 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.

23 Sub-Clause 12.0 Deleted

24 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 4 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.

25 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 GM/Projects/NMRC on behalf of MD/NMRC" at following address:

Office of GM/Projects/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 GM/Project-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 GM/Project-NMRC on behalf of MD/NMRC, the Employer will forward a panel of 05 names to the Contractor.

Part Design & Construction of Elevated Viaduct and 10 nos. of Elevated Stations for Extension Projects of NMRC's Aqua Line from Botanical Garden to Noida Sec-142 (from Chainage (-) 383.959 to 12130.143) and from Depot Station to Boraki MMTH (Chainage 28678.253 to 31263.482).

26 Sub-Clause 4.2.1 Performance Security Amount

- a) FDR is not permitted as a form of Performance Security.
- b) Clause 4.2.1 (iii) is deleted.
- c) In case of additional bank guarantee where Variation (positive) exceed 25% of the original contract value, the Contractor shall submit an additional Performance Bank Guarantee at the rate of 10% of the Total Variation amount within the stipulated time.

**26 Sub-Clause 11.2.1 Advances
and 11.2.2**

The Advances against Mobilisation and Plant & Machinery shall be interest bearing.

The Rate of Interest shall be charged at "RBI Bank Rate + 2% (Two Percent) simple interest. Interest will be chargeable and calculated on reducing balance method.

The recovery of interest shall be same as the recovery of advances as mentioned in GCC Clause 11.2.4.

Note: The Schedules attached to SCC may be modified as considered necessary at the time of finalization of the contract.

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 recommence 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

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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) **2026** Between Noida Metro Rail Corporation Limited, 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) Letter of acceptance (LOA)
 - b) Volume 1
 - Notice Inviting Tender (NIT)
 - Instructions to Tenderers (ITT) (Including Annexures)
 - Form of Tender (including Appendices)
 - c) Volume 2
 - Special Conditions of Contract (SCC)
 - General Conditions of Contract (GCC)
 - Conditions of contract on Safety & Health & Environment (SHE).
 - d) Volume 3
 - Employer's Requirements
 - e) Volume 4
 - Outline Design Specifications
 - Outline Construction Specifications of Civil Works

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- f) Volume 5
Tender Drawings
- g) Volume 6
Bill of Quantities
- h) Volume 7
Geotechnical Investigation Report
- i) Contractor's proposal submitted along with the tender
- j) Pre-Bid Queries & Replies
- k) Post bid clarifications and their replies
- l) Contractor's financial bid
- m) 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. Copies of the Addenda are available with the Employer, Contractor and Employer's Representative. As and when required, they could be referred to and in case of any discrepancy between the corrections/modifications incorporated in the consolidated contract documents and the Addenda, the provision of the Addenda shall prevail.

Contractor has submitted Performance Security in the form of Bearing No. dated for an amount of Rs. (Rupees) issued by..... (Name of bank) and duly confirmed by the Employer's bank i.e.

- 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.

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IN WITNESS WHEREOF the parties here to 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

SCHEDULE 3

BANK GUARANTEE NO: **ISSUE DATE:**

**FORM OF BANK GUARANTEE AGAINST MOBILIZATION ADVANCE
(Refer Clause 11.2 of GCC)**

This Bank Guarantee executed at _____ by _____ (Name of Bank) having its Head / Registered office at _____ (hereinafter referred at as "the Guarantor") which expression shall unless it be repugnant to the subject or context thereof include its successors and assigns;

In favour of

The **Noida Metro Rail Corporation Limited** (hereinafter called "NMRC" on Employer), having its registered office at Block-III, 3rd Floor, Ganga Shopping Complex, Sector-29, Noida-201301 Distt. Gautam Budh Nagar (U.P)., which expression shall unless it be repugnant to the subject or context thereof include its successors and assigns;

WHEREAS:

- i. The Employer has awarded the Contract (Name of Contract) vide Agreement dated XX.XX.20XX for the work of (Hereinafter called the "Contract") to (Name of the Contractor) (Hereinafter called the "Contractor").
- ii. Vide Clause No..... of General Conditions of contract, Mobilization Advance limited (%) of the original contract Value ₹ (In words.....) s payable to contractor against acceptable Bank Guarantee in installments.
- iii. The contractor hereby applies for part Advance of % (i.e. 1st Installment/2nd Installment*) amounting to (Amount in Rupees/FC*) (Amount in Words) against Mobilization Advance of% of Original Contract Value for completing preliminaries such as construction of site office, depots, hiring of accommodation, labour hutments, arranging electricity and water supply, movement of staff, labour, plant and machinery etc.
- iv. The value of this Bank Guarantee towards security of "Mobilization Advance" is (%) of part advance claimed, which amounts to ₹ (in words

NOW THEREFORE we, (Name of Bank) being fully authorized to sign and to incur obligations for and on behalf of and in the name of (Name of Bank) hereby declare that the said Bank will guarantee the employer the full amount of ₹ (in words) and we undertake to pay you, upon your first written demand and without cavil, demur or argument, any sum or sums within the limits of _____ (Amount of Guarantee) as aforesaid without your needing to prove or to show grounds or reasons for your demand for the sum specified therein.

1. At any time during the validity of this guarantee, if the advance is not recovered as per the Clause 11.2.4 & 11.2.5 of GCC (or in terms of applicable relevant Clause of the Agreement), it is understood that the Bank will extend this guarantee under the same conditions for the required time on demand of the Employer and at the risk & cost of the Contractor.

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2. The Bank shall pay to the Employer any money so demanded notwithstanding any dispute/disputes raised by the Contractor in any suit or proceedings pending before any Court, Tribunal, Arbitrator or Forum(s) relating thereto and the liability under this guarantee shall be absolute and unequivocal.
3. This bank guarantee is valid up to (The period for which this guarantee will be valid shall be original completion date as stated in the contract).
4. The Bank agrees that no change, addition, modifications to the terms of the contract Agreement or to any documents, which have been or may be executed between the Employer and the Contractor, will in no way release the bank from the liability under this Guarantee; and the Bank, hereby, waives any requirement for notice of any such change, addition or modification to the Bank.
5. The guarantee hereinbefore contained shall not be affected by any change in the Constitution of bank or of the contractor.
6. The neglect or forbearance of the Employer in enforcement of payment of any outstanding amount, the payment whereof is intended to be hereby secured or the giving of time by the Employer for the payment hereof shall in no way relieve the bank of their liability under this deed.
7. Notwithstanding anything contained herein:
 - a. Our liability under this Bank Guarantee shall not exceed ₹ (Rupees).
 - b. This Bank guarantee is valid upto xx-xx-xxxx.
 - c. We are liable to pay the guarantee amount or part thereof under this Bank Guarantee only & only if, you serve upon us a written claim or demand on or before

In witness whereof I/We of the bank have signed and sealed this guarantee on the day of (Month & Year) being herewith duly authorized.

For an on behalf of the (Name of the Bank)

Signature of Authorized Bank Official

Name:
Designation:
Stamp/Seal of the Bank:

Signed, sealed and delivered for and on behalf of the Bank by the above named in the presence of:

Witness 1.

Witness 2.

Signature
Name
Address

Signature
Name
Address

Notes:

1. The Stamp papers of appropriate value shall be purchased in the name of the Bank, who issues the 'Bank Guarantee'.
2. The 'Bank guarantee' shall be from the Scheduled Commercial Bank based in India or from a Branch in India of a scheduled foreign bank, acceptable to Employer.

SCHEDULE 4

BANK GUARANTEE NO: ISSUE DATE: FORM OF

**BANK GUARANTEE AGAINST ADVANCE PAYMENT FOR PLANT & MACHNIERY
(Refer Clause 11.2 of GCC)**

This Bank Guarantee executed at _____ by _____ (Name of Bank) having its Head / Registered office at _____ (hereinafter referred to as "the Guarantor") which expression shall unless it be repugnant to the subject or context thereof include its successors and assigns; In favour of The Noida Metro Rail Corporation Limited (hereinafter called "NMRC" or Employer), having its registered office at Block-III, 3rd Floor, Ganga Shopping Complex, Sector-29, Noida-201301 Distt. Gautam Budh Nagar (U.P). which expression shall unless it be repugnant to the subject or context thereof include its scissors and assigns;

WHEREAS: -

- i. The Employer has awarded the contract (Name of Contract) vide agreement dated XX.XX.XXXX for the work of (Hereinafter called the "Contract") to (Name of the Contractor) (Hereinafter called the "Contractor).
- ii. Vide Clause No. of General Conditions of Contract, Advance against Plant and Machinery limited (%) of the original contract Value ₹ (In words) is payable to contractor against acceptable Bank Guarantee.
- iii. The contractor hereby applies for part Advance against Plant and Machinery amounting to ₹ (In words) for payment against plant, equipment and machinery which has reached the site or in the case of new items/second hand items in working order meant specifically for the work whose firm purchase order has been placed and the invoices received.
- iv. The value of this Bank Guarantee towards security of "Advance payment for Plant & Machinery" is (%) of part advance claimed, which amounts to ₹ (in words).

NOW THEREFORE we, (Name of Bank) being fully authorized to sign and to incur obligations for and on half of and in the name of (Name of Bank) hereby declare that the said Bank will guarantee the employer the full amount of ₹..... (in words) and we undertake to pay you, upon your first written demand and without cavil, demure or argument, any sum or sums within the limits of _____ (Amount of Guarantee) as aforesaid without your needing to provide or to show grounds or reasons for your demand for the sum specified therein.

1. At any time during the validity of this guarantee, if the advance is not recovered as per the Clause 11.2.4 & 11.2.5 of GCC (or in terms of applicable relevant Clause of the Agreement), it is understood that the Bank will extend this guarantee under the same conditions for the required time on demand of the Employer and at the risk & cost of the Contractor.

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2. The Bank shall pay to the Employer any money so demanded notwithstanding any dispute/disputes raised by the Contractor in any suit or proceedings pending before any Court, Tribunal, Arbitrator or Forum(s) relating thereto and the liability under this guarantee shall be absolute and unequivocal.
3. This bank guarantee is valid up to (The period for which this guarantee will be valid shall be original completion date as stated in the contract).
4. The Bank agrees that no change, addition, modifications to the terms of the contract Agreement or to any documents, which have been or may be executed between the Employer and the Contractor, will in no way release the bank from the liability under this Guarantee; and the Bank, hereby, waives any requirement for notice of any such change, addition or modification to the Bank.
5. The guarantee hereinbefore contained shall not be affected by any change in the constitution of bank or of the contractor.
6. The neglect or forbearance of the Employer in enforcement of payment of any outstanding amount, the payment whereof is intended to be hereby secured or the giving of time by the Employer for the payment hereof shall in no way relieve the bank of their liability under this deed.
7. Notwithstanding anything contained herein:
 - a. Our liability under this Bank Guarantee shall not exceed ₹ (Rupees).
 - b. This bank guarantee is valid upto xx-xx-xx.
 - c. We are liable to pay the guarantee amount or part thereof under this Bank Guarantee only & only if, you serve upon us a written claim or demand on or before

In witness hereof I/We of the bank have signed and sealed this guarantee on the day of (Month & Year) being herewith duly authorized.

For and on behalf of the (Name of the Bank)

Signature of Authorized Bank Official

Name:

Designation:

Stamp/Seal of the Bank:

Signed, Sealed and delivered for and on behalf of the Bank by the above named in the presence of:

Witness 1.

Witness 2.

Signature

Signature

Name

Name

Address

Address

Notes:

Part Design & Construction of Elevated Viaduct and 10 nos. of Elevated Stations for Extension Projects of NMRC's Aqua Line from Botanical Garden to Noida Sec-142 (from Chainage (-) 383.959 to 12130.143) and from Depot Station to Boraki MMTH (Chainage 28678.253 to 31263.482).

1. The non-judicial stamp papers of appropriate value shall be purchased in the name of the Bank, who issues the 'Bank Guarantee'.
2. The 'Bank Guarantee' shall be from the Scheduled Commercial Bank based in India or from a branch in India of a scheduled foreign bank, acceptable to Employer.

Part Design & Construction of Elevated Viaduct and 10 nos. of Elevated Stations for Extension Projects of NMRC's Aqua Line from Botanical Garden to Noida Sec-142 (from Chainage (-) 383.959 to 12130.143) and from Depot Station to Boraki MMTH (Chainage 28678.253 to 31263.482).



NOIDA METRO RAIL CORPORATION (NMRC) LIMITED

CONTRACT NO: NGNECC-01

Part Design & Construction of Elevated Viaduct and 10 nos. of Elevated Stations for Extension Projects of NMRC's Aqua Line from Botanical Garden to Noida Sec-142 (from Chainage (-) 383.959 to 12130.143) and from Depot Station to Boraki MMTH (Chainage 28678.253 to 31263.482).

E Tender No.: NMRC/Projects/NGNECC/2026/457

TENDER DOCUMENTS

VOLUME 2

Conditions of Contract on Safety & Health and Environment

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



NOIDA METRO RAIL CORPORATION LIMITED

**CONDITIONS OF CONTRACT ON
SAFETY & HEALTH AND ENVIRONMENT**

(April 2023)

NOIDA METRO RAIL CORPORATION LIMITED

**Block-III, 3rd Floor, Ganga Shopping Complex, Sector-29, Noida -201301,
District Gautam Budh Nagar, Uttar Pradesh, India**

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PART – I: SAFETY & HEALTH AND ENVIRONMENT MANAGEMENT

1.0 General

1.1 Scope

1.1.1 This document defines the principal requirements of the Employer in two critical areas during construction viz. Safety and Health as well as in Environment associated with the contractor / sub-contractor and any other agency to be practiced at construction worksites and associated activities at all times.

1.1.2 The Contractor shall be responsible for both viz. Safety and Health as well as Environment Management of all activities in connection with the execution of the Contract and shall take all necessary actions to ensure the safety of all persons who may be on or adjacent to the site as well as all contract related works and also ensure that environmental requirements are complied with.

1.1.3 For Effective Site Management, the works have been divided into following five categories:

- **Category A:** All Civil contracts of value more than 500 crore rupees.
- **Category B:** All Civil Contracts of value between 100 crore rupees and 500 crore rupees.
- **Category C:** All Civil Contracts of value less than 100 crore rupees.
- **Category D: Track Contracts** of Supply, Installation, Testing and Commissioning of Ballast Less Track, Supply of Rails, Fastening System, Turnouts, Scissor Crossovers, etc.
- **Category E:** Pre-Engineered Building Contract (PEB) and for the following E&M and Systems Contracts:
 - o Design, Manufacture, Supply, Installation, Testing and Commissioning of Platform Screen Doors
 - o Supply, installation, testing and commissioning of Automatic Fare Collection (AFC) system
 - o Supply, Installation, Testing and Commissioning of 25 kV Overhead Equipment (OHE), 33 kV Auxiliary Power Supply and SCADA Systems,
 - o Design, Manufacturing, Supply, Installation, Testing & Commissioning of automatic moving walkways
 - o Design, Detailed Engineering, Supply, Installation, Testing, Commissioning of Auxiliary Sub Station cum Traction Sub Station & HT cabling work of Receiving Sub Station,
 - o Design, Detail Engineering, Supply, Installation, Testing and Commissioning of HVAC System
 - o Any other E&M or S&T or System contracts not mentioned above.

1.1.4 The decision of the Employer will be final in case there is any dispute regarding placement of a tender in a particular category.

1.2 Definition / languages

1.2.1 In this document

- i) The use of 'shall' indicates a mandatory requirement.

- ii) The use of 'should' indicates a guideline that is strongly recommended.
- iii) The use of 'may' indicates a guideline that is to be considered.
- iv) 'SHE' means Safety & Health and Environment.
- v) Employer means Noida Metro Rail Corporation Ltd., (NMRC).
- vi) NMRC's Corporate Safety Head means an officer nominated by NMRC who will overall monitor and is responsible for compliance of all Safety functions prescribed in this document.
- vii) NMRC's Corporate Environment Head means an officer nominated by NMRC who will overall monitor and is responsible for compliance of all Environment functions prescribed in this document.
- viii) NMRC's Corporate Welfare Head means an officer nominated by NMRC who will overall monitor and is responsible for compliance of all Welfare, Labour Laws and Health functions prescribed in this document.
- ix) BOCWA means Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996
- x) BOCWR means Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Central Rules, 1998
- xi) UPBOCWR means Uttar Pradesh Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Rules, 2009
- xii) DG means Director General of Ministry of Labour, Govt. of India.
- xiii) DG set means Diesel Generator set
- xiv) GG means Gas Generator
- xv) CIIBC means Chief Inspector of Inspection of Building and Other Construction of Govt. of Uttar Pradesh.
- xvi) EPA means Environment Protection Act 1986
- xvii) MoEF&CC means Ministry of Environment, Forest and Climate Change, Government of India
- xviii) CPCB means Central Pollution Control Board
- xix) UPPCB means Uttar Pradesh Pollution Control Board
- xx) EPCA means Environment Pollution (Prevention & Control) Authority
- xxi) ISO means International Organization for Standardization
- xxii) GRAP means Graded Response Action Plan notified by the Ministry of Environment, Forest and Climate Change, Government of India
- xxiii) SPCB means State Pollution Control Board
- xxiv) CGWA means Central Ground Water Authority
- xxv) DAC means District Advisory Committee for groundwater regularization and management
- xxvi) CLRA means Contract Labour Regulation and Abolition Act 1970
- xxvii) Minimum Wage means Minimum wage notified by appropriate Govt. for the industry in region
- xxviii) WMP means Waste Management Programme

1.3 Application of this document

- 1.3.1 This document applies to all aspects of the contractor's scope of work, including all aspects conducted by sub-contractors and all other agencies. There shall be no activity associated to the contract, which is exempted from the purview of this document.

1.4 Purpose of this document

- 1.4.1 The objective of these guidelines is to ensure that adequate precautions are taken for incident/occupational illness free safe work execution as well as to avoid harmful effects on the environment during construction.
- 1.4.2 This document:
- i) Describes the Safety & Health and Environment interfaces between Employer and the Contractor.
 - ii) Details the processes by which the contractor shall manage Safety & Health and Environment issues while carrying out the work under the contract.
- 1.4.3 These requirements shall be read together with, ISO 45001: 2018 Occupational Health and Safety Management System and ISO 14001: 2015 Environmental Management Systems.

2.0 Safety & Health and Environment (SHE) Targets and Goals

- 2.1 The Safety & Health targets, goals and aim for the Works are to achieve:

- i) Zero reportable incidents
- ii) Zero non-conformances in respect of statutory laws related to Health and Welfare measures, living conditions and Safety regulations
- iii) Total compliance of recording and reporting of all types of incident
- iv) 100% compliance on Safety Induction of all personnel
- v) Total compliance of conducting inspections and audits.
- vi) Executing construction work with least inconvenience to the road users and traffic.

- 2.2 The Environment targets, goals and aim for the works are to achieve:

- i. Zero non-conformances in respect of statutory laws related to Environment regulations
- ii. Total compliance of conducting inspections and audits as per approved Environment plan
- iii. Executing construction work with least disturbance to the environment, adjoining road users and traffic
- iv. Minimize waste generated at sites and maximize reuse of materials
- v. Maintaining environment conditions of site as per statutory requirement of DPCC/SPCB, NGT etc to avoid penalty

vi. To achieve construction site as zero discharge site as far as is possible

3.0 Compliance

3.1 Memorandum of Understanding (MOU)

3.1.1 A Memorandum of Understanding placed at **Appendix No.: 1** shall be executed before the award of contract by the contractor with regard to various provisions on Safety, Health as well as Environment, to be practiced during the construction work.

3.2 NMRC's Safety and Health Policy and Management Systems

3.2.1 The construction works shall be undertaken in accordance with NMRC's Safety, Health and Environment Policies and Management Systems as amended from time to time provided in NMRC Condition of Contract on Safety & Health and Environment. Prior approval of NMRC Environment Department is required before engaging training, audit and ISO agencies.

3.3 Indian statutory requirements

3.3.1 Primary statutory regulations on Safety and Health are:

3.3.1.1 Contractor shall develop thorough understanding about Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996, Central Rules 1998, Uttar Pradesh Govt. Rules, Building and Other Construction Workers' Welfare Cess Act, 1996 and Central Rules, 1998 and Uttar Pradesh Building Construction Workers' Welfare Board Rules and Environmental Protection Act 1986 and Rules 1986 not only to satisfy the Inspectors' perspective but the use of legislation as the strong tool for effective SHE management at construction worksites. Contractor is strongly advised to practice the principle of voluntary compliance

3.3.1.2 In order to facilitate the contractor for better understanding on the various provisions of the above Act and Uttar Pradesh Govt. Rules, a tabulated information highlighting the Sections/Rules referring to the corresponding registration of contractors, maintenance of registers and records, hours of work and wages, welfare, medical facilities and safety requirements are given in **Appendix No.: 2**. It is an indicative one and not a limiting list.

3.3.1.3 In addition, the construction works shall be undertaken in accordance with all updated applicable legislation and Indian statutory requirements listed below but not limiting to:

- i) Indian Electricity Act 2003 and Rules 1956
- ii) National Building Code, 2016
- iii) Factories Act, 1948 Uttar Pradesh factory rules
- iv) Motor Vehicles Act as amended in 1994 and The Central Motor Vehicles Rules, 1989.

- v) Indian Road Congress Code IRC: SP: 55-2001 'Guidelines on Safety in Road Construction Zones.
- vi) The Petroleum Act, 1934 and Rules 1976
- vii) Gas Cylinder Rules, 2003
- viii) Indian Explosives Act. 1884, along with the Explosives substance Act 1908 and the Explosives Rules 1983
- ix) The (Indian) Boilers Act, 1923
- x) The Public Liability Insurance Act 1991 and Rules 1991
- xi) Minimum Wages Act, 1948 and Rules 1950
- xii) Contract Labour Act, 1970 and Rules 1971
- xiii) Child Labour (Prohibitions & Regulations) Act, 1986 and Rules 1950
- xiv) Payment of Wages Act, 1936
- xv) EPF and MP Act, 1948
- xvi) ESI Act, 1948
- xvii) ID Act, 1947
- xviii) Employees Compensation Act, 1923 along with allied Rules

3.3.1.4 The contractor shall ensure that all his employees / workmen are covered under Employees Compensation Act and shall pay compensation to his workmen as and when the eventuality for the same arises.

3.3.1.5 Notwithstanding the above Act/Rules, there is nothing in those to exempt the contractor from the purview of any other Act or Rule in Republic of India for the safety, Health and Welfare of men and materials.

3.3.1.6 If the requirements stated in this document are less stringent than or in conflict with the country's applicable legislation, the latter shall apply.

3.3.2 Primary statutory regulations on Environment are

3.3.2.1 The construction works shall be undertaken in accordance with all applicable legislation and Indian statutory requirements and their latest amendments listed below but not limiting to:

- i) Environment Protection Act, 1986 and Rules 1986
- ii) Air (Prevention and control of Pollution) Act, 1981 and Rules 1981
- iii) Water (Prevention and Control of Pollution) Act, 1974 and Rules 1974
- iv) The Noise Pollution (Regulation & Control) Rules, 2000
- v) Notification on Control of Noise from Diesel Generator (DG) sets, 2002 and amended up to 2016.
- vi) The Central Ground Water Authority Notification dated 24th September 2020
- vii) Manufacture, Storage & Import of Hazardous Chemicals Rules, 1989

- viii) Hazardous and other Wastes (Management & Trans-boundary Movement) Rules, 2016
- ix) Uttar Pradesh Tree Preservation Act
- x) Batteries (Management & Handling) Rules, 2001 and amendment 2010
- xi) Fly ash utilization notification, Sept 1999 and its subsequent amendments
- xii) Solid Waste Management Rules, 2016
- xiii) Construction and Demolition Waste Management Rules 2016
- xiv) E-Waste (Management) Rules 2016
- xv) Plastic Waste Management Rules, 2016
- xvi) The Ancient Monuments and Archaeological sites and Remains Act,1958 amended in 2010
- xvii) Central Ground Water Authority guidelines
- xviii) Applicable NGT Guidelines issued time to time
- xix) Provisions of Graded Response Action Plan notified by the MoEF&CC (copy annexed)
- xx) The Ozone Depleting substance (Regulation and Control) Rules, 2000 and its amendments.

3.3.2.2 Notwithstanding the above Act/Rules, there is nothing in those to exempt the contractor from the purview of any other Act or Rule in Republic of India for preservation of environment and for the safety of men and materials.

3.3.2.3 If the requirements stated in this document are less stringent than or in conflict with the country's applicable legislation, the latter shall apply.

3.3.2.4 Contractor shall apply and take various environment clearances from the concerned agencies as presented in Table below: These clearances are indicative and contractor is required to take any other clearance as required for its construction activities.

Table 3.1: Key Environmental Clearance Required

Permission/ Clearance/Permit	RELEVANT ACTS/RULES	Concerned Agency
Consent to Establish and Consent to Operate batching plants and casting yards	<ul style="list-style-type: none"> • The Water (Prevention and Control of Pollution) Act, 1974, and • The Air (Prevention and Control of Pollution) Act 1981, 	Uttar Pradesh Pollution Control Board/ State Pollution Control Board
Consent to Establish and Operate Effluent Treatment Plants	The Water (Prevention and Control of Pollution) Act, 1974,	Uttar Pradesh Pollution Control Board / State Pollution Control Committee

Permission/ Clearance/Permit	RELEVANT ACTS/RULES	Concerned Agency
Authorization for generation, handling, storage and transportation hazardous waste	Hazardous Waste (Management, Handling & Transboundary Movement) Rules, 2008	Uttar Pradesh Pollution Control Board Control Committee
Permission for extraction of ground water	Environment (Protection) Act, 1986/Central Ground Water Authority guidelines	Uttar Pradesh Jal Nigam/Noida & Greater Noida Authority/ Central Ground Water Authority
Pollution Under Control Certificate	Central Motor and Vehicle Act 1988 Vehicular Exhaust Norms, CPCB 2007	Transport Department Government of Uttar Pradesh
C&D Waste Management Plan	Construction & Demolition Waste Management Rules, 2016	Local Authority (Municipal Corporation)

3.4 International Standards, Guidelines & ISO Certifications

3.4.1 The works should be undertaken in accordance with the applicable international guidelines, standards and specifications on Safety & Health and Environment and every contract shall aim to achieve ISO certifications listed below during the currency of the contract within eight months from the date of award of the contract:

ISO 45001: 2018: Occupational Health and Safety Management System. (Applicable only for Category A and Category B contracts). For other category of contracts, the Contractor shall ensure that its Corporate Office is certified to ISO 45001:2018 during the currency of the contract.

ISO 14001-2015: Environmental Management Systems (Applicable only for Category A and Category B contracts). For other category of contracts, the Contractor shall ensure that its Corporate Office is certified to ISO 14001:2015 during the currency of the contract.

3.4.2 The certification shall be maintained throughout the currency of the contract.

3.4.3 The process of certification shall start immediately and not exceeding three months from the date of contract agreement and completed within eight months. Towards this, the contractor shall undertake the required steps including appointment of ISO consultant for obtaining the certification on Occupational Health and Safety Management System and Environment Management System.

3.4.4 In case of failure on the part of the contractor, the Employer shall do the same at the cost of the contractor.

4.0 Contractor Safety & Health and Environment Policies and Plans

4.1 Contractor's Safety & Health Policy and Plan

4.1.1 The contractor as per rule 39 of the BOCW central rule shall formulate a Safety & Health policy in line with NMRC's policies and get it approved by Employer and display it at conspicuous places at work sites in Hindi and a local language understood by the majority of construction workers. The policy shall contain the following as minimum coverage:

- i) The intention and commitments of the establishment regarding health, safety and environment protection of the workers
- ii) Organisational arrangement made to carry out the policy specifying the responsibilities at different levels of hierarchy
- iii) Responsibilities of the contractors, sub-contractor, transporter or other agencies involved in the construction work
- iv) Techniques and methods for assessment of risk to safety and health and remedial measures
- v) Arrangement for training of works, supervisors or other persons engaged in the construction work
- vi) Other arrangement for making the policy more effective

4.1.2 Contractor shall revise the policy whenever any modification having implication on the safety and health of the workers is made or any new construction work, substances, or technique are introduced which have implication on health, safety of workers

4.1.3 Within Four weeks from date of contract agreement, the Contractor shall submit a detailed and comprehensive Contract specific site Safety & Health Plan. The Safety & Health Plan shall include detailed policies, procedures and regulations which, when implemented, will ensure compliance of the contract provisions as well as statutory regulations. The Safety & Health Plan shall include the following but not be restricted to:

- i) A statement of the Contractor's policy, organisation and arrangements for Safety & Health
- ii) The name(s) and experience of person(s) within the Contractor's proposed management who shall be responsible for co-ordinating and monitoring the Contractor's Safety & Health performance;
- iii) The number of Safety & Health staff who shall be employed on the Works, their responsibilities, authority and line of communication with the proposed Contractor's agent;
- iv) A statement of the Contractor's policy and procedures for identifying and estimating hazards, and the measures for addressing the same;
- v) A list of Safety & Health hazards anticipated for this Contract and sufficient information to demonstrate the Contractor's proposals for achieving effective and efficient health and safety procedures;
- vi) A description of the Safety & Health training courses and emergency drills which shall be provided by the Contractor, with an outline of the syllabus to be followed;
- vii) Details of the safety equipment which shall be provided by the Contractor, including personal protective equipment;
- viii) A statement of the Contractor's policy and procedures for ensuring that

Contractor's Equipment used on the Project Site are maintained in a safe condition and are operated in a safe manner;

- ix) A statement of the Contractor's policy and procedures for ensuring that sub-contractors comply with the Contractor's safety plan;
- x) A statement of the Contractor's disciplinary procedures with respect to Safety & Health related matters;
- xi) A statement of the Contractor's procedure for reporting and investigating accidents, dangerous occurrences or occupational illnesses;
- xii) Detailed Standard Operating Procedures (SOP)/Safe Work Procedures (SWP) for every activity likely to be undertaken as well as for use and maintenance of Plant, Machines & Equipment shall be made as part of Safety & Health Plan;
- xiii) Contract shall formulate format like work permit etc. and made checklist for activity involving risk as well as for using plant & machines/equipments

4.2 Contractor's Environment Policy and Plan

4.2.1 The Contractor shall formulate an Environment Policy in line with NMRC's Environment and other policies and get it approved by the NMRC's Corporate Environment Head and display it at conspicuous places at work sites in Hindi and a local language understood by the majority of construction workers.

4.2.2 Within Four weeks of the notification of acceptance of the tender, the Category A (as defined in the beginning of this document) contractor shall submit a detailed and comprehensive contract specific site Environmental Plan. The Environment Plan shall include detailed policies, procedures and regulations which, then implemented, will ensure compliance of the contract provisions.

4.2.3 The site Environment Plan shall include the following but not be restricted to:

- i. Within the period defined above, the contractor shall submit a draft contract specific Site Environment Plan for the approval of the NMRC and a final version prior to the commencement of the works.
- ii. The site Environment Plan shall provide details of the means (as elaborated in Point No. iv below) by which the contractor (and all sub-contractors working for the contractor) will implement the recommended mitigation measures and achieve the environmental performance standards defined both in Indian environmental legislation and in this document.
- iii. The contract –specific Site Environmental Plan will contain details of manpower required for environment related works, description of all procedures developed to meet the requirement defined in various sections of this document, to control environment pollution and organizational hierarchy for the effective implementation of the plan. Elements of the plan must address the management of pollution, the monitoring programme and the reporting requirements.
- iv. Outline of the Site Environmental Plan is given below:

Table 4.1: 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 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.
(iii)	Procedure is available for Contractor's system of enforcing good environmental practices of its Sub-contractor. By procedure it is implied that the Sub Contractor has been given clear written directions to comply with all requirements mentioned in this document and as applicable.
(iv)	The Site Environmental Plan contains procedures for screening material used in the contract, for their environmental friendliness. This implies that the procedure will comply with MC2 and MC 3 credits of IGBC Green Mass Rapid System (MRTS).
2	ENVIRONMENT FRIENDLY CONSTRUCTION PRACTICES
(i)	The Site Environmental Plan shall contain specific procedures for achieving environmental performance requirements as given in the Employer's requirements on Environment.
(ii)	Procedures for carrying out Aspect/Impact analysis of contractor's proposed works and their effect on environment. This will be cross reference with ISO 14001:2015 (EMS) procedures.
(iii)	Procedures for setting up Objectives and Targets commensurate with Employer's requirement on Environment and how these shall be met.
(iv)	Procedures for formulating Environmental Management Plans and Operational Control Procedures to meet contractual requirements.
(v)	Procedures for offering environmental training and methods for promoting environmental awareness amongst his employees.
(vi)	The Site Environmental Plan must contain details on Air Monitoring and Control Plan which details Mitigation measures / Corrective Action / Preventive Action and Monitoring Schedule.
(vii)	The Site Environmental Plan must contain details on Noise Monitoring and Control Plan which details Mitigation measures / Corrective Action / Preventive Action and Monitoring Schedule.
(viii)	The Site Environmental Plan must contain procedures on prevention and control of water pollution from sanitary surface runoff and process wastewater.
(ix)	The Site Environmental Plan must contain details on procedures for Storage, handling and disposal of waste including, Municipal, C&D, Plastic, Bio-Medical, Chemical and Hazardous wastes.
(x)	The Site Environmental Plan must contain procedures for reuse/recycle of waste, selling to authorised recyclers and records thereof.
(xi)	The Site Environmental Plan must contain procedures for preservation of landscape disturbed due to

	construction, housekeeping/Environmental Sanitation and traffic management as required under the contract.
(xii)	The Site Environmental Plan must contain procedures for dealing with unforeseen environmental situations under Environmental Emergency.
3	MONITORING, AUDITS AND RECORDS
(i)	The Site Environmental Plan shall contain the environmental monitoring requirements as per the contract requirements.
(ii)	The Contractor keeps records of environmental monitoring and the Site Environmental Plan must contain provision for reporting results of environmental monitoring in a manner as specified in this document.
(iii)	The Site Environmental Plan must contain procedures for carrying out inspections
(iv)	The Site Environmental Plan must contain provisions for submitting monthly Environmental Management reports.
(v)	The Site Environmental Plan must contain procedures for recording environmental complaints and response process.
4.	Training details/Training matrix
5.	Environment Emergencies identified and its control plan

- 4.3 The Contractor shall, from time to time and as necessary as required by the Employer to produce supplements to the Safety & Health and Environment Plans such that it is at all times a detailed, comprehensive and contemporaneous statement by the Contractor of his site safety industrial health, responsibilities, policies and procedures relating to work on Site. Any and all submissions of supplements to the Safety & Health and Environment Plans shall be made to the Employer in accordance with the agreed procedures.
- 4.4 If at any time the Safety & Health and Environment plans is, in the Employer’s opinion, insufficient or requires revision or modification to ensure the security of the Works and the safety, health and welfare of all workmen upon and visitors to the Site, the Employer may instruct the Contractor to revise the Safety & Health and Environment plans and the Contractor shall within 7 days submit the revised plan to the Employer for review.
- 4.5 Any omissions, inconsistencies and errors in the Safety & Health and Environment Plans or the Employer’s acceptance or rejection of the Safety & Health and Environment Plans and/or supplements thereto shall be without prejudice to the Contractor's obligations with respect to site safety, industrial health and environment and shall not excuse any failure by the contractor to adopt proper and recognized safety and environmental practices throughout the execution of the Work.
- 4.6 The Contractor shall adhere to the Safety & Health and Environment Plans and shall ensure, as far as practically possible, that all sub-contractors of all tiers require that

contracting parties each have a copy of the Site Safety & Health and Environment Plans and comply with its provisions.

4.7 The details of contents to be covered in the site Safety & Health plan are given in **Appendix No.: 3.**

5.0 Designer's role

5.1 Designer's role in Safety & Health and Environment

5.1.1 Designer's primary role includes to minimize the risk to health and safety of those who are going to construct, maintain, clean, repair, dismantle or demolish the structures and anyone else like adjoining road users/general public, who might be affected by the work.

Duty to adequately address environmental risks in the drawing itself lies with the designer who has been engaged by the contractor to provide such design. Hence overall responsibility of design of works in terms of Safety & Health and Environment risks completely rests with the contractor.

5.2 General philosophy

5.2.1 When considering health and safety in designer's work, they shall be expected to do what is reasonable at the time the design is prepared. It may be possible for hazards, which cannot be addressed at the feasibility stage to be looked at during detailed design. In deciding what is reasonably practicable, the risk to health and safety produced by a feature of the design has to be weighed against the cost of excluding the feature.

5.2.2 The overall design process does not need to be dominated by a concern to avoid all risks during the construction phase and maintenance. However, a judgement has to be made by weighing up one consideration against another so the cost is counted not just in financial terms, but also those of fitness for purpose, aesthetics, buildability or environmental impact. By applying these principles, it may be possible to make decisions at the design stage, which will avoid or reduce risks during construction work. In many cases, the large number of design considerations will allow a number of equally valid design solutions. What is important is the approach to the solutions of design problems. This should involve a proper exercise of judgement, which takes account of health and safety issues. In case of situations where the designers have carried out the design work and concluded that there are risks, which was not reasonably practicable to avoid, detailed information shall be given about the environmental risks, which remain. This information needs to be included with the design to alert others to the risks, which they cannot reasonably be expected to know. This is essential for the parties who have to use the design information.

5.2.3 The role of designer shall be critical in the following activities/works/functions:

- i. Launching Girders
- ii. Gantries

- iii. Temporary Support Structures like trussles, Cribs or similar
- iv. Scaffolding
- v. False Work/ Frame work
- vi. Erection activities which includes Steel Beams, Precast Girders/segments and cast-in-situ works
- vii. Excavation
- viii. Piling which also includes support Piles
- ix. Access ladders for Underground and Elevated work

The above list is not exhaustive and many more activities/functions may be included.

5.3 Hierarchy of Risk Control

5.3.1 Designers shall need, so far as reasonably practicable, to avoid or reduce risks by applying a series of steps known as the hierarchy of risk control or principles of prevention and protection. The steps to be adopted shall include the following:

- i) Elimination: Physically remove the hazard - Redesign the job or substitute a substance so that the hazard is removed or eliminated.
- ii) Substitution: Replace the hazard - Replace the material or process with a less hazardous one. For example, use a MEWP to access work at height instead of step ladders. Care should be taken to ensure the alternative is safer than the original.
- iii) Engineering Controls: Isolate people from the hazard - Use work equipment or other measures to prevent falls where you cannot avoid working at height. Install or use additional machinery such as local exhaust ventilation to control risks from dust or fume. Separate the hazard from operators by methods such as enclosing or guarding dangerous items of machinery/equipment. Give priority to measures which protect collectively over individual measures.
- iv) Administrative Controls: Change the way people work - These are all about identifying and implementing the procedures you need to work safely. For example: reducing the time workers are exposed to hazards (eg by job rotation); prohibiting use of mobile phones in hazardous areas; increasing safety signage, and performing risk assessments, providing job specific trainings etc.
- v) Personal Protective Equipment: Protect the worker with personal protective equipment - Only after all the previous measures have been tried and found insufficient in controlling risks to a reasonably practicable level, must personal protective equipment (PPE) be used.

The Hazard Identification, Risk Assessment & its Control Measures shall be carried out for each activity involving risks to person and be made in **Sample Form (SF-01)**. Aspect Impact analysis shall be carried out for each activity involving Environment degradation and to be made in **Sample Form (SF-02)** and to be submitted with work method statement.

5.4 Duty to provide health and safety risks in the drawing itself

- 5.4.1** Duty to adequately address Safety and health risks in the drawing itself lies with the designer who has been engaged by contractor to provide such design. Hence the overall responsibility of design of works in terms of safety, health and environment risks completely rests with the contractor.
- 5.4.2** In case of situations where the designers have carried out the design work and concluded that there are risks, which was not reasonably practicable to avoid, detailed information shall be given about the health and safety risks, which remain. This information needs to be included with the design to alert others to the risks, which they cannot reasonably be expected to know. This is essential for the parties who have to use the design information.
- 5.4.3** If the designers' basic design assumptions affect health or safety, or health and safety risks are not obvious from the standard design document, the designer shall provide additional information. The information shall include a broad indication of the assumptions about the precautions for dealing with the risks. The information will need to be conveyed in a clear manner; it shall be included on drawings, in written specifications or outline method statements. The level of detail to be recorded will be determined by the nature of the hazards involved and the associated level of risk.

5.5 Employer's approval

- 5.5.1** Every structure includes temporary formworks like scaffolding, trestle erection, falsework, launching girder, earth retaining structures, parapet anchoring arrangement etc. shall have its design calculations included in the method statements in addition to health and safety risks. All designs shall be vetted by external third party designer for their stability, rigidity as well as load bearing. Employers' designer or his approved proof check consultants as applicable as per the contract conditions shall approve all these designs. This shall also be a part of Method Statement and be submitted to NMRC along with it or separately.
- 5.6** Any non-standard structures like trestles made up of re-bars or structures which are very old, corroded, repaired for many times etc. for which no design calculations can be made accurately from any national standards, shall not be allowed to be used at sites even for short duration.
- 5.7** If any of the above mentioned clauses are not adhered penalty shall be imposed depending upon the gravity of the unsafe act and or condition.

5.6 Contractor's Method Statement

- 5.6.1** The Contractor shall prepare Method Statement in advancement of critical works, for the approval of the Employer (only for A Category Contracts). A list of critical works is given in **Appendix-3A**.

- 5.6.2 The Contractor's Environmental Officer will be one of the signatories apart from other senior contractor's staff to the method statement, after assessing and verifying the environmental impact of the construction activity and ensuring that effective control measures will be in place, timely

6.0 Contractor Safety & Health and Environment Organisation

6.1 Contractor Safety & Health Organisation

6.1.1 Education and Experience

- 6.1.1.1 The contractor shall appoint the required Safety & Health personnel as prescribed in **Appendix No. 4** based upon the statutory requirement and establish the safety organisation based upon the contract value and mobilise Labour Welfare personnel based on the number of workers engaged/deployed at site. The minimum educational qualification and the work experience are given in **Appendix No. 5**. The layout for deployment of Safety & Health manpower shall be prepared as per format provided in **Sample Form (SF- 03)**.

- 6.1.1.2 In order to effectively implement labour welfare provisions and to interact on such provisions with the Employer and the statutory authorities enforcing the labour welfare legislations every contractor shall employ as many fulltime Labour Welfare Officer duly qualified and experienced as per clause 6.1.1.

6.1.2 Conduct and Competency

- 6.1.2.1 The conduct and functioning of the contractor Safety & Health personnel shall be monitored by the NMRC. Any default or deficiency shall attract penalty as per details given under penalty clause of this document.
- 6.1.2.2 The Contractor shall ensure that all personnel are competent to perform the job assigned to them. In the event that the Contractor is unable to demonstrate the competency of any person whose activities can directly impact on the Works' Safety & Health performance, NMRC shall remove that person from the site without any procedural formalities.

6.1.3 Approval from Employer

- 6.1.3.1 The name, address, educational qualification, work experience and health condition of each personnel deployed for Safety & Health jobs shall be submitted to the Employer for comments and approval well before the start of the work or before his/her deployment whichever earlier. Only on approval these personnel are authorised to deploy/work. In case any of the Safety & Health personnel leaves the contractor the same shall be intimated to the NMRC within a week otherwise non-informing the employer will attract penalty. The contractor shall recruit new personnel and fill up the vacancy on immediate basis within one month before relieving the existing manpower and ensure proper handover of all the documents.

6.1.4 Responsibility of Safety & Health personnel

6.1.4.1 For all works carried out by the contractor and his sub-contractors, the responsibility of ensuring the required Safety & Health manpower lies with the main contractor only. The minimum required manpower indicated by the Employer includes the sub-contractors' work also. It shall be the responsibility of the main contractor to provide required Safety & Health manpower for all the works executed by all contractors. Necessary conditions shall be included in all sub-contract documents executed by the main contractor like to encourage sub-contractors; they also deploy the Safety & Health manpower.

6.1.5 Employment status of Safety & Health personnel

6.1.5.1 No contractor shall engage Safety & Health manpower from any outsourcing agencies in which case the effectiveness would be lost. All Safety & Health manpower shall be on the payroll of the main contractor only and not on the payroll of any subcontractor or outsourcing manpower agencies etc. This condition does not apply to positions like traffic marshals who are engaged almost on a daily requirement basis.

6.1.6 Reporting of Safety & Health personnel

6.1.6.1 All Safety & Health personnel are to report to the Chief Safety Manager who shall report directly to the Chief Project Manager/Leader. The Employer shall monitor adherence to this procedure at all times. In case of non-adherence penalty shall be levied as indicated in the penalty clause.

6.1.7 Inadequate Safety & Health personnel

6.1.7.1 Contractor shall appoint its Chief Safety Manager well before the start of activity for preparatory work like formulation, submission & approval of Safety & Health Plan, Method Statements, Safety & Health training facilities, identification & finalization of Agencies for External Safety & Health Audit, ISO certification, Safety & Health Training, Hospital Tie-up etc. The organisation shall grow as the work fronts are made available and adequate Safety & Health manpower shall be ensured as per the contract agreement and site availability. No demobilisation of safety & Health Manpower shall take place without the approval of NMRC. However, key positions like Chief Safety Manager, Safety & Health (Fire) Manager, Safety & Health (Electrical) Manager, Labour Welfare Manager, Barricade Manager, Occupational Health Officer, shall always remained filled with competent professional till final handover of the project to NMRC.

6.1.7.2 In case if the contractor fails to provide the minimum required manpower as illustrated in **Appendix No. 4**, or fail to fill up vacancies created within 14 days, the same shall be provided by the Employer at contractor's cost. Any administrative expenses involved to provide the same like paper advertisement or manpower consultant charges, etc shall also be at the cost of contractor.

6.1.8 Prohibition of performance of other duties

6.1.8.1 As per Schedule VIII of BOCW central rules, no Safety & Health personnel shall be required or permitted to do any work which is unconnected to, inconsistent with or detrimental to the performance of the Safety & Health duties for respective category.

6.1.9 Facilities to be provided to Safety & Health personnel

6.1.9.1 As per Schedule VIII of BOCW central rules, no Safety & Health personnel shall be required or permitted to do any work which is unconnected to, inconsistent with or detrimental to the performance of the Safety & Health duties for respective category.

6.1.9 Facilities to be provided to Safety & Health personnel

6.1.9.1 As per schedule VIII of BOCW central rules, the contractor shall provide all Safety & Health personnel with such facilities, equipment and information that are necessary to enable him to dispatch his duties effectively. The facilities include but not limiting to:

-Provision of equipments like scanner, lamination machines, earth resistance monitoring device (megger), handheld gas monitors, portable anemometer, provision of walkie talkie for critical activities like tandem lifting, TBM lowering, Launcher erection, Push launching etc.

6.1.9.2 In addition, the minimum Employer's requirements of such facilities / equipments to be provided for Safety & Health and Environment personnel are given in the **Appendix No. 6 for Safety & Health and Environment respectively.**

6.2 Contractor's Environment Organization

6.2.1 The Contractor shall establish a separate Environment organization for overseeing the environmental aspects of contractor's work for Category A, Category B, and Category D contracts. The Environment organization of the employer shall be headed by Chief Environment Officer or Senior Environment Officer as the case may be. For Category C and Category E contracts the contractor need not constitute a separate Environment Department but designate the responsibility to a responsible person having work experience of minimum 5 years or more in the construction field and having qualification in Engineering or Science to oversee the implementation of Environmental requirements. This person shall be responsible for preparing all environmental related submissions to the employer. For supervising and ensuring environmental compliance during night time activities, the contractor shall designate Environment Wardens at all stations, batching plant, casting yard, depots, staff quarter and hostel construction sites for Category A and Category B contracts. Such designated persons shall report to the Chief Environment Officer or Senior Environment officer as the case may be.

6.2.2 Education and Experience

6.2.2.1 The contractor shall appoint the required Environmental personnel as prescribed in **Appendix No- 4A** (enclosed at the end) and establish the environment organization based upon the contract value and nature of work. The minimum educational qualification and the work experience are given in **Appendix- No.-5A.**

6.2.2.2 The contractor shall appoint the Chief Environment Officer within 8 weeks of award of work and Senior Environment officer within 4 weeks of award of work. The Environment officer shall be appointed within 12 weeks of award of work.

6.2.3 Conduct and Competency

6.2.3.1 The conduct and functioning of the contractor's Environment personnel shall be monitored by the NMRC. Any default or deficiency shall attract penalty as per details given under penalty clause of this document.

6.2.3.2 The Contractor shall ensure that all personnel are competent to perform the job assigned to them. In the event that the Contractor is unable to demonstrate the competency of any person whose activities can directly impact on the Works' Environmental performance, the NMRC shall remove that person from the site without any procedural formalities.

6.2.4 Approval from Employer

6.2.4.1 The name, address, educational qualification, work experience and health condition of each personnel deployed for Environment jobs shall be submitted to NMRC for comments and approval well before the start of the work. Only on approval by the NMRC, these personnel are authorized to work. The contractor shall not demobilize Environment personnel without prior consent of the NMRC. In case any of the Environment personnel leaves the contractor, the same shall be intimated to the NMRC within a week otherwise non-informing the employer will attract penalty. The contractor shall recruit new personnel and fill up the vacancy on immediate basis before relieving the existing manpower and ensure proper handover of all the documents.

6.2.5 Responsibility of Environment personnel

6.2.5.1 For all works carried out by the contractor and his sub-contractors, the responsibility of ensuring the required Environment manpower lies with the main contractor only. The minimum required manpower indicated by the Employer includes the sub-contractors' work also. It shall be the responsibility of the main contractor to provide required Environment manpower for all the works being executed by him or his sub-contractor. Necessary conditions shall be included in all sub-contract documents executed by the main contractor.

6.2.6 Employment status of Environment personnel

6.2.6.1 No contractor shall engage Environment manpower from any outsourcing agencies in which case the effectiveness would be lost. All Environment manpower shall be on the payroll of the main contractor only and not on the payroll of any subcontractor or outsourcing manpower agencies etc.

6.2.7 Reporting of Environment personnel

6.2.7.1 In the case of Category-A, Category-B and Category-D contracts, all Environment personnel are to report to the Chief Environment Officer/Senior Environment Officer (as the case may be) who shall report directly to the Contractor's Chief Project Manager. In the case of Category-C & Category-E contracts, the designated person responsible for fulfilling the environmental requirements shall report directly to the contractor's Project Manager. The Employer shall monitor adherence to this procedure at all times. In case of non-adherence penalty shall be levied as indicated in the penalty clause.

6.2.8 Inadequate Environment personnel

6.2.8.1 In case if the contractor fails to provide the minimum required manpower as illustrated in **Appendix-4A**, or fail to fill up vacancies created within 14 days, the same shall be provided by the NMRC , at contractor's cost. Any administrative expenses involved providing the same like paper advertisement or manpower consultant charges, etc. shall also be at the cost of the contractor.

6.2.8.2 The Environmental Personnel shall be deployed till the issuing of taking over certificate by the Employer.

6.2.9 Prohibition of performance of other duties

6.2.9.1 No Environment personnel shall be required or permitted to do any work which is unconnected to inconsistent with or detrimental to the performance of the Environmental duties.

6.2.10 Facilities to be provided to Environment personnel

6.2.10.1 During entire currency of contract, the contractor shall provide all Environment personnel with such facilities, equipment and information that are necessary to enable him to dispatch his duties effectively.

The facilities include but not limiting to:

-Provision of equipments like scanner, Type-1 or Type-II noise level meter, handheld gas monitor etc.

6.2.10.2 The minimum Employer's requirements of such facilities / equipments to be provided for Environment personnel are given in the Appendix-6A.

7.0 Contractor Safety & Health and Environment Committee

7.1 All employees should be able to participate in the making and monitoring of arrangements for safety, occupational health and environment at their place of work. The establishment of site SHE committees in which employees and Contractor and sub-contractor management are represented can increase the involvement and commitment of employees. The contractor shall ensure the formation and monitor the functioning of contractor SHE committees.

7.2 Guidelines on Terms of Reference, Agenda, Minutes of Meeting of SHE Committee

7.2.1 The Terms of Reference for the committee shall be as follows;

- i) To establish company Safety & Health and Environment policies and practices
- ii) To monitor the adequacy of the contractor's site Safety & Health and Environment plans and ensure its implementation
- iii) To review compliance to Safety & Health and Environment legal requirements
- iv) To review Safety & Health and Environment training
- v) To review the contractor's monthly monitoring report consisting Air and Noise monitoring results
- vi) To review the contractor's monthly waste management records
- vii) Review the progress of ISO certification
- viii) To review the contractor's monthly Safety & Health and Environment reports.
- ix) To identify probable causes of accident and unsafe practices in building or other construction work and to suggest remedial measures.
- x) To stimulate interest of Employer and building workers in safety by organizing safety week, safety competition, talks and film-shows on safety, preparing posters or taking similar other measures as and when required or as necessary.
- xi) To go round the construction site with a view to check unsafe practices and detect unsafe conditions, condition of health and welfare amenities and to recommend remedial measures for their rectifications including medical first-aid, occupational health centres and welfare facilities like canteen, rest room, drinking water, toilet/urinals etc.
- xii) Committee team members should perform a site inspection before every committee meetings and to monitor Safety & Health and Environment inspection reports.
- xiii) To bring to the notice of the Employer the hazards associated with use, handling and maintenance of the equipment used during the course of building and other construction work
- xiv) To suggest measures for improving welfare amenities in the construction site and other miscellaneous aspect of safety, health and welfare in building or other construction work.
- xv) To look into the health hazards associated with handling different types of explosives, chemicals and other construction materials and to suggest remedial measures including personal protective equipment.
- xvi) To review the last SHE committee meeting minutes and to take action against persons/sub-contractors for non-compliance if any.

7.3 Within 14 days of award of contract, the SHE committee shall be constituted and notification regarding the same shall be communicated to the members and employees as per the format provided in **Sample Form (SF – 04)**.

7.4 SHE Committee meeting shall be conducted at least once in a month with the minimum members listed below:

Table 7.1: SHE Committee Members

Chairman	Project Manager
Secretary	Chief Safety Manager (In-charge)
Members	<ul style="list-style-type: none"> i) Chief Environment Officer/ Senior Environment Officer ii) Labour Welfare Officer iii) Plant and Machinery In-charge iv) Electrical In-charge v) Store In-charge vi) Senior Managers/ Engineers heading different sub functions like construction manager/station manager/via-duct manager/Tunnel manager. vii) Sub – contractor’s representative viii) Labour Contractor’s representative ix) Workers’ representative x) Co-contractor representative. xi) Safety & Health staffs and Environment Staffs
Employer’s Representatives	Representatives from NMRC Execution, Safety, Environment & Welfare departments

7.5 Site SHE Committee meeting (internal safety& Environment review meeting) shall be conducted at least once in a week with the minimum members listed below:

Table 7.2: Site SHE Committee Members

Chairman	Project Manager
Secretary	Chief Safety Manager (In-charge)
Members	<ul style="list-style-type: none"> i) Chief Environment Officer/ Senior Environment Officer ii) Labour Welfare Officer iii) Plant and Machinery In-Charge iv) Site Electrical In-Charge v) Senior Managers / Engineers heading different sub functions like construction manager/station manager/via-duct manager/Tunnel manager. vi) Sub- Contractor’s representative vii) Labour contractor’s representative viii) Workers’ representatives ix) All Safety & Health and Environment Staffs

7.6 Co-contractors’ participation

7.6.1 In case of depot, station and other contiguous areas where more than one main contractors are working together, the Employer shall instruct the other contractors to join for the monthly SHE committee meeting of the main civil contractor, so as to discuss and decide about the common interface issues like provision of security, Fire

fighting facilities, Site lighting, toilet, drinking water etc. and sharing the maintenance cost of the same etc.

7.6.2 Participation of System contractor in Monthly Safety Committee meeting of main (civil) contractor is also mandatory. Similarly, they shall also participate in Monthly CPM safety review meeting, electrical audits as well as in emergency mock drill conducted by main (civil) contractor.

7.6.3 The general principle for sharing the cost of common facilities such as security, provision of illumination, drinking water etc. shall be either based on the contract value of works executed at the contiguous area or the daily average number of workmen employed by each contractor in the contiguous area.

7.7 Minimum time between two monthly SHE Committee meetings

7.7.1 A minimum period of 21 days shall be maintained between any two SHE monthly committee meetings.

7.8 Agenda

7.8.1 The Secretary shall circulate the agenda of the meeting at least seven working days in advance of the scheduled date of the meeting to all members as well as to the Employer.

7.8.2 The agenda should broadly cover the following:

- i) Confirmation of minutes of last meeting
- ii) Chairman's review/overview of site SHE performance / condition
- iii) Previous month Safety & Health and Environment statistics
- iv) Incident and Accident Investigation / dangerous occurrence / near miss report
- v) Site Safety & Health and Environment inspection & issues
- vi) Sub-contractors' site Safety & Health and Environment issues
- vii) Presentation on Environment aspects by Contractor's Environment representative which shall include the following:
 - a. Legal compliance
 - b. Air and Noise monitoring results
 - c. Monthly waste management record
 - d. Progress of ISO certification
 - e. Progress of Green Building Certification
 - f. Material consumption details (cement, aggregate, water, steel, sand etc)
 - g. Fly ash consumption details
 - h. Use of products made from recycled C&D waste products
 - i. Public Complaints on Environment especially related to Noise, dust and vibration
 - j. Steps taken to improve Environment sanitation at site
 - k. Steps taken to address Employers instruction on Environment
 - l. Environmental issues related to site
- viii) Non-compliances raised by statutory authorities
- ix) Safety presentation by Members, if any
- x) Report from Employer

- xi) Matters arising
- xii) Any other concern

7.9 Minutes of the meeting

- 7.9.1 The Minutes of the meeting shall be prepared as per the format provided at **Sample Form (SF-05)** and sent to all members as well as employer within 2 working days preferably by e mail followed by hardcopy. SHE Committee meeting minutes shall also be displayed in the notice board for wider publicity to all concerned.

7.10 Disciplinary Action

- 7.10.1 The chairman shall inform the members of any outstanding issues in the meeting and in case of repeated offence/ non-compliance by some members or other co/sub-contractors or non-attendance of the sub-contractor's representative invited for the meeting and propose suitable disciplinary action including provisions of monetary penalty as per the relevant contract clauses, the Employer shall ensure that the same is implemented.

8.0 Safety & Health and Environment orientation training

- 8.1 The Contractor shall ensure that all personnel working at the site receive an induction Safety & Health and Environment training immediately on the first day of joining explaining the nature of the work, the hazards that may be encountered during the site work and the particular hazards attached to their own function within the operation. Personnel shall only be deployed at site once he/she has completed Safety & Health and Environment induction. The training shall cover the contents as given in the **Appendix No. 7& Appendix No. 7A**. The topics on Environment as part of the Induction Training shall be imparted by Contractor's Environment representative.

9.0 ID Card and First day at work

- 9.1 Photo Identity Card to Contractor's Site Personnel
- 9.2 All personnel shall be issued a photo identity card of size 85mm x 55mm duly signed by the authorized representative of the contractor before they are engaged for any work as per the format given in the **Appendix No. 8**. PF no, UAN ID and ESI no shall also appear on this card.
- 9.3 These cards shall be Smart Bio-metric Identity Cards capable of attendance, Training as well as Data recording function. Statutory compliances like ESIC and EPF contribution, Monthly wages paid, Personal Information etc. shall be linked with this card which shall also carry information regarding Medical data, Education and Training, Skill details, work History etc.
- 9.4 Contractors shall share all such data with NMRC for Centralised management by nominated authority.

- 9.5 Contractor shall also issue a personnel pocket Safety & Health and Environment handbook in a language known to the workers, which provides information on safety and Environment measures to be adopted during work activities and emergency procedures that all personnel working on contract are required to know and the need to follow. Contractor shall ensure that this is distributed, and its content introduced to all personnel working at the site.
- 9.6 Use of Mobile Phone at NMRC Construction site is prohibited. Contractor to ensure the compliance through publicity by posters, training & Toolbox Talk and Monitoring by site supervisory personal

10.0 Safety & Health and Environment Training

10.1 Safety & Health Training

- 10.1.1 The behaviour of people at all levels of the contractor is critical for Safety performance. To achieve a more participative approach and sharing of Safety functions by site teams, the contractor shall ensure that all site staff engaged for project execution is Safety trained and holds a competency certificate from an organisation of repute or those appended in this document.
- 10.1.2 The contractor shall organise Safety & Health training to engage Managers, supervisors and other personnel in behavioural change and improve safety performance and effective compliances on Labour Welfare provisions. The attendance for the same shall be maintained and produced on demand by NMRC.
- 10.1.3 The Contractor shall analyse the training requirements for all the employees and initiate a training program to demonstrate that all persons employed, including subcontractors, are suitably qualified, competent and fit. This will include:
- i) Detailed Job descriptions for all personnel, to include their specific Safety & Health and Environment responsibilities
 - ii) Specification of qualifications, competency and training requirements for all personnel
 - iii) Assessment and recording of training needs for all personnel, including subcontractors' employees in the workforce, vendor representatives and site visitors
 - iv) A system for assessing new hirers e.g. previous training
 - v) A means of confirming that the system is effective
 - vi) A matrix and schedule of training requirements, covering general, task-specific and Safety & Health and Environment-related training, showing the training frequency and interval between refresher courses
 - vii) Timely, competent delivery of training courses
- 10.1.4 The contractor shall arrange behavioural-based training programmes for all the executives to identify, recognise and eliminate unsafe act and unsafe conditions as well as to adopt best HR practices for the welfare or workmen.

- 10.1.5 The minimum Employer's requirement of training needs for various categories of employees are given in **Appendix No. 9**.
- 10.1.6 The contents of Safety & Health training to Managers/Supervisors as given in **Appendix No. 10** shall be conducted
- 10.1.7 The refresher-training programme to all employees shall be conducted once in six months and the workers/employees shall be made aware about their Provident Fund number, UAN ID, IP number etc.
- 10.1.8 Toolbox talk which shall also include information about minimum wage, PF and ESI benefits shall be conducted by site Engineer along with assistance of Safety & Health and Environment personnel to all workmen every day.
- 10.1.9 On-the spot practical skill development training on height safety including scaffold safety, crane safety, welding safety, electrical safety, traffic safety for marshals shall also be conducted to all foremen/ workmen who were associated to the concerned jobs.
- 10.1.10 Daily Safety Oath shall be taken by every employee including workman without fail.
- 10.1.11 All vehicle drivers including Hydra operators shall be trained on defensive driving at any reputed institute with prior approval of employer. All vehicle drivers shall also undergo refresher training on defensive driving provided by the same institute once in 6 months. Every contractor shall train their operators/drivers of Construction Plant, Machinery & other Vehicle like crane /rig machine /Mobile Elevated Working Platform (MEWP) etc. for safe lifting operation/safe equipment operation through Original Equipment Manufacturer (OEM) before deployment at site.
- 10.1.12 All the above listed training programmes except at clause 10.10 shall be organised by the contractor only after taking approval from the Employer for the training faculty / organisation, content and durations.
- 10.1.13 In case of failure on the part of the contractor to provide all the above-mentioned training programs to all employees in time, the same shall be provided by the Employer through accredited agencies if required by formulating a common scheme to all contractors. Any administrative expenses and training fee towards the same shall be at the cost of the contractor.
- 10.1.14 Competency Building Training including Safety & Health Training**
- (i) Contractor shall provide training on Safety & Health (to all its workers / staff / employees / sub-contractors of at least 84 hrs. at the time of induction. Before postings of any his workers / staff / employees / sub-contractors. Contractor shall give a certificate that said person had undergone the requisite Safety & Health training.
 - (ii) Safety Trainer shall be qualified and competent (having Degree/Diploma in Engineering and having recognised diploma in industrial safety) with minimum 5

years of experience in training field for Management as well as supervisory level and shall have minimum 2 years of experience in training field for worker level.

- (iii) Minimum 20% Competent and certified staff for skilled and semi-skilled trades (Electrician, Welders, Mason, Carpenters, Steel Handlers, Scaffolders, Crane Operators, Construction Vehicle and Plant Operators, Tunnelling workers etc) shall be mobilised by the contractor at all times during the currency of contract.
 - (iv) System contracts & Track Contracts (Track, E&M, S&T, Traction (OHE, ROCS), ECS, Lifts & Escalators, RSS etc), Rolling stock contracts, PEB contracts, Pipe line contracts shall also ensure 96 hrs Safety & Health and Environment training to their staff & workers.
 - (v) No staff of Safety & Health department shall be engaged in providing training to their site staff/workmen unless additional manpower is deployed to conduct the training programme and he/she shall not have any other role at site level except of providing training.
 - (vi) Every contractor shall maintain a detailed record of each personnel trained or undergoing training of 84 hrs which shall be updated on regular basis. The detailed record shall be submitted to the employer on monthly basis before 5th of every month in the format as suggested by the employer.
 - (vii) For 84 hrs training, methodology along with training matrix containing topics, duration etc along with CV of the trainers shall be got approved from the employer well in advance before start of the training.
- 10.1.15 Every contractor shall identify execution staff as Lifting Engineer to supervise the lifting operation and get them trained to affectively discharge there responsibility. The training module, agency and scheme of training shall be got approved from NMRC.
- 10.1.16 Every contractor shall identify execution staff as Certified Scaffolder to supervise the safe erection, use & dismantling of the scaffold/trestle. The training module, agency and scheme of training shall be got approved from NMRC.

10.2 Environmental Training

- 10.2.1 The behaviour of people at all levels of the contractor is critical for Environment performance. To achieve a more participative approach and sharing of Environment functions by site teams, the contractor shall ensure that all site staff engaged for project execution is trained on Environment issues for Category A contracts, Staff Quarter and Depot works of Category B contracts, Category D contracts and Design, Detailed Engineering, Supply, Installation, Testing, Commissioning of Auxiliary Sub Station cum Traction Sub Station & HT cabling work of Receiving Sub Station work of Category E contracts from those organizations appended in this document. For Category C and remaining contracts of Category B and E training is not mandatory. However, it is advised that the contractor organize environmental awareness training to all site staff.

- 10.2.2 The contractor shall organize environmental trainings to the engaged Managers, supervisors, workmen/labourers and other personnel in behavioural change and improve environment performance. The total training hours shall be 12 hours. The contractor/ agency shall issue certification to all participants upon successful completion of training.
- 10.2.3 The refresher-training programme to all employees shall be conducted once in six months.
- 10.2.4 All the above listed training programmes shall be organised by the contractor only after taking approval from the Employer for the training faculty / organisation, content and durations. The contents of Environment training is given in **Appendix No. 10A** of this document. A list of empanelled agencies is appended with this document for the ready reference of the contractor (**Appendix-11**). Contractor shall deploy agency only after getting prior approval from NMRC Environment Department. The agency deployed for training should meet the following criteria:
- (i) The agency shall have at least One Master Trainer having relevant consultancy/training experience of minimum 10 years and shall be holding following qualification
 - a) B.E./B.Tech in Engineering with Post Graduation/ Diploma in Environment from a recognized institution/body or
 - b) B.Sc with M.Sc in Environment Science from a recognized institution/body
 - (ii) He shall be supported by a minimum of one (01) qualified and competent trainer having B.E./B.Tech in Engineering with Post Graduation/ Diploma in Environment from a recognized institution/body or B.Sc with M.Sc in Environment Science from a recognized institution/body with minimum 3 years of experience in training field for Management as well as supervisory level and minimum 1 years for worker level.
- 10.2.5 In case of failure on the part of the contractor to provide all the above-mentioned training programs to all employees in time, the same shall be provided by the Employer through accredited agencies if required by formulating a common scheme to all contractors. Any administrative expenses and training fee towards the same shall be at the cost of the contractor.

11.0 Site Inspection

11.1 Safety & Health Inspection

- 11.1.1.1 The contractor shall evolve and administer a system of conducting Safety & Health inspections and other risk management analysis on a periodical basis.
- 11.1.1.2 The purpose of Safety & Health inspection is to identify any variation in construction activities and operations, machineries, plant and equipment and processes and compliances of labour welfare provisions against the Safety & Health Plan and its supplementary procedures and programs.
- 11.1.1.3 Following Safety & Health inspections program shall be adopted.

- i) Planned General Inspection
- ii) Routine Inspection
- iii) Specific Inspection
- iv) Other Inspection

11.1.2 Planned General Inspection

11.1.2.1 Planned general inspections are performed at predetermined intervals and it usually involves the representation from both Contractor and the Employer.

11.1.2.2 Inspections that will be classified under this inspection program are:

- i) Monthly contractor and sub-contractors site SHE committee Inspection.
- ii) Weekly Safety & Health and Environment inspection by contractor Project Manager along with heads of different departments, Station Manager/In-charge/Tunnel/Viaduct/LG In-charge shall participate in the inspection.
- iii) Daily Safety & Health and Environment inspection by contractor site Safety & Health team.

11.1.3 Routine Inspection

11.1.3.1 Routine inspections are often referring to the inspection of work site, equipment and temporary structures performed by site and equipment operators and temporary structure erectors. Inspections that will be classified under this inspection program are:

- i) Daily Inspection of plant and equipment by operator
- ii) Weekly Inspection of temporary structures including scaffold/trestle by competent scaffolder
- iii) Monthly Inspection of electrical equipments, power and portable/handheld tools by competent electrical supervisor
- iv) Monthly inspection of lifting gears, tools tackles and appliances.
- v) Quarterly Inspection of temporary electrical systems by competent electrical in-charge and of Plant & machines by P&M In-charge.
- vi) Wages, PF and ESI related records
- vii) Half-yearly inspection of lifting machinery, lifting appliances, equipment and gears by Govt. approved competent person empanelled by NMRC.
- viii) Quarterly colour coding of lifting gears, tools & tackles. The recommended colour coding for the 4 quarters of the years shall be as under:
 - a. January – March: GREEN**
 - b. April – June: YELLOW**
 - c. July – September: BLUE**
 - d. October – December: WHITE**

11.1.3.2 The list mentioned above is not exhaustive. Contractor may add additional categories. Contractors' Site Safety Manager will ensure that a system of routine inspections are carried out periodically to all plants, equipment, powered tools and any other temporary structures that will pose a hazard to operators and workmen.

11.1.4 Specific Inspection

11.1.4.1 Specific inspections are performed on activities without a predetermined date. Competent supervisors usually perform inspections for ensuring an activity whether it is executed in accordance to a general set of rules; method statement submitted or developed procedures. The following are examples that will be commonly performed as required on the construction site:

- i) Inspection performed before a heavy lifting operation.
- ii) Inspection performed before and after the entry of person into a confined space.
- iii) Inspection performed before and after a welding and gas cutting operation.
- iv) Inspection of formwork before concreting by formwork erector.

The list mentioned above is not exhaustive. The contractor shall ensure that a competent supervisor inspects all high-risk processes and activities.

11.1.4.2 Other Inspection which includes the following:

- i) Inspections by Labour Welfare Department of Employer, Government Labour Department and other statutory agencies
- ii) NMRC management, Safety and Execution team

11.1.5 The contractor shall prepare all required safety inspection checklist for all activity operations and equipment. Checklists will be prepared based on the Indian standards, rules and regulations and Employer's requirements.

11.1.6 All inspection records and reports will be properly kept and filed for audit purpose. Inspection reports of Planned General Inspection and Routine Inspection will be used for discussion during Safety Committee Meetings. The reports of the weekly safety inspection shall be prepared by the contractor Chief Safety & Health Manager and be submitted within 2 days along with follow up compliance report of the same within 6 days in **Sample Form (SF – 06)**.

11.1.7 The participation of system contractor in weekly safety inspection of main (civil) contractor shall be mandatory. Their Project Manager & Chief Safety Manager shall be participating in the Safety Inspection.

11.2 Environmental Inspection

11.2.1 The contractor shall evolve and administer a system of conducting Environment inspections on a periodic basis. The purpose of Environment inspection is to identify any variation in construction activities and operations, machineries, plant and equipment and processes against the Site Environment Plan and its supplementary procedures and programs. Following Environment inspections program shall be adopted

- i. Planned General Inspection
- ii. Other Inspection

11.2.2 Planned General Inspection

Planned general inspections are performed at predetermined intervals and it usually involves the representatives from both Contractor and the Employer. Inspections that will be classified under this inspection program are:

- i. Monthly contractor and sub-contractors site SHE committee inspection
- ii. Weekly/ daily site inspection by Contractor's Environment team

11.2.3 Other Inspections

11.2.3.1 Other inspections include the following:

- i. NMRC Environment Management team
- ii. Inspections by Central Pollution Control Board, Uttar Pradesh Pollution Control Board/State Pollution Control Board, Environmental Pollution (Prevention & Control) authority (EPCA), Ministry of Environment and Forest and Climate Change, National Green Tribunal etc.

11.2.4 The contractor shall prepare all required Environmental inspection checklists for all activities, operations and equipment. Checklists will be prepared based on the Indian standards, rules and regulations and Employer's requirements. The formats provided in the Appendix No-12 may be referred.

11.2.5 All inspection records and reports will be properly kept and filed for audit purpose.

11.2.6 Whenever employer's representative conducts an inspection, contractor shall depute its representative to accompany him/her.

11.2.7 Conformity report shall be submitted by the contractor within 1 week of submission of inspection report to the employer.

11.2.8 In case of non-conformity of items, the Employer shall take necessary steps including stoppage of work and or imposing penalty for getting the item implemented.

11.2.9 Whenever employers representative conduct an inspection, contractor shall depute its representative to accompany him/her.

12.0 Safety & Health and Environment Audit

12.1 Safety & Health Audit

12.1.1 General

12.1.1.1 The purpose and scope of Safety & Health audit is to assess potential risk, liabilities and the degree of compliance of construction, Safety & Health plan and its supplementary procedures and programs against applicable and current Safety & Health legislation regulations and requirements of the employer.

12.1.1.2 Project Manager holds the ultimate responsibility in ensuring implementation of Safety & Health audit program during the construction work

12.1.2 Monthly Audit Rating Score (M A R S)

12.1.2.1 Monthly Audit Rating Score (MARS) will be performed once in a month. A team consisting of Contractor's Project Manager, Chief Safety Manager and Employer execution representative will conduct it based on the pre-designed score rating format. The report shall be submitted in the format as prescribed by the employer, **Sample Form (SF – 07)**.

12.1.2.2 This Monthly Safety & Health Audit Rating Score (MARS) report will enable the Employer to evaluate the general compliance by the Contractor with the Conditions of Contract, and the Contractor's site specific Safety & health Plan. A minimum

compliance level to achieve 75% overall Audit rating is essentially required. Failing this, the Employer will take punitive action which includes non-processing of Running Account Bills.

12.1.2.3 Timing

12.1.2.3.1 The Monthly Audit Rating Score (MARS) should be conducted at least 7 days prior to the scheduled date of Monthly SHE Committee meeting.

12.1.2.4 Evaluation

12.1.2.4.1 The numerical scoring has been weighed on a 1-10 scale. The audit team will use their observations noted in evaluating the points to be awarded against each of the elements of the audited section. Wherever some topics and sub-topics are not applicable the score rating need not be given. The overall audit ratings shall be achieved by:

$$\text{Overall Auditing rating} = \frac{\text{Actual Score Achieved}}{\text{Maximum Possible Score}} \times 100$$

12.1.2.4.2 The criticality of the required actions for the respective sections of the Audit will be classified as

Table 12.1: Audit Action

Sl. No.	Score	Description	Action
1	< 60%	Immediate	Require Contractor to rectify within 24 hours
2	< 75%	Improvement Necessary	Contractor rectification within 7 days and confirmed in writing to Employer
3	< 90%	Improvement Desirable	Contractor rectification within one month and confirmed in writing to Employer

12.1.2.5 Report

A copy of each Audit Report will be sent to Employer and to all subcontractors, with whom it will then be discussed in detail at the Monthly SHE Committee Meeting in order to ensure that any corrective actions are agreed upon.

12.1.3 Monthly Electrical Safety and Labour Audit

12.1.3.1 A team comprising of contractor’s Chief Safety Manager and Senior Safety (Electrical) Engineer along with Employer’s representative shall conduct monthly electrical safety audit covering the following and submit the report to Employer. The report shall be submitted in the format as prescribed by the employer, Sample Form (SF – 08).

- i) Electrical accidents investigation findings and remedy
- ii) Adequacy of power generation and power requirements
- iii) Power distribution and transmission system in place
- iv) Updated electrical single line diagram showing the current condition of power source and distribution including the IP rated DBs arrangement.
- v) Electrical protection devices – selection, installation and maintenance.
- vi) Earth or ground connection and earth pit maintenance details
- vii) Education and training of electrical personnel undertaken
- viii) Routine electrical inspection details
- ix) Electrical maintenance system and register.
- x) Name plate details of major electrical equipment
- xi) Classified zones in the site, if any.

12.1.3.2 A team of all labour welfare officers and employers representatives shall conduct monthly Labour audit to verify all Statutory Reports and Registers.

12.1.4 External Safety & Health Audit

12.1.4.1 External Safety & Health audits are to be conducted by external agencies that have qualified, competent auditors with ISO, OHSMS and DGFASLI etc with the prior approval of the Employer.

12.1.4.2 Areas of competence of Audit team

12.1.4.2.1 Practical understanding of BOCW Act and Rules, National as well as International statutory requirements on Safety and Health like medical and welfare of workmen, construction hazards and its prevention and control, traffic management, electrical safety, rigging and safety of construction equipment

12.1.4.3 Audit shall be conducted as per the guidelines of Contract Conditions, OHSMS, ISO, ILO, and national standards. An elaborate Audit report comprising two categories i.e. Safety Management System and Construction site activities containing element/topic wise status of Safety & Health performance at Management as well as at site level shall be submitted to the employer.

12.1.4.4 External Safety & Health audit shall be conducted on a quarterly basis throughout the currency of the contract.

12.1.4.5 Targets of Safety & Health Audit

12.1.4.5.1 The contents and coverage of the external audit shall include the following but not limited to the following items:

12.1.4.5.1.1 Safety & Health Management:

- i) Safety & Health Organization
- ii) Safety & Health policy and plan

- iii) SHE Committee
- iv) Safety & Health orientation
- v) Safety & Health training
- vi) Safety & Health inspection
- vii) Safety & Health communication and motivation
- viii) Safety & Health submittals to the employer
- ix) Safety & Health promotional and awareness program
- x) Incident reporting and investigation
- xi) Onsite/Offsite Emergency preparedness plan
- xii) Hazard identification and Risk Assessment

12.1.4.5.1.2 Technical:

- i) Work Method Statements
- ii) Operational Control Procedures/Safe operating procedures
- iii) Working at Height
- iv) Hand tools and Power tools
- v) Electrical Safety
- vi) Fire prevention and control
- vii) Housekeeping
- viii) Overhead protection
- ix) Slipping, Tripping, Cutting, Drowning and Falling hazard
- x) Lifting appliances and Gear, Tools and Tackles
- xi) Lifting and Launching operation
- xii) Construction plant and machinery
- xiii) Machine and area guarding
- xiv) Material handling
- xv) Hot Work
- xvi) Demolition
- xvii) Excavation and Tunnelling
- xviii) Work Permit System
- xix) Traffic Management
- xx) Chemical Handling
- xxi) Dangerous and Harmful Environments
- xxii) Maintenance matrix of Mechanical and Electrical Machines/Equipments
- xxiii) Working on or under water
- xxiv) Working near or under High Tension line
- xxv) Personal Protective Equipments
- xxvi) Visitors at Site
- xxvii) Occupational Health and Welfare measures
- xxviii) All statutory Forms, returns under various statutes

12.1.4.6 Audit Documents:

12.1.4.6.1 Contractor shall make the below listed documents available for review by the Audit team. The list is not limited and additional records can also be added.

- i) Safety & Health policy
- ii) Safety Inspections
- iii) Safety & Health organization chart
- iv) Annual Safety & Health objectives / programs
- v) Accident / near miss statistics and analysis
- vi) Safety & Health Training program / records for all personnel
- vii) Operation and Maintenance manual of all equipments including Safe operating procedures for various activities, checklists etc.
- viii) Records of test and examination of all lifting appliances and gears, plant and machines
- ix) Medical records for all personnel
- x) Risk identification, assessment and control details
- xi) On-site emergency plans and records of Mock Drills
- xii) Records of work permits
- xiii) Record of monitoring of flammable and explosive substances at work place
- xiv) Maintenance and testing of fire fighting equipments
- xv) Records of industrial hygiene surveys (noise, ventilation and levels, illumination levels, airborne and toxic substances, explosive gases)
- xvi) All statutory Registers, Forms, Returns under various statutes
- xvii) First Aid, Medical facilities and other welfare measures
- xviii) Material Safety Data Sheets
- xix) Housekeeping inspection records
- xx) Minutes of SHE committee meetings
- xxi) Maintenance procedure of Plant & machines
- xxii) Calibration & Testing records
- xxiii) Safety budget
- xxiv) Records of previous Audits
- xxv) Safety inspection records

12.1.4.7 Audit Preparation:

- i) Audit team members are required to gather information by observations through interviews and by checks of hardware and documentation.
- ii) Audit team shall prepare checklist to cover all parts based on Safety & Health legislations rules and regulations and NMRC requirements.
- iii) Audit team members shall verify the facts and findings leading to the identified gaps and weakness.
- iv) Audit leader has overall responsibility for reaching a conclusion.

12.1.4.8 Reporting:

12.1.4.8.1 Audit report shall be prepared and directly sent to the Employer within 7 days of conducting the audit with a copy to the contractor.

12.1.4.9 Report contents:

- i) Executing summary - the audit leader will compile a concise and accurate summary of observations and findings.

- ii) Introduction - this will contain basic information regarding the facilities or organization audited, the specific audit dates (inclusion of those for preparation and post-audit activities).
- iii) Principal positive findings - This will contain the summary of positive aspects as observed by the auditors. It will also contain highlights of those issue, which may warrant dissemination as best practice regarding methodology used or achievement.
- iv) Audit Findings - All audit findings as detailed in the audit checklists shall be grouped together as priority 1 and 2 as detailed below in a separate listing.
 - a) Priority 1: Actions to rectify gaps or weakness should generally be implemented within two weeks time, if risk potential is high or unacceptable.
 - b) Priority 2: Actions should be generally implemented or rectified with a maximum of 3 – 4 weeks, if not rectified would create a likelihood of minor injury or business loss.

12.1.4.1 Conformity Report & Action by Employer

12.1.4.10.1 The auditor shall inspect the site after 14 days of conducting initial audit for checking the adequacy of implementation of items maintained under priority 1 by the contractor and shall submit a conformity / non-conformity report to the Employer with a copy to the contractor.

12.1.4.10.2 The auditor shall again inspect after 28 days of conducting initial audit for checking the adequacy of implementation of items mentioned under priority 2 by the contractor and shall submit a conformity / non-conformity report to the Employer with a copy to the contractor.

12.1.4.10.3 In case of non-conformity of items mentioned by auditor, the Employer shall take necessary steps including stoppage of work and or imposing any penalty for getting the item implemented.

12.1.4.11 Failure of contractor to conduct External Safety & Health Audit

12.1.4.11.1 If the contractor fails to conduct the external Safety & Health audit in time, the Employer at the cost of contractor shall get it done.

12.2 Environmental Audit

12.2.1 Contractor's Environmental Audit

12.2.1.1 The purpose and scope of environmental audit is to assess the degree of compliance of environmental plan and its supplementary procedures and programs against applicable and current environment legislations and requirements of the employer.

12.2.1.2 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.

12.2.1.3 Quarterly audits will be conducted in accordance with NMRC guidelines. The contractor's Project Manager, Chief Environmental Officer/Senior Environment Officer accompanied by NMRC's Corporate Environment Head's representative shall carry out the audit.

12.2.1.4A checklist of environmental requirements will be prepared 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.

12.2.1.5 The criteria against which the review will be undertaken will be derived from (but not limited to):

- (a) The appropriate 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 requirement and the effective lines of communication with regard to environmental issues;
- (d) Compliance with procedure 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.

12.2.1.6 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.

11.2.1.7 A copy of each Audit Report will be sent to NMRC Environment Department and to all subcontractors, with whom it will then be discussed in detail at the Monthly SHE Committee Meeting in order to ensure that any corrective actions are agreed upon.

12.2.2 External Environmental Audit

12.2.2.1 Category A, Category B, Category D and Design, Detailed Engineering, Supply, Installation, Testing, Commissioning of Auxiliary Sub Station cum Traction Sub Station & HT cabling work of Receiving Sub Station work of Category E contracts are required to carry out External Environment Audit on quarterly basis. External Environment Audit is not mandatory for other category contracts.

12.2.2.2 External Environmental audits are to be conducted by external agencies that are competent with ISO qualified auditors with the prior approval of the Employer. List of empanelled agencies for providing external Environmental audit is given as **Appendix No. 11**. Agency deployed for External Environment audits should meet the following criteria.

1. The agency shall have at least One Master Lead Auditor having relevant industry experience of minimum 10 years in auditing and shall be holding B.E./B.Tech in Engineering with Post Graduation/ Diploma in Environment or B.Sc with M.Sc in Environment Science qualification. He shall also be certified as Lead Auditor in ISO 14001 (EMS)
2. He shall be supported by a minimum of 1 (01) qualified and competent auditors having B.E./B.Tech in Engineering with Post Graduation/ Diploma in Environment or B.Sc with M.Sc in Environment Science qualification with minimum 3 years of experience in Auditing.

12.2.2.3 The audit team shall 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.

12.2.2.4 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.

12.2.2.5 Audit shall be conducted as per the requirements laid out in the conditions of contract on environment, as the case may be.

12.2.2.6 External Environmental audits shall be conducted on a quarterly basis throughout the currency of the contract.

12.2.2.7 Audit Documents

12.2.2.7.1 Contractor shall make the below listed documents available for the review by the Audit team.

- i) Environmental policy
- ii) Site Environment Plan
- iii) Environmental Rules and Regulation
- iv) Environmental organization chart (Model Organization Chart is given in Sample Form SF – 03)
- v) Annual Environmental objectives / programs
- vi) Environment Training program / records for all personnel
- vii) Environmental hazard identification, assessment and control details,
- viii) Environment monitoring and management reports

- ix) Environmental submittals to the employer
- x) Environmental monitoring reports
- xi) Environmental sanitation records
- xii) Minutes of SHE committee meetings
- xiii) Environment budget

12.2.2.9 Reporting:

12.2.2.9.1 Audit report shall be prepared and directly sent to the Employer within 7 days of conducting the audit with a copy to the contractor.

12.2.2.10 Report contents:

- i) Executing summary - the audit leader will compile a concise and accurate summary of observations and findings.
- ii) Introduction - this will contain basic information regarding the facilities or organization audited, the specific audit dates (inclusion of those for preparation and post-audit activities).
- iii) Principal positive findings - This will contain the summary of positive aspects as observed by the auditors. It will also contain highlights of those issue, which may warrant dissemination as best practice regarding methodology used or Achievement.
- iv) Audit Findings - All audit findings as detailed in the audit checklists shall be grouped together as priority 1 and 2 as detailed below in a separate listing.
 - a) Priority 1: Actions to rectify gaps or weakness should generally be implemented within two-weeks time, if risk potential is high or unacceptable.
 - b) Priority 2: Actions should be generally implemented or rectified with a maximum of 3 – 4 weeks, if not rectified would create a likelihood of minor injury or business loss.

12.2.2.11 Conformity Report & Action by Employer\

12.2.2.11.1 The auditor shall inspect the site after 14 days of conducting initial audit for checking the adequacy of implementation of items maintained under priority 1 by the contractor and shall submit a conformity / non-conformity report to the Employer with a copy to the contractor.

12.2.2.11.2 The auditor shall again inspect after 28 days of conducting initial audit for checking the adequacy of implementation of items mentioned under priority 2 by the contractor and shall submit a conformity / non-conformity report to the Employer with a copy to the contractor.

12.2.2.11.3 In case of non-conformity of items mentioned by auditor, the Employer shall take necessary steps including stoppage of work and or imposing any penalty for getting the item implemented.

12.2.2.12 Failure of contractor to conduct External Environmental Audit

12.2.2.12.1 If the contractor fails to conduct the external Environment audit in time, the Employer at the cost of contractor shall get it done.

13.0 Safety & Health and Environment Communication

13.1 The contractor shall take every effort to communicate the Safety, Occupational health, Statutory notice under labour laws, Govt. Schemes on welfare facilities, NMRC LWF benefits and facilities under registration with BOCW Board and Environment management measures through posters campaigns / billboards / banners / glow signs being displayed around the work site as part of the effort to raise safety awareness amongst to the work force. Posters should be in Hindi, English and other suitable language deemed appropriate. Posters / billboards / banners/ glow signs should be changed at least once in a month to maintain the impact.

13.2 The contractor shall also observe important days as listed in **Appendix No.13** and printing and displaying safety and Health signage and posters as listed in **Appendix No. 14**.

13.3 The list indicated are the minimum requirements of the Employer and the contractor is encouraged to further the Safety & Health and Environment communication activities by formulating suitable reward schemes for safety performers and any other activities, which deem fit for the purpose.

13.4 The contract shall also be rewarded for effective compliances of labour laws and providing best welfare facilities to workers at site.

14.0 Safety & Health and Environment Submittals to the Employer

14.1 Safety & Health Submittals

14.1.1 The contractor's Safety & Health management should send the following reports to the Employer periodically:

- i) Daily Reporting of total no of workmen
- ii) Monthly Safety & Health Report
- iii) SHE Committee Meeting Minutes
- iv) Safety & Health Inspection & compliance reports
- v) Safety & Health Audit Reports
 - a) Monthly Audit Rating Score (MARS) report
 - b) External Safety & Health Audit
 - c) Electrical Safety Audit
- vi) Safety & Health compliance details required for monthly CPM Safety review meetings like mandatory 96 hrs training, other competency based training, OEM

training, Tunnelling Safety & Health details, Electrical compliances, Updated Org. Chart etc.

- 14.1.1.1 Contractor shall have its documentation through a SAP system for centralised recording, analysis and reporting. This shall reduce huge volume of paper work and enable quick retrieval of information/records. The same shall be shared with NMRC, on demand.

14.1.2 Daily Reporting of total no of workmen

- 14.1.2.1 The contractor shall report to the Employer the total no of workmen engaged by all including any subcontractor within 2 hours of starting of any shift in any day. This reporting shall be the primary duty of the Chief Safety Manager of the contractor and reporting shall be through email. The onus of checking the receipt of the same by the Employer lies with the contractor. If the information is not received or received more than 2 hrs after starting of the shift, penalty shall be levied as per relevant clause.

14.1.3 Monthly Safety & Health Report

- 14.1.3.1 The contractor shall prepare a monthly Safety & Health report as per **Sample Form (SF-09)** consisting of the following and submit within 7th of every month to the Employer. The minimum contents to be covered as:

- i) Monthly Accident Statistics as specified in **Sample Form (SF-10)**
- ii) Monthly accident / incident details category wise.
- iii) SHE committee details
- iv) Details of Safety & Health training conducted in the month
- v) Safety & Health Inspection and Compliance status
- vi) Brief details of Safety & Health internal audit like Electrical audit, MARS etc.
- vii) Safety & Health Communication activities undertaken in the month including the number of posters displayed and balance availability in stock.
- viii) Toolbox talks details
- ix) PPE details: Quantity purchased, issued to the workmen and stock available.
- x) Details on IP rated panel boards, lighting poles, welding and cutting equipments and inspection of Ladders, Hoists, Lifting appliances, tools & tackles etc.
- xi) Monthly site illumination monitoring results including emergency power back up
- xii) Housekeeping
- xiii) Barricade lighting and maintenance details
- xiv) No of critical excavations
- xv) Health & Welfare activities, Statutory Registers and returns
- xvi) Safety walk conducted by Contractors' Project Manager in the month
- xvii) Safety & Health Activities Planned for next month
- xviii) Maintenance schedule of plant and machines

14.2 Environmental Submittals to the Employer

- 14.2.1 The Contractor's Environment Management shall send the following reports to the Employer periodically:

1. Site Environment Plan (for Category A, B Contracts)
2. Waste Management Plan (for Category A, B, C, D & E contracts)
3. Environmental Environment Report (for Category A, B & D contracts)
4. Quarterly Environment Report (for Category C & E contracts)
5. External Environment Audit report (Category A, B, D & E contracts)
6. Minutes of SHE Committee meeting (for Category A, B, C, D & E contracts)
7. Inspection reports (for Category A, B, C, D & E contracts)

14.2.2 Monthly Environmental Reports: Monthly Environmental Report of the previous month shall be submitted within 7th of next month. The monthly Environment Report (MER) shall include (but not limited to) the following:

- I. Executive summary (Maximum 1 Pages)
- II. Brief mention of construction activities (Maximum 1 Page)
- III. Monitoring report of Air, noise and water quality (**Sample Form - SF-11**)
- IV. Waste Management Record i.e. quantity generated and disposed of all types of wastes for the month and cumulative quantities (**Sample Form - SF-12**)
- V. Details of C&D waste produce procured and consumed
- VI. Details of Water Consumption for the month and cumulative consumption (**Sample Form - SF - 13**)
- VII. Details of fly ash consumption for the month and cumulative consumption (**Sample Form - SF - 14**)
- VIII. Raw materials consumption for the month and cumulative consumption (**Sample Form - SF - 15**)
- IX. Energy Consumption details
- X. Environment Initiatives implemented at site
- XI. Environment Incident (Minor/Major)
- XII. Environment Mock drill conducted
- XIII. Weekly Environment Inspection checklist (**Sample Form - SF - 16**)
- XIV. Details of environmental training imparted
- XV. Point wise compliance of NMRC's comments made on previous Monthly Environmental Report

15.0 Accident reporting

15.1 Reporting to Employer

- 15.1.1 All accidents and dangerous occurrences shall immediately be informed verbally to the Employer (NMRC Safety as well as Execution). This will enable the Employer to reach to the scene of accident/dangerous occurrences to monitor/assist any rescue work and/or start conducting the investigation process so that the evidences are not lost.

15.1.2 Preliminary Reports of all accidents (fatal / injury) and dangerous occurrences shall also be sent within 24 hours followed by detailed investigation report as per format **Sample Form (SF – 17)**

15.1.3 No accident/dangerous occurrence is exempted from reporting to the Employer. In case of injury/fatality, the labour welfare organisation of NMRC shall also be informed directly so that medical treatment and further necessary action may be started at the earliest. A copy of all the documents of claim settlement must be submitted to NMRC Labour Welfare Organisation within Seven days.

15.1.4 Any wilful delay in verbal and written reporting to the Employer shall be penalised as per relevant clause.

15.2 Reporting to Govt. organisations

15.2.1 In addition to the above verbal and written reporting to the Employer as per Rule 11 of Employee Compensation and Rule 210 of BOCWR, notice shall be sent of any accident to a worker at the building or construction site that:

- a) causes loss of life; or
- b) disables a worker from working for a period of 48 hours or more immediately following the accident;
- c) shall forthwith be sent by telephone or similar other means including special messenger within four hours in case of fatal accidents and 72 hours in case of other accidents, to:
 - i) the Regional Labour Commissioner (central), wherein the contractor has registered the firm/work
 - ii) the board with which the worker involved was registered as a beneficiary;
 - iii) Director General and
 - iv) the next of kin or other relative of the worker involved in the accident;

15.2.2 Further, notice of accident shall be sent in respect of an accident which

- (a) causes loss of life; or
- (b) disables the injured worker from work for more than 10 days to
 - i) the officer-in-charge of the nearest police station;
 - ii) the District Magistrate or, if the District Magistrate by order so desires, to
 - iii) the Sub-Divisional Magistrate
- (c) Form EE shall be sent within 7 days and Form XIV within 24 hours of the accident

15.2.3 In case of an accident causing injury, first-aid shall be administered and the injured worker shall be immediately transferred to a super/multi-speciality tie-up hospital for medical treatment.

15.2.4 Where any accident causing disablement that subsequently results in death, notice in writing of such death, shall be sent to the authorities mentioned in clause 16.2.1 and 16.2.2 above within 72 hours of such death.

15.2.5 Reporting of dangerous occurrences:

15.2.5.1 The following classes of dangerous occurrences shall be reported to the Inspector having jurisdiction, whether or not any disablement or death caused to the worker, namely:

- (a) collapse or failure of lifting appliances, or hoist, or conveyors, or similar equipment for handling of building or construction material or breakage or failure of rope, chain or loose gears; or overturning of cranes used in construction work;
- (b) falling of objects from height;
- (c) collapse or subsidence of soil, tunnel, pipe lines, any wall, floor, gallery, roof or any other part of any structure, launching girder, platform, staging, scaffolding or means of access including formwork;
- (d) explosion of receiver or vessel used for storage of pressure greater than atmospheric pressure, of any gas or gases or any liquid or solid used as building material;
- (e) fire and explosion causing damage to any place on construction site where building workers are employed;
- (f) spillage or leakage of any hazardous substance and damage to their container;
- (g) collapse, capsizing, toppling or collision of transport equipment;
- (h) leakage or release of harmful toxic gases at the construction site;

15.2.6 In case of failure of launching girder, lifting appliance, loose gear, hoist or building and other construction work, machinery and transport equipment at a construction site, such appliances, gear, hoist, machinery or equipment and the site of such occurrence shall, as far as practicable, be kept undisturbed until inspected by the Authorities;

15.2.7 Every notice given for fatal accidents or dangerous occurrences shall be followed by a written report to the concerned Authorities under Section 39 of BOCWA and the Director General in the specified Form XIV of BOCWR.

15.2.8 Actions to be taken post incident/accident:

- i. In case any incident/accident happens at site leading to injury to the worker, the worker/s is/are required to be taken to the nearest Super-speciality hospital immediately.
- ii. Labour Welfare Officer of Contractor and responsible official from NMRC needs to report the incident to the labour welfare team of NMRC immediately without fail for all the death cases including natural deaths.
- iii. In case of fatal accident, doctor from the nominated hospital is only authorised to declare the death of the worker and not to be decided suo-moto by any other person.
- iv. FIR to be registered for all the fatal cases which happens at the site/Labour camp.
- v. Post Mortem of the dead body is mandatory in all the death cases i.e. whether it is natural or due to any incident / accident.

- vi. Family members of the injured / deceased worker are to be informed immediately.
- vii. In case of fatal accident, the dead body is to be handed over to the family members. Arrangement of sending the dead body to native place has to be done and cash payment for meeting out last rites expenses has to be made to the family members of the deceased by the contractor as per rule.
- viii. Fatal accident report is to be sent to State Labour Authority in Form EE within seven days and to the Licensing Authority in Form XIV within 24 hours of the incident/accident.
- ix. Workmen's Compensation dues are to be deposited with the Employee's Compensation Commissioner within 30 days of the death or the period of notice served by the Employee's Compensation Commissioner.
- x. Copy of all the documents (deposited with any labour authority, FIR, Post Mortem, Medical Reports etc.) and duly approved LWF form are to be submitted with the labour welfare team of the NMRC.
- xi. Contractor shall be liable to get disbursement on Provident Fund benefits, compensation under Employee compensation Act, benefits of ESI Act to the workman/ dependents of the deceased workman. The contractor shall also provide accommodation and transportation to dependents of the deceased workman or to the disabled workman who comes for settlement of terminal claims.

16.0 Accident investigation

16.1 General

- 16.1.1 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
- 16.1.2 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.
- 16.1.3 Near misses and minor accidents should also be investigated by the Contractor as soon as possible as they are signals that there are inadequacies in the safety management system.

16.2 Procedure of incident investigation

- 16.2.1 It is important after any accident or dangerous occurrence that information relating to the incident is gathered in an organised way. The following steps shall be followed;
 - a) take photographs and make sketches
 - b) examine involved equipment, workpiece 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.

- 16.2.2 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. The cause of an accident should never be classified as carelessness. The specific act or omission that caused the accident must be identified.

- 16.2.3 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) publicise the findings and the remedial actions taken

16.3 Employers' independent incident investigation

- 16.3.1 In case of fatal / dangerous occurrence the Employer shall also conduct independent investigation. Contractor and his staff shall extend necessary co-operation and testify about the accident.
- 16.3.2 The contractor shall take every effort to preserve the scene of accident till the Employer completes the investigation.
- 16.3.3 All persons summoned by the Employer in connection to witness recording shall obey the instructions without delay. Any wilful suppression of information by any person shall result into his removal from site immediately and / or punishable as per relevant penalty clause.

16.4 Accident Review & Preventive Measures

- 16.4.1 After each fatal accident and grievous injury, contractor's project manager/Leader shall give power point presentation to NMRC's Management within 72 hours highlighting their findings of root cause of accidents & proposed remedial measures. The presentation may be sought also after a serious near miss/dangerous occurrence as deemed fit by NMRC. The final accident report shall be submitted within 24hrs of the presentation.

17.0 Emergency preparedness plan

- 17.1 The Contractor shall prepare an Emergency Response Plan for all work sites as a part of the Contractor Safety & Health Plan and Environment Plan. The plan shall integrate the emergency response plans of the Contractor and all other subcontractors. The Emergency Response Plan shall detail the Contractor's procedures, including detailed communications arrangements, for dealing with all emergencies that could affect the Site. This include where applicable, injury, sickness, evacuation, fire, chemical spillage, severe weather and rescue.
- 17.2 The contractor shall ensure that an Emergency Response Plan is prepared to deal with emergencies arising out of:

- i) Fire and explosion
 - ii) Collapse of lifting appliances and transport equipment
 - iii) Collapse of building, sheds or structure etc.
 - iv) Gas leakage or spillage of dangerous goods or chemicals
 - v) Bomb threatening, Criminal or Terrorist attack
 - vi) Drowning of workers
 - vii) Landslides getting workers buried floods, Earthquake, storms and other natural calamities.
- 17.2.1 The above list is not exhaustive and other emergencies can also be included.
- 17.3 Arrangements shall be made for emergency medical treatment and evacuation of the victim in the event of an accident or dangerous incident occurring, the chain of command and the responsible persons of the contractor with their telephone numbers and addresses for quick communication shall be adequately publicized and conspicuously displayed in the workplace in **Sample Form (SF – 18)**
- 17.4 Contractors shall require to tie-up with the super-speciality or multi-speciality hospitals and fire stations located in the neighbourhood for attending to the casualties promptly and emergency vehicle kept on standby duty during the working hours for the purpose.
- 17.5 Contractor shall conduct an onsite emergency mock drill once in every month for all his workers and his subcontractor's workers.
- 17.6 It shall be the responsibility of the contractor to keep the Local Law & Order Authorities informed and seek urgent help, as the case may be, so as to mitigate the consequences of an emergency. Prompt communication to NMRC, telephonically initially and followed by a written report, shall be made by the contractor.
- 18.0 Experts / Agencies for Safety & Health and Environment services**
- 18.1 Contractors may utilise the services of experts/agencies empanelled for the purpose of training, audit, ISO certification and any other SHE services with prior approval of the Employer. This approval can be withdrawn at any time if the quality of output of the agency is found not satisfactory by NMRC.
- 18.2 As an aid to contractors, a list of experts/agencies and the offered service are given in **Appendix No.: 11** for ready reference. In addition to it if the contractor would like to use any expert/agencies' services for any Safety & Health and Environment activities the same can also be allowed provided that they are competent and meet to the general requirements of Employer. In every case prior approval of the Employer is mandatory.
- 18.3 The Contractor shall release the payment due to the Safety & Health and Environment experts/ agencies within 2 months of the submission of bills failing which the employer may directly make the payment to such agencies/experts and adjust this amount from the payment which is due to the contractor.
- 19.0 Role of Main/Civil Contractor**
- 19.1 The Civil contractor must be identified as the MAIN Contractor. He is the lead contractor whose Safety and Environment system is applied to all contractors and he will be responsible for monitoring and bringing to NMRC attention any departures from the

system. All system contractors shall abide by the lawful instructions of representative of civil contractor.

- 19.2 Although the responsibility of general lighting, area security, drinking water, toilets/urinals and access etc. lies with the main (civil) contractor, the system contractor shall also be required to:
- i. Provide adequate task lighting
 - ii. Guard their assets
 - iii. Provide adequate amenities like drinking water, rest area, toilet/urinal on viaduct/inside the tunnels etc.
 - iv. Maintain fire points for protecting their own assets Keep Environment sanitation of acceptable level

The responsibility matrix of various contractors for above provisions is detailed in **Appendix-11A**. In case of any clarification on the same, Chief Project Manager/Civil/NMRC shall be the nodal officer.

- 19.3 Stagnant Water: The civil contractor is responsible for removal of water from all the areas of the station except the ECS Plant Rooms which will be the responsibility of ECS contractor. For tunnel works, the civil contractor will hand over this responsibility to the track contractor and subsequently fire fighting/ system contractor.
- 19.4 Main civil contractor shall be required to provide Fire extinguishing system and walkway in tunnel and these facilities shall remain till the complete handover.
- 19.5 A notice boards to be maintained by civil contractor wherein all system/track contractors mobilised at station and the level at which they are working can be displayed.
- 19.6 Identification of men and resources of different contractors shall be clearly visible by providing appropriate labelling.

20.0 Installation of CCTV Cameras

- 20.1 The purpose of installing CCTV cameras is to monitor the site activities around the clock. The contractors shall install CCTV cameras at construction sites in such a way that the cameras will provide a view of entire construction site. For this purpose the contractor may have to install cameras at multiple locations in one site.
- 20.1.2 The contractor shall install CCTV cameras at the following locations:
- a. Minimum one camera at all exit gates of construction site, batching plant and casting yard.
 - b. Minimum 3 cameras within construction sites.
 - c. Minimum 1 cameras within the batching plant area.
 - d. Minimum 2 cameras within the casting yard area.

e. The above requirement of cameras is bare minimum and the contractor is obliged to install more cameras if necessary and as recommended by the Employer's representative.

20.2 The camera shall be connected to **NMRC's** centralized server and the system shall be equipped for real time monitoring. The contractor shall maintain the camera network throughout the currency of the contract.

20.3 The contractor shall make all necessary arrangements required to be done for installation and maintenance of camera systems and the same shall be done by the contractor at its own cost.

20.4 The contractor shall not share visuals/ images from these cameras to any person/ agency/organization (both Public and Private) without the prior written consent of the Employer.

20.5 The cameras shall have the following specifications:

- Minimum 2MP PTZ Camera with 25X zoom
- Minimum 1920×1080@30fps resolution
- Cameras shall have night vision facility
- Color:0.005 Lux@@(F1.6, AGC ON) BW: 0.001 Lux @(F1.6, AGC ON) 0 Lux with IR
- 25× optical zoom and 16× digital zoom
- WDR, HLC, BLC, 3D DNR, Defog, EIS, Regional Exposure, Regional Focus
- Up to 150 m IR distance
- 24 VAC & Hi-PoE
- Support H.265+/H.265 video compression

20.6 Storage back-up of minimum 15 days to be ensured at all times, failing which penalty shall be imposed.

PART – II: SAFETY

21.0 Housekeeping

21.1 Housekeeping is the act of keeping the working environment cleared of all unnecessary waste, thereby providing a first-line of defence against accidents and injuries. Further details regarding Housekeeping can be found in Section 52.9 of this document.

22.0 Working at Height

22.1 Organisation and planning

The contractor shall ensure that work at height is

- i) properly planned for any emergencies and rescue
- ii) appropriately supervised; and
- iii) carried out in a manner, which is reasonably practicable safe.

22.2 The contractor shall ensure that work at height is carried out only when the weather conditions do not jeopardise the health or safety of persons involved in the work.

22.3 Competence:

The contractor shall ensure that no person engages in any activity, including organization, planning and supervision, in relation to work at height or work equipment for use in such work unless he is competent to do so or, if being trained, is being supervised by a competent person. Issuance of Height pass in addition to normal ID card for worker deployed at height is mandatory. They shall be issued with a different colour high visibility jacket for ease of identification.

22.4 Avoidance of risks from work at height

The contractor shall ensure that work is not carried out at height where it is reasonably practicable to carry out the work safely otherwise than at height

22.5 Where work is carried out at height, the contractor shall take suitable and sufficient measures as given below to prevent, so far as is reasonably practicable, any person falling a distance liable to cause personal injury.

- (a) his ensuring that the work is carried out
 - (i) from an existing place of work; or
 - (ii) (in the case of obtaining access or egress) using an existing means, complying to the requirements as given in 22.14 where it is reasonably practicable to carry it out safely and under appropriate ergonomic conditions; and

- (b) where it is not reasonably practicable for the work to be carried out in accordance with sub-paragraph (a), his providing sufficient work equipment for preventing, so far as is reasonably practicable, a fall occurring.

22.6 Where the measures taken under clause 22.5 do not eliminate the risk of a fall occurring, every contractor shall

- (a) so far as is reasonably practicable, provide sufficient work equipment to minimise -
 - (i) the distance and consequences; or
 - (ii) where it is not reasonably practicable to minimise the distance, the consequences, of a fall; and
- (b) Without prejudice to the generality of clause 22.3, provide such additional training and instruction or take other additional suitable and sufficient measures to prevent, so far as is reasonably practicable, any person falling a distance liable to cause personal injury.

22.7 Selection of 'work equipment' for work at height

- 1) the contractor, in selecting work equipment for use in work at height, shall
 - a) give collective protection measures priority over personal protection measures; and
 - b) take account of
 - i) the working conditions and the risks to the safety of persons at the place where the work equipment is to be used;
 - ii) in the case of work equipment for access and egress, the distance to be negotiated;
 - iii) the distance and consequences of a potential fall;
 - iv) the duration and frequency of use;
 - v) the need for easy and timely evacuation and rescue in an emergency; and
 - vi) any additional risk posed by the use, installation or removal of that work equipment or by evacuation and rescue from it;
- (2) The contractor shall select work equipment for work at height which:
 - a) has characteristics including dimensions which:
 - (i) are appropriate to the nature of the work to be performed and the foreseeable loadings; and
 - (ii) allow passage without risk; and

- b) is in other respects the most suitable work equipment, having regard in particular to the purposes specified in 22.4 and 22.5.

22.8 Fragile surfaces

- 22.8.1 The contractor shall ensure that no person at work passes across or near, or working on, from or near, a fragile surface where it is reasonably practicable to carry out work safely and under appropriate ergonomic conditions without his doing so.
- 22.8.2 Where it is not reasonably practicable to carry out work safely and under appropriate ergonomic conditions without passing across or near, or working on, from or near, a fragile surface, every contractor shall,
 - (a) ensure, so far as is reasonably practicable, that suitable and sufficient platforms, coverings, guard rails or similar means of support or protection are provided and used so that any foreseeable loading is supported by such supports or borne by such protection;
 - (b) Where a risk of a person at work falling remains despite the measures taken under the preceding provisions of this regulation, take suitable and sufficient measures to minimise the distances and consequences of his fall.
- 22.8.3 Where any person at work may pass across or near, or work on, from or near, a fragile surface, every contractor shall ensure that
 - (a) prominent warning notices are so far as is reasonably practicable affixed at the approach to the place where the fragile surface is situated; or
 - (b) where that is not reasonably practicable, such persons are made aware of it by other means.

22.9 Falling objects

- 22.9.1 The contractor shall, where necessary to prevent injury to any person, take suitable and sufficient steps to prevent, so far as is reasonably practicable, the fall of any material or object.
- 22.9.2 Where it is not reasonably practicable to comply with the requirements of 22.8, every contractor shall take suitable and sufficient steps to prevent any person being struck by any falling material or object which is liable to cause personal injury.
- 22.9.3 The contractor shall ensure that no material or object is thrown or tipped from height in circumstances where it is liable to cause injury to any person.

22.9.4 Every employer shall ensure that materials and objects are stored in such a way as to prevent risk to any person arising from the collapse, overturning or unintended movement of such materials or objects.

22.10 Danger areas

22.10.1 Without prejudice to the preceding requirements of these Regulations, every contractor shall ensure that

(a) where a workplace contains an area in which, owing to the nature of the work, there is a risk of any person at work

i) falling a distance; or

ii) being struck by a falling object,

which is liable to cause personal injury, the workplace is so far as is reasonably practicable equipped with devices preventing unauthorised persons from entering such area; and

(b) such area is clearly indicated.

22.11 Inspection of work equipment

22.11.1 The contractor shall ensure that, where the safety of work equipment depends on how it is installed or assembled, it is not used after installation or assembly in any position unless it has been inspected in that position.

22.11.2 The contractor shall ensure that work equipment exposed to conditions causing deterioration which is liable to result in dangerous situations is inspected

(a) at suitable intervals; and

(b) each time that exceptional circumstances which are liable to jeopardise the safety of the work equipment have occurred, to ensure that health and safety conditions are maintained and that any deterioration can be detected and remedied in good time

22.11.3 Without prejudice to paragraph 22.11.1, the contractor shall ensure that a working platform

(a) used for construction work; and

(b) From which a person could fall 2 metres or more, is not used in any position unless it has been inspected in that position or, in the case of a mobile working platform, inspected on the site, within the previous 7 days.

22.11.4 The contractor shall ensure that the reports of all inspections are properly maintained and shown to the Employer as and when required.

19.11.5 In this clause "inspection",

- (a) means such visual or more rigorous inspection by a competent person as is appropriate for safety purposes;
- (b) includes any testing appropriate for those purposes,

22.12 Inspection of places of work at height

22.12.1 The contractor shall so far as is reasonably practicable ensure that the surface and every parapet, permanent rail or other such fall protection measure of every place of work at height are checked on each occasion before the place is used.

22.13 Duties of persons at work

22.13.1 Any workmen employed by the contractor shall report to the supervisor about any defect relating to work at height which he knows is likely to endanger the safety of himself or another person.

22.13.2 Every workmen shall use any work equipment or safety device provided to him for work at height by the contractor, in accordance with

- (a) any training in the use of the work equipment or device concerned which have been received by him; and
- (b) the instructions respecting that use which have been provided to him by the contractor as per the requirements of the Employer.

22.14 Requirements for existing places of work and means of access or egress at height
Every existing place of work or means of access or egress at height shall

- (a) Be stable and of sufficient strength and rigidity for the purpose for which it is intended to be or is being used;
- (b) Where applicable, rest on a stable, sufficiently strong surface;
- (c) Be of sufficient dimensions to permit the safe passage of persons and the safe use of any plant or materials required to be used and to provide a safe working area having regard to the work to be carried out there;
- (d) Possess suitable and sufficient means for preventing a fall;
- (e) Possess a surface which has no gap
 - (i) Through which a person could fall;
 - (ii) Through which any material or object could fall and injure a person; or

- (iii) Giving rise to other risk of injury to any person, unless measures have been taken to protect persons against such risk;
- (f) be so constructed and used, and maintained in such condition, as to prevent, so far as is reasonably practicable -
 - (i) The risk of slipping or tripping; or
 - (ii) Any person being caught between it and any adjacent structure;
- (g) Where it has moving parts, be prevented by appropriate devices from moving inadvertently during work at height.

22.15 Requirements for guardrails, toe-boards, barriers and similar collective means of protection

- i) Unless the context otherwise requires, any reference in this section to means of protection is to a guardrail, toe-board, barrier or similar collective means of protection.
- ii) Means of protection shall
 - (b) be of sufficient dimensions, of sufficient strength and rigidity for the purposes for which they are being used, and otherwise suitable;
 - (c) be so placed, secured and used as to ensure, so far as is reasonably practicable, that they do not become accidentally displaced; and
 - (d) be so placed as to prevent, so far as is practicable, the fall of any person, or of any material or object, from any place of work.
- iii) In relation to work at height involved in construction work
 - (a) the top guard-rail or other similar means of protection shall be at least 950 millimetres above the edge from which any person is liable to fall;
 - (b) toe-boards shall be suitable and sufficient to prevent the fall of any person, or any material or object, from any place of work; and
 - (c) any intermediate guardrail or similar means of protection shall be positioned so that any gap between it and other means of protection does not exceed 470 millimetres.
- iv) Every contractor shall ensure that handrail for protection of wall opening/edges shall be made up of sturdy material and fabricated by pipes or rebars of 32mm dia only. The handrail shall be of sufficient strength to withstand the impact fall load. The handrail shall be made in two layers i.e. mid rail and top rail along with provision of toe guard/board of minimum 150 mm in height from the level from

where handrail is erected (Detailed drawing is enclosed as **Sample Drawings 1, 2 and 3** for reference and compliance).

- v) Any structure or part of a structure which supports means of protection or to which means of protection are attached shall be of sufficient strength and suitable for the purpose of such support or attachment.

22.16 Requirements for all Working Platforms

- i) Every working platforms requires a supporting structure for holding it.
- ii) Any surface upon which any supporting structure rests shall be stable, of sufficient strength and of suitable composition safely to support the supporting structure, the working platform and any loading intended to be placed on the working platform.
- iii). Stability of supporting structure
Any supporting structure shall
 - (a) be suitable and of sufficient strength and rigidity for the purpose for which it is being used;
 - (b) in the case of a wheeled structure, be prevented by appropriate devices from moving inadvertently during work at height;
 - (c) in other cases, be prevented from slipping by secure attachment to the bearing surface or to another structure, provision of an effective anti-slip device or by other means of equivalent effectiveness;
 - (d) be stable while being erected, used and dismantled; and
 - (e) when altered or modified, be so altered or modified as to ensure that it remains stable.
 - (f) Have suitable base plates and properly footed thereby.
 - (g) Detailed drawing is enclosed as **Sample Drawing- 4** for reference and compliance
- iv). Stability of working platforms
A working platform shall
 - (a) be suitable and of sufficient strength and rigidity for the purpose or purposes for which it is intended to be used or is being used;
 - (b) be so erected and used as to ensure that its components do not become accidentally displaced so as to endanger any person;

- (c) when altered or modified, be so altered or modified as to ensure that it remains stable; and
 - (d) be dismantled in such a way as to prevent accidental displacement.
- v) Safety on working platforms
- A working platform shall
- (a) be of sufficient dimensions to permit the safe passage of persons and the safe use of any plant or materials required to be used and to provide a safe working area having regard to the work being carried out there;
 - (b) possess a suitable surface and, in particular, be so constructed that the surface of the working platform has no gap
 - i) through which a person could fall;
 - ii) through which any material or object could fall and injure a person;
 - or
 - iii) giving rise to other risk of injury to any person, unless measures have been taken to protect persons against such risk; and
 - (c) be so erected and used, and maintained in such condition, as to prevent, so far as is reasonably practicable
 - i) the risk of slipping or tripping; or
 - ii) any person being caught between the working platform and any adjacent structure.
 - (d) be fully decked to avoid any fall of material or person.
 - (e) be of min. 900 mm in width. Use of single challies/grating as working platform is prohibited. Specific size working Challis/Grating of Drop In type design is recommended. Oversize use as well as tying with binding wire is strictly prohibited.
 - (f) The platform shall be tied up properly with the structure in such a way that it cannot be displaced in any circumstances by its own.
 - (g) Collective fall protection in the form of two level of handrail of adequate strength to withstand the impact load shall be ensured.
 - (h) Proper and safe means of access/egress shall be ensured to these working platforms.
- vi) Loading
- A working platform and any supporting structure shall not be loaded so as to give rise to a risk of collapse or to any deformation, which could affect its safe use.

Concrete, debris or other material shall be not allowed to accumulate at any platform on a scaffold.

vii) Additional requirements for scaffolding

Strength and stability calculations for scaffolding shall be carried out unless

(a) a note of the calculations, covering the structural arrangements contemplated, is available; or

(b) it is assembled in conformity with a generally recognised standard configuration.

viii) Depending on the complexity of the scaffolding selected, a competent person shall draw up an assembly, use and dismantling plan. This may be in the form of a standard plan, supplemented by items relating to specific details of the scaffolding in question.

ix) A copy of the plan, including any instructions it may contain, shall be kept available for the use of persons concerned in the assembly, use, dismantling or alteration of scaffolding until it has been dismantled.

x) The dimensions, form and layout of scaffolding decks shall be appropriate to the nature of the work to be performed and suitable for the loads to be carried and permit work and passage in safety.

xi) While a scaffold is not available for use, including during its assembly, dismantling or alteration, it shall be marked with general warning signs in accordance with and be suitably delineated by physical means preventing access to the danger zone.

xii) **Scaffolding** may be assembled, dismantled or significantly altered only under the supervision of a competent person and by persons who have received appropriate and specific training in the operations envisaged which addresses specific risks which the operations may entail and precautions to be taken, and more particularly in

(a) understanding of the plan for the assembly, dismantling or alteration of the scaffolding concerned;

(b) safety during the assembly, dismantling or alteration of the scaffolding concerned;

(c) measures like provision of safety nets, safety harness etc. to prevent the risk of persons, materials or objects falling;

- (d) safety measures in the event of changing weather conditions which could adversely affect the safety of the scaffolding concerned;
 - (e) permissible loadings
 - (f) Measures to ensures its stability like provision of diagonal/cross bracings, provision of base plate, sole plate, anchoring with wall with maximum gap of 3 metre between two anchoring point in any direction.
 - (g) ensuring no defects in the scaffold material like bending, damaged etc.
 - (h) prohibiting use of Re-bars instead of standard locking pins, pins shall be provided at both ends (top & bottom) of the standards while coupling/joining two standards with each other;
 - (i) ensuring stability of partially dismantled scaffold. The same shall be permitted only after safety of the remaining portion has been ensured;
 - (j) permitting openings in any working platform especially for allowing access only.
 - (k) in case of high height tower scaffolds, the height of tower scaffold is not more than four times of least base dimension of such scaffold. Such scaffold shall be lashed/anchored to a building or a fixed structure before being used;
 - (l) construction of Mobile tower scaffold with regard to stability. These shall be used on plain & even surface, and have casters provided with positive locking devices;
 - (m) prohibiting presence of worker on board scaffold, tools, material when such is being shifted from one place to other;
 - (n) The underneath area of the erection/ dismantling shall be barricaded or guarded to prevent any unauthorised entry
 - (o) any other risks which the assembly, dismantling or alteration of the scaffolding may entail
- (xiii) Suspension scaffold shall be provided at each of its suspension point with secondary safety wire rope with automatic locking or similar safety device mounted on each of such rope so that secondary safety rope supports the platform in the event of failure of primary suspension wire ropes;

22.17 Temporary works

- (i) Every contractor shall appoint Certified Temporary Works Co-ordinator (TWC) preferably civil engineer having an experience of 5 years of related temporary

works to look after all temporary works including erection of trestle, scaffolding etc. He shall be responsible for safe erection and upkeep of all temporary works and supported by adequate no. of certified scaffolder along with trained/competent scaffolding team.

- (ii) All Temporary work shall be so designed, constructed and maintained that such arrangement support the load that may get imposed on them and it is so erected that working platform, means of access, bracing, means of handling and stabilising could easily be fixed. Approved design of temporary works by designer duly vetted by independent third party agency shall be available at site before commencement of erection work.
- (iii) Work of erection, dismantling of structures or Temporary work or shoring or any other work shall be carried out by trained worker under competent supervision.
- (iv) The completed/erected temporary work shall be inspected by the competent engineer/supervisor for its strength, stability, rigidity and safe for use before taken into use. As built checking and certification by temporary works coordinator along with tagging to be obtained. Once it is erected and certified "safe to use" no modification and alteration to be allowed without designer written approval.
- (v) A site specific checklist to be developed including all the above mentioned items to ensure effective compliance. Checklist to be signed by competent scaffold supervisor, construction site in charge and site safety manager. A sample checklist is attached as **Appendix 15**.
- (vi) All inspected temporary works, staging, scaffolding etc. shall be appropriately tagged for their safe worthiness or otherwise.

22.18 Requirements for collective safeguards for arresting falls

- i) Collective safeguard are safety net, airbag or other collective safeguard for arresting falls
- ii) A safeguard shall always be used if
 - (a) a risk assessment has demonstrated that the work activity can so far as is reasonably practicable be performed safely while using it and without affecting its effectiveness;
 - (b) the use of other, safer work equipment is not reasonably practicable; and
 - (c) a sufficient number of available persons have received adequate training specific to the safeguard, including rescue procedures.

- iii) A safeguard shall be suitable and of sufficient strength to arrest safely the fall of any person who is liable to fall. To ensure this, thorough inspection of the arrangement installed shall be carried out by competent site personnel along with safety representative. Inspection procedure for the same to be developed and submitted to NMRC for approval.
- iv) A safeguard shall
 - (a) in the case of a safeguard which is designed to be attached, be securely attached to all the required anchors, and the anchors and the means of attachment thereto shall be suitable and of sufficient strength and stability for the purpose of safely supporting the foreseeable loading in arresting any fall and during any subsequent rescue;
 - (b) in the case of an airbag, landing mat or similar safeguard, be stable; and
 - (c) in the case of a safeguard, which distorts in arresting a fall, afford sufficient clearance.
- v) Suitable and sufficient steps shall be taken to ensure, so far as practicable, that in the event of a fall by any person the safeguard does not itself cause injury to that person.

22.19 Requirements for personal fall protection systems

- i) A personal fall protection system shall be used only if
 - (a) a risk assessment has demonstrated that
 - (i) the work can so far as is reasonably practicable be performed safely while using that system; and
 - (ii) the use of other safer work equipment is not reasonably practicable; and
 - (b) the user and a sufficient number of available persons have received adequate training specific to the operations envisaged, including rescue procedures.
- ii) A personal fall protection system shall
 - (a) be suitable and of sufficient strength for the purposes for which it is being used having regard to the work being carried out and any foreseeable loading;
 - (b) where necessary, fit the user;

- (c) be correctly fitted;
 - (d) be designed to minimise injury to the user and, where necessary, be adjusted to prevent the user falling or slipping from it, should a fall occur; and
 - (e) be so designed, installed and used as to prevent unplanned or uncontrolled movement of the user.
- iii) A personal fall protection system designed for use with an anchor shall be securely attached to at least one anchor, and each anchor and the means of attachment thereto shall be suitable and of sufficient strength and stability for the purpose of supporting any foreseeable loading.
- iv) Suitable and sufficient steps shall be taken to prevent any person falling or slipping by provisioning of personal fall protection system. In case due to site constraint, workers are exposed to working near open edges, a retractable fall arrestor device shall be mandatorily used at the work location. All workers to be provided with personalised safety harnesses and trained and supervised to ensure it's anchoring with the fall arrestor system at all time during working. The same arrangement is also recommended for use while working/ascending/descending on EOT Gantries as well as temporary support systems like Cribs/Trestles etc.

22.20 Requirements for Ladders

- 1) Every contractor shall ensure that a ladder is used for work at height only if a risk assessment has demonstrated that the use of more suitable work equipment is not justified because of the low risk and
 - i) The short duration of use; or
 - ii) Existing features on site, which he cannot alter.
- 2) In no case ladder shall be permitted beyond 6m height for any work or access. Access above 6m height in the form of proper Dog Legged staircase needs to be provided.
- 3) Only metal/aluminium ladders with handrail shall be allowed for lesser height and on temporary basis. Bamboo/wooden/rope ladders and improvised ladder assembled from staging/scaffolding material are strictly prohibited.

- 4) Any surface upon which a ladder rests shall be stable, firm, of sufficient strength and of suitable composition safely to support the ladder so that its rungs or steps remain horizontal, and any loading intended to be placed on it.
- 5) A ladder shall be so positioned as to ensure its stability during use. Base to height ratio of 1:4 to be maintained.
- 6) A suspended ladder shall be attached in a secure manner and so that, with the exception of a flexible ladder, it cannot be displaced and swinging is prevented.
- 7) A portable ladder shall be prevented from slipping during use by -
 - i) securing the stiles at or near their upper or lower ends;
 - ii) an effective anti-slip or other effective stability device; or
 - iii) Any other arrangement of equivalent effectiveness.
- 8) A ladder used for access shall be long enough to protrude sufficiently above the place of landing to which it provides access, unless other measures have been taken to ensure a firm handhold.
- 9) No interlocking or extension ladder shall be used unless its sections are prevented from moving relative to each other while in use.
- 10) A mobile ladder shall not be move while workers are climbed on it.
- 11) Where a ladder or run of ladders raises a vertical distance of 6 metres or more above its base, there shall, where reasonably practicable, be provided at suitable intervals sufficient safe landing areas or rest platforms.
- 12) Every ladder shall be used in such a way that
 - (a) a secure handhold and secure support are always available to the user; and
 - (b) the user can maintain a safe handhold when carrying a load unless, in the case of a step ladder, the maintenance of a handhold is not practicable when a load is carried, and a risk assessment has demonstrated that the use of a stepladder is justified because of
 - (i) the low risk; and
 - (ii) the short duration of use.
- 13) Ladders rungs made of rebars or round pipes are prohibited. Handrails used in ladders shall be of sufficient strength to withstand the side impact load.
- 14) Ladder which is fabricated locally shall have rungs at equal intervals as ergonomically suitable for use and comply to the relevant standards.

15) In case of working during interface all ladders shall have marked of companies to which they belong

22.21 Mobile Elevated Working Platforms (MEWP)

22.21.1 Every contractor shall ensure that Mobile Elevated Working Platform (MEWPs) which includes provision of Sky Lifts/Scissor Lifts shall be used as means of access/egress wherein there is impossible to use safe & sturdy means of access/working platform in the form of stair tower/scaffold. One MEWP for each one km of active worksite and two no's of MEWP for each tandem lift operations. Similarly in underground station constructions, scissor lift, one each at every level for station needs to be provided. Any change in number of such MEWP shall be decided by NMRC site In charge in consultation with NMRC Project Safety team.

22.21.2 Truck Mounted Mobile Elevated Working Platforms (MEWP) are prohibited to be used on undulated construction sites, but can be used on levelled surface. Rough Terrain types Mobile Elevated Working Platforms (MEWP) are to be used on undulated construction sites, but not suitable for long marching on levelled surface.

22.21.3 The use of Mobile Elevated Working Platforms shall only be conducted in presence of competent supervision.

22.21.4 All Safety measures as advised by OEM shall be strictly followed while use of such MEWP's.

23.0 Overhead protection

- i) All contractors shall provide overhead protections as per Rule 41 of BOCWR Overhead protection should be erected along the periphery of every building and other structures which is under construction and where the risk of falling objects from height exists during construction activity. Similar arrangement shall also be made during erection of OHE mast and signalling poles on public road.
- ii) Overhead protection shall be minimum 2m wide and the outer edge shall be 150mm higher than the inner edge and an angle not more than 20° to its horizontal sloping into the building.
- iii) Areas of inadvertent hazard of falling of material shall be guarded or barricaded or roped-off thereby by the contractor.

24.0 Slipping, Tripping, Cutting, Drowning and Falling Hazards

As per Rule 42 of BOCWR,

- i) All places like passageways, working platforms and other places of construction should be free from accumulation of dust, debris or other materials and from obstructions that may lead to slip/trip.
- ii) Sharp projections or any protruding nails or similar objects which may cause any cutting hazards shall be removed or made safe by taking suitable measures.
- iii) Contractor shall not allow workmen to work or use platforms, scaffolds/passageways or walkways or any other elevated working surface which is slippery and in dangerous condition and shall ensure that water, grease or oil or similar substances, which may render surface slippery, be removed or sanded, saw dusted to make it safe from slip hazard.
- iv) When workers are exposed to areas where fall into water is possible, the contractor shall provide suitable and adequate equipment for saving the workers from drowning and rescuing from such hazard. If the Employer considers necessary, the contractor shall provide well-equipped boat or launch, manned with trained personnel at the work place.
- v) Every open side or opening through which worker, material, equipment, vehicle or lifting appliance may fall at a building or outside shall be guarded suitably to prevent such fall except in places where free access is necessary by reasons of nature of work.
- vi) Adequate and suitable safety net shall be provided at places wherever there is a chance of falling of any material, equipment or person. Such safety nets shall be in accordance with national/international standards.
- vii) When workers are exposed to hazards of falling from height, they shall be provided with adequate equipment or means like double lanyard with shock absorber, retractable type full body safety harness shall be provided where worker's movement is within defined distance. Life line of adequate strength for saving them from such hazards. Life line of steel wire rope only to be used for life line purposes. Such equipments shall be in accordance with national/international standards.

- viii) Safety critical activities like Parapet stitching and Boundary wall panel erection and stitching shall be carried out only after Method Statement is prepared, submitted and approved.
- ix) Reinforcement of Pier and stations columns shall be secured from the risk of tilting through provisioning of minimum three guy wires ropes anchored to any concrete block/counter weight of sufficient capacity.

25.0 Lifting Appliances and Gear

- 25.1 Lifting appliances means a crane, hoist machinery, derrick, winch, gin pole, sheer legs, jack, hoist drum, slewing machinery, pulley blocks, hooks or other equipment used for lifting materials, objects or building workers and lifting gears means ropes, chain slings, web slings, shackles, hooks, Spreader beam, lifting lugs, wire ropes, lifting eyebolts and eye nuts and other accessories of a lifting appliance.
- 25.2 No machine shall be selected to do any lifting on a specific job until its size and characteristics are considered against:
- i) the weights, dimensions and lift radii of the heaviest and largest loads;
 - ii) the maximum lift height, the maximum lift radius and the weight of the loads that must be handled at each;
 - iii) the number and frequency of lifts to be made;
 - iv) how long the crane will be required on site;
 - v) the type of lifting to be done (for example, is precision placement of loads important;
 - vi) the type of carrier required (this depends on ground conditions and machine capacity In its operating quadrants: capacity is normally greatest over the rear, less over the side, and non-existent over the front;
 - vii) whether loads will have to be walked or carried;
 - viii) whether loads will have to be suspended for lengthy periods;
 - ix) the site conditions, including the ground where the machine will be set up, access roads and ramps it must travel, space for erection and any obstacles that might impede access or operation.
- 25.3 The contractor shall ensure that a valid certificate of fitness is available for all lifting appliances including synchronised mobile jacks, pre-stressing hydraulic jacks, jacks fitted with launching girders etc. and Employers approval before inducting to the site.

Only after obtaining the approval from the Employer any lifting appliances and gear shall be used.

- 25.4 The laminated photocopies of fitness certificate issued by competent person and plant & Machinery In-charge, the Employers' approval letter, the operators' photo, manufacturer's load chart and competency certificate shall always be either kept in the operator cabin or pasted on the lifting appliances however the same shall not hinder the operator/driver vision.
- 25.5 All lifting appliances and loose gears shall be clearly marked for its safe working load and identification by stamping or other suitable means.
- 25.6 The contractor shall also maintain a register containing a system of identification of all tools and tackles, its date of purchase, safe working load, competent person date of examination etc.

25.7 Test and periodical examination of lifting appliances and gears

- 25.7.1 All lifting appliances including all parts and gears thereof, whether fixed or movable shall be thoroughly tested and examined by a competent person once at least in every six months or after it has undergone any alterations or repairs liable to affect its strength or stability. Within the validity, if the lifting appliances are shifted to a new site, re-examination by the competent person for ensuring its safety shall also be done.
- 25.7.2 Contractors can utilise the services of any competent person approved by Chief Inspector of Factories and as empanelled by the employer
- 25.7.3 All alarms and signals like automatic safe load indicators (SLI), boom angle indicators, boom extension indicators, over lift boom alarm, swing alarm, hydraulic safety valves, mechanical radius indicators, load moment indicators etc. shall be periodically examined and maintained always in working condition.
- 25.7.4 No lifting appliances or gears shall be over loaded in any circumstances except for testing under the supervision of Third party competent person & in controlled environment

25.8 Automatic safe load indicators and Data Logger in Lifting Appliances

- 25.8.1 As stipulated in relevant of UPBOCW Rules, every lifting appliances and gears like cranes, hydras etc, if so constructed that the safe working load may be varied by raising or lowering of the jib or otherwise, shall be attached with an automatic indicator

of safe working loads approved by Bureau of Indian standards/ International certifying bodies which gives a warning to the operator whenever the load being handled exceeds the safe working limit.

25.8.2 Provision of functional data logger with alert facility through SMS and web in all cranes shall be mandatory.

25.8.3 Cut-out shall be provided which automatically arrests the movements of the lifting parts of every crane if the load exceeds the safe working limit.

25.9 Qualification of operator of lifting appliances etc

25.9.1 The contractor shall not employ any person to drive or operate a lifting machine like crane, hydra etc whether driven by mechanical power or otherwise to work as a operator unless he

- i) is above twenty eight years of age and possesses a valid heavy transport vehicle driving licence.
- ii) is absolutely competent and reliable;
- iii) possesses the knowledge of the inherent risks involved in the operation of lifting appliances by undergoing a formal training at any institution of national importance acceptable to Employer;
- iv) is medically examined periodically as specified in schedule VII of BOCW Rules.

25.10 General requirements

25.10.1 The sweep area (work area) of the construction machinery shall be always free from obstructions.

25.10.2 All hydraulic piping and fittings shall be maintained leak proof.

25.10.3 The operator cab shall possess good and safe:

- i) structure, windows and windshield wipers
- ii) Drivers chair and foot rest
- iii) Control handles
- iv) Cab instrumentation
- v) Telecommunication
- vi) Cab out fitting
- vii) wind indicator with an adjustable set point shall be in a position representative for the wind on the crane. The indicator shall give continuous information regarding constant speeds and gusts

25.11 Mandatory rigging requirement

- 25.11.1 Rigging shall be done under experienced and qualified rigger only. All Load shall be adequately and safely rigged to prevent any danger.
- 25.11.2 The primary requirement in rigging shall be to assess the weight of load before attempting any lift.
- 25.11.3 All hooks shall be fitted with Master Rings having certificate of fitness from the competent person, so that the hooks are subjected to balanced vertical loading only.
- 25.11.4 Only four legged slings shall be allowed which includes master link (ring), intermediate master link (ring) if necessary, chain / wire rope sling, sling hook or other terminal fitting.
- 25.11.5 Hand spliced slings shall not be used at site for any lifting purpose.
- 25.11.6 Requirements of outriggers
- i) All outriggers shall be fully extended and all tyres are clear of the ground
 - ii) Heavy duty blocking having large bearing area shall be necessary to prevent sinking of floats
 - iii) Provision of heavy steel plates/ high density interconnected wooden logs of required dimension shall be used to uniformly distribute the load
 - iv) The crane shall be setup on fully compacted ground.
- 25.11.7 Minimum site illumination is to be ensured at all lifting operations.
- 25.11.8 Slings shall not be wrapped in hook while lifting of material

25.12 Overhead Gantries

- 25.12.1 All gantries shall have designed End Stoppers and Storm Brakes as per OEM. The design shall be submitted to NMRC after vetting by independent/Third party Designer. As built certification by contractor's Plant & Machinery In charge shall be submitted.
- 25.12.2 Railings shall be provided along the gantry track to avoid any worker getting injured from gantry crane or any of its part during its movement.
- 25.12.3 Provision of anti-collision devices shall be mandatorily ensured and kept in working condition.

- 25.12.4 All gantry crane shall be provided with fail safe devices to avoid any hoist free fall in case of brake failure. Wireless operation of Gantry is prohibited.
- 25.12.5 Fall arrestor arrangement shall be made at access location to the gantry to prevent free fall of the operator during ascend/descend
- 25.13 Preventive maintenance of Gantry Crane Hoist by OEM with safe worthiness certification during initial assembly and subsequently on six monthly basis shall be ensured.
- 25.14 In respect of age of lifting appliances as specified in **Appendix No. 16**, contractor Plant & Machinery In-charge shall give indemnity/undertaking regarding the age of appliance.
- 25.15 Helper shall be mandatory with each lifting appliances during their movement at site.
- 25.16 Every Contractor shall appoint/nominate a qualified & competent Lifting Engineer or Lifting Consultant to monitor the lifting operation. The complete lifting operation shall be carried out under the supervision of lifting engineer/consultant. He shall be accountable for the lifting activity. Minimum age of 28 years for crane operators and 24 years for other site personnel like riggers, signallers and helpers etc. is mandatory.

25.17 Pick & Carry Operation

- 25.17.1 Prohibition on Use of “Tractor transmission type Pick and Carry Hydra Crane”:
Tractor transmission type Pick and Carry-1st Generation model is prohibited at NMRC works. Contractor shall mobilize “Truck transmission type” Pick and Carry (Hydra) Crane – minimum 2nd Generation model only.
- 25.17.2 Pick and Carry operation is prohibited at all NMRC construction sites except for the tailing purpose for lowering of pile cage, erection of radio tower, electrical poles, exhaust structures etc.
- 25.17.3 For transportation and lifting of small materials like rail sleepers, staging material, concrete blocks, shuttering material, barricade boards etc. loader cranes shall be used. Truck mounted cranes with storage facilities to be used for lifting of load and stowed in secured platform and then shifted.
- 25.17.4 Pick & Cary cranes shall not be used for any lowering operation below the ground level

25.18 Fixed lifting appliances

- a) Fixed lifting appliances like Tower Crane etc. shall be installed by competent person and in such a manner that appliance cannot be displaced by any load, vibration or other influence, operator is not exposed to danger from loads, ropes or drums.
- b) Adequate clearance is provided between parts or loads of lifting appliance and the permanent structure such as walls & objects like posts or any electrical conductors.
- c) All tower crane operators shall be trained and capable to work at height are deployed to operate tower cranes.
- d) the ground on which a tower crane stands has adequate bearing capacity and shall be firmed & levelled properly. Such cranes are erected at a reasonably safe distance from excavation and be operate within limits as specified by manufacturer.
- e) Tower cranes are sited in such a way that the loads are not handled over any occupied premises, public thoroughfares, railways or near power cables etc other than construction work.
- f) When two or more cranes are operated at same place, measures to ensure positive and proper communication between operators of such cranes to avoid any danger or dangerous occurrences.
- g) Fall arrestor arrangement shall be made at access location to the tower crane to prevent free fall of the operator during ascend/descend.

25.19 Moveable Lifting appliances

All moveable tower cranes shall be checked and certified for their safe worthiness by the plant and machinery in charge of the contractor after its installation. All original equipment manufacturers (OEM) recommendation for installation and use shall be strictly complied.

25.20 Winches

Every contractor shall ensure that:

- i) winches are not used if control levers operate with excessive friction or play.
- ii) adequate protection is provided to winch operator against abnormal weather.
- iii) control levers are secured in the neutral position and winches shall be power shut-off whenever winches are left unattended.
- iv) No worker is authorised to transfer, alter or adjust electric control circuits except electrician along with winch operator.

- v) apart from mechanical brakes, winches shall also have the provision of OEM fitted Electrically operated braking system.
- vi) Anchoring and stability of the winches shall be ensured and certified by P&M team.
- viii) Standard counter weight as per OEM recommendation shall be used.

25.21 Vacuum and Magnetic lifting gears

Every contractor shall ensure that

- i) no vacuum lifting gear, magnetic lifting gear or any other lifting gear where load on it is held by adhesive power, be used while workers are performing operations beneath such gear.
- ii) lifting gear used in work shall be provided with an alternative supply of power, such as batteries which may come in operation in case of power failure.
- iii) no worker shall be allowed to work within the swinging zone of the lifting gear or load or material suspended to such gear.

25.22 Operation of Lifting Appliances

Every contractor shall ensure that:

- i) the complete lifting operation shall be governed by signals as per established standards.
- ii) Adequate measures to be taken to ensure that no worker is allowed to stand or pass under the load.
- iii) No lifting appliances shall be left by the operator while power is on or load is suspended.
- iv) After completion of the lifting operation, all doors of the appliances shall be closed by the operator and ignition/operation key should be handed over to competent reliever operator or site In-charge.
- v) No person shall be allowed to rides or sit on a suspended load.
- vi) Every receptacle/material bucket used for hoisting bricks, tiles, or other material shall be enclosed from all side including bottom completely to prevent fall of any material. No wheel barrow shall be used to lift or lower the material. Such receptacle or bucket shall not be overloaded or the material shall not cross the top level of the bucket.

- vii) No material shall be raised or lowered or slewed which can leads to sudden jerks to appliances.
- viii) No load shall be slewed over public areas without stopping the pedestrians and road traffic first. Measures shall be adopted to divert the traffic during lifting/lowering operation requiring long duration traffic stoppage..
- ix) All loads are provided with minimum two tag lines to ensure that the load can be controlled at all times.
- x) No close working to any live overhead power line is permitted without system of a 'Permit to Work' and prior permission of the employer shall be obtained before performing such operation.
- xi) During shifting of material near open edges, signalman and other workers shall not be allowed to lean out for communicating with ground staff unless they are provided with full body safety harness duly anchored with sturdy points.
- xii) Danger zone shall be identified and cordoned off for all lifting appliances during their operation.
- xiii) Appropriate measures shall be adopted to prevent foot of the derrick to lift out of its socket or support.
- xiv) All guy ropes of the derrick shall be adequately anchored to rigid points and should in tension with the use of turn buckle without any sagging.
- xv) A register shall be maintained for fitness of the derrick which shall include all elements like derrick setup, anchoring, lifting tools & tackles, means of access and should be filled & signed after every shifting of the derrick.
- xvi) All lifting appliances, gears, tools & tackles shall be maintained in good condition at all times to avoid any damage to them. Slings shall be discarded once they get any sign of deterioration beyond permissible limit defined by OEM and authenticated by Plant & Machinery In-charge.
- xvii) All lifting gears & slings shall be stamped or appropriate tags for their identification no & SWL.
- xviii) Knotting/wrapping of chains & slings shall not be allowed at site.
- xix) No person shall be allowed to be raised, lowered or carried by lifting appliances except on man hoist/elevator or on suspended platform or elevated working platforms. Prior permission of employer shall be obtained before permit to use.

- xx) Lifting appliances shall not be used for any dragging or pulling purposes. Contract shall refer to 75% capacity load chart for ascertaining the suitability of crane for safe lifting of load.
- xxi) During tandem lift, available capacity of crane in respect of SWL shall be considered after reduction of 15% for 75% (DIN) load chart respectively. In addition, additional derating as advised by third party testing and certified agency shall also apply
- xxii) During hoisting of long material, use of suitable lifting beam is recommended.
- xxiii) Lifting operation for handling load above one ton shall not be allowed without approval of lift plan/study and permit to work. The lift plan/study as well as checklist & work permit shall be signed by the nominated lifting engineer before performing any lifting operation.
- xxiv) No person shall be allowed to rig or de-rig at height unless safe means of access is provided.
- xxv) Only original equipment manufacturer (OEM) supplied/provided load chart shall be used during lifting operation.
- xxvi) Before performing any lifting operation, all electronic devices, control levers, hydraulic oil, wind pressure etc. shall be checked and necessary spare parts to be kept in stock to handle any breakdown during time bound lifting operation.
- xxvii) All underground utilities shall be identified and necessary measures shall be adopted before set up of cranes for lifting.
- xxviii) Loose as well as long material shall be adequately tied up with each other before lifting.
- xxix) All equipments including Electrical panels, Hoist if gantries etc shall only be lifted with the help of all lifting point/eye bolts as provided & recommended by the original equipment manufacturer. Safe slinging shall be ensured.
- xxx) Lifting point shall be considered on the I-Girders/U Girder/C Girder/Steel girder/parapet etc during the casting of the same. Design load calculation for the same should be conducted.
- xxxi) Lifting and lowering of the plant & machines like transit mixer, excavator, tractor etc shall be done as per recommendation from the Original Equipment Manufacturer.
- xxxii) Certification from designer for the stability and load bearing of "A" frame used for lifting of the escalators shall be obtained before its use.

- xxxiii) All lifting activities shall be stopped in case of high speed wind and similar adverse whether condition or as prescribed by the crane manufacturer.
- xxxiv) All cranes shall be provided with fail safe devices to avoid any hoist free fall in case of brake failure.

26.0 Launching Operation

- 26.1 As launching operation is one of the safety critical job, the contractor shall take utmost precaution at all stages like; planning, establishing casting yard, casting segments, transporting segments, fabrication and erection of launching girders, launching of segments, pre-stressing, auto launching of girders and dismantling of launching girders.
- 26.2 The contractor shall prepare a comprehensive Method Statement for the launching operation, adhering to the SHE conditions laid down in conditions of contract on SHE.. Particular reference shall be made to the provisions on working at height. As the entire process of launching has to be undertaken at an elevated level the safety of workers and the girder is paramount important. The following general guidelines shall be adhered throughout the launching operation.
 - i) Necessary 'working platforms' and fall protection anchorage arrangement shall be provided on the launching girder itself.
 - ii) Provisions for mounting light fittings shall also be made available in the launching girder.
 - iii) The casting yard shall be established ensuring the provision given in clause 38.0
 - iv) The workmen engaged in fabrication of reinforcement, concreting the segment shall be provided with necessary PPEs including compulsory hand protection gloves.
 - v) Casting and curing of segment shall be undertaken under the direct supervision of the responsible engineer of the contractor.
 - vi) Trucks/Trailers of adequate capacity with valid registration, licence, safe worthiness certificate, Employer's approval certificate, and pollution under check certificate shall only be used for transport of segments
 - vii) Drivers engaged for driving these trucks, shall be trained once in 6 months on defensive driving from approved agency.

- viii) Drivers shall also have undergone proper medical examination as per relevant clause mentioned under 'Medical Facilities'.
- ix) The segments shall be rigidly secured to the truck with necessary wooden wedges and necessary red indicators/safety tapes provided so that the vehicle is clearly seen by other road users both in day / night time.
- x) Every launching girder shall have a responsible engineer on duty all the time. Unloading of segments from trucks, lifting of segments, shifting of segments, gluing shall be done under the direct supervision of launching engineer.
- xi) All the time from erection to dismantling the area wherein launching is in progress shall be barricaded.
- xii) Auto launching shall be done only after approval from the Employer. After every auto launching the stability of launching girder shall be ensured.
- xiii) The vertical deflection of launching girder shall be monitored at all critical stages like with/without loads and after every auto launching.
- xiv) A register containing all important operational details from erection to dismantling of launching girders shall be maintained and made available to Employer whenever called for.
- xv) Test certificate for all lifting gears including Macalloy bars shall be maintained at a location closer to the launching girder itself so that it can be referred during all inspections.
- xvi) Adequate site illumination at all time shall be ensured in the entire area of operation.
- xvii) Access to drinking water & toilet shall be ensured to all workmen engaged for launching process.
- xviii) Proper & safe access stairways shall be maintained for safe ascending / descending of workmen / engineers to or from launchers.
- xix) Adequate collective and personnel fall protection measures like provision of safety nets while working over live roads/railways, life line for anchoring of safety harness, safe means of access on main box girder shall be ensured.
- xx) Before starting of the launching, valid third party test certificate of the launcher hoist shall be available and torquing of all the bolts shall be carried out and duly verified by Launching In charge.
- xxi) Safe and fully deck working platform duly covered from all side shall be ensured for stressing work at front support.

- xxii) Provision of lightning arrestor shall be ensured at minimum two locations at each launching Girders.
- xxiii) Adequate earthing shall be provided as per applicable standards while crossing over any existing electric line. Monitoring of the earth resistance shall be done periodically.
- xxiv) Counter weights of launcher shall be as per designer recommendation and of uniform dimension and be connected with each other.
- xxv) At gradient, adequate additional measures as per designer's recommendation shall be adopted while auto launching of LG..
- xxvi) Safety checklist for all activities of launching cycle shall be prepared, got approved & implemented.
- xxvii) Assembly and Dismantling of Launching Girders shall be carried out only after method statement is prepared, submitted and got approved.
- xxviii) Use of non-standard locking pins shall attract penalty.
- xxix) Safe jointing of rails as well as Gauge of temporary rail track for movement of rear trolley/segment trolley shall always be ensured.

26.3 Non-adherence to any of the clauses mentioned above shall be viewed seriously by the Employer and penalty levied as per relevant clause.

27.0 Construction Machinery

27.1 Construction machineries may include dumpers and dump trucks, lift trucks and telescopic handlers piling rigs, vibro hammers, rail welding equipments, mobile elevating work platforms, cranes, tipper lorries, lorry loaders, skip wagons, 360° excavators, 180° backhoe loaders, crawler tractors, scrapers, graders, loading shovels, trenchers, side booms, pavers, planers, chippers, road rollers, locomotives, tankers and bowsers, trailers, hydraulic and mechanical breakers etc. Helical rings to be prepared through mechanized means only.

27.2 Safe worthiness certificate

27.2.1 Every construction equipment shall be in sound mechanical working condition and certified by either competent person under Factories Act or manufacturers' warranty in case of brand new equipments or authorized persons / firms approved by Employer before induction to any site.

27.2.2 Every such certificate shall have the date of purchase, main overhauling undertaken in the past, any accident to the equipment, visual examination details, critical components safety check, list of safety devises and its working condition, manufacturer's maintenance checklist, past projects wherein the equipments were used etc as its minimum content.

27.2.3 Fitness of the machine shall be carried out on regular basis or after every maintenance work excluding any minor service/oil or filter change and be documented properly. The certificate shall be available in operator/driver cabin.

27.3 Reverse Horns

27.3.1 All Vehicles shall be fitted with audible reverse alarms and maintained in good working condition. Reversing shall be done only when there is adequate rear view visibility or under the directions of a banksman.

27.4 General operating procedures

- i) Drivers entering site shall be instructed to follow the safe system of work adopted on site. These shall be verbal instructions or, preferably, written instructions showing the relevant site rules, the site layout, delivery areas, speed limits, any live overhead electrical cable etc.
- ii) No passengers shall be carried, unless specific seating has been provided in accordance with the manufacturer's recommendations.
- iii) Working on gradients beyond OEM recommendation shall not be allowed.
- iv) To prevent accidental falling of construction vehicle in the excavation, suitable wheel stopper at sufficient distance from the edge of excavation shall be ensured. The manufacturer's recommended bucket size must not be exceeded in excavators.
- v) No construction material, other than soil shall be carried in excavator buckets.
- vi) If excavators operating on a gradient which cannot be avoided, it must be ensured that the working cycle is slowed down, that the bucket is not extended too far in the downhill direction, and that travel is undertaken with extreme caution. A large excavator must never be permitted to travel in a confined area, or around people, without a banksman to guide the driver, who should have the excavator attachment close in to the machine, with the bucket just clear of the ground. On wheeled excavators, it is essential that the tyres are in good condition and correctly inflated. If stabilizing devices are fitted, they should be employed when the machine is excavating.
- vii) When the front shovel of the 180^o backhoe loaders is being employed, the backhoe attachment shall be in its "travel" position, with the safety locking device in place.

- viii) When operating the backhoe in poor ground conditions, the stabilisers tend to sink into the surface of the ground, reducing stability. Therefore frequent checks shall be made for the stability of the machine. The loading shovel should always be lowered to the ground to stabilise the machine when the backhoe is employed.
- ix) The netting operation of the skip wagons should be carried out prior to lifting the skip to reduce the risks of working on the rear platform
- x) If a tractor dozer is employed on clearing scrub or felling trees, it shall be provided with adequate driver protection.
- xi) When two or more scrapers are working on the same job, a minimum distance of at least 25m shall be kept between them.
- xii) In case of hydraulic breakers, hydraulic rams and hoses shall be in good working condition
- xiii) Every contractor shall ensure that Competency certificate for driver/operators shall be issued by their Plant and Machinery In-charge. The certificate shall be pasted on the machine body in such a way that drivers/operator vision is not hindered.
- xiv) Checklist shall be prepared for all construction machinery and be filled on daily basis by the operator and be counter signed by plant & machinery person.
- xv) All machines shall be fitted with head lights, tail lights, side indicators etc and maintained in good working condition.
- xvi) Machines and Vehicles shall not be loaded beyond their safe carrying capacity/overloaded. Safe capacity shall also be marked on such machines and vehicles.
- xvii) No unauthorised person shall drive/operate the machines except designated driver/operator. All doors of the machines shall be closed by the driver/operator and ignition key should be hand over to the Site In-charge in-case of leaving the machine or site.
- xviii) All machines and Vehicles shall be parked at levelled surfaces. However in case of inescapable parking on slope, appropriate wheel stoppers shall be provided at all four wheels location.
- xix) Two wheel trolleys are prohibited at construction sites. Only four wheel trolleys shall be mobilised.

- xx) Vehicle shall not move unless driver has satisfied himself that no one is beneath the vehicle and vehicle can move forward or backward without causing any harm to other worker.
 - xxi) Tailing units for trailers used for girder shifting shall have proper sitting arrangement for operator and his helper on the other side.
 - xxii) All tractors shall have roll over protection arrangement (ROP).
 - xxiii) Provision of Helper is mandatory for each construction appliances and vehicles during their movement inside and outside of site.
 - xxiv) All material shifting Trolleys shall have braking arrangements properly designed and incorporated as mentioned in OEM manual. Each trolley shall have serial number, marked and got approved from NMRC engineer before loading/lowering.
- 27.5 Use of technology for ensuring safety in Lifting Appliances like provision of Reverse Camera along with display in driver/operator cabin, Proximity sensors, Wheel Guards, Biometric thumb impression base access to competent person, RUPD(Rear Under-run Protection Devices), LUPD(Lateral Under-run Protection Devices) (As per Motor Vehicle Act), Anti-collision devices, synchronisation devices and Limit Switches in gantries cranes shall be ensured.
- 27.6 Provision of Helper with whistle and lighted hand battle shall be mandatory with every construction machines/vehicle. Helper shall always remain at the rear of the vehicle in case of reversing to guide the driver safely. He shall also be trained to ensure his own safety while vehicles are reversing.
- 27.7 A trained team of banks man/helper shall be deployed at material receipt location/batching plant. In case the vehicle entering the site is not having helper, these trainer banks man dully provided with whistle and lighted hand batten shall guide the vehicle within the site until unloading is completed and vehicle leave the exit site.
- 27.8 Provision of use of CCTV camera with at least one week storage backup and its serviceability at all times is mandatory. The camera shall be installed at entry/exit of the casting yard/batching plant, station entry/exit.
- 27.9 In respect of age of construction plant and machines as specified in **Appendix No. 16**, contractor Plant & Machine In-charge to give indemnity/undertaking regarding the age of machines/vehicle.

27.10 Operation of construction machinery shall be strictly carried out as per the recommendation of Original equipment manufacturer. Similarly while shifting, OEM recommendations shall be followed.

27.11 QR based code tagging system for inspection of plant and machines, Electrical equipment or any other type of work equipment/system and machine certification is mandatory.

27.12 Penalty

27.12.1 If any of the above clauses are not adhered, penalty shall be imposed as per relevant clause depending upon the gravity of the unsafe act and or condition.

28.0 Machine and General Area Guarding

28.1 The contractor shall ensure at the construction site all motors, cogwheels, chains and friction gearing, flywheels, shafting, dangerous and moving parts of machinery are securely fenced or legged. The fencing of dangerous part of machinery is not removed while such machinery is in motion or in use.

28.2 All wood working or tile/marble cutting machines shall be fitted with suitable guards and devices such as top guard, reviving knife, push stick, guards for drive belts and chains, and emergency stop switch easily accessible by the operator.

29.0 Manual lifting and carrying of excessive weight

29.1 The contractor shall ensure at his construction site of a building or other construction work that no building worker lifts by hand or carries overhead or over his back or shoulders any material, article, tool or appliances exceeding in weight as said below as per Rule 38 of BOCWR, unless aided by another building worker or device.

Person	Maximum weight in kg.
Adult man	55
Adult woman	30

29.2 No building worker aided by other building worker shall lift or carry weight higher than or exceeding the sum of total of maximum limits set out for each building worker separately as mentioned in the table above.

30.0 Site Electricity

30.1 Competency of Electrical personnel:

30.1.1 The contractor shall employ relevantly qualified and competent electrical personnel as specified in **Appendix No. 5**.

30.2 Assessment of power

30.2.1 The contractor shall assess the size and location of the electrical loads and the manner in which they vary with time during the currency of the contract.

30.2.2 The contractor shall elaborate as to how the total supply is to be obtained / generated. The details of the source of electricity, earthing requirement, substation / panel boards, distribution system shall be prepared and necessary approval from Employer obtained before proceeding of the execution of the job.

30.2.3 The main contractor shall take consideration, the requirements of the sub / petty contractors' electric power supply and arrive at the capacity of main source of power supply from diesel generators. All the norms on installation and maintenance have to be adhered.

30.2.4 As the sub / petty contractors' small capacity generators create more noise and safety hazard, no small capacity diesel generators shall be allowed for whatsoever the type of job to be executed under this contract.

30.2.5 If any unsafe noise making small capacity diesel generators are found used by sub / petty contractors the main contractor shall only be penalised.

30.2.6 Usage of Transformers inside the tunnel is strictly prohibited.

30.3 Work on site

30.3.1 The contractor shall also submit electrical single line diagram, schematic diagram and the details of the equipment for all temporary electrical installation and these diagrams together with the temporary electrical equipment shall be submitted to the Employer's for necessary approval. Failure to do so shall invite penalty as per relevant clause.

30.4 Strength and capability of electrical equipment

- 30.4.1 No electrical equipment shall be put into use where its strength and capability may be exceeded in such a way as may give rise to danger.

30.5 Adverse or hazardous environments

- 30.5.1 Electrical equipment which may reasonably foresee ably be exposed to-
- (a) Mechanical damage;
 - (b) the effects of the weather, natural hazards, temperature or pressure;
 - (c) the effects of wet, dirty, dusty or corrosive conditions; or
 - (d) any flammable or explosive substance, including dusts, vapours or gases, shall be of such construction or as necessary protected as to prevent, so far as is reasonably practicable, danger arising from such exposure.

In all the above situations, only appropriate IP rated electrical panels, plug, socket etc shall be used.

30.6 Distribution system:

- 30.6.1 The contractor shall provide distribution system for control and distribution of electricity from a main AC supply of 50Hz for different appliances of 3 phase 415 volt and single phase 230 volt at site.

- 30.6.2 Reduced low voltage supplies of 110 Volt shall be used for lightings and other portable hand held equipments inside tunnel. Usage of Fire Retardant Low Smoke (FRLS) cable in tunnels is mandatory.

30.7 Electrical protection circuits

- 30.7.1 Precautions shall be taken, either by earthing or by other suitable means, to prevent danger arising when any conductor (other than a circuit conductor) which may reasonably foreseeable become charged as a result of either the use of a system, or a fault in a system, becomes so charged. A conductor shall be regarded as earthed when conductors of sufficient strength and current-carrying capability to discharge electrical energy to earth connect it to the general mass of earth. If a circuit conductor is connected to earth or to any other reference point, nothing which might reasonably be expected to give rise to danger by breaking the electrical continuity or introducing high impedance shall be placed in that conductor unless suitable precautions are taken to prevent that danger.

- 30.7.2 Appropriate electrical protection shall be provided for all circuits, against over load, short circuit and earth fault current. All Diesel generator sets shall also be protected through provision of OEM supplied protection panels.
- 30.7.3 The contractor shall provide sufficient ELCBs (maintain sensitivity 30 mA) / RCCBs for all the equipments, electrical switchboards, distribution panels etc. to prevent electrical shocks to the workers. ELCB's test for measuring both values i.e. current and time through Digital instruments is mandatory.
- 30.7.4 All protection devices shall be capable of interrupting the circuit without damage to any equipments and circuits in case of any fault may occur.
- 30.7.5 Rating of fuses and circuit breakers used for the protection of circuits should be coordinate with equipment power ratings.
- 30.7.6 Protection against lightning shall be ensured through lightening arrester for equipments kept in open at sites.

30.8 Cables:

- 30.8.1 Cables shall be selected after full consideration of the condition to which they shall be exposed and the duties for which they are required. Supply cable up to 3.3 kV shall be in accordance with BS 6346.
- 30.8.2 For supplies to mobile or transportable equipment where operating of the equipment subjects the cable to flexing, the cable shall conform to any of these codes BS 6007 / BS 6500 / BS 7375.
- 30.8.3 Flexible cords with a conductor cross sectional area smaller than 1.5 mm² shall not be used and insulated flexible cable shall conform to BS 6500 and BS 7375.
- 30.8.4 Where low voltage cables are to be used, reference shall be made to BS 7375. The following standards shall also be referred to particularly for underground cables BS 6346 and BS 6708
- 30.8.5 Cables buried directly in the ground shall be of a type incorporating armour or metal sheath or both. Such cables shall be marked by cable covers or a suitable marking tape and be buried at a sufficient depth to avoid their being damaged by any disturbance of the ground. Cable routes shall be marked on the plans kept in the site electrical register.

- 30.8.6 Cabling passing under the walk way and across way for transport and mobile equipment shall be laid in ducts at a minimum depth of 0.6 meters.
- 30.8.7 Cables that need to cross open areas, or where span of 3m or more are involved, a catenary wire on poles or other supports shall be provided for convenient means of suspension. Minimum height shall be 6 m above ground.
- 30.8.8 Cables carrying a voltage to earth in excess of 65V other than supply for welding process shall have metal armour or sheath, which has been effectively earthed and monitored by the contractor. In case of flexible and trailing cables such earthed metal sheath and/or armour should be in addition to the earth core in the cable and shall not be used as the protective conductor.
- 30.8.9 Armoured cables having an over-sheath of polyvinyl chloride (PVC) or an oil resisting and flame retardant compound shall be used whenever there is a risk of mechanical damage occurring.
- 30.8.10 Electrical cable of Five Core shall be used in all three phase equipments.

30.9 Plugs, socket-outlets and couplers:

- 30.9.1 The contractor shall ensure plugs, socket-outlets, and couplers available in the construction site as “splash proof” type. The minimum degree of Ingress Protection should be of IP44 and IP 65 (in tunnels and in continuous exposure water areas) in accordance with BS EN 60529.
- 30.9.2 Only plugs and fittings of the weatherproof type shall be used and they should be colour coded in accordance with the Internationally recognised standards for example as detailed as follows:
- (a) 110 volts : Yellow.
 - (b) 240 volts : Blue.
 - (c) 415 volts : Red.

30.10 Connections

- 30.10.1 Every joint and connection in a system shall be mechanically and electrically suitable for use to prevent danger. Proper cable connectors as per national/international standards shall only be used to connect cables.

30.10.2 No loose connections or tapped joints shall be allowed any where in the work site, office area, stores and other areas. Penalty as per relevant clause shall be put in case of observation of any tapped joints.

30.11 Portable and hand-held equipments:

30.11.1 The contractor shall ensure the use of double insulated or all-insulated portable electrical hand equipment.

30.12 Other equipments:

30.12.1 All equipment shall have the provision for major switch/auto emergency cut-off switch in the equipment itself.

30.12.2 All non-current carrying metal parts of electrical equipment shall be earthed through insulated cable.

30.12.3 Isolate exposed high-voltage (over 415 Volts) equipment, such as transformer banks, open switches, and similar equipment with exposed energized parts and prevent unauthorised access.

30.12.4 Approved perimeter markings shall be used to isolate restricted areas from designated work areas and entryways and shall be erected before work begins and maintained for entire duration of work. Approved perimeter marking shall be installed with either red barrier tape printed with the words "DANGER—HIGH VOLTAGE" or a barrier of yellow or orange synthetic rope, approximately 1 to 1.5 meter above the floor or work surface.

30.12.5 All gantry tracks shall be suitably earth at multiple locations at regular intervals.

30.12.6 All temporary metal structures like barricade boards, temporary metal containers/shed etc. shall be adequately earthed through suitable means.

30.12.7 All the earth pits shall be properly numbered alongwith display of resistance value and inspection records of the same shall be maintained.

30.13 Work on or near live conductors

30.13.1 No person shall be engaged in any work activity on or so near any live conductor (other than one suitably covered with insulating material so as to prevent danger) that danger may arise unless-

- a) it is unreasonable in all the circumstances for it to be dead; and
- b) it is reasonable in all the circumstances for him to be at work on or near it while it is live; and
- c) suitable precautions (including where necessary the provision of suitable protective equipment) are taken to prevent injury.

30.13.2 Whenever piling work is undertaken manually through tripod in the influence zone of live OHE, method statement shall be prepared, submitted and got approved before start of work.

30.14 Inspection and Maintenance

30.14.1 All electrical equipment should be permanently numbered and a record kept of the date of issue, date of last inspection and recommended inspection period.

30.14.2 Fixed installations shall be inspected at least at three monthly intervals; routine maintenance being carried out in accordance with equipment manufactures recommendations.

30.14.3 All Electrical panels/DG panels/ Distribution boxes etc. shall be provided with rubbers mats.

30.14.4 Eye wash facility shall be provided at battery charging room/area.

31.0 Lighting:

31.1 The contractor shall provide sufficient site lighting, of the right type and at the right place for it to be properly effective. Lighting ought not to introduce the risk of electric shock. Therefore, 230V supplies should be used for those fittings, which are robustly installed, and well out of reach e.g. flood lighting or high-pressure discharge lamps

31.2 Selection of Luminaries:

31.2.1. Area lighting in stations, tunnels, viaducts including all locations of sites as well as casting yard and batching plant shall be provided with suitable luminaries except halogen lamp.

31.2.2. Flood/fog lighting of suitable luminaries as per requirement during conditions like winter season and traffic diversion arrangement, etc. shall be arranged.

31.3 The contractor shall ensure that luminaries should always be placed so that no person is required to work in their own shadow and so that the local light for one person is not a source of glare for the others. Strongly made clamps should be available for attaching luminaries to poles and other convenient supports.

31.4 Luminaries should be robust, resistant to corrosion and rain proof especially at the point of the cable entry.

31.5 The correct type of lamp for each luminaries should always be used and when lamps need to be replaced if shall be in accordance with the supply voltage.

- 31.6 Lamp holders not fitted with a lamp should be capped off.
- 31.7 The contractor shall take every effort to illuminate the work site as per the Employer's requirement illustrated in **Appendix No. 17**.
- 31.8 Provision of Emergency light at under craft and other station areas having adequate illumination level for the access/egress during emergency.
- 31.9 The general lighting of the station/tunnel/viaduct area shall be the responsibility of the main Civil contract. However, task Lighting shall be the responsibilities of the respective system/track/PEB/piping work contract.

32.0 Hand Tools and Power Tools

32.1 General

- 32.1.1 The contractor is wholly responsible for the safe condition of tools and equipment used by his employees and that of his sub-contractors.
- 32.1.2 Use of short / damaged hand tools shall be avoided and the contractor shall ensure all his hand tools used at his worksite are safe to work with or stored and shall also train his employees (including his sub-contractors) for proper use thereby.
- 32.1.3 All hand tools and power tools shall be duly inspected before use for safe operation.
- 32.1.4 All hand tools and power tools shall have sufficient grip and the design specification on par with national/international standards on anthropometrics.
- 32.1.5 The contractor shall ensure the use of double insulated or all-insulated portable electrical hand equipment
- 32.1.6 In case of repeated violation and non-conformances observed at site in respect of insulation condition as well as inbuilt safety provisions, contractor shall be prohibited from using wires hand tools and shall be directed to use cordless tools only.

32.2 Hand tools

- 32.2.1 Hand tools shall include saws, chisels, axes and hatches, hammers, hand planes, screw drivers, crow bars, nail pullers etc.
- 32.2.2 The contractor shall ensure that,

- i) For crosscutting of hardwood, saws with larger teeth points (no. of points per inch) shall be preferred to avoid the saw jumping out of the job.
- ii) Mushroom headed chisels shall not be used in the worksite where the fragments of the head may cause injury.
- iii) Unless hatchet has a striking face, it shall be used as a hammer.
- iv) Only knives of retractable blades shall be used in the worksite.
- v) No screwdrivers shall be used for scraping, chiselling or punching holes.
- vi) A pilot hole shall always be driven before driving a screw.
- vii) Wherever necessary, usage of proper PPEs shall be used by his employees.

32.3 Power tools

32.3.1 Power tools include drills, planes, routers, saws, jackhammers, grinders, sprayers, chipping hammers, air nozzles and drills.

32.3.2 The contractor shall ensure that

- i) Electric tools are properly grounded or / and double insulated.
- ii) RCCBs shall be used with all portable electric tool operated especially outdoors or in wet condition.
- iii) Before making any adjustments or changing attachments, his workers shall disconnect the tool from the power source.
- iv) When operating in confined spaces or for prolonged periods, hearing protection shall be required. The same shall also apply to working with equipments, which gives out more noise as mentioned in this contract document.
- v) Tool is held firmly and the material is properly secured before turning on the tool.
- vi) All drills shall have suitable attachments respective of the operations and powerful for ease of operation.
- vii) When any work / operation need to be performed repeatedly or continuously, tools specifically designed for that work shall be used. The same is applicable to detachable tool bit also.
- viii) Size of the drill shall be determined by the maximum opening of the chuck n case of drill bit.
- ix) Attachments such as speed reducing screwdrivers and buffers shall be provided to prevent fatigue and undue muscle strain to his workers.
- x) Stock should be clamped or otherwise secured firmly to prevent it from moving.

- xi) Workers shall never stand on the top of the ladder to drill holes in walls / ceilings, which can be hazardous, instead standing on the fourth or fifth rung shall be recommended.
 - xii) Electric panels and DGs shall not be operated with loose clothing or long scarf or open jacket.
 - xiii) Safety guards used on right angle head or vertical portable grinders must cover a minimum of 180° of the wheel and the spindle / wheel specifications shall be checked.
 - xiv) All power tools / hand tools shall have guards at their nip points.
 - xv) Low profile safety chain shall be used in case of wood working machines and the saw shall run at high rpm when cutting and also correct chain tension shall be ensured to avoid “kickback”.
 - xvi) Leather aprons and gloves shall be used as an additional personal protection auxiliary to withstand kickback.
 - xvii) Push sticks shall be provided and properly used to hold the job down on the table while the heels moves the stock forward and thus preventing kickbacks.
 - xviii) Air pressure is set at a suitable level for air actuated tool or equipment being used. Before changing or adjusting pneumatic tools, air pressure shall be turned off.
 - xix) Only trained employees shall use explosive actuated tools and the tool shall also be unloaded when not in use.
 - xx) Usage of such explosive actuated tools shall be avoided in case of places where explosive/flammable vapours or gases may be present.
 - xxi) Explosive actuated tools and their explosives shall be stored separately and be taken out and loaded only before the time of immediate use.
 - xxii) Misfired cartridges of explosive actuated tools must be placed in a container of water and be removed safely from the project.
 - xxiii) No worker shall point any power operated / hand tool to any other person especially during loading / unloading.
- 32.4 All hand tools shall be securely tie up or kept in such a way that fall of any tools shall not occurred especially while working at height.

33.0 Welding, Gouging and Cutting

- 33.1 Gas cylinders in use shall be kept upright on a custom-built stand or trolley fitted with a bracket to accommodate the hoses and equipment or otherwise secured. The metal

- cap shall be kept in place at all times to protect the valve when the cylinder is not connected for use.
- 33.2 Hose clamp or clip shall be used to connect hoses firmly in both sides of cylinders and torches.
- 33.3 All gas cylinders shall be fixed with pressure regulator and dial gauges
- 33.4 Non-return valve and Flashback arrester shall be fixed at both end of cylinder and torch.
- 33.5 Domestic LPG cylinders shall not be used for Gas welding and Cutting purpose.
- 33.6 DCP or CO₂ type Fire Extinguisher not less than 5 kg shall be fixed at or near to welding process zone in an easily accessible location. Fire Extinguisher should confirm to IS 2190: 1992.
- 33.7 Use firewatchers if there is a possibility of ignition unobserved by the operator (e.g. on the other side of bulkheads).
- 33.8 Oxygen cylinders and flammable gas cylinders shall be stored separately, at least 6.6 meters (20 feet) apart or separated by a fire proof, 1.6 meters (5 feet) high partition. Flammable substances shall not be stored within 50 feet of cylinder storage areas. All cylinders shall be stacked in upright positions
- 33.9 Usage of three phase welding machines shall be preferable instead of single phase welding machine.
- 33.10 Transformer used for electrical arc welding shall be fixed with Ammeter and Voltmeter and also fixed with separate main power switch.
- 33.11 Welding grounds and returns should be securely attached to the work by cable lugs, by clamps in the case of stranded conductors, or by bolts for strip conductors. The ground cable will not be attached to equipment or existing installations or apparatus.
- 33.12 Use a low voltage open circuit relay device if welding with alternating current in constricted or damp places.
- 33.13 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.

- 33.14 Avoid being in contact with water or wet floors when welding. Use duckboards or rubber protection.
- 33.15 All electrical installations shall meet the IS: 5571: 1997 and NFPA 70 for gas cylinder storage area and other hazardous areas.
- 33.16 The current for Electric arc welding shall not exceed 300 A on a hand welding operation.
- 33.17 All control levers of the welding machine shall be insulated. Line and system earthing shall be provided in welding machines.
- 33.18 Machines shall always be maintained in working condition.

34.0 Dangerous and harmful environment

As per BOCWR Rule 40,

- i) When internal combustion engines are to be used into a confined space or excavation or tunnel or any other workplace where neither natural or artificial ventilation system is inadequate to keep carbon monoxide below 50ppm, exposure of building workers shall be avoided unless suitable measures are taken and provided by the contractor.
- ii) No worker shall be allowed into any confined space or tank or trench or excavation wherein there is given off any dust, fumes / vapours or other impurities which is likely to be injurious or offensive, explosive or poisonous or noxious or gaseous material or other harmful articles unless steps are carried out by the contractor and certified by the responsible person to be safe.

35.0 Fire prevention, protection and fighting system

- 35.1 The contractor shall ensure that construction site is provided with fire point comprising at least two sand buckets and two portable fire extinguisher to extinguish any probable fire at construction site. An adequate water supply is provided at ample pressure as per national standard shall also be maintained.
- 35.2 Recharging of fire extinguishers and their proper maintenance should be ensured and as a minimum should meet Indian National Standards and maintained in **Sample Form (SF – 19)**

- 35.3 All drivers of vehicles, foreman, supervisors and managers shall be trained on operating the fire extinguishers and fire fighting equipment.
- 35.4 The contractor shall also give consideration to the provision of adequate fire provision of Fire Service compatible hose connections and emergency lighting
- 35.5 All lifting appliances/construction machines driver cabin should be provided with a suitable portable fire extinguisher.
- 35.6 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 metres from any construction work or any other combustible material.
- 35.7 Every fire, including those extinguished by contractor personnel, shall be reported to the Employer representatives.
- 35.8 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 and as a part of the programme, the Telephone Number of the local fire brigade should be prominently displayed near each telephone on site.
- 35.9 Portable fire extinguisher shall also be kept near any hot work or with every gas cutting/welding machines.
- 35.10 Fire retardant blanket shall be provided over any escalator or flammable material before conducting any hot work over or near the area.

36.0 Corrosive substances

- 36.1 As per BOCWR Rule 44, corrosive substances including alkalis and acids shall be stored and used by a person dealing with such substances at a building / construction site in a manner that it does not endanger the building worker and suitable PPE shall be provided by the contractor to the worker during such handling and work. In case of spillage of such substances on building worker, the contractor shall take immediate remedial measures.

37.0 Demolition

- 37.1 The Contractor shall ensure that

- i) all demolition works be carried out in a controlled manner under the management of experienced and competent supervision.
- ii) the concerned department of the Government or local authority be informed and permission obtained wherever required. Media shall also be informed regarding this concern.
- iii) all glass or similar materials or articles in exterior openings are removed before commencing any demolition work and all water, steam, electric, gas and other similar supply lines are put-off and such lines so located or capped with substantial coverings so as to protect it from damage and to afford safety to the building workers and public..
- iv) examine the walls of all structures adjacent to the structure to be demolished to determine thickness, method of support to such adjacent structures
- v) no demolishing work be performed if the adjacent structure seems to be unsafe unless and until remedial measures like sheet piling, shoring, bracing or similar means be ensured for safety and stability for adjacent structure from collapsing.
- vi) debris / bricks and other materials or articles shall be removed by means of-
 - a) chutes
 - b) buckets or hoists
 - c) through openings through floors or
 - d) any other safe means
- vii) No person other than building workers or other persons essential to the operation of demolition work shall be permitted to enter a zone of demolition and the area be provided with substantial barricades for cordoning of sufficient area as per Risk Assessment for protection against falling objects.
- viii) Barricades and warnings signs are erected along every side throughout the length and breadth of the building or work to be demolished to prevent unauthorised entry. Warning signs are displayed or erected at conspicuous places of work.
- ix) Sequence of Demolition shall be followed and stability of remaining structure after stage wise demolishing shall be vetted by the competent site person.
- x) No wall, or other part of the structure is left unguarded or in such condition that it may fall, collapse or weaken due to wind pressure or vibration.
- xi) Safe working platform shall be arranged for workers engaged in demolition work. Safe access or egress shall be arranged at all times in the course of demolition.

- xii) Material shall not be thrown or dropped from the building.
- xiii) All material shall be stored or kept in such a way as it may not endanger the site personnel or not block any access, passageways etc. and suitable barricading shall be ensured to prevent materials from sliding or rebounding in to any space used by workers.
- xiv) Appropriate PPE's shall be provided to the workers engaged in Demolition work based upon nature of job and risk assessment like protection against noise, dust, vibration, falling objects etc.
- xv) Use of Hydraulic Pile Head cutting machines to cut and remove pile head is desirable.

38.0 Excavation and Tunnelling:

38.1 Excavation

38.1.1 The contractor shall ensure

- i) Where any construction building worker engaged in excavation is exposed to hazard of falling or sliding material or article from any bank or side of such excavation which is more than one 1.5 m above his footing, such worker is protected by adequate piling and bracing against such bank or side. When stability of any structure adjoining workplace or other area to be excavated is under doubt/danger, measures like Underpinning, piling, shoring or other means to support such structure shall be arranged.
- ii) Undercutting during excavation shall be avoided. Wherever it is inescapable and banks of an excavation are undercut, adequate shoring is provided to support the material or article overhanging such bank.
- iii) Excavated material is not stored at least 0.65 m from the edge of an open excavation or trench and banks of such excavation or trench are stripped of loose rocks and the banks of such excavation or trench are stripped of loose rocks and other materials which may slide, roll or fall upon a construction building worker working below such bank.
- iv) Ladders with handrail and staircases or ramps are provided, as the case may be, for safe access to and egress from excavation where, the depth of such

excavation exceeds 1.5 m and such ladders, staircases or ramps comply with the IS 3696 Part 1&2 and other relevant national standards.

- v) Trench and excavation is protected against falling of a person by suitable measures if the depth of such trench or excavation exceeds 1.5 m and such protection is an improved protection in accordance with the design and drawing of a professional engineer, where such depth exceeds 4m.
- vi) Excavation and its vicinity shall be checked after every rain, storm or other occurrences carrying hazards and adequate protection against slides and cave-in shall be adopted.
- vii) Shores and braces are of adequate dimensions and are so placed as to be effective for their intended purposes. Earth supported shores or braces bear against a footing of sufficient area and stability to prevent the shifting of such shores or bracing.
- viii) Identification of utilities and their diversion if requires shall be carried out prior to start of excavation. For safety of utility as well as personnel, a trail trench shall be excavated manually only after clearance from competent Electrical personnel in respect of Electrical cables subsequent to testing by a cable detector.

38.2 Tunnelling

- 38.2.1 The contractor shall inform in writing to the Director General within 30 days, prior to the commencement of any tunnelling work.
- 38.2.2 The contractor shall appoint a responsible person for safe operation for tunnelling work as per Rule 121 & 125 of BOCWR.
- 38.2.3 The contractor shall ensure
 - i) Every compressed air system in a tunnel is provided with emergency power supply for maintained continued supply of compressed air as per Rule 155 of BOCWR.
 - ii) Watertight bulkhead doors are installed at the entrance of a tunnel to prevent flooding.
 - iii) Reliable and effective means of communication such as telephone or walkie-talkie are provided and maintained for arranging better effective communication at an excavation or tunnelling work as per Rule 136 of BOCWR.

- iv) Inspection lamp used in under ground and confined space at an excavation or tunnelling work is operated at a voltage not exceeding 24V.
- v) Only flame proof equipment of appropriate type as per IS:5571:2000 and or other relevant national standard is used inside the tunnel.
- vi) petrol or LPG of any other flammable substances are not used, stored inside the tunnel except with prior approval from Employer, and also no oxy-acetylene gas is used in a compressed air environment in excavation or tunnelling.
- vii) adequate number of water outlets provided for fire fighting purpose, an audible fire alarm and adequate number and types of fire extinguishers are provided and maintained.
- viii) Temperature in any working chamber in an excavation or tunnelling work where workers employed does not exceed 29°C as per Rule 165 of BOCWR.
- ix) All working areas in a free air tunnel are provided with ventilation system as approved by the Director General and the fresh air supplied in such tunnel is not less than 6 m³/ min for each worker employed in tunnel as per Rule 153 of BOCWR.
- x) Only small capacity (2m³) Transit Mixer with rotating operator cabin shall be allowed in the underground stations/tunnels.
- xi) Provision of CCTV with at least one week storage backup and its serviceability at all times is mandatory. The CCTV camera shall be installed at each launching shaft to cover whole shaft as well as at Tunnel Boring Machine covering segment lifter.
- xii) Transformer for tunnel lighting shall be installed at launching shaft/surface level
- xiii) In case of simultaneous works of cross passage and tunnelling Provision of additional Manchester gates near cross passage location shall be ensured. This is in addition to the normal provision of Manchester gates during the Tunnelling.
- xiv) Standard audio or video signal warning facility shall be used in excavation or tunnelling work and are conspicuously located near entrance of workplace and in such other locations as may be necessary to bring such signals to notice of workers.
- xv) No internal combustion engine is used in excavation or tunnelling work unless the air entering the engine gets cleared before entry and no fumes or sparks are emitted by the engine.

- xvi) Continuous gas monitoring of the tunnel in TBM shall be carried out. Monitoring of the gas shall also be conducted with the help of hand held gas monitors in addition to the above. Such instrument shall be calibrated on regular basis.
- xvii) Tally board system shall be adopted where any person entering the launching shaft or tunnel shall register his/her details before entering in such places.
- xviii) Adequately wide and safe walkway at suitable height shall be provided inside the tunnel for safe movement of the workers. As far as possible such walkway shall be arranged at the opposite side of tunnel from utilities.
- xix) Provision of emergency lights in addition to general lights shall be made at regular interval throughout the length of the tunnel.
- xx) All life saving and fire fighting facilities shall be arranged in accordance with BS 6164 latest revision..
- xxi) Removal of temporary rings shall be carried out in accordance with approved MS.

38.3 Warning signs and notices:

38.3.1 The contractor shall ensure that

- i) suitable warning signs or notices, required for the safety of building workers carrying out the work of an excavation or tunnelling, shall be displayed or erected at conspicuous places in Hindi and in a language understood by majority of such building workers at such building such excavation or tunnelling work
- ii) such warning signs and notices with regard to compressed air working shall include
 - a) The danger involved in such compressed air work.
 - b) fire and explosion hazard.
 - c) The emergency procedures for rescue from such danger or hazards.
- iii) Warning signage's for excavation or pits in the construction zone shall be prominently displayed.

39.0 Work Permit System

39.1 The Contractor shall develop a Work Permit system, which is a formal written system used to control certain types of work that are potentially hazardous. A work permit is a document, which specifies the work to be done, and the precautions to be taken. Work Permits 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.

39.2 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:

- i) Entry into confined spaces including high pressure area
- ii) Work in close proximity to overhead power lines and telecommunication cables.
- iii) Hot work
- iv) To dig—where underground services may be located.
- v) Work with heavy moving machinery.
- vi) Working on electrical equipment
- vii) Work with radioactive isotopes/explosives.
- viii) Heavy lifting operations and lifting operations closer to live power line
- ix) Tandem Lifting
- x) Control Blasting

The sample forms for different types of work permit to be adopted as per **Sample Form (SF – 20, SF – 21, SF – 22, SF – 23 & SF 24)**

39.3 A Work Permit authorisation form shall be completed with the maximum duration period not exceeding 12 hours. Work shall not be carried out without issue of permit to work.

39.4 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.

39.5 All hot work above the material like escalator etc. belonging to system/track/PEB contracts shall be performed with Hot Work Permit jointly signed by Civil contractor and other contractor of which material belongs. The whole activity shall be performed under the supervision of the both contracts i.e civil contract and system/track/PEB contracts.

Fire Retardant covers is mandatory for all hot works above the materials like escalator etc.

39.6 Work permit shall be issued by the Station Manager/In-charge or by qualified & competent person as nominated by the station manager/in-charge. Permit shall be cancelled after the completion of the work activity or 12 hrs whichever is earlier. If any activity requires more than 12 hrs to complete, fresh permit shall be issued/signed.

39.7 Lifting permit shall only be signed by the nominated lifting engineer.

40.0 Traffic Management

40.1 The basic objective of the following guidelines is to lay down procedures to be adopted by contractor to ensure the safe and efficient movement of traffic and also to ensure the safety of workmen at construction sites.

40.2 All construction workers should be provided with high visibility jackets with reflective tapes as most of viaduct /tunnelling and station works or either above or under right-of-way. The conspicuity of workmen at all times shall be increased so as to protect from speeding vehicular traffic.

40.3 The guiding principles to be adopted for safety in construction zone are to

- i) Warn the road user clearly and sufficiently in advance.
- ii) Provide safe and clearly marked lanes for guiding road users.
- iii) Provide safe and clearly marked buffer and work zones
- iv) Provide adequate measures that control driver behaviour through construction zones.

40.4 Legal permission

40.4.1 In all cases, the contractor shall employ proper precautions. Wherever operations undertaken are likely to interfere with public traffic, specific traffic management plans shall be drawn up and implemented by the contractor in consultation with the approval of local police authorities and/or the concerned metropolitan/civil authorities as the case may be.

40.4.2 Such traffic management plans shall include provision for traffic diversion and selection of alternative routes for transport of equipment. If necessary, the contractor shall carry out road widening before commencement of works to accommodate the extra load

40.5 The primary traffic control devices used in work zones shall include signs, delineators, barricades, cones, pylons, pavement markings and flashing lights.

40.6 The road construction and maintenance signs which fall into the same three major categories as do other traffic signs, that are Regulatory Signs, Warning Signs and Direction (or guidelines) Signs shall only be used. The IRC: 67 (Code of Practice for Road Signs) provide a list of traffic signs. The size, colours and placement of sign shall confirm to IRC: 67.

40.7 Regulatory signs

40.7.1 Regulatory signs impose legal restriction on all traffic. It is essential, therefore, that they are used only after consulting the local police and traffic authorities.

40.8 Warning signs

40.8.1 Warning signs in the traffic control zone shall be utilised to warn the drivers of specific hazards that may be encountered.

40.8.2 The contractor shall place detour signage at strategic locations and install appropriate warning signs. In order to minimize disruption of access to residences and business, the contractor shall maintain at least one entrance to a property where multiple entrances exist.

40.8.3 A warning sign as given in **Appendix No. 18** shall be installed an at all secondary road which merges with the primary road where the construction work is in progress at sufficient distance before it merges with the primary road so as to alert the road users regarding the 'Metro Work in Progress'.

40.8.4 Materials hanging over / protruded from the chassis / body of any vehicle especially during material handling shall be indicated by red indicator (red light/flag) to indicate the caution to the road users.

40.9 Delineators

The delineators are the elements of a total system of traffic control and have two distinct purposes:

- i) To delineate and guide the driver to and along a safe path
- ii) As a taper to move traffic from one lane to another.

40.9.1 These channelizing devices such as cones, traffic cylinders, tapes and drums shall be placed in or adjacent to the roadway to control the flow of traffic. These should normally be retro-reflectors complying to IRC: 79 - Recommended Practice for Road Delineators.

40.9.2 Traffic cones and cylinders

40.9.2.1 Traffic cones of 500mm, 750mm and 1000mm high and 300mm to 500mm in diameter or in square shape at base and are often made of plastic or rubber and normally have retro-reflective red and white band shall be used wherever required along with provision of concrete crash barriers.

40.9.3 Drums

40.9.3.1 Drums about 800mm to 1000mm high and 300mm in diameter can be used either as channelizing or warning devices. These are highly visible, give the appearance of being formidable objects and therefore command the respect of drivers along with provision of concrete crash barriers.

40.10 Barricades

40.10.1 Full height fence, barriers, barricades etc. shall be erected around the site in order to prevent the working area from the risk of accidents due to speedy vehicular movement. Same the way barricades protect the road users from the danger due to construction equipment and other temporary structures. Verticality of the barricades shall be ensured at all time..

40.10.2 The structure dimension of the barricade, material and composition (metal as well as reinforcement fibre plastic), its colour scheme, NMRC logo and other details shall be in accordance with specifications laid down in tender document.

40.10.3 All barricades shall be erected as per the design requirements of the Employer, numbered, painted and maintained in good condition and also Barricade in-charge maintains a barricade register in site.

40.10.4 All barricades shall be conspicuously seen in the dark/night time by the road users so that no vehicle hits the barricade. Conspicuity shall be ensured by affixing retro reflective stripes of required size and shape at appropriate angle at the bottom and middle portion of the barricade at a minimum gap of 1000mm. In addition minimum one red light blinker or rope light should be placed at the top of each barricade.

40.11 The contractor shall ensure that all his construction vehicles plying on public roads (like dump trucks, trailers, etc.) have proper license to ply on public roads from the State Transport Authority. Drivers holding proper valid license as per the requirements of Motor Vehicles Act shall drive these vehicles

- 40.12 The contractor shall not undertake loading and unloading at carriageways obstructing the free flow of vehicular traffic and encroachment of existing roads by the contractor applying the excuse of work execution.
- 40.13 Provision of well illuminated height barriers shall be ensured before entrance of the station and other under construction metro structures above the live road to avoid unauthorised entrance of over dimension public vehicle which may endanger safety of structure. The height barrier shall be designed to withstand maximum anticipated impact. As built certificate after installation shall also be insured without fail.
- 40.14 The warning sign as per relevant IRC code of height barriers shall be displayed well in advance on the road to avoid entrance or the barrier may be installed at the junction of the road so that the incoming heavy vehicle can be diverted.
- 40.15 During transportation of precast concrete girders and specialised steel span, provision of a pilot vehicle and tailing vehicle with adequate no of traffic marshal shall be ensure while shifting from casting yard to erection site/stacking site. A mock/trail of the shifting shall be carried at least 24 prior to actual planned shift to envisage any difficulty and take remedial action.
- 40.16 Speed Governor to prevent over speeding in addition to speed breakers and speed limit, caution signage's within the site and GPS monitoring system for live tracking of vehicle, its movement and speed on public road is mandatory.
- 40.17 Specialised vehicles for working on Public road**
- 40.17.1 An "Impact Protection Vehicle (IPV)" shall be arranged to be used as tailing vehicle during movement of slow moving construction vehicles on Public road. This IPV shall be of sturdy design and shall also have provision of softening/dampening of impact by accidently striking vehicle. The IPV shall be fabricated on a Four Wheeled Light Commercial Vehicle (LCV) chassis of minimum payload capacity of one ton.
- 40.17.2 The contractor shall make arrangements of keeping toe away van / manpower to tow away any breakdown vehicle in the traffic flow without any delay.
- 40.18 Cleaning of roads**
- 40.18.1 The contractor shall ensure the cleanliness of roads and footpaths by deploying proper manpower for the same. The contractor shall have to ensure proper brooming, cleaning washing of roads and footpaths on all the time throughout the entire stretch till the currency of the contract including disposal of seepage.

41.0 Work to adjacent railways

41.1 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 railways shall be strictly observed

42.0 Batching Plant / Casting Yard

- i) The batching plant / casting yard shall be effectively planned for smooth flow of unloading and stacking the aggregates reinforcements and cement, batching plant, transport of concrete, casting the segment, stacking the segment and loading the segments to the trucks. As far as possible the conflicts should be avoided.
- ii) The batching plant / casting yard shall be barricaded and made as a compulsory PPE zone
- iii) If in case of material unloading area is not maintainable as PPE zone, the same shall be segregated properly and made as a non-PPE zone with appropriate barrications.
- iv) Electrical system shall also be suitably planned so that location of diesel generator, if any, location of DBs, routing of cables and positioning of area lighting poles/masts does not infringe on any other utility and pose danger.
- v) Drainage shall be effectively provided and waste water shall be disposed after proper treatment
- vi) Time office, canteen, drinking water, toilet and rest place shall be suitably located for the easy access to workers. All the facilities shall be properly cleaned and maintained during the entire period of operation.
- vii) Manual handling of cement shall be avoided to a larger extent. Whenever it is absolutely necessary the workmen shall be given full body protection, hand protection and respiratory protection as a basic measure of ensuring better health.

- viii) The PPEs provided to cement handling workmen shall conform to international standards.
- ix) Access roads and internal circulation roads shall be well laid and maintained properly at all time.

43.0 Personal Protective Equipments (PPEs)

43.1 The contractor shall provide required PPEs to workmen to protect against safety and / or health hazards. Primarily PPEs are required for the following protection

- i) Head Protection (Safety helmets)
- ii) Foot Protection (Safety footwear, Gumboot, etc)
- iii) Body Protection (High visibility clothing (waistcoat/jacket), Apron, Shoulder Pads etc)
- iv) Personal fall protection (Full body harness, Rope-grap fall arrester, etc)
- v) Eye Protection (Goggles, Welders glasses, etc)
- vi) Hand Protection (Gloves, Finger coats, etc)
- vii) Respiratory Protection. (Nose mask, SCBAs, Self rescuers for TBM workers etc)
- viii) Hearing Protection (Ear plugs, Ear muffs, etc)
- ix) Trouser restrainers' (For Track workers, Traction workers as well as Civil

contract workers deployed on Lanching Girders, Deck slab casting and Parapet erection etc.)

x) Applicable National/International standards along with Vendor/Make for each type of Personal Protective Equipments (PPE's) is attached as per **Appendix 20**.

The list is not exhaustive and more PPE's, Standards and Vendors may be included.

43.2 The PPEs and safety appliances provided by the contractor shall be of the standard as prescribed by Bureau of Indian Standards (BIS) or any international standard applicable

43.3 All construction workers should be provided with high visibility jackets with reflective tapes confirming to the requirement specified under BS EN 471: 1994 as most of viaduct /tunnelling and station works are executed either above or under right-of-way. The conspicuity of workmen at all times shall be increased so as to protect them from speeding vehicular traffic.

43.4 The contractor shall provide safety helmet, safety shoe and high visibility clothing for all employees including workmen, traffic marshal and other employees who are engaged for any work under this contract as per the following requirement.

All employees of the Contractor including workmen	Traffic marshals
<ul style="list-style-type: none"> i) Hard hat with company Logo and reflective tapes ii) Safety boots iii) Hi-visibility waistcoat covering upper body and meeting the following requirements as per BS EN 471:1994: <ul style="list-style-type: none"> a) Background in fluorescent orange-red in colour b) Two vertical green strips of 5cm wide on front side, covering the torso at least 500 cm² c) Two diagonal strips of 5 cm wide on back in an 'X' pattern covering at least 570cm² d) Horizontal strips not less than 5cm wide running around the bottom of the vertical strip in front and 'X' pattern at back. e) The bottom strip shall be at a distance of 5cm from the bottom of the vest. f) Strips must be retro reflective and fluorescent g) Waistcoat shall have a side adjustable fit and a side and front tear-away feature on vests made of nylon. 	<ul style="list-style-type: none"> i) Hard hat with company logo and reflective tape ii) Safety boots iii) Hi-visibility jacket covering upper body and meeting the following requirements as per BS EN 471:1994 : <ul style="list-style-type: none"> a) Background in fluorescent orange-red in colour b) Jackets with full-length sleeves with two bands of retro reflective material, which shall be placed at the same height on the garment as those of the torso. The upper band shall encircle the upper part of the sleeves between the elbow and the shoulder; the bottom of the lower band shall not be less than 5cm from the bottom of the sleeve. c) Two vertical green strips of 5cm wide on front side, covering the torso at least 500 cm² d) Two diagonal strips of 5 cm wide on back in an 'X' pattern covering at least 570cm² e) Horizontal strips not less than 5cm wide running around the bottom of the vertical strip in front and 'X' pattern at back. f) The bottom strip shall be at a distance of 5cm from the bottom of the vest. g) Strips must be retro reflective and fluorescent.

43.4.1 Colour coding for helmets

Safety Helmet Colour Code (Every Helmet should have the LOGO* affixed /painted)	Person to use
White	NMRC staffs
Grey	All Designers, Architect, Consultants, etc.
Violet	Main Contractors (Engineers / Supervisors)
Blue	All Sub-contractors (Engineers / Supervisors)
Red	Electrical Staff (Both Contractor and Sub-contractor)
Green	Safety Professionals (Both Contractor and Sub-contractor)
Orange	Security Guards / Traffic marshals
Yellow	All workmen
White (with "VISITOR" sticker)	Visitors including trainee/interns

Note: LOGO*

1. Logo shall have its outer dimension 2"X2" and shall be conspicuous
2. Logo shall be either painted or affixed
3. No words shall come either on Top / Bottom of Logo

Logo of the corresponding main contracting company for their employees and sub-contracting company for their employees shall only be used.

43.5 In addition to the above any other PPE required for any specific jobs like, welding and cutting, working at height, tunnelling etc shall also be provided to all workmen and also ensure that all workmen use the PPEs properly while on the job. To avoid entanglement of loose trousers, restrainers'/leg strap shall be used.

43.6 The contractor shall not pay any cash amount in lieu of PPE to the workers/sub-contractors and expect them to buy and use during work.

43.7 The contractor shall at all time maintain a minimum of 10% spare PPEs and safety appliances and properly record and show to the Employer during the inspections. Failing to do so shall invite appropriate penalty as per the provisions of the contract.

43.8 It is always the duty of the contractor to provide required PPEs for all visitors. Towards this required quantity of PPEs shall be kept always at the security post.

43.9 Warning to Safety offenders

- 43.9.1 A warnings cards shall be issued by nominated person of NMRC to Contractor staff or worker in case of serious violation.
- 43.9.2 Yellow card shall be issued on first safety offence/violation. A sticker to be pasted on his helmet and his identity card shall be stamped for two weeks during which he will be under observation. The warning cards shall be withdrawn by the same nominated person after satisfactory completion of two weeks of period.
- 43.9.3 Red card shall be issued in case of repeat safety violation carried out in two weeks by the same person or if he repeats safety violation more than three times in a year. Such Red card holders shall be withdrawn from site and attend a repeat Safety Training for min. three days before re-induction. The person shall be demobilised in case of second Red Card issue.

44.0 Visitors to site

- 44.1 No visitor is allowed to enter the site without the permission of the Employer. All authorised visitors should report at the site office. Contractor shall provide visitor's helmet (White helmet with visitor sticker) and other PPEs like Safety Shoe, reflective jacket, respiratory protection etc. as per requirement of the site.
- 44.2 All Visitors, Trainee/interns shall be accompanied at all times by a responsible member of the site personnel.
- 44.3 The contractor shall be fully responsible for all visitors' safety and health within the site.

45.0 General Issues including Interface

- 45.1 The Diesel Generator sets mobilised by system contractor shall complied to all the NMRC contract conditions w.r.t Air and Noise Pollution
- 45.2 Fire protection system and other safety systems shall be made operational, before the charging of ASS,
- 45.3 Third party testing and load test for all lifting hooks provided by main civil contractor for shifting and installation of electrical equipment to be made available at all the times.

PART – III: OCCUPATIONAL HEALTH AND WELFARE

46.0 Physical fitness of workmen

- 46.1 The contractor shall ensure that his employees/workmen subject themselves to such medical examination as required under the law or under the contract provision and keep a record of the same.
- 46.2 The contractor shall not permit any employee/workmen to enter the work area under the influence of alcohol or any drugs.

47.0 Medical Facilities

47.1 Medical Examination

- 47.1.1 The contractor shall arrange a medical examination of all his employees including his sub-contractor employees employed as drivers, operators of lifting appliances and transport equipment before employing, after illness or injury, if it appears that the illness or injury might have affected his fitness and, thereafter, once in every two years up to the age of 40 and once in a year, thereafter.
- i) The Contractor shall maintain the confidential records of medical examination or the physician authorized by the Employer.
 - ii) No building or other construction worker is charged for the medical examination and the cost of such examination is borne by contractor employing such building worker.
 - iii) The medical examination shall include: -
 - Full medical and occupational history.
 - a) Clinical examination with particular reference to
 - i) General Physique;
 - ii) Vision: - Total visual performance using standard orthorator like Titmus Vision Tester should be estimated and suitability for placement ascertained in accordance with the prescribed job standards.
 - iii) Hearing: - Persons with normal must be able to hear a forced whisper at twenty-four feet. Persons using hearing aids must be able to hear a warning shout under noisy working conditions.

- iv) Breathing: - Peak flow rate using standard peak flow meter and the average peak flow rate determined out of these readings of the test performed. The results recorded at pre-placement medical examination could be used as a standard for the same individual at the same altitude for reference during subsequent examination.
 - v) Upper Limbs: - Adequate arm function and grip
 - vi) Spine: - Adequately flexible for the job concerned.
 - vii) Lower Limbs: - Adequate leg and foot concerned.
 - viii) General: - Mental alertness and stability with good eye, hand and foot coordination.
- c) Any other tests which the examining doctor considers necessary

47.1.2. If the contractor fails to get the medical examination conducted as mentioned above, the employer will have the right to get the same conducted by through an agency with intimation to the contractor and deduct the cost and overhead charges.

47.2 Occupational Health Centre

47.2.1 The contractor shall ensure at a construction site an occupational health centre, mobile or static is provided and maintained in good order. Services and facilities as per the scale lay down in Schedule X of BOCWR. A construction medical officer appointed in an occupational health centre possess the qualification as laid down in Schedule XI of BOCWR.

47.3 Ambulance van and room

47.3.1 The contractor shall ensure at a construction site of a building or other construction work that an ambulance van and room are provided at such construction site or an arrangement is made with a nearby hospital for providing such ambulance van for transportation of serious cases of accident or sickness of workers to hospital promptly and such ambulance van and room are maintained in good repair and is equipped with standard facilities specified in Schedule IV and Schedule V of BOCWR.

47.4 First-aid boxes

47.4.1 The contractor shall ensure at a construction site one First-aid box for 100 workers provided and maintained for providing First-aid to the building workers. Every First-aid

box is distinctly marked “First-aid” and is equipped with the articles specified in Schedule III of BOCWR. Adequate no. of trained First aid person shall be available at each work site in each shift.

47.5 HIV/ AIDS prevention and control

- 47.5.1 The contractor shall adopt the Employer’s Policy on “HIV / AIDS Prevention and Control for Workmen Engaged by Contractors” and the copy of the policy is given in **Appendix No.: 19.**
- 47.5.2 The Employer will engage a professional agency for implementing the guidelines laid down in the policy and communicate to the contractor.
- 47.5.3 The Contractor shall extend necessary support to the appointed agency by deputing the workmen to attend the awareness creation programmes.
- 47.5.4 The contractor shall also extend necessary organizational support to the appointed agency for the effective implementation of the Employers’ workplace policy on HIV/AIDS for workmen of the Contractors.
- 47.5.5 As laid down in the policy the contractor shall identify peer educators (1 for every 100 workers) and refer them for professional training to the Employers’ appointed agency for the purpose.
- 47.5.6 The peer educators on completion of the training shall serve as the focal point for any information, education and awareness campaign among the workmen throughout the contract period.
- 47.5.7 The peer educators will be paid a monthly honorarium as fixed by the Employer for rendering his services in addition to his regular duty.
- 47.5.8 The total number of peer educators (1 for 100 workers) shall always be maintained by the contractor.
- 47.5.9 In case if these peer educators leave the contractor by creating vacancy, then the contractor at his own expense train the new replacement peer educator from the Employers’ appointed agency for the purpose.
- 47.5.10 It is suggested to the contractor that due care should be taken to select the peer educators from among the group of workmen so that they remain with the contractor throughout the contract period.
- 47.5.11 Use of tobacco and alcohol at NMRC construction site is prohibited. Contractor shall arrange resources for identification of violators through breathe analyser in sufficient no. etc.

47.6 Prevention of mosquito breeding

47.6.1 Measures shall be taken to prevent breeding at site. The measures to be taken shall include:

- i) 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.
- ii) Still waters shall be treated at least once every week with oil in order to prevent mosquito breeding.
- iii) 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.
- iv) Water storage tanks shall be provided.

47.6.2 Posters in both Hindi and English, which draw attention to the dangers of permitting mosquito breeding, shall be displayed prominently on the site.

47.6.3 The contractor at periodic interval shall arrange to prevent mosquito breeding by fumigation / spraying of insecticides. Most effective insecticides shall include SOLFAC WP 10 or Baytex, The Ideal Larvicide etc.

7.7 Alcohol and drugs

47.7.1 The contractor shall ensure at all times that no employee is working under the influence of alcohol / drugs which are punishable under Govt. regulations.

47.7.2 Smoking at public worksites by any employee is also prohibited as per Govt. regulations.

48.0 Noise

48.1 The Contractor shall consider noise as an environmental constraint in his design, planning and execution of the Works and provide demonstrable evidence of the same on Employer's request. The Contractor shall, at his own expense, take all appropriate measures to ensure that work carried out by the Contractor and by his sub-Contractors, whether on or off the Site, will not cause any unnecessary or excessive noise which may disturb the occupants of any nearby dwellings, schools, hospitals, or premises with similar sensitivity to noise.

48.1.1 Without prejudice to the generality of the foregoing, noise level reduction measures shall include the following:

- i) The Contractor shall ensure that all powered mechanical equipment used in the Works shall be effectively sound reduced using the most modern techniques available including but not limited to silencers and mufflers.
- ii) The Contractor shall construct acoustic screens or enclosures around any parts of the Works from which excessive noise may be generated.

48.1.2 The Contractor shall ensure that noise generated by work carried out by the Contractor and his sub-Contractors during daytime and night time shall not exceed the maximum permissible noise limits, whether continuously or intermittently. The same may be varied from time to time by and at the sole discretion of the Employer, In the event of a breach of this requirement, the Contractor shall immediately re-deploy or adjust the relevant equipment or take other appropriate measures to reduce the noise levels and thereafter maintain them at levels which do not exceed the said limits. Such measures may include without limitation the temporary or permanent cessation of use of certain items of equipment.

48.2 Control Requirements

48.2.1 Construction material should be operated and transported in such a manner as not to create unnecessary noise as outlined below:

- i) Perform Work within the procedures outlined herein and comply with applicable codes, regulations, and standards established by the Central and State Government and their agencies.
- ii) Keep noise to the lowest reasonably practicable level. Appropriate measures will be taken to ensure that construction works will not cause any unnecessary or excessive noise, which may disturb the occupants of any nearby dwellings, schools, hospitals, or premises with similar sensitivity to noise. Use equipment with effective noise-suppression devices and employ other noise control measures as to protect the public.
- iii) Schedule and conduct operations in a manner that will minimize, to the greatest extent feasible, the disturbance to the public in areas adjacent to the construction activities and to occupants of buildings in the vicinity of the construction activities.
- iv) The Contractor shall submit to the Employer a Noise Monitoring and Control Plan (NMCP) under contract specific Site Environmental Plan. It shall include full and

comprehensive details of all powered mechanical equipment, which he proposes to use during daytime and night time, and of his proposed working methods and noise level reduction measures. The NMCP shall include detailed noise calculations and vibration levels to demonstrate the anticipated noise generation and vibrations by the Contractor.

- v) The NMCP prepared by the Contractor shall guide the implementation of construction activity. The NMCP will be reviewed on a regular basis and updated as necessary to assure that current construction activities are addressed. It may appear as a regular agenda item in project coordination meetings, if noise is an issue at any location in the contract.

48.3 Occupational Noise

- i) Protection against the effects of occupational noise exposure should be provided when the sound levels exceeds the threshold values..
- ii) When employees are subjected to sound levels exceeding those listed in the Table, feasible administrative or engineering controls should be utilized. .
- iii) If such controls fail to reduce sound levels within the levels of the table, personal protective equipment shall be provided and used to reduce sound levels within the levels of the table.
- iv) 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 and sample computation..

48.4 Vibration Level

48.4.1 In locations where the alignment is close to historical / heritage structures, the contractor shall prepare a monitoring scheme prior to construction at such locations. This scheme for monitoring vibration level at such historical / heritage sites shall be submitted to Employer for his approval. This scheme shall include:

- i) Monitoring requirements for vibrations at regular intervals throughout the construction period.
- ii) Pre-construction structural integrity inspections of historic and sensitive structures in project activity.
- iii) Information dissemination about the construction method, probable effects, quality control measures and precautions to be used.

- iv) The vibration level limits at work sites adjacent to the alignment shall conform to the permitted values of peak p velocity.

49.0 Ventilation and illumination

49.1 Ventilation

49.1.1 The contractor shall ensure at a construction site of a building or other construction work that all working areas in a free tunnel are provided with ventilation system as approved by the DG/CIIBC and the fresh air supply in such tunnel is not less than 6m³/min for each building worker employed underground in such tunnel and the free air flow movement inside such tunnel is not less than 9m/min.

49.1.2 The oxygen level shall not be less than 19.5% in the working environment.

49.2 Illumination

49.2.1 The contractor shall take every effort to illuminate the work site as per the Employer's requirement illustrated in **Appendix no. 17**.

49.2.2 The contractor shall conduct a monthly illumination monitoring by lux meter for all the locations and the report shall be sent to the Employer within 7th of the next month and the same shall be reviewed during the monthly SHE committee meeting.

50.0 Radiation

50.1 The use of radioactive substances and radiating apparatus shall comply with the Govt. regulatory requirements and all subsidiary legislation

50.2 Operations involving ionising radiation shall only be carried out after having been reviewed without objection by the Employer's representative and shall be carried out in accordance with a method statement.

50.3 each area containing irradiated apparatus shall have warning notices and barriers, as required by the Regulations, conspicuously posted at or near the area.

50.4 Radioactive substances will be stored, used or disposed shall be strictly in accordance with the Govt. Enactments.

50.5 The contractor shall ensure that all site personnel and members of the public are not exposed to radiation.

51.0 Welfare measures for workers

51.1 Latrine and Urinal Accommodation

51.1.1 The contractor shall provide one latrine seat for every 20 workers up to 100 workers and thereafter one for every additional 50 workers. In addition one urinal accommodation shall be provided for every 100 workers.

51.1.2 When women are employed, separate latrine and urinals accommodation shall be provided on the same scale as mentioned above.

51.1.3 Latrine and urinals shall be provided as per Section 33 of BOCWA and maintained as per Rule 243 of BOCWR and shall also comply with the requirements of public health authorities

51.1.4 Moving sites

51.1.4.1 In case of works like track laying, the zone of work is constantly moving at elevated level or at underground level. In such cases mobile toilets with proper facility to drain the sullage shall be provided at reasonably accessible distance.

51.1.5 In case if the contractor fail to provide required number of urinals and latrines or fail to maintain it as per the requirements of Public Health laws, the Employer shall have the right to provide/maintain through renowned external agencies like "Sulabh" at the cost of the contractor.

51.2 Canteen:

51.2.1 In every workplace wherein not less than 100 workers are ordinarily employed the contractor shall provide an canteen conforming to Section 42 Contract Labour (R& A) Rules. The charges for food stuff shall be based on 'no profit no loss' basis. The price list of all items shall be conspicuously displayed in such canteen..

51.3 Serving of tea and snacks at the workplace:

51.3.1 As per Rule 246 of BOCWR, at a building or other construction work where a workplace is situated at a distance of more than 200 m from the canteen provided under Rule 244(1) of BOCWR, the contractor employing building works shall make suitable arrangement for serving tea and light refreshment to such building works at such place.

51.4 Drinking water

51.4.1 As per Section 32 of BOCWA the contractor shall make in every worksite, effective arrangements to provide sufficient supply of wholesome drinking water with minimum quantity of 5 litres per workman per day. Quality of the drinking water shall conform to the requirements of national standards on Public Health.

51.4.2 While locating these drinking water facility due care shall be taken so that these are easily accessible within a distance of 200m from the place of work for all workers at all location of work sites.

51.4.3 All such points shall be legible marked "Drinking Water" in a language understood by a majority of the workmen employed in such place and such point shall be situated within six metres of any washing places, urinals or latrines.

51.5 Contractor's Labour Camp

The Employer will not provide living accommodation for the use of the Contractor or any of his staff or labour employed on the Works. Living accommodation shall not be established on any land provided to the contractor by the Employer.

51.5.1 Provision of Labour Camp

The Contractor, shall, at his own expense, make adequate arrangements for the housing, supply of drinking water and provision of bathrooms, latrines and urinals, with adequate water supply, for his staff and workmen directly or through sub-contractors employed on the Works at the location authorised by Engineer. No labour camp shall be allowed at work site or any unauthorised place. The Contractor at his own cost shall maintain all campsites in a clean and sanitary condition. The Contractor shall obey all health and sanitary rules and regulations, and carry out at his cost all health and sanitary measures that may from time to time be prescribed by the Local/Medical Authorities and permit inspection of all health and

sanitary arrangements at all times by the Employer, Engineer and the staff of the local municipality or other authorities concerned. Should the Contractor fail to provide adequate health and sanitary arrangements these shall be provided by the Employer and the cost recovered from the Contractor. The Contractor shall at his own cost, provide First Aid and Medical facilities at the Labour Camp and at work sites on the advice of the Medical Authority in relation to the strength of the Contractor's staff and workmen, employed directly or through sub-contractors. The Contractor shall at his own cost, provide the following

Minimum requirements for fire precautions:

- Portable Fire Extinguishers.
- Manual Fire Alarms.
- Water Supply for use by the Fire Service.

The Contractor at his own cost shall provide necessary arrangements for keeping the camp area sufficiently lighted to avoid accidents to the workers. He should also ensure that electrical installations are done by Trained Electricians. These installations shall be maintained and daily maintenance records must be made available for inspection of the Engineer.

51.5.2 Camp Discipline

The Contractor shall take requisite precautions, and use his best endeavours to prevent any riotous or unlawful behaviour by or amongst his workmen, and others, employed directly or through sub-contractors. These precautions shall be for the preservation of the peace and protection of the inhabitants and security property in the neighbourhood of the Works. In the event of the Employer requiring the maintenance of a Special Police Force at or in the vicinity of the site, during the tenure of the work, the expenses hereof shall be borne by the Contractor and if paid by the Employer, shall be recoverable from the Contractor.

The sale of alcoholic drinks or other intoxicating drugs or beverages upon the work, in any labour camp, or in any of the buildings, encampments or tenements owned or occupied by, or within the control of, the Contractor or any of his employees directly or through sub-contractors employed on the work, shall be forbidden, and the Contractor shall exercise his influence and authority to secure strict compliance with this condition.

The Contractor shall also ensure that no labour or employees are permitted to work at the site in an intoxicated state or under the influence of drugs. The Contractor shall remove from his camp such labour and their families, as refuse protective inoculation and vaccination when called upon to do so by the Engineer on the advice of the Medical Authority. Should Cholera, Plague or any other infectious disease break out, the Contractor shall at his own cost burn the huts, bedding, clothes and other belongings of or used by the infected parties. The Contractor shall promptly erect new huts on healthy sites as required by the Employer, within the time specified by the Employer, failing which the work may be done by the Employer and the cost recovered from the Contractor.

51.5.3 Labour Accommodation

The Contractor shall provide living accommodation that is equal to or exceeds the minimum criteria established in the following sub-sections and also conforming to the provision to section 34 of BOCWA, needed to house his staff, workers employed directly or through sub-contractors. The buildings shall be constructed so as to have minimum life of not less than the length of the Contract.

- a. The roofs shall be watertight and laid with suitable non-flammable materials permissible for residential use under local regulations and for which the consent of the Engineer has been obtained.
- b. Each hut shall have suitable ventilation. All doors, windows, and ventilators shall be provided with security leaves and fasteners. Back to back units may be avoided.
- c. The minimum height of each unit shall be 2.10m and shall have separate cooking place.
- d. Suitable no. of common toilet/bath shall be provided.

51.5.4 Water Supply

The Contractor shall provide an adequate supply of water for the use of labourers in the Camp. The provision shall not be less than two gallons of pure and wholesome water per head per day for drinking purposes and three gallons of clean water per head per

day for bathing and washing purposes. Where piped water supply is available, supply shall be at stand posts and where the supply is from wells or river, tanks which be of metal or masonry shall be provided. The Contractor shall also at his expense make arrangements for the provision and laying of water pipe lines from the existing mains wherever available and shall pay for all the fees and charges thereof.

51.5.5 Drainage

The Contractor shall provide efficient arrangements for draining away sullage water so as to keep the camp neat and tidy. Surface water shall be drained away from paths and roads and shall not be allowed to accumulate into ditches or ponds where mosquitoes can breed.

51.5.6 Sanitation

The Contractor shall make arrangements for conservancy and sanitation in the labour camps according to the rules and regulations of the Local Public Health and Medical Authorities. The Contractor shall provide a sewage system that is adequate for the number of residents in the camp, and which meets the requirements of the Municipality Authorities.

51.6 Creches

51.6.1 In every workplace where in more than 50 female workers are ordinarily employed, there shall be provided and maintained a suitable room for use of children underage of 6 yrs, conforming to the provisions of Section 35 of BOCWA.

PART – IV: ENVIRONMENTAL MANAGEMENT

For Environment Management, the works have been divided into following five categories:

- **Category A:** All Civil contracts of value more than 500 crore rupees.
- **Category B:** All Civil Contracts between 100 crore rupees and 500 crore rupees.
- **Category C:** All Civil Contracts of value less than 100 crore rupees.
- **Category D: Track Contracts** of Supply, Installation, Testing and Commissioning of Ballast Less Track, Supply of Rails, Fastening System, Turnouts, Scissor Crossovers, etc.
- **Category E:** For Pre-Engineered Building (PEB) contract and the following E&M and Systems Contracts:
 - Design, Manufacture, Supply, Installation, Testing and Commissioning of Platform Gates
 - Supply, installation, testing and commissioning of Automatic Fare Collection (AFC) system
 - Supply, Installation, Testing and Commissioning of 25 kV Overhead Equipment (OHE), 33 kV Auxiliary Power Supply and SCADA Systems,
 - Design, Manufacturing, Supply, Installation, Testing & Commissioning of automatic moving walkways
 - Design, Detailed Engineering, Supply, Installation, Testing, Commissioning of Auxiliary Sub Station cum Traction Sub Station & HT cabling work of Receiving Sub Station,
 - Design, Detail Engineering, Supply, Installation, Testing and Commissioning of HVAC System
 - Any other E&M or S&T or System contracts not mentioned above.

The decision of the Employer will be final in case there is any dispute regarding placement of a tender in a particular category.

52.0 GENERAL ENVIRONMENTAL REQUIREMENTS

Category of contracts i.e. Category A to E are defined in the Part-I of this document. The general requirements on Environment for all categories of contract are given from Clause 52.1 to 52.16. All clauses from 52.1 to 52.16 are applicable to Category A contracts. However, certain clauses from 52.1 to 52.16 are not applicable to category B, C, D and E contracts. Category wise applicability of each clauses are mentioned as note under each clause. Wherever, applicability is not mentioned it means that clause is applicable for that category of contract. Applicability of requirements mentioned in Part-I of this document w.r.t Environment are summarized in a matrix format and given in Appendix No. 24.

52.1 TOPSOIL CONSERVATION

- 52.1.1 The contractor shall ensure that adequate measures are taken for the prevention of erosion of the topsoil during the construction phase.
- 52.1.2 The contractor should maintain the record of topsoil quantity excavated from construction from all locations where vegetation existed prior to construction. The record shall include photographic evidence of the topsoil quantity excavated.
- 52.1.3 Top soil should be stripped to a depth of 20 cm from the areas to be disturbed, it should be stockpiled to a maximum height of 40 cm in designated areas, covered or stabilized with temporary seeding for erosion prevention and should be reapplied to site during plantation of the proposed vegetation. Topsoil should be separated from subsoil, debris and stones larger than 50mm diameter. The stored topsoil may be used as finished grade for planting areas.

NOTE: Category A Contracts: All clauses are applicable.

Category B & C contracts: All Clauses under 52.1 are applicable except clause 52.1.2 and the requirement is applicable only when construction is being carried out on land with previous vegetation.

Category D & E contracts: Clause 52.1 not applicable.

52.2 FELLING OF TREES & TREE PRESERVATION

- 52.2.1 The contractor shall identify the number and type of trees that are required to be felled as a result of construction of works and facilities related to Noida Metro Project and inform the Employer.
- 52.2.2 All trees and shrubbery, which are not specifically required to be cleared or removed for construction purposes, shall be preserved and shall be protected from any damage that may be caused by Contractor's construction operations and equipment. The contractor shall not fell, remove or dispose of any tree or forest produce in any land handed over to him for the construction of works and facilities related to Noida Metro except with the previous permission obtained from the Forest Department.
- 52.2.3 The Employer shall arrange permission from the forest department for trees to be felled or transplanted. The Employer will permit the removal of trees or shrubs only after prior approval.
- 52.2.4 The contractor shall ensure that no tree, existing or otherwise, shall be harmed and damage to roots during trenching, placing backfill, driving or parking heavy equipment, dumping of trash, oil, paint, and other materials detrimental to plant health.
- 52.2.5 The contractor shall avoid cut and fill in the root zones.
- 52.2.6 Special care shall be exercised where trees or shrubs are exposed to injuries by construction equipment, blasting, excavating, dumping, chemical damage or other operation and the Contractor shall adequately protect such trees by use of protective barriers or other methods approved by the Employer. Trees shall not be used for anchorage.

52.2.7 Trees should be protected around 1m periphery by providing tree guard and no construction or storage of materials shall be carried out within its premise.

NOTE: Category A, B & C Contracts: All clauses are applicable.

Category D & E contracts: Clause 52.2 not applicable.

52.3 FLY ASH

52.3.1 The contractor shall use fly ash as a percentage substitution of cement, in concrete for certain structures and works as prescribed in the latest MoEF&CC fly ash notification dated September 1999 and its subsequent amendments. The notification makes it mandatory for use of fly ash-based products in construction activities located within 300Km from coal or lignite based thermal power plants.

52.3.2 As per the notification, only fly ash based products shall be used for construction such as cement or concrete, fly ash bricks or blocks or tiles or clay fly ash bricks, block or tiles or cement fly ash bricks or bricks or blocks or similar products or a combination or aggregate of them. The contractor shall provide details of usage of such products to employer. The reporting details of fly ash consumption shall be as per **Sample Form SF-14**.

52.3.2 In all such uses of Fly Ash, the contractor shall maintain a detailed record of usage of Fly Ash. The contractor shall also collect related details and provide to the Employer. The reporting details on consumption of Fly Ash shall be as per **Sample Form SF-14**.

NOTE: Category A, B and C Contracts: All clauses are applicable.

Category D and E contracts: Clause 52.3 not applicable.

52.4 CONTAINMENT OF AIR POLLUTION

52.4.1 At Construction Site

52.4.1.1 The Contractor shall erect barricades securely around all construction work sites during the entire phase of construction activity, to contain dust within the site area and also to reduce air turbulence caused by passing traffic. The specifications for barricades are found elsewhere in the tender document.

52.4.1.2 Barricades are to be installed on either side of the road or at the centre of the road median.

52.4.1.3 Barricades are also required at work sites around the periphery of which are located residential or commercial property.

52.4.1.4 The barricades shall be safely secured to the ground to prevent from toppling. There shall be no gap between bottom of barrier and ground/road. The barrier shall be placed at all times till there is likelihood of dust escaping from the site or material being stored at the site.

52.4.1.5 In case of construction work located near residential or commercial properties, the contractor shall erect barricade of suitable approved material around the entire

construction site of height not more than 10m or 1/3rd of building height whichever is less, having acoustic properties, apart from providing relief from dust. There should be no gap in the enclosure erected by the barrier except at entry and exit to or from site.

- 52.4.1.6 The barricading material if used as noise barrier shall conform to have following acoustic properties:

Table 52.1 Properties of Noise Barrier

Barrier type	Absorptive
Life span	At least 5 years
NRC	More than 0.75
Insertion Loss	10 dBA

- 52.4.1.7 The barrier material shall be light weight, weatherproof, fire resistant and easy to maintain. The supporting frames and mountings should also be light weight and easy to install.

- 52.4.1.8 Before the start of work, the Contractor shall provide wet automated wheel washing facility with two stage sedimentation tank at the exit of Batching Plant, Casting Yard, and Underground stations. It shall also be provided at off the road elevated stations. At other locations i.e. viaduct, on the road elevated stations etc. where there is space restrictions, the contractor shall adopt dry wheel cleaning mechanism with prior approval from employer. If work site contains multiple exits then wheel washing facility shall be provided for all these exits where vehicle carrying construction materials or trucks or vehicles or plant/machinery transit from construction site on to live public roads. The wheel wash shall be located as close to the exit gate, as possible. However, care to be taken to ensure that the surface from wheel wash to exit gate is either bitumen or concrete paved. The contractor shall ensure the wheel washing facility remains functional till the end of contract.

- 52.4.1.9 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 up to 10 minutes of wash time.

- 52.4.1.10 Wheel washing facility shall be provided with efficient drainage, incorporating silt traps to prevent any excessive build up of water. These facilities should include water re-circulation mechanism to minimise water consumption.

- 52.4.1.11 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. A representative drawing of wheel washing facility is attached as **Appendix No. 21**.

- 52.4.1.12 At each construction site including batching plant and casting yard, the Contractor shall provide storage facilities for dust generating materials which 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. Suitable sprinkling system shall be installed and operationalized in this area. The quality of water for sprinkling shall be the same as used for concrete batching.
- 52.4.1.13 The contractor shall not store any construction material/debris/soil outside barricaded area.
- 52.4.1.14 Soil, sand, aggregate, debris of any kind and all dust prone material that is stored at site will be fully covered with tarpaulin or hessian cloth in all respects with proper anchorage so that it does not disperse in the air in any form. Availability of tarpaulin cover shall be ensured at the time of fitness inspection of the vehicle and shall be checked with monthly inspection at the time of issuance of Green card for the vehicle.
- 52.4.1.15 The dust emissions from the construction site should be completely controlled and all precautions taken in that behalf.
- 52.4.1.16 The Contractor shall use nozzle based mist system at construction sites such as elevated station, underground station, launching shaft, depot, retrieval shaft, batching plant & casting yard as required to suppress dust. No. of mist gun shall be according to no. of sites.
- 52.4.1.17 Nozzle based mist system shall also be used during the delivery and handling of sand and aggregate and other similar materials, when dust is likely to be generated.
- 52.4.1.18 At sites where the sprinkling is to be carried out manually, sprinkling will be carried out at a frequency of at least thrice a day or as directed by engineer in charge. For dust suppression contractor shall use, STP treated water or RO reject or treated water from sedimentation tank. In no case shall fresh water only shall be used.
- 52.4.1.19 Stockpiles of sand and aggregate greater than 20m³, used for concrete manufacturing, shall be enclosed on three sides, with walls extending above the height of stockpile and two (2) meters beyond the front of the stockpile. The contractor shall provide sprinkler system in sand and aggregate storage area and the water for sprinkling shall be of the same quality as used for concrete batching.
- 52.4.1.20 Areas within the site such as casting yard and batching plant, where there is a regular movement of vehicles shall have an approved hard surface (PCC) that is kept clear of loose surface material.
- 52.4.1.21 Unless the Employer has given consent otherwise, the Contractor shall restrict all motorised vehicles on the site to a maximum speed of 10 kilo-meter per hour and vehicles shall move on designated path.
- 52.4.1.22 The contractor shall use wet-jet in grinding and stone cutting works with two stage sedimentation tank facility to recycle/re-use the water. The water from the final chamber of sedimentation tank shall be reused.
- 52.4.1.23 In the event recorded PM₁₀ level is 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.
- 52.4.1.24 Where the recorded baseline levels exceed the ambient air quality standards, then at such locations the baseline level shall be considered as limit level. Contractor shall

take all effective remedial measures to contain the levels to their limit level as a result of his activities.

52.4.1.25 If the measures to control air pollution are found to be ineffective, the employer may issue stop work order till the time remedial measures are found to be effective to the satisfaction of employer.

52.4.1.26 At the Batching plant the following additional conditions shall be complied with:

- a) The contractor shall not install Star Batcher Concrete Batching Plant for manufacturing/producing concrete
- b) Inside the batching plant, ground surface must be paved with Cement Concrete. The plant shall have proper drainage system with outlet connected to two stage sedimentation tank. No dust shall be allowed to deposit on road inside Batching plant.
- c) The contractor shall procure cement through bulker instead of conventional cement bags.
- d) Continuous dust/wind breaking barricades of height at least 6 meters around the batching plant shall be constructed of suitable material which will act as boundary wall.
- e) If the batching plant is located near the residential area then the boundary wall shall be acoustically treated to act as noise barrier also. In such event the property of boundary wall cum noise barrier will conform to specification given in para 52.4.1.6 above.
- f) The contractor shall provide sufficient number of openings in the cement godown/cement feeding area with industrial grade exhaust fans with ducting system. The ducts shall be connected to a container filled with water.
- g) The contractor shall cover the conveyor belt used for carrying aggregate.
- h) Nozzle based mist system shall be used during the delivery and handling of sand and aggregate and other similar materials, when dust is likely to be generated and to dampen all stored materials.
- i) The contractor shall provide and ensure dust masks (proper PPEs) to all workers/labour/staff working at batching plant.
- j) The Contractor shall undertake at all times the prevention of dust nuisance as a result of his activities.
- k) The Contractor shall frequently clean and water the concrete batching plant and crushing plant sites and ancillary areas to minimise any dust emission.
- l) The Contractor shall provide Beton Wash facility (concrete recycling/wash plant) of suitable capacity at casting yard and/ or batching plant to reclaim slurry water and aggregate from transit mixer wash out. The contractor shall ensure the facility remains functional till the end of contract. The Beton wash system should be fitted with sieve separators to separate coarse and fine aggregate. The washing facility shall be provided with three stage sedimentation chamber and efficient drainage system. The minimum size of 1st, 2nd and 3rd chamber shall be 4m x 3m, 4m x 2.5m and 4m x 2m respectively. Separate area shall be provided for drying slurry before its final disposal. The water and

aggregate from the Beton wash facility shall be reused. The use of slurry water in concrete batching can be explored.

- 52.4.1.27 Use of Generators is prohibited during the time when the Graded Response Action Plan (GRAP) is under implementation, which is from 15th October to 15th March every year. This duration of GRAP may be extended by the statutory authority for different months and duration also. The contractor is advised to arrange for grid supply before the start of work.
- 52.4.1.28 Minimum stack height of DG set shall be as given in Central Pollution Control Board (CPCB) Emission Regulations Part IV:COINDS/26/1986-87 and Emission Standards for Diesel Engines (Engine Rating more than 0.8 MW (800 KW) which were notified by the Environment (Protection) Third Amendment Rules 2002, vide G.S.R. 489 (E), dated 9th July, 2002 at serial no. 96, under the Environment (Protection) Act, 1986.
- 52.4.1.29 Consent for height of stacks of Diesel Engines with rating more than 800 KW shall be obtained by the Contractor from statutory Government agency. Where the calculated height of stack is obtrusive and does not blend with the neighbourhood, the contractor could provide either alternative source 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. The contractor shall take necessary provisions to ensure that DG stack emission does not impact any residential, hospital, school on down stream side. The contractor may have to carry out DG stack monitoring as per the Pollution Control Board's requirement.
- 52.4.1.30 Contractor's transport vehicles and other equipments shall conform to emission standards fixed by Statutory Agencies of Government of India or the State Government from time to time. The contractor shall carry out periodical checks and undertake remedial measure including replacement, if required so as to ply within permissible norms.
- 52.4.1.31 Contractor shall provide green net for dust control at construction sites i.e stations, viaduct, depot, staff quarter, hostel, batching plant, casting yard, at the top of barricade boards near residential/commercial and sensitive areas. These should be of sufficient height and firmly secured so as to prevent escape of dust to residential/commercial and industrial areas.
- 52.4.1.32 To avoid dust generation during drilling and grinding, it is preferred to use drilling machine, angle grinder and floor grinder connected to a vacuum cleaner. The dust collected in the vacuum cleaner should be disposed off without causing air pollution.
- 52.4.1.33 All Air Conditioner's shall conform the Ozone depleting substances (Regulation and Control) Rules, 2000.

NOTE: *Category A and B Contracts: All clauses are applicable.*

Category C contracts: All clauses under clause 52.4.1 are applicable except clauses 52.4.1.5, 52.4.1.6, 52.4.1.7, 52.4.1.8, 52.4.1.9, 52.4.1.10, 52.4.1.11, 52.4.1.12, 52.4.1.16, 52.4.1.17, 52.4.1.19, 52.4.1.20, 52.4.1.21, 52.4.1.22, 52.4.1.26, 52.4.1.28 and 52.4.1.29.

Category D contracts: All clauses under clause 52.4.1 are applicable except clauses 52.4.1.2, 52.4.1.3, 52.4.1.5, 52.4.1.6, 52.4.1.7, 52.4.1.8, 52.4.1.9, 52.4.1.10, 52.4.1.11, 52.4.1.12, 52.4.1.16, 52.4.1.17, 52.4.1.18, 52.4.1.19, 52.4.1.20, 52.4.1.22, 52.4.1.23, 52.4.1.24, 52.4.1.25, 52.4.1.27, 52.4.1.30, and 52.4.1.31. Additionally, the contractor shall provide water sprinkling at any time for dust suppression & shall continue dust control activities even during work stoppages.

Category E contracts: All clauses under clause 52.4.1 are applicable except clauses 52.4.1.2, 52.4.1.3, 52.4.1.5, 52.4.1.6, 52.4.1.7, 52.4.1.8, 52.4.1.9, 52.4.1.10, 52.4.1.11, 52.4.1.12, 52.4.1.14, 52.4.1.16, 52.4.1.17, 52.4.1.18, 52.4.1.19, 52.4.1.20, 52.4.1.21, 52.4.1.22, 52.4.1.23, 52.4.1.24, 52.4.1.25, 52.4.1.26, 52.4.1.27, 52.4.1.30, and 52.4.1.31. Additionally, the Contractor shall provide storage facilities for dust generating materials which 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 take precautions to minimize visible particulate matter from being deposited upon public roads as a direct result of his operations. In locations of Receiving Substation the contractor shall ensure that the wheels of transport vehicles are washed properly while exiting the site. For this, a simple wheel washing facility shall be provided and operated at the exit such that the road from wheel wash up to the exit on to public roads is metalled or tarred.

52.4.2 During Handling of excavated earth

- 52.4.2.1 Storage of Excavated earth should be such that it's maximum height shall be 0.5 m below the barricading height.
- 52.4.2.2 Excavated earth shall be covered with tarpaulin sheets which are firmly secured to the ground, as long as it is stored at site.
- 52.4.2.3 If the excavated material is to be stored for long duration, dust containment measures like growing grass should be adopted.

NOTE: Category A, B and C Contracts: All clauses are applicable.

Category D and E contracts: Clause 52.4.2 not applicable.

52.4.3 During Transport of Material/muck/soil/C&D Waste (Debris)

- 52.4.3.1 The Contractor shall take precautions to minimise visible particulate matter from being deposited upon public roadways as a direct result of his operations. Toe dust along the barricade shall be cleaned regularly at least once a day
- 52.4.3.2 The vehicle carrying construction materials and construction debris of any kind should be cleaned in all respect before it is permitted to ply on the road.
- 52.4.3.3 The contractor shall take precaution against spillage of concrete on road from transit mixer by providing collection bag at end point discharge chute
- 52.4.3.4 Any deposition of material/muck/soil on public streets due to construction should be promptly removed by manual sweeping, or by deploying electro – mechanical devices.
- 52.4.3.5 Trucks carrying construction material, excavated earth and debris shall be fully covered and protected so as to ensure that these materials do not get dispersed into the air or atmosphere, in any form whatsoever or fall off the vehicle. Such trucks

carrying construction material shall not be permitted to leave the site until this requirement is met.

NOTE: *Category A, B, C and D Contracts: All clauses are applicable.*

Category E contract: *Clause 52.4.3 not applicable*

52.4.4 At Dumping Sites

52.4.4.1 The dumping sites should be temporarily barricaded by the contractor or as per provisions in the Employer's Requirements on Construction. The contractor shall provide wheel cleaning mechanism at the exit gate of dumping site, as elaborated in **Appendix No. 21**.

52.4.4.2 The Contractor shall place excavated materials in the dumping/disposal areas designated in the drawings.

52.4.4.3 The Contractor shall place material in a manner that will minimise dust generation. Material shall be stabilised each day by watering or other acceptable dust suppression techniques.

52.4.4.4 The heights from which materials are dropped shall be the minimum practical height to limit fugitive dust generation.

52.4.4.5 The Contractor shall stockpile material in the Employer designated locations with suitable slopes. Access to the site shall be regulated for entry of men, material and machine.

52.4.4.6 The contractor should cover the surface with grass to prevent dust generation during summer months and erosion in rainy period.

52.4.4.7 The Contractor shall provide water sprinkling at any time that it is required for dust control use.

52.4.4.8 Sufficient equipment, water, and personnel shall be available at dumping sites at all time to minimise dust formation and to prevent nuisance.

52.4.4.9 Dust control activities shall continue even during work stoppages.

NOTE: *Category A and B Contracts: All clauses are applicable.*

Category C, D & E contracts: *Clause 52.4.4 not applicable.*

52.5 CONTAINMENT OF WATER POLLUTION AND CONSERVATION OF WATER

52.5.1 The Contractor shall provide digital water meters at all the bore wells, inlets and outlets of RO plants, dewatering outlets, municipal water delivery points and other suitable locations to record the accurate figures of water extraction and consumption for various purposes and submit the details as per **Sample Form SF-13**. The contractor shall obtain necessary permission for extracting ground water from relevant government agency.

- 52.5.2 At underground construction site and dumping sites, temporary drainage works shall be maintained, removed and reinstated as necessary and all other necessary precautions should be taken for avoidance of damage by flooding and silt.
- 52.5.3 Temporary open storage of excavated materials from cut and cover and tunnelling work used for backfill at site should be covered with tarpaulin which is firmly secured to ground.
- 52.5.4 Polymer slurry or other grouts used in diaphragm wall construction piling and other concrete works shall be collected in a separate slurry collection system. If reuse is not practicable then it shall only 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. Record of disposal of Polymer slurry at landfills or elsewhere shall be maintained by the contractor and reported in the contractor's Monthly Environment Report to be shown to employer when requested.
- 52.5.5 Beneath the hopper of Batching Plant, the slope of the surface shall be maintained in a such a way that the slurry from Batching Plant shall enter into sedimentation tank. The area should be cleaned regularly to avoid slush generation.
- 52.5.6 Any mud slurry from drilling, tunnelling, diaphragm wall construction or grouting etc. shall not be discharged into the drainage system unless treatment is carried out that will remove silt, mud particles etc. The Contractor shall provide treatment facilities as necessary to prevent the discharge of contaminated ground water.
- 52.5.7 The Contractor is not allowed to discharge water from the site without the approval of the Employer. The Contractor must comply with the requirements of the Central Ground Water Board for discharge of water arising from dewatering. Any water obtained from dewatering systems installed in the works must be either re-used for construction purposes or recharged to the ground or pumped into the nearest water body/park or supplied to concerned authority with prior permission of the Employer. In case, the dewatered water is required to be used for reuse in construction or recharge, the Contractor must submit his proposals for prior approval of Employer along with, his proposed locations of dewatering.
- 52.5.8 Roof top run-off from casting yard and batching plants as well as water from curing should be conserved through properly designed rainwater harvesting structures via adequately designed sand/silt removal facilities such as sand traps, silt traps or sediment basins. Excess discharge should be discharged into storm drains.
- 52.5.9 Perimeter channels/drains shall be constructed in casting yard and batching plant. 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.

- 52.5.10 Oil separator/interceptors shall be provided to prevent the release of oil and grease into the drainage system. These shall be cleaned on a regular basis. Area which is storing admixtures/oils should be connected to a drainage system with a oil & grease trap. Spillage of material during transfer should be avoided by using appropriate /design mechanism for such transfer.
- 52.5.11 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.
- 52.5.12 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. Discharge of surface run-off into sewers must always be prevented in order not to unduly overload the sewerage system.
- 52.5.13 The drainage system should cover the entire area of Casting Yard/ Batching Plant. The drainage system shall be designed in such a way that it should have sufficient capacity to hold the runoff of the catchment area
- 52.5.14 Waste water from Reverse Osmosis (RO) plant shall be used only for dust suppression, wheel washing and road washing. It shall not be drained into public sewers or storm water drainage system.
- 52.5.15 The Contractor may discharge wastewater arising from site offices, canteens or toilet facilities constructed by him into sewers after obtaining prior approval of agency controlling the system.

NOTE: Category A & B Contracts: All clauses are applicable.

Category C contracts: All clauses under clause 52.5 are applicable except clauses 52.5.2, 52.5.4, 52.5.5, 52.5.7, 52.5.8, 52.5.9, 52.5.10, 52.5.12, and 52.5.13.

Category D contracts: All clauses under clause 52.5 are applicable except clauses 52.5.2, 52.5.3, 52.5.4, 52.5.5, 52.5.6, 52.5.7, 52.5.8, 52.5.9, 52.5.10, 52.5.11, 52.5.12, 52.5.13 and 52.5.14. Additionally, the contractor is not allowed to discharge wastewater from the site into the sewer without the approval of sewer owing agency. At batching plant temporary drainage works shall be maintained as necessary and all other necessary precautions should be taken for avoidance of damage by flooding and silting. Any mud slurry from batching plant shall not be discharged into the drainage system unless silt, mud particles etc. are removed. At the batching plant, Oil separator/interception shall be provided to prevent the release of oil and grease into the drainage system. These shall be cleaned on a regular basis.

Category E contracts: All clauses under clause 52.5 are applicable except clauses 52.5.1, 52.5.2, 52.5.3, 52.5.4, 52.5.5, 52.5.6, 52.5.7, 52.5.8, 52.5.9, 52.5.10, 52.5.11, 52.5.12, 52.5.13, 52.5.14 and 52.5.15. Additionally, water tapped from the ground or provided by municipal supply for construction shall be measured and records kept. Records of water consumption shall also be kept and provided on request of employer. The Contractor is not allowed to discharge wastewater from the site without the approval of the sewer owning agency. For sites where receiving Substation is proposed, the main contractor shall ensure that the surface runoff from the site is properly drained to a municipal drainage system and that it does not create water logging in adjacent areas.

52.6 CONTAINMENT OF NOISE AND VIBRATION

- 52.6.1 Construction often generates community noise/vibration complaints despite the limited time frame over which it takes place. Complaints typically arise from interface with people’s activity, especially when community has no clear understanding of the extent or duration of construction.
- 52.6.2 This situation underscores the need for early identification and assessment of potential problem areas. An assessment of the potential for complaints can and should be made.
- 52.6.3 If done timely, such assessment can aid contractor in allowing changes in construction approach and reduce noise mitigation cost before the construction plans are finalised.
- 52.6.4 The contractor shall conform to ambient air quality standards with respect to noise.
- 52.6.5 The Employer will monitor noise level at site before the start of work and share the values with contractor. Thereafter, the contractor will employ necessary engineering control to ensure that noise levels do not exceed preconstruction noise.
- 52.6.6 Where there are no ambient measurements, the noise levels from construction activities shall be limited to levels measured near the construction site as given in table below:

Table 52.2.: Allowable Construction Noise

S. No	Land Use	Maximum Noise Levels (Leq- 5min)
1	Industrial	75
2	Residential and Other areas	65

- 52.6.7 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) Acoustic barriers should be placed near construction sites. The properties of acoustic barrier are given in **Table 52.1**.

- (ii) Minimize the use of impact devices, such as jackhammers, and pavement breakers. 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.
 - i. 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.
 - ii. Provide mufflers or shield panelling for other equipment, including internal combustion engines, recommended by manufacturers thereof.
 - iii. Employ prefabricated structures instead of assembling on-site.
 - iv. Use construction equipment manufactured or modified to dampen noise and vibration emissions, such as:
 - a. Use hydraulic tools instead of pneumatic impact tools.
 - b. Maximize physical separation, as far as practicable, between noise generators and noise receptors such as locating stationary equipment so as to minimize noise and vibration impact on community.
 - c. Use of electric powered equipment instead of diesel-powered equipment.
 - v. Grading of surfaced irregularities on construction sites to prevent the generation of impact noise and ground vibrations by passing vehicles.
 - vi. Schedule work to avoid simultaneous activities that generate high noise levels.
- 52.6.8 The contractor shall provide enclosures for stationary equipment and noise barriers around particularly noisy areas on site depending upon the land use.
- 52.6.9 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 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.
- 52.6.10 Schedule truck loading, unloading, and hauling operations so as to minimize noise impact near noise sensitive locations and surrounding communities.
- 52.6.11 Other measures that the contractor may adopt to mitigate noise include:
- a) Minimize noise intrusive impacts during most noise sensitive hours.
 - b) Plan noisier operations during times of highest ambient noise levels
 - c) Keep noise levels relatively uniform; avoid excessive and impulse noises.
 - d) Equipment and plant should not to be kept idling when not in use.
 - e) Use only well-maintained plant & equipment at site, which should be serviced regularly.
 - f) Shall maintain equipment such that parts of vehicles and loads are secured against vibrations and rattling
 - g) Conduct truck loading, unloading and hauling operations in a manner such that noise and vibration are kept to a minimum.
 - h) Route construction equipment and vehicles carrying soil, concrete or other materials over streets that will cause least disturbance to residents in vicinity of work.

- i) Avoid operating truck on streets that pass by schools during school hours
 - j) Select truck routes for muck disposal in such a way that noise from heavy-duty trucks will have minimal impact on sensitive land uses (e.g., residential) and submit the proposed routes to the Employer for approval.
- 52.6.12 If back-up alarms are used on construction equipment, their noise level near noise sensitive receptors such as residences, schools, hospitals and similar areas where silence is essential, should be regulated, especially at night time. Visual alarms shall preferably be used during night time operation.
- 52.6.13 The contractor shall make efforts to bring down the noise levels due to the DG set, outside his premises, within the ambient noise requirements by proper setting and control measures.
- 52.6.14 Installation of a DG set must be strictly in compliance with the recommendations of the DG set manufacturer. The contractor shall ensure that all necessary permissions/ approvals/consent is obtained from relevant authorities before installation and operation of Generator set
- 52.6.15 A proper routine and preventive maintenance procedure for the DG set should be set and followed in consultation with the DG set manufacturer which would help prevent noise levels of the DG set from deteriorating with use
- 52.6.16 The maximum permissible sound pressure level for new diesel generator (DG) sets (upto 1000 KVA) manufactured on or after the 1st July,2003 shall be 75 dB(A) at 1 metre from the enclosure surface. The diesel generator sets should be provided with integral acoustic enclosure at the manufacturing stage itself.
- 52.6.17 Noise limit for DG sets not covered by above paragraph shall be as follows:
- a) Noise from DG set shall be controlled by providing an acoustic enclosure or by treating the room acoustically, at the user's end.
 - b) The acoustic enclosure or acoustic treatment of the room shall be designed for minimum 25 dB (A) insertion loss or for meeting the ambient noise standards, whichever is on the higher side (if the actual ambient noise is on the higher side, it may not be possible to check the performance of the acoustic enclosure/acoustic treatment. Under such circumstances the performance may be checked for noise reduction up to actual ambient noise level, preferably, in the night time). The measurement for Insertion Loss may be done at different points at 0.5 m from the acoustic enclosure/room, and then averaged.
 - c) The DG set shall be provided with proper exhaust muffler with insertion loss of minimum 25 dB(A)
- 52.6.18 If the measures to control noise pollution are found to be ineffective, the employer may issue stop work order till the time remedial measures are found to be effective to the satisfaction of employer.
- 52.6.19 Contractor is strongly urged to explore all possibilities for installing Generator set run on Natural Gas viz Gas Generator (GG) set. This will help the contractor to overcome the restrictions imposed during the execution of Graded Response Action Plan (GRAP).

52.6.20 Vibration consists of rapidly fluctuating motions with an average motion of zero. During vibration the oscillatory waves propagate from the source through the ground to adjacent buildings. Vibration from construction projects is caused by general equipment operations is usually highest during pile driving, soil compacting, jack hammering and construction related demolition activities

52.6.21 The following steps may be taken by the contractor to reduce construction vibration:

(a) Design considerations and project layout:

1. Route heavily loaded trucks away from residential streets.
2. If possible, Select street with fewest homes, if no alternatives are available.
3. Operate earthmoving equipment on the construction lot as far away from vibration sensitive sites as possible.

(b) Sequence of operations:

1. Phase demolition, earthmoving and ground-impacting operations so as not to occur the same time period. Unlike noise, the total vibration level produced could be significantly less when each vibration source operates separately.
2. Avoid night time activities. People are more aware of vibration in their homes during the night time hours.

(c) Alternative construction methods:

1. Avoid impact pile driving where possible in vibration-sensitive areas.
2. Drilled piles or the use of a sonic or vibratory pile driver causes lower vibration levels where the geological conditions permit their use.
3. Select demolition methods not involving impact, where possible. For example, sawing bridge decks into sections that can be loaded onto trucks results in lower vibration levels than impact demolition by pavement breakers, and milling generates lower vibration levels than excavation using clam shell or chisel drops.
4. Avoid vibratory rollers and packers near sensitive areas.

NOTE: *Category A, B and D Contracts: All clauses are applicable.*

Category C contracts: All clauses under clause 52.6 are applicable except clauses 52.6.1, 52.6.5, 52.6.7, 52.6.8, 52.6.11.j, 52.6.14, 52.6.15, 52.6.16, 52.6.17, 52.6.20 and 52.6.21.

Category E contracts: Clause 52.6 is not applicable. Additionally, to the extent required to meet the noise limits, the Contractor shall use reasonable efforts to minimize construction noise emission levels, some of which are given below:

- 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.
- The contractor's equipment and plant should not be kept in idling conditions when not in use.

- The contractor shall use only well-maintained plant & equipment at site, which should be serviced regularly.
- The maximum permissible sound pressure level for new generator sets (up to 1000 kVA) run on diesel, shall be 75 dBA at one meter from the enclosure surface.
- For diesel generator sets having no acoustic enclosures, 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 25dBA insertion loss or for meeting the ambient noise standards, whichever is on higher side.

52.7 WASTE MANAGEMENT

52.7.1 General

52.7.1.1 The following types of waste are most likely to be encountered during execution of contract:

1. General refuse
2. C&D waste
3. Hazardous waste
4. E-waste
5. Bio medical waste
6. Plastic waste
7. Batteries Waste

52.7.1.2 Disposal of waste as per legal requirement is found in the table below:

Table52.4: Construction Wastes – Type and Disposal

S. No	Waste Type	Disposal	Legal requirement for handling, storage & disposal
1	General refuse	Re-use/Recycle/land fill	Solid Waste Management Rules, 2016
2.	Vegetation/timber etc	As per forest clearance advice	Uttar Pradesh Tree prevention Act
3.	Construction and Demolition (C&D) waste	Authorized recycling unit/re-use within site	Construction and Demolition Waste Management Rules, 2016
4.	Hazardous waste	Licensed Recycler	Hazardous and Other Wastes (Management & Trans-boundary Movement) Rules, 2016.

S. No	Waste Type	Disposal	Legal requirement for handling, storage & disposal
5	Electronic waste	Licensed Recycler	E-waste (Management) Rules, 2016
7.	Bio-medical waste	Bio-medical waste treatment and disposal facility	Bio-medical waste Management Rules, 2016
8	Chemical waste	Licensed contractor	Manufacture, Storage and handling of hazardous chemical rules 1989
9	Plastic Waste	Licensed agency	Plastic Waste management Rules, 2016

- 52.7.1.3 In addition to above, excavated earth and metal scrap is likely to be generated in large quantity. The excavated material comprises mainly soil and rock. Soil may be used for backfill at locations identified by employer. The rock may be sold off.
- 52.7.1.4 The contractor is required to develop, institute and maintain a Waste Management Programme (WMP) during the construction of the project for his works. This WMP shall be a part of Contractor's site Environmental Management Plan. Data sheet to be provided under WMP is given in **Appendix No. 22**. However, a Waste Management Plan specific for handling and disposal of C&D waste shall be prepared separately by the contractor as per the provisions of C&D Waste Management Rules, 2016.
- 52.7.1.5 A mechanism is required to ensure that designated areas for the segregation and temporary storage of reusable, recyclable and waste materials are incorporated into the WMP.
- 52.7.1.6 The Contractor shall handle waste in a manner that ensures they are held securely without loss or leakage thus minimizing potential for pollution following all legal requirements for handling and storage. The Contractor shall maintain and clean waste storage areas regularly. The contractor shall use foot operated waste bins.
- 52.7.1.7 The contractor shall strictly manage transportation and disposal of all waste complying all legal/statutory requirements.
- 52.7.1.8 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.

NOTE: *Category A and B Contracts: All clauses are applicable.*

Category C contracts: All clauses under clause 52.7.1 are applicable except clauses 52.7.1.6 and 52.7.1.8.

Category D contracts: All clauses under clause 52.7.1 are applicable except clauses 52.7.1.3 and 52.7.1.5.

Category E contracts: All clauses under clause 52.7.1 are applicable except clauses 52.7.1.3 and 52.7.1.5. Additionally, following clauses are also applicable:

- The Contractor shall ensure that the E-waste generated by them is handed over only to producer take back/buy back system or to an authorized dismantler/recycler/Collector who is part of producers take back channelization system.
- The contractor shall ensure that used lamps are not disposed in the municipal bin but handed over (in a properly packed form) to take back system/ collection and channelization system of producer or to a collection centre of an authorised recycler who is part of producer channelization system.
- The contractor shall maintain records of e-waste generated by them in Form-2 (as per E-waste Management Rules, 2016).

52.7.2 General Refuse

- 52.7.2.1 This category of waste is generated from living camps, offices, workshops, kitchen, and other work areas. Such type of waste includes food scraps (solids + liquids), Paper, Cardboard, Plastics (recyclable bottles, other), Glass (different colours), Aluminium and other cans, Wooden boxes, crates etc.
- 52.7.2.2 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.
- 52.7.2.3 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.
- 52.7.2.4 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 each category of waste.
- 52.7.2.5 General refuse should be stored in enclosed bins or units separate from construction and chemical wastes. A waste collector should be employed by the contractor to remove general refuse from the site on a daily basis to minimise odour, pest and litter impacts.
- 52.7.2.6 Handling and disposal of general refuse should cope with the peak construction workforce during the construction period. The refuse should be stored and transported in accordance with good environment practice and disposed at licensed landfills.
- 52.7.2.7 Respective Waste with residual value is to be disposed off by selling to recyclers. The remaining can be disposed off through collection and disposal by local municipal agency.
- 52.7.2.8 Office waste can be reduced through recycling of paper if volumes are large enough to warrant collection.
- 52.7.2.9 Burning of refuse at construction site is not permitted. Dumping of any type of waste is strictly prohibited along the bed of river Hindon.

52.7.2.10 Colour Coded Dustbin in suitable numbers at each working area shall be used for segregation of waste during collection. The waste management plan should clearly quantify and identify the number and locations of different types of dustbins that will be provided at each working site. Colour coding of dustbins shall be as per given Table:

Table 52.5 - Colour Coding of Dust Bins

Type of Waste	Colour
Wet/Organic/ Bio-Degradable Waste	Green Bins with lids
Dry/Recyclable waste (excluding Bio-medical waste/ hazardous waste)	Blue
Bio-Medical waste	Red with lids
E-Waste	Black
Hazardous Waste	Brown
COVID Waste	Yellow

NOTE: *Category A, B & C Contracts: All clauses are applicable.*

Category D & E contracts: All clauses under clause 52.7.2 are applicable except clauses 52.7.2.1, 52.7.2.2, 52.7.2.4, 52.7.2.5 and 52.7.2.6.

52.7.3 Construction and Demolition Waste

52.7.3.1 Construction and Demolition waste" means the waste comprising of building materials, debris and rubble resulting from construction, re-modelling, repair and demolition of any civil structure.

52.7.3.2 Construction & Demolition (C&D) waste shall be stored at a designated area.

52.7.3.3 The C&D waste shall be disposed off in a manner in compliance with the procedure given in the Construction & Demolition Waste Management Rules, 2016.

52.7.3.4 The contractor shall be responsible for collection, segregation and storage of construction and demolition waste, as directed or notified by the concerned local authority in consonance with the Construction & Demolition Waste Management Rules, 2016.

52.7.3.5 The contractor shall ensure that other waste does not get mixed with this waste and is stored and disposed separately.

52.7.3.6 The contractor shall dispose C&D waste only at authorized processing facilities and ensure that there is no littering or deposition of construction and demolition waste so as to prevent obstruction to the traffic or the public or drains.

52.7.3.7 Disposal of C&D waste along the river bed, natural drainage and wet land is strictly prohibited and the contractor shall be fined for non compliance of this requirement in addition to the penalty imposed by the NGT from time to time.

52.7.3.8 The requirement of concrete/RCC/PCC waste disposal, generated from the entire contract shall be either when 15 Tonnes of C&D waste has been generated or such

C&D waste has been stored for 15 days (irrespective of quantity), of the two whichever is earlier.

- 52.7.3.9 C&D Waste generated from construction depot, viaduct, station during construction to be transported to NMRC/any other processing plant only within 30 km lead from the site and cost of the same is also included in lump sum cost of schedule A.
- 52.7.3.10 A proper arrangement in record keeping has to be maintained to ensure disposal of C&D waste to C&D waste recycling plant. For this purpose, it is required that contractor shall generate triplicate copies/slips of dispatch when sending C&D waste from site to C&D recycling facility. One copy be retained at site, one copy for C&D waste processing authority and one received copy from C&D waste processing authority to be kept along with the initial copy. The slip shall contain name of contractor, serial number, date, vehicle number and quantity of waste among other things. The actual quantity of C&D waste shall be that which is mentioned by weighing bridge slip generated by the C&D waste recycling facility. Contractor shall submit the record of C&D waste disposal to recycling facility, in his Monthly Environment Report.
- 52.7.3.11 All the copies of dispatch slip will be countersigned by NMRC site staff and will be used for reconciliation of quantity of C&D waste disposed.
- 52.7.3.12 A minimum of 10% of C&D recycled products shall be used for external development and road works for finishing contracts. Before accepting recycled products, the same shall be tested as per required specifications. The recycled materials products shall be used in non-structural members like kerb stone, paver tiles in foot path, earth filling, use of bricks in non-load bearing partition walls, boundary walls, toe walls, recycled aggregates in lean concrete/PCC etc.
- 52.7.3.13 As per requirements of C&D Waste Management Rules 2016 and its subsequent amendments, a C&D waste board is to be displayed at entry to the site. The format of board is mentioned at **Appendix No. 23**.

NOTE: Category A, B, C, D and E Contracts: All clauses are applicable.

52.7.4 Hazardous Waste Management

- 52.7.4.1 Generally, the hazardous waste from construction site includes used oil, grease, oil filters etc. A comprehensive list of hazardous waste is found in Hazardous waste management and handling rules 2016. If encountered or generated as a result of Contractor's activity, then waste classified as hazardous under the "Hazardous and Other Wastes (Management & Transboundary Movement) Rules, 2016 shall be disposed off in a manner in compliance with the procedure given in the rules under the aforesaid act.
- 52.7.4.2 Chemicals classified as hazardous chemicals under "Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 of Environment (Protection) Act, 1986 shall be disposed off in a manner in compliance with the procedure given in the rules under the aforesaid act.
- 52.7.4.3 The contractor shall identify the nature and quantity of hazardous waste generated as a result of his activities. The contractor shall obtain authorization for handling, storage

of hazardous waste from the concerned pollution control board/committee. The contractor shall file annual return in prescribed format with the concerned pollution control board/ committee and forward a copy of receipt to employer.

- 52.7.4.4 The contractor shall provide and maintain a separate hazardous waste storage area for a) flammable, ignitable, reactive and b) Non-compatible wastes with suitable opening, Flame proof Electrical fittings should be at 15 m distance between the storage sheds. The storage yards should be provided with proper peripheral drainage system connected with the sump so as to collect any accidental spills.
- 52.7.4.5 The storage area for Hazardous waste shall:
- a) Be clearly labelled and used solely for the storage of chemical waste;
 - b) Be enclosed on at least three sides;
 - c) Have an impermeable floor and bunding of capacity to accommodate 110% of the volume of the largest container or 20% by volume of the hazardous waste stored in that area, whichever is greater;
 - d) Have adequate ventilation;
 - e) Be covered to prevent rainfall entering and
 - f) Be arranged so that incompatible materials are adequately separated
- 52.7.4.6 Outside the storage area, the contractor shall place a 'display board', which will display quantity and nature of hazardous waste, on date. Hazardous Waste needs to be stored in a secure place.
- 52.7.4.7 It shall be the responsibility of the contractor to ensure that hazardous wastes are stored, based on the composition, in a manner suitable for handling, storage and transport. The labelling and packaging is required to be easily visible and be able to withstand physical conditions and climatic factors
- 52.7.4.8 Lubricants including oil and grease generated from operation of the TBM should be disposed off as a hazardous waste.
- 52.7.4.9 Drip pans of suitable size and numbers 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.
- 52.7.4.10 The contractor shall approach only Authorised Recyclers of Hazardous Waste for disposal of Hazardous Waste, under intimation to the Employer.

NOTE: Category A, B and C Contracts: All clauses are applicable.

Category D contracts: All clauses under clause 52.7.4 are applicable except 52.7.4.2, 52.7.4.4, 52.7.4.5 and 52.7.4.8.

Category E contracts: All clauses under clause 52.7.4 are applicable except 52.7.4.2, 52.7.4.3, 52.7.4.4, 52.7.4.5 and 52.7.4.8.

52.7.5 Chemical Waste

- 52.7.5.1 The contractor should ascertain if some paints and solvents are classified as chemical waste and, if used on site, shall be subject to the stringent requirements of the Waste Disposal of Chemical Waste. Empty paint cans shall be recycled or collected as waste.
- 52.7.5.2 Any dry paint waste should be swept up (broomed/ vacuumed) and collected in containers for disposal.

52.7.5.3 Containers used for the storage of chemical waste shall:

- a) Be suitable for the substances they are holding, resistant to corrosion, maintained in good condition, and securely closed.
- b) Be of adequate capacity and
- c) Display a label in English and Hindi as to the contents, quantity and safe method of disposal in accordance with instructions contained in Material Safety Data Sheet (MSDS).

52.7.5.4 The storage area for chemical waste shall:

- a) Be clearly labelled and used solely for the storage of chemical waste;
- b) Be enclosed on at least three sides;
- c) 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 greater;
- d) Have adequate ventilation;
- e) Be covered to prevent rainfall entering and
- f) Be arranged so that incompatible materials are adequately separated.

52.7.5.5 Disposal of chemical waste shall be through a licensed waste collector duly authorized by the MoEF & CC or State Pollution Control Board as the case may be under intimation to the Employer.

52.7.5.6 No lubricants, oils, solvents or paint products shall be allowed to discharge into water courses, either by direct discharge, or as contaminants carried in surface water runoff from the construction site.

52.7.5.7 In sum, even though the exact quantities of chemical waste that will be generated per contract are expected to be small, still, because of the potential environmental and health & safety hazard that these chemicals pose, they must be handled, stored and disposed of appropriately, in accordance with the law.

NOTE: *Category A & B Contracts: All clauses are applicable.*
Category C, D and E contract: Clause 52.7.5 not applicable.

52.7.6 Metal Scrap

52.7.6.1 Steel and other metals should be recovered from the construction waste and recycled as far as practical.

52.7.6.2 The contractor shall have a separate scrap yard with hard surface

52.7.6.3 Disposal of scrap shall be through a licensed waste collector/recycler under intimation to the Employer.

NOTE: *Category A, B and C Contracts: All clauses are applicable.*

Category D and E contracts: All clauses under clause 52.7.6 are applicable except clause 52.7.6.2.

52.7.7 Polymer Slurry

- 52.7.7.1 Polymer slurries or other grouts used in diaphragm wall construction, piling and other concrete works should be collected in a separate slurry collection system.
- 52.7.7.2 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.
- 52.7.7.3 Some Polymer slurry shall be used in diaphragm wall, bore-pile or to support the cutting face during maintenance of the TBM. This should be reconditioned and reused wherever practicable.
- 52.7.7.4 However, it may not be possible for re-use when it is extracted along with rock waste when tunnelling resumes following each intervention period. In this case the polymer will be mixed with rock and drained as usual before sending to the final disposal site.

NOTE: **Category A Contracts:** All clauses are applicable.

Category B, C, D and E category contracts: Clause 52.7.7 not applicable.

52.8 ENVIRONMENTAL MONITORING

52.8.1 GENERAL

- 52.8.1.1 The Contractor shall carry out the monitoring of air, noise, vibration and ground water to assess the impact on environment during construction.
- 52.8.1.2 In addition, soil monitoring shall be carried out at underground station till no excavation is required. Representative sensitive receivers in the vicinity of the works shall be monitored for noise and air quality impacts. Vibration monitoring shall be carried out as and when directed by the employer.
- 52.8.1.3 The Environmental monitoring shall be carried out by a recognised agency/lab (approved by NMRC Environment Department) with the prior approval of NMRC Environment Department. This approval can be withdrawn at any time if the quality of output of the laboratory/agency is found not satisfactory by NMRC Environment Department.
- 52.8.1.4 The contractor shall release the payment due to the monitoring agency within 2 months of the submission of bills failing which the Employer may directly make the payment to such agencies and adjust this amount from the payment which is due to the contractor.

NOTE: Category A and B Contracts: All clauses are applicable.
Category C, D and E category contracts: Clause 52.8.1 not applicable.

52.8.2 Air Monitoring

- 52.8.2.1 For carrying out air monitoring the contractor shall appoint agency duly approved by NMRC's Environment department with intimation to the employer. The contractor shall provide 220V AC power point, safety and security of monitoring equipment and suitable access at each monitoring point. Monitoring stations should be free from local obstructions or sheltering.
- 52.8.2.2 The monitoring shall be carried out till handing over of the site to the employer or as approved by NMRC Environment Department.
- 52.8.2.3 Ambient Air Quality Standards have been notified by the CPCB vide Gazette Notification dated 16th November 2009. These standards have to be referred by the Contractor for Limit Levels of PM₁₀ and PM_{2.5} in ambient air which may be followed in estimating the pollution level caused by Contractor's activities.
- 52.8.2.4 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.
- 52.8.2.5 Where the Employer determines that the recorded PM₁₀ & PM_{2.5} levels are 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.
- 52.8.2.6 Where the recorded baseline levels exceed the ambient air quality standards, then at such locations the limit level is the recorded baseline. 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 NMRC.
- 52.8.2.7 The Contractor should inform the NMRC of all steps taken to investigate cause of exceedance and immediate action taken to avoid further exceedance through written reports and proposals for action.
- 52.8.2.8 The contractor shall ensure 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.
- 52.8.2.9 The Contractor shall keep records of air quality monitoring (including location, date, time) and shall be available for review by the Employer. The Contractor shall submit a copy of monitoring results through the Monthly Environment Report (MER) to the Employer.

52.8.2.10 PM₁₀ monitoring shall be done using Respirable Dust Sampler (RDS) and for PM_{2.5} either cyclone or impactor shall be used. Monitoring shall be done as per CPCB methodology

52.8.2.11 PM₁₀ shall be monitored at following locations:

- a) Batching Plant and Casting Yard
- b) Elevated Stretch (Station and Viaduct)
- c) Underground Station (at ground level)

52.8.2.12 PM_{2.5} shall be monitored in tunnel. In addition, the employer may direct contractor to carry out monitoring of PM_{2.5} at those location where PM₁₀ monitoring is carried out if need arises.

A) At Batching Plant/Casting Yard, the RDS sampler to be placed such that:

- The entry point of air should be at 2.5± 0.5 m above the ground.
- The sampler to be placed near to the receptor at least 2.5-3.0 m away from barricades/obstruction.
- Ensure flow rate of 1.15m³/m.
- The location will be finalized by environmental engineer at site in consultation with NMRC Environment deptt.

B) Elevated stretch: PM₁₀ monitoring to be carried out at every elevated station at a height of 2.5 ± 0.5 m. In the viaduct PM₁₀ monitoring to be performed at one location per 2 kms, if station is not within 2 km. The location of air monitoring in viaduct will be specified by Environment Engineer in consultation with NMRC Environment department.

C) Underground Station: PM₁₀ to be monitored at 2.5± 0.5 m above the ground. The specifications to be as per elevated stations

NOTE: *Category A Contracts: All clauses are applicable.*

Category B contracts: All clauses under clause 52.8.2 are applicable except Clause 52.8.2.12.B and 52.8.2.12.C for category B contracts. PM₁₀ monitoring to be carried out at depot, staff quarter and hostel sites only. Monitoring equipment shall be placed at a height of 2.5 ± 0.5 meter. The location of air monitoring will be specified by Environment Engineer in consultation with NMRC. The specifications shall be as per batching plant/casting yard requirements.

Category C, D and E category contracts: Clause 52.8.2 not applicable.

52.8.3 Noise Monitoring

52.8.3.1 Noise monitoring shall be carried out at Batching plant, Casting Yard, Elevated station, Underground station, Depot, Staff Quarter, Hostel and near viaduct once in a week till site is handed over to the employer. The monitoring location shall be near to boundary of construction site and or as directed by the employer. Construction noise measurements shall coincide with daytime and night time periods of maximum noise generating construction activities.

- 52.8.3.2 The Contractor shall submit a copy of monitoring results. The results should represent a comparison of data in form of bar charts for evaluation of trends and comparison with noise emission standards.
- 52.8.3.3 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.
- 52.8.3.4 Monitoring shall be carried out for day and night separately.
- 52.8.3.5 The noise monitoring parameters are L_{max} , L_{min} , L_{eq} , L_{90} , L_{50} & L_{10} . All the parameters will be reported separately for day time and night time.
- 52.8.3.6 The contractor shall ensure calibration of noise monitoring instrument and its calibration shall be carried out in accordance with the manufacturer's requirement to ensure it perform to the same level of accuracy as stated in the manufacturer's specifications.
- 52.8.3.7 Type I/II integrating sound level meter with free -field microphone and tripod stand of 1 to 1.5 m height shall be used for noise monitoring. The microphone of the instrument shall be near the receptor.
- 52.8.3.8 The minimum requirements to the specifications of sound level meter are given in BIS: 9779-1981 and its latest amendment. Measurement frequency of 31.5 Hz to 8000 Hz. Noise measurements shall be reported in dB(A). Sound Level Meter should be Type-I/II with A, C & Z weighing and measured sound values should also be suitably presented for quick comparison and interpretation.
- 52.8.3.9 Contractor shall maintain a Class 1 integrating sound level meter with proper calibration certificate at all time, for recording instantaneous noise level during the high noise generating activities and planning suitable mitigation measures.

NOTE: Category A and B Contracts: All clauses are applicable.

Category C, D and E category contracts: Clause 52.8.3 not applicable.

52.8.4 Vibration

- 52.8.4.1 Steady State Vibration on any pre-identified site or building shall be measured on any foundation or intermediate storey of any building, as directed by the employer or his representative.

52.8.4.2 Vibration measurements shall be made preferably in velocity mode (PPV) or acceleration (dBv / vdB) in X-Y-Z directions with the help of a measurement system calibrated in an NABL accredited laboratory/equivalent. The transducer used for measurements should be firmly fixed on to the measurement surface as per internationally accepted measurement practices. Precautions should be taken to ensure that the mounting methods do not affect the accuracy of measurement results. The accelerometer shall be fixed firmly to the vibrating surface with the help of special wax or through magnetic mounts.

52.8.4.3 The measured vibration values should be accurate within an overall measurement uncertainty of $\pm 10\%$ over the frequency range 1Hz – 100 Hz.

52.8.4.4 The data should be presented in suitable single number quantities like VdB or PPV values as per current international practices so that the final values are comparable directly with the accepted norms for structural integrity, human comfort etc.

NOTE: *Category A and B Contracts: All clauses are applicable.*

Category C, D and E category contracts: Clause 52.8.4 not applicable.

52.8.5 Ground Water

52.8.5.1 The employer may require the contractor to monitor surface/ ground water, for which requirements of IS 10500:2012 or its latest amendments shall be followed for sampling and testing (physical and chemical parameters).

52.8.5.2 Frequency of such monitoring at batching plant and or casting yard may be once in six months.

NOTE: *Category A and B Contracts: All clauses are applicable.*

Category C, D and E category contracts: Clause 52.8.5 not applicable.

52.8.6 Soil

52.8.6.1 The contractor shall carry out soil testing at all underground stations. The frequency of testing shall be once in six months till no excavation is required. The parameters of monitoring shall be Lead (Pb), Cadmium (Cd), Chromium (Cr6+), Mercury (Hg), Arsenic (As) and cyanide (CN). The sample collection, testing shall be as per relevant APHA standard.

NOTE: *Category A, B Contracts: All clauses are applicable.*

Category C, D and E category contracts: Clause 52.8.6 not applicable.

52.8.7 Environmental Monitoring Programme

52.8.7.1 The various parameters, monitoring locations and Frequency of monitoring are presented in **Table** below:

Table 52.5: Summary of contractor’s Environmental Monitoring Programme

Parameters	Location	Frequency
Air		
PM ₁₀ (µ/m ³)	All station locations, depot, staff quarter and hostel locations Batching plant* Casting yard*	2x 24 hrs once in 15 days
PM _{2.5} (µ/m ³)	Inside the Tunnel and in underground stations	2 x24 hrs once in 15 days
Noise		
Day Time (6 AM – 10PM) L _{max} , L _{min} , L _{eq} , L ₁₀ , L ₉₀ , L ₅₀ Night Time (10PM – 6AM) L _{max} , L _{min} , L _{eq} , L ₁₀ , L ₉₀ , L ₅₀	All station locations, depot, staff quarter and hostel locations Batching plant* Casting yard*	Once a week for 24hrs (Separately for day time and night time)
Ground Water		
pH, Sodium, Potassium, Chloride, Nitrogen, Phosphorus, Organic Matter, Heavy Metals (Mercury, Cadmium, Arsenic, Cyanide, Lead, Chromium), Oil & Grease.	At Batching Plant and Casting Yard	Once in six months
Soil		
Lead (Pb), Cadmium (Cd), Chromium (Cr6+), Mercury (Hg), Arsenic (As) and cyanide (CN).	At underground stations	Once in six months
Vibration		
Vibration in mm/s or VdB.		During complaints or as directed by employer.

* If CY/BP is at the same place, then the location of monitoring shall be one

NOTE: Category A and B Contracts: All clauses are applicable.

Category C, D and E category contracts: Clause 52.8.7 not applicable.

52.9 ENVIRONMENTAL SANITATION/HOUSEKEEPING

- 52.9.1 Environmental Sanitation/ Housekeeping refers to providing for a clean, hygienic, safe and aesthetically pleasing work area, as far as possible. It is the act of keeping the working environment cleared of all unnecessary waste, thereby providing a first-line of defence against accidents and injuries.
- 52.9.2 Contractor shall understand and accept that improper housekeeping is the primary hazard in any construction site and ensure that a high degree of housekeeping is always maintained. Indeed "Cleanliness is indeed next to Godliness"
- 52.9.3 Housekeeping is the responsibility of all site personnel, and line management commitment shall be demonstrated by the continued efforts of supervising staff towards this activity.
- 52.9.4 General Housekeeping shall be the responsibility of Site In charge and monitored by the House keeping Manager at all times at Work Site, Construction Depot, Batching Plant, Labour Camp, Offices and toilets/urinals. Towards this the Contractor shall constitute a special group of housekeeping personnel as per Appendix No. 4. This group shall ensure daily cleaning at work sites and surrounding areas and maintain a register as per the approved format by the Employer. Contractor's Environment officer shall be responsible for Environmental sanitation/housekeeping.
- 52.9.5 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 housekeeping group will ensure daily cleaning work at the site and its surrounding areas.
- 52.9.6 The Contractor's designated department will impart the necessary introduction and education to labours on housekeeping. This will be done through toolbox talks.
- 52.9.7 Every individual would be responsible for environmental sanitation in his area i.e.
- 52.9.7.1 At Work Site: All workers should clean their workplace after completion of their job. Supervisor should ensure good environmental sanitation of their respective work area through their workers. Environment Managers shall ensure sanitation in their area through their supervisors. Contractor's designate department will monitor this activity through environment manager as well as site supervisor.
- 52.9.7.2 Labour Camp: All workers should be responsible to maintain good sanitation 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.

- 52.9.7.3 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.
- 52.9.7.4 At Office: Everyone is responsible to maintain sanitation of their work station. Disposal of waste materials (i.e. stationary, cigarette buds, tea bags etc.) must be in dustbin only.
- 52.9.8 Adequate time shall be assigned to ensure that good housekeeping is maintained. This shall be carried out by team of housekeeping squad.
- 52.9.9 The contractor shall be responsible to provide segregated containers for disposal of debris at required places and regular cleaning of the same.
- 52.9.10 Full height fence, barriers, barricades etc. shall be erected around the site in order to prevent the surrounding area from excavated soil, rubbish etc, which may cause inconvenience to and endanger the public. The barricade especially those exposed to public shall be aesthetically maintained by regular cleaning and painting as directed by the employer. These shall be maintained in one line and level. Measures shall be adopted to ensure that seepage from site shall not go on road/public area.
- 52.9.11 The structure dimension of the barricade, material and composition, its colour scheme, NMRC logo and other details shall be in accordance with specifications laid down in tender document.
- 52.9.12 All stairways, passageways and gangways shall be maintained without any blockages or obstructions. All emergency exits passageways, exits fire doors, break-glass alarm points, firefighting equipment, first aid stations, and other emergency stations shall be kept clean, unobstructed and in good working order.
- 52.9.13 Lumber with protruding nails shall be bent / removed and properly stacked.
- 52.9.14 All surplus earth and debris are removed/disposed off from the working areas to officially designated dumpsites. Trucks carrying sand, earth and any pulverized materials etc. in order to avoid dust or odour impact shall be covered while moving. The tyres of the trucks leaving the site shall be cleaned with water, wherever the possibility of spillage on carriageways meant for regular road traffic exists.
- 52.9.15 No parking of trucks/trolleys, cranes and trailers etc. shall be allowed on roads, which may obstruct the traffic movement.
- 52.9.16 Roads shall be kept clear and materials like: pipes, steel, sand boulders, concrete, chips and brick etc. shall not be allowed on the roads to obstruct free movement of road traffic.
- 52.9.17 Water logging on roads shall not be allowed. If it is observed on road endangering the safety of road users, the contractor shall be penalised as per relevant clause.
- 52.9.18 Proper and safe stacking of material are of paramount importance at yards, stores and such locations where material would be unloaded for future use. The storage area shall be well laid out with easy access and material stored / stacked in an orderly and safe manner.
- 52.9.19 Flammable chemicals / compressed gas cylinders shall be safely stored.

- 52.9.20 Unused/surplus cables, steel items and steel scrap lying scattered at different places within the working areas shall be removed to identified locations(s).
- 52.9.21 All wooden scrap, empty wooden cable drums and other combustible packing materials, shall be removed from workplace to identified location(s).
- 52.9.22 Empty cement bags and other packaging material shall be properly stacked and removed.
- 52.9.23 The Contractor shall ensure that all his sub-contractors maintain the site reasonably clean through provisions related to housekeeping.
- 52.9.24 Debris shall be handled and disposed off in such a manner that it does not create any hazards to the site personnel. Debris shall not be accumulated to form a hazard and should be kept sufficiently moist to bring down the dust level within permissible limit.
- 52.9.25 Debris or other material shall not be thrown inside or outside the site premises from any height. The debris or waste material shall be disposed off at regular interval and as soon as the work has been completed.
- 52.9.26 All material shall be stored or stacked in a safe manner. At every site at the end of each shift, a nominated Contractor's responsible Site Engineer shall confirm through site book entry that all plant and machinery, free standing object and structures have been secured through anchoring to rigid structure or ground and are in stable equilibrium Stability as well as the easy access for the person to the stacked material shall also be ensured.
- 52.9.27 Material shall not be stacked or stored or placed so closed to any edges of a floor or platform which may endanger the safety of the person working in close vicinity of it.

52.10 AVOIDANCE OF NUISANCE

- 52.10.1 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.
- 52.10.2 Following site clearing and before construction, the Contractor shall remove all trash, debris and other weeds.
- 52.10.3 The Contractor shall ensure that the workplace is free of trash, garbage, debris and weeds.
- 52.10.4 Light used for construction can illuminate adjacent areas in undesired ways. Such lighting and glare shall be prevented from striking adjacent areas, where feasible, through directional shielding.
- 52.10.5 The other measures include but not limited to:
 - (a)Erection of decorative screen hoarding prominently displaying the logo of Noida Metro Rail Corporation.
 - (b)Minimizing 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 high 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.

52.10.6 Measures shall be taken to prevent Mosquito breeding at site. The measures to be taken shall include, but not limited to, the following:

- a. Construction run-off shall not be allowed to stagnate at work sites specially at construction depots and batching plant locations, by executing an efficient drainage system and / or levelling of low-lying areas.
- b. 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 site regularly.
- c. Still waters shall be treated at least once every week with oil in order to prevent mosquito breeding; 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.
- d. All coolers should be scrubbed and cleaned once a week and mopped, dry before refilling and if cannot be emptied, put one tablespoon of temephos/ petrol.
- e. Collection of stagnant water should not be allowed inside or around construction sites / office premises/ project sites / parking area/ labour camps and if the same does not take place a little quantity of kerosene/ petrol/ diesel may be put in such stagnant wastewater collection.
- f. Ensure that over head and other water tanks / containers are kept closed properly with lid and overflow pipe/ air vent are covered with wire mesh.
- g. Unused/ broken bottles, plastic cups, pots and tyres etc that can hold water should not be left in open in all contractor's premises.
- h. Provision of access to roof tops and over head tanks in all contractor's offices to facilitate checking of mosquito breeding.

NOTE: *Category A, B and C Contracts: All clauses are applicable.*

Category D and E contracts: All clauses under clause 52.10 are applicable except clauses 52.10.1, 52.10.2, 52.10.3 and 52.10.5 (a, b, e & f). Additionally, following clauses are also applicable:

- *The Contractor shall take all precautions to avoid any nuisance which includes (i) Improper environmental sanitation (housekeeping), (ii) improper stacking of materials, (iii) lack of barricades where required, (iv) emission of dust, wastewater, waste and noise etc which is a cause of complaint, arising from his operations. This shall be accomplished, wherever possible by suppression of nuisance at source rather than abatement of the nuisance once generated.*

52.11 ARCHAEOLOGICAL AND HISTORICAL PRESERVATION

52.11.1 The contractor shall seek to accommodate archaeological and historical preservation concerns that may arise due to the construction of the project especially in close vicinity of such areas where such monuments may be located.

52.11.2 The contractor shall consult the Archaeological Survey of India (ASI) and other parties, on the advice of the Employer, to identify and assess construction effects and seek ways to avoid, minimize or mitigate adverse effects on such monuments.

52.11.3 Adverse effects may include reasonably foreseeable effects caused by the construction that may occur later in time, be farther removed in distance or those that alter, howsoever temporarily, the significance of the structure.

52.11.4 Where the alignment, runs within the prohibited/regulated zone of the monuments, Employer will apply for No Objection Certificate (NOC) from Director of Archaeology Archaeological Survey of India as per provision of National Monuments and Archaeological Sites and Remains (Amendment & Validation Act 2010).

NOTE: Category A Contracts: All clauses are applicable.

Category B, C, D and E contracts: Clause 52.11 not applicable.

52.12 LANDSCAPE AND GREENERY

52.12.1 As far as is reasonably practicable, the Contractor shall maintain ecological balance by preventing deforestation and defacing of natural landscape.

52.12.2 The Contractor shall, so conduct his construction operations, as to prevent any avoidable destruction, scarring or defacing of natural surroundings in the vicinity of work.

52.12.3 Where destruction, scarring, damage or defacing may occur as a result of operations relating to Permanent or Temporary works, the same shall be repaired, replanted or otherwise corrected at Contractor's expense. All work areas shall be smoothed and graded in a manner to conform to natural appearance of the landscape as directed by the Employer.

52.12.4 Contractor shall clear the construction site of all scarp, dust, C&D waste and restore the site as per initial condition at the end of contract. Final dues to the contractor shall be paid only after the Employer is satisfied with the restoration of site.

NOTE: Category A, B and Contracts: All clauses are applicable.

Category D and E contracts: Clause 52.12 not applicable.

52.13 ENVIRONMENTAL SITE INSPECTION

52.13.1 Site inspection shall be undertaken by the Contractor's Project Manager along with Environmental team 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.

52.13.2 The Contractor shall, submit to the Employer a contract specific comprehensive Environment Inspection checklist as requirement of Site Environmental Plan.

52.13.3 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.

- 52.13.4 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.
- 52.13.5 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.
- 52.13.6 The results of monthly environmental inspection shall be discussed in monthly SHE committee meeting.

NOTE: Category A and B Contracts: All clauses are applicable.

Category C contracts: All clauses under clause 52.13 are applicable except Clause 52.13.2.

Category D & E contracts: Clause 52.13 not applicable.

52.14 STOPPAGE OF WORK

- 52.14.1 The Employer shall have the right to stop the work at his sole discretion, if in his opinion the work is being carried out in such a way that it may cause environmental degradation.
- 52.14.2 The contractor shall not proceed with the work until he has complied with each direction to the satisfaction of Employer.
- 52.14.3 The Contractor shall not be entitled for any damages / compensation for stoppage of work, due to safety reasons and the period of such stoppage of work shall not be taken as an extension of time for Completion of the Facilities and will not be the ground for waiver of levy of liquidated damages.

NOTE: Category A, B, C, D and E Contracts: All clauses are applicable.

52.15 REPORTING SYSTEM

- 52.15.1 Reporting under the Environmental Management System will contain results of monitoring and inspection programmes.
- 52.15.2 In Site Environmental Plan, the Contractor shall prepare and submit monthly Environmental Management Reports in accordance with Employer's Requirements.
- 52.15.3 The Monthly Environment Management reports shall continue to be submitted till entire duration of contract and its extension.

NOTE: Category A Contracts: All clauses are applicable.

Category B contracts: All clauses under clause 52.15 are applicable except clauses 52.15.2. In this case the Contractor shall prepare and submit Monthly Environmental Reports in accordance with the Employer's requirements.

Category C contracts: All clauses under clause 52.15 are applicable except clauses 52.15.2 and 52.15.3. In this case contractor shall prepare and submit quarterly Environment reports in accordance with the Employer's requirements. Quarterly

environment report shall continue to be submitted till entire duration of contract and its extension.

Category D contracts: *All clauses under clause 52.15 are applicable except clauses 52.15.2. In this case the Contractor shall prepare and submit Monthly Environmental Reports in accordance with the Employer's requirements.*

Category E contracts: *All clauses under clause 52.15 are applicable except clauses 52.15.2 and 52.15.3. In this case the contractor shall prepare and submit quarterly Environment reports in accordance with the Employer's requirements. Quarterly environment report shall continue to be submitted till entire duration of contract and its extension.*

52.16 BIO-TOILET

52.16.1 The contractor shall provide bio toilets at every construction site. Additional information regarding this can be found at Part-III occupational Health and Welfare Section of this document.

52.16.2 The upkeep of the Bio-toilets in hygienic manner, disposal of waste and similar issues shall be the responsibility of the contractor.

52.16.3 The Bio-toilets shall be dismantled after work is completed in entirety and written approval for the same has been obtained from the Employer.

52.16.4 The general specification of bio-toilets is listed below:

1. Single Cabin FRP Structure with water tank and bio-digester
2. The cabin shall be made of FRP material
3. Bio-Digester tank of required capacity (Bio Digester Tank will be minimum 5 mm thick FRP material)
4. Very easy to install at site
5. Other technical specifications preferably as prescribed by the DRDO-Ministry of Defense.

NOTE: Category A, B, C, D and E Contracts: All clauses are applicable.

PART - V: PENALTY AND AWARDS

53.0 Charges to be recovered from contractor for unsafe act or condition

53.1 NMRC has built an image of safety conscious organisation meticulously over a period of several years. Any reportable accident (fatality / injury) results in loss of life and/or property damage. These accidents not only result in loss of life but also damage the reputation of NMRC. Most of the accidents are avoidable and caused preliminary due to contractors' negligence. Hence NMRC shall recover the cost of damages from the contractors for every reportable incident (fatality / injury).

53.2 In addition every NMRC work site is exposed to public scrutiny as the work is executed just on the right-of-way. Any unsafe act / unsafe condition observed by public further damages our reputation. Because of the non-voluntary compliance of contractors to the condition of contract on Safety & Health and Environment, NMRC has been forced to establish safety-enforcing organisation. The cost of establishing such organisation is to be recovered from contractors for all safety violations observed at sites.

53.3 The following table indicates the Safety, Health and Environment violation (unsafe act / unsafe condition) and charges to be recovered from contractors:

SL. NO.	TOPIC	UNSAFE ACT/UNSAFE CONDITION	DEDUCTIBLE AMOUNT
1.	Safety & Health Organisation	Not complying to the minimum manpower requirements as mentioned in clause 6.1.1.1 Appendix no. 04 in respect of Key personnel of Safety & Health Organization	Rs. 2,00,000 per month for first month and Rs. 4,00,000 for subsequent months.
2.	Safety & Health and Environment (SHE) committee	Failed to formulate or conduct SHE Committee meeting for any month as per clause 7.0.	Rs.1,00,000 for the first violation and Rs.5,00,000 for the subsequent violations
3.	ID card	i) Non-adherence of clause 9.1 ii) Non-adherence of clause 9.2 iii) Non-adherence of clause 9.3	Rs.1,00,000 for first violation and Rs.2,00,000 for subsequent violations
4.	Safety & Health Training	i) Not complying to the requirements as mentioned in conditions of contract on Safety & Health regard to: a) Supervisor/engineer/manager training not conducted as per clause 10. b) Skill development training not conducted as clause 10.1.14 c) Training room with basic amenities not available	Rs.50,000 for first violation on and Rs.1,00,000 for subsequent violations

		<ul style="list-style-type: none"> d) 96 Hour training for worker and staff not done. e) Top management behavior based Safety & Health training conducted as per clause 10.1.1. f) Driver/Operator training from OEM as per clause 10. 1.11 g) Non-Compliance of Clause 10 	
5.	Safety and Health Inspection	i) Not complying to the requirements as mentioned in conditions of contract clause 11.0	Rs.1,00,000 for first violation and Rs. 2,00,000 for subsequent violations
6.	Safety and Health Audit	Internal Audit: MARS and Electrical Audit Not conducted as per Safety and Health Plan as per clause 12.1	Rs.50,000 for first violation and Rs.1,00,000 for subsequent violations.
		External Audit as per clause 12.1.4 Not conducted as per Safety and Health Plan	Rs.1,00,000 for first violation and Rs.2,00,000 for subsequent violations.
		ISO 45001-2018 Certification not obtained within the stipulated time (Clause 3.4)	Rs.1,00,000 for first violation and Rs.2,00,000 for subsequent violations.
7.	Injury and Incidence reporting	<ul style="list-style-type: none"> i) Fatal accidents ii) Injury accident <ul style="list-style-type: none"> a) Major Injury causing absence from duty beyond 7 days or permanent disability or amputation b) Repeated Injuries of same nature. iii) Abnormal delay in reporting accidents or willful suppression of information about any accidents / dangerous occurrence as per clause 15.1.4 iv) Delay in informing about any accidents / dangerous incidents. v) Non-compliance of the clause 15.0 	<ul style="list-style-type: none"> i. Rs. 20,00,000 for each fatality case ii. For item ii) a) Rs. 2,50,000 for first case and Rs. 5,00,000 for every subsequent case for ii) b) Rs.1,00,000 for first violation and Rs.2,00,000 for subsequent violations <p>For items iii), iv) and v) Rs.50,000 for first violation and Rs.1,00,000 for subsequent violations</p>

8.	Working at Height / Ladders and Scaffolds	<ul style="list-style-type: none"> i) Not using or anchoring Safety Belt as per clause 22.19 ii) Not using Safety Net as per clause 22.18 iii) Absence of life line or anchorage point to anchor safety belt as per clause 24.0 iv) Non-compliance of clause 22.16 v) Using Bamboo ladders vi) Painting of ladders vii) Improper usage (less than 1m extension above landing point, not maintaining 1:4 ratio) viii) Aluminium ladders without base rubber bush ix) Usage of broken / weak ladders x) Usage of re-bar welded ladders xi) Improper guardrail, toe board, barriers and other means of collective protection xii) Improper working platform xiii) Working at unprotected fragile surface xiv) Working at unprotected edges xv) Non usage of MEWP 	Rs. 10,000 per single violation Compounded to a maximum of Rs.1,00,000 at any single instance
9.	Lifting appliances and gear	<ul style="list-style-type: none"> i) Non availability of fitness certificate as per clause 25.3 ii) Documents not displayed on the machine or not available with the operator as per clause 25.4 iii) Maximum Safe Working Load not written on the machine as per clause 25.5 iv) Non-compliance of 25.6 v) Non-compliance of 25.7 vi) Automatic safe load indicator not provided or not in working condition as per clause 25.8 vii) Age of the operator less than 28 years or without any license and non-compliance of other item as per clause 25.9 viii) Non-compliance of 25.10 	Rs. 25,000 per single violation Compounded to a maximum of Rs.2,00,000 at any single instance

		<ul style="list-style-type: none"> ix) Non-compliance of any of the items mentioned regarding rigging requirements as per clause 25.11 x) Failure to submit method statement in case of all critical lifting xi) Person riding on crane. xii) Non- availability of helper as per clause xiii) Creating more noise and smoke xiv) Absence of portable fire extinguisher in driver cabin xv) Fail to guard hoist platform xvi) No fencing of hoist rope movement area xvii) Hoist platform not in the horizontal position xviii) Usage of Prohibited Cranes 	
10.	Launching operation	Non-adherence of any of the provisions mentioned in clause 26.2	Rs. 2,00,000 for first violation and Rs. 4,00,000 for subsequent violations.
11.	Construction Plant and Machinery	<ul style="list-style-type: none"> i) Non- Compliance of Clause 27.2, 27.3, 27.4 ii) Non- Compliance of Clause 27.5, 27.6, 27.7, 27.8, 27.9, 27.10, 27.11 	<p>For item i) Rs.10,000 per single violation Compounded to a maximum of Rs.1,00,000 at any single instance For item ii) Rs. 25,000 for first violation and Rs. 50,000 for subsequent violations</p>
12.	Site Electrical safety	<ul style="list-style-type: none"> i) Non-compliance of clause 30.1.1 ii) Non-compliance of clause 30.2.4, 30.2.5,30.2.6 iii) Non-compliance of clause 30.3.1 iv) Non-compliance of clause 30.7, 30.8 and 30.9.1 v) Non-compliance of clause 30.10 30.11,30.12 and 30.13 vi) Non-compliance of clause 31.2.2 vii) Exposed electric lines (fermentative damage) and circuits in the workplace. viii) Inserting of bare wires into the socket 	Rs.10,000 per single violation Compounded to a maximum of Rs.1,00,000 at any single instance

		<ul style="list-style-type: none"> ix) Improper grounding for the electrical appliances x) Electrical cables running on the ground xi) Non-compliance clause 30.0, 31.0 xii) Usages of prohibited Electrical Appliances 	
13.	Hand tools and Power tools	<ul style="list-style-type: none"> i) Non-compliance of clause 32.0 	Rs.10,000 per single violation Compounded to a maximum of Rs.1,00,000 at any single instance
14.	Gas Welding/ Cutting	<ul style="list-style-type: none"> ii) Wrong colour coding of cylinder. iii) Cylinders not stored in upright position. iv) Flash back arrester, non-return valve and regulator not present or not in working condition. v) Fail to put cylinders in a cylinder trolley. vi) Damaged hose. vii) Using domestic LPG cylinders viii) Fail to store cylinder 6.6m away from fire prone materials ix) Fail to use hose clamps x) Fire extinguisher not placed in the vicinity during operation xiii) Non-compliance clause 33.0 	Rs. 25,000 per single violation Compounded to a maximum of Rs. 1,00,000 at any single instance
15.	Electric Arc Welding	<ul style="list-style-type: none"> i) Voltmeter and Ammeter not provided/not working or found damaged . ii) Improper grounding and return path. iii) Damaged welding cable iv) Bare openings in the cable. v) Non-availability of separate switch in the transformer vi) Non-availability of main switch control to switch off power to the welding unit. vii) Usage of reinforcement rod as return conductor viii) Damaged holder ix) Fire extinguisher not placed in the vicinity during operation. 	Rs.10,000 per single violation Compounded to a maximum of Rs.50,000 at any single instance

16.	Fire precaution	<ul style="list-style-type: none"> i) Smoking and open flames in fire prone area ii) Using more than 24V portable electrical appliances in the fire prone area iii) Not proper ventilation in cylinder storage area. iv) Absence of fire extinguishers v) Fire extinguishers not refilled once in a year. vi) Fire extinguisher placed in a not easily accessible location vii) Non-compliance clause 35.0 	Rs. 10,000 per single violation Compounded to a maximum of Rs. 50,000 at any single instance.
17.	Excavation, Tunneling , confined space and Demolition	<ul style="list-style-type: none"> i) Non-compliance of clause 38.1.1 ii) Non-compliance of clause 38.2.2 and 38.2.3 iii) Non-compliance of clause 38.3 iv) Non- compliance of clause 37.0 	Rs. 25,000 per single violation Compounded to a maximum of Rs. 1,00,000 at any single instance.
18.	Work permit system	<ul style="list-style-type: none"> i) Non-compliance of clause 39.2 ii) Non-compliance of clause 39.5 iii) Non-compliance of clause 39.7 iv) Non-compliance of clause 39.0 	Rs.50,000 per first violation and Rs.1,00,000 for subsequent violations
19.	Traffic Management	<ul style="list-style-type: none"> i) Non-compliance of clause 40.4.1 ii) Non-compliance of clause 40.8.3 iii) Non-compliance of clause 40.9.2 iv) Non-compliance of clause 40.9.3 	Rs.10,000 per single violation Compounded to a maximum of Rs.1,00,000 at any single instance

		<p>a) Barricades</p> <ul style="list-style-type: none"> i) Not Cleaned ii) Not in alignment iii) Not numbered iv) Not painted v) Red lights / reflectors not working vi) Damages not repaired vii) Not secured properly viii) Barricade inspector not employed ix) Protruding parts / portions repaired x) Barricades maintaining register not properly maintained up to date xi) Non Compliances of clause 40.10 	<p>Rs.10,000 per single violation Compounded to a maximum of Rs.1,00,000 at any single instance</p>
		<p>b) Contractor Vehicles</p> <ul style="list-style-type: none"> i) Over loading of vehicles ii) Unfit drivers or operators iii) Unlicensed vehicles iv) Absence of traffic marshals v) Absence of reversing alarm vi) Absence of fog light (at winter) vii) Power / hand brakes not in working condition. viii) Provision of helper on construction vehicle ix) Provision of IPV 	<p>Rs.10,000 per single violation Compounded to a maximum of Rs.1,00,000 at any single instance</p>
		<p>c) Water Logging on roads / non-cleaning of tyres of dumpers and transit mixers</p> <ul style="list-style-type: none"> i) Water Logging on the Roads ii) Non-cleaning of tyres of dumpers and transit mixers before leaving the site and thereby creating a traffic safety hazard to road users. iii) Non compliance of clause 21.14 and 40.18 	<p>Rs.10,000 on first observation and Rs. 1,00,000 on subsequent observation</p>
20.	Batching plant / Casting yard	Non-adherence of any of the provisions mentioned in clause 42.0.	Rs. 10,000 for single violation compounded to a maximum of Rs. 1,00,000 at any single instant.
21.	PPE	<ul style="list-style-type: none"> i) Not having ii) Not wearing (or) using and kept it elsewhere 	Rs. 1000 per single violation and Compounded to a maximum of Rs.1,00,000 at any single

		<ul style="list-style-type: none"> iii) Using damaged one iv) Using wrong type v) Using wrong colour helmet or helmet without logo vi) Using for other operation (e.g. Using safety helmet for storing materials or carrying water from one place to other) vii) Not conforming to BIS standard viii) Non-compliance of clause 43.6, 43.7 and 43.8. 	instance
22.	Occupational Health	<ul style="list-style-type: none"> i) Fail to conduct Medical examination to workers (clause 46.1) ii) Absence of ambulance van & room (clause 47.3) iii) Workers not having valid ID card or blood group not mentioned (clause 9.2.1) iv) Absence of first-aid person in work site (clause 47.4.1). v) Absence or inadequacy of first-aid box (clause 47.4). vi) Misuse of first-aid box (clause 47.4). vii) First-aid box not satisfy the minimum Indian standard (clause 47.4). viii) Smoking inside the construction site (clause 47.7.2). ix) Drink and drive or work (clause 47.7.1). x) Fumigation / insecticides not sprayed to prevent Mosquito breeding (clause 47.6.3). xi) Non-compliance of clause 47.1 and 47.2, 47.3 	Rs.10,000 per single violation Compounded to a maximum of Rs.1,00,000 at any single instance
23.	Labour Welfare measures	<ul style="list-style-type: none"> i) Inadequate no. of toilets (clause 51.1.1) ii) Toilets not cleaned properly (clause 51.1.3) iii) Absence of water facilities for toilets and washing places (clause 51.1.3) iv) Toilet placed more than 500m from the work site (clause 51.1.3 and 51.1.4) 	Rs.10,000 per single violation Compounded to a maximum of Rs.1,00,000 at any single instance

		<ul style="list-style-type: none"> v) Accommodation not provided as per BOCWA (clause 51.5.1) vi) Absence of drinking water (clause 51.4) vii) Excessive Noise and vibration (clause 48.3 and 48.4) viii) Canteen not provided (clause 51.2) ix) Food Stuff not served on no loss no profit basis (clause 51.3) x) Crèche not provided (clause 51.6) xi) Non adherence of Labour welfare provisions of BOCWA xii) Fail to register establishment and display the registration certificate at workplace xiii) Absence of workers register and records xiv) Absence of muster roll and wages register xv) Fail to display an abstract of BOCWA and BOCWR xvi) Non maintenance /improper maintenance of statutory registers. xvii) Delay or non –filling of forms/challans xviii) Non-reporting of any accident to the labour welfare department. 	
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53.4 Without limiting to the unsafe acts and or conditions mentioned above in clause 53.3 the Employer shall have the right to deduct charges for any other unsafe act and or condition depending upon the gravity of the situation on a case-to-case basis. The charges shall be in comparison with that of the similar offence indicated in clause 53.3.

53.5 Details about Penalties imposed on the Contractor would be intimated to their Corporate Headquarters by NMRC. The penalties imposed by NMRC shall not be allowed to be transferred to the Sub Contractors.

54.0 Stoppage of work

54.1 The Employer shall have the right to stop the work at his sole discretion, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and / or property, and / or equipments. In such cases, the contractor shall be informed in writing about the nature of hazards and possible injury / accident.

- 54.2 The contractor shall not proceed with the work until he has complied with each direction to the satisfaction of Employer
- 54.3 The Contractor shall not be entitled for any damages / compensation for stoppage of work, due to safety reasons and the period of such stoppage of work shall not be taken as an extension of time for Completion of the Facilities and will not be the ground for waiver of levy of liquidated damages.
- 54.4 The Employer shall have the right to stop the work if the contractor is working without license or has failed to comply provisions relating to wages, provident fund and ESI for the workers consecutively for three months.

55.0 Awards

The following categories will be considered for awards as per the scheme in practice of Employer

- i) For every safe million man hour working without any reportable incidents
- ii) Zero fatality contracts
- iii) 100% adherence to voluntary reporting of all accidents throughout the currency of contract
- iv) Safest project team of the year.
- v) Best SHE team of the year.
- vi) Safest Contractor of the year.
- vii) Best statutory compliances and welfare facility

56.0 Environmental Penalties

56.1 The following table indicates the Environmental violation and charges to be recovered from contractors.

SL. No.	Topic	Violation	Deductible Amount
1.	Contractor's Environment Organization	a. Not engaging key Environmental personnel for the entire duration of contract and its extension	Rs. 2,00,000/- for first month and Rs. 4, 00,000/- for subsequent months
2.	ISO Certification	a. Not obtaining ISO 14001:2015 & ISO 45001:2018 certification within the stipulated time frame	Rs. 1,00,000/- per single violation and Rs. 2,00,000for subsequent violations.

SL. No.	Topic	Violation	Deductible Amount
3.	External Environmental Audit	a. Not carrying out External Environmental Audit	Rs. 1,00,000/-for first violation and Rs. 2,00,000/- subsequent violation
4.	Environmental Training	a. Not carrying out Environmental Training	Rs. 50,000/-for first violation and Rs. 1,00,000/- subsequent violation
5.	Installation of CCTV camera	a. Not installing CCTV cameras as per the requirement b. CCTV camera not functional c. Camera not connected to NMRC's centralized server d. Unauthorized sharing of photos/videos/recordings of CCTV cameras	Rs. 10,000/- for violation of each item compounded to a maximum of Rs. 50,000/- at any given instance
6.	Environmental Sanitation	a. Environment Sanitation maintenance register not properly maintained up to date b. Surrounding areas of drinking water tanks/ taps not hygienically cleaned / maintained c. Office, stores, toilet/ urinals not properly cleaned and maintained d. Required dustbins at appropriate places not provided / not cleaned e. Water stagnation leading to mosquito breeding	Rs. 10,000/- for violation of any single item compounded to a maximum of Rs. 1,00,000/- at any single instance
7.	Felling of Trees & Tree Preservation	a. Felling of trees without obtaining requisite permission from NMRC/Statutory Authority	Rs. 1,00,000/- on single violation for item a)
8.	Top Soil Preservation	a. Top soil preservation not practiced	Rs. 25,000/- on each violation/ per instance

SL. No.	Topic	Violation	Deductible Amount
9.	Containment of Air Pollution	a. Not adhering to provision of Graded Response Action Plan (GRAP)	Rs. 5,00,000/- on single violation for item a)
		b. Wheel washing facility not provided at exit gates of casting yard, batching plant and underground station sites c. Beton washing system not provided/Transit Mixture(TM) washing facility not provided at casting yard/ batching plant d. Soil, sand, aggregate, debris of any kind and all dust prone materials stored without proper tarpaulin coverage e. Sprinkling or mist-based dust suppression methods not practiced at site f. Casting yard and batching plant not provided with hard surface and access roads and internal circulation roads not maintained properly g. Not maintaining required DG Stack height as prescribed in the standard h. Ducting system connected to a container filled with water not provided in cement go-down and cement feeding area i. Conveyor belt used for carrying aggregate not covered j. Carrying out construction work without erecting proper barricades k. Providing unauthorized access points/gaps in barricading	Rs. 25,000/- on single violation compounded to a maximum of Rs. 1,00,000/- at any single instance

SL. No.	Topic	Violation	Deductible Amount
		<ul style="list-style-type: none"> <li>l. Storage facility for dust generating materials/debris not provided <li>m. Storing material/debris/soil outside barricaded area <li>n. Storing aggregates and sand in open <li>o. Over speeding of construction vehicles <li>p. Operating vehicles, machineries and other equipments without valid PUC <li>q. Operating visibly polluting vehicles, machineries and other equipments <li>r. Truck carrying Material/ muck/ soil/ C&D waste (debris) not covered / tyre not cleaned/washed while leaving site <li>s. Vehicles / equipments of contractor or sub-contractor parked /placed on road obstructing free flow of traffic <li>t. Deposition of material/muck/soil on public streets <li>u. Dumping sites not barricaded <li>v. Toe dust along the barricade not cleaned regularly <li>w. Not practicing any other dust control measures mentioned in this document 	

SL. No.	Topic	Violation	Deductible Amount
10.	Containment of Water Pollution and Conservation of Water	<ul style="list-style-type: none"> a. Water meter not provided b. Drainage system not maintained at casting yard or and batching plant c. Not providing treatment facility before discharge of muck slurry into drainage system d. Washout of construction or excavated materials directly diverted to drainage system e. Not installing Rain Water Harvesting (RWH) System at Batching Plant and Casting Yard f. Spillage or dumping of Bentonite slurry/Poly-mud slurry or other grouts onto public road or any other ecologically sensitive location g. Rain Water Harvesting system not functional h. Using ground water instead of treated effluent for sprinkling i. Discharge water from the site without the approval of the Employer j. Discharge of de-watered water from underground construction work to drains without prior approval of the Employer 	Rs. 25,000/- for violation of any single item compounded to a maximum of Rs. 1,00,000/- at any single instance

SL. No.	Topic	Violation	Deductible Amount
11.	Containment of Noise	<ul style="list-style-type: none"> a. Not providing noise barrier of required height near noise sensitive receptors such as residences, schools, hospitals and similar areas b. Not providing acoustic enclosure or acoustic treatment for DG sets for meeting the ambient noise standards c. Breaching allowable noise limits given in this document d. Not adhering to noise limits for DG sets e. Not providing PPE to workers against occupational noise 	Rs. 25,000/- for violation of any single item from a) to b) compounded to a maximum of Rs. 2,00,000/- at any single instance
12.	Containment of Waste	<ul style="list-style-type: none"> a. Waste Management Plan not submitted along with Environment Plan b. Leakage of waste during handling, storage and transportation of waste causing pollution c. Material Safety Data Sheet for material/ chemicals/ substances used not provided d. Not following waste disposal mechanism in accordance with this document e. Discharging of Bentonite slurry/Poly-mud slurry or other grouts drainage directly in to drainage system f. Delay in disposal of waste items g. Burning of refuse at construction site h. Required number of colour coded dust bins not provided i. Not disposing C&D waste by authorized means j. Disposal of C&D waste along the river bed, natural drainage and wet land 	Rs. 25,000/- for violation of any single item from a) to n) compounded to a maximum of Rs. 1,00,000/- at any single instance

SL. No.	Topic	Violation	Deductible Amount
		<ul style="list-style-type: none"> k. Separate hazardous waste storage area not provided l. Drip pans of suitable size not provided m. Not maintaining separate scrap yard with hard surface n. Not displaying C&D waste board as per the C&D waste Management Rules, 	
13.	Environmental Monitoring	<ul style="list-style-type: none"> a. Air monitoring not implemented as per requirement given in this document b. Noise monitoring not implemented as per requirement given in this document c. Soil testing not implemented as per requirement given in this document d. Groundwater testing not implemented as per requirement given in this document e. Carrying out monitoring through un-approved laboratories f. Not keeping records of monitoring g. Not maintaining Type I or Type II integrating sound level meter with proper calibration certificate at all time h. Not maintaining check on the quality of monitoring agency while carrying out monitoring work at site i. Not verifying the correctness of monitoring data submitted by monitoring lab j. Not ensuring calibration of air monitoring instruments used by monitoring agency k. Not ensuring calibration of noise monitoring instrument 	Rs. 25,000/- for violation of any single item compounded to a maximum of Rs. 1,00,000/- at any single instance


SL. No.	Topic	Violation	Deductible Amount
		used by monitoring agency	
14.	Housekeeping	<ul style="list-style-type: none"> i) Noncompliance of clause 52.9 ii) Housekeeping maintenance register not properly maintained up to date iii) Surrounding areas of drinking water tanks / taps not hygienically cleaned / maintained iv) Office, stores, toilet / urinals not properly cleaned and maintained. v) Required dustbins at appropriate places not provided / not cleaned. vi) Stairways, gangways, passageways blocked. vii) Lumber with protruding nails left as such viii) Openings unprotected ix) Unused surplus cables/ steel scraps lying scattered x) Excavated earth not removed within a reasonable time. xi) Truck carrying excavated earth not covered / tyres not cleaned. xii) Vehicles / equipments parked / placed on roads obstructing free flow of traffic xiii) Wooden scraps, empty wooden cable drums lying scattered xiv) Water stagnation leading to mosquito breeding Disposal of debris in unsafe manner 	Rs. 10,000 per single violation Compounded to a maximum of RS. 1,00,000 at any single instance

56.2 The penalty on each account as given in Clause 56.1 above can be imposed by NMRC.

- 56.3 The penalty shall be imposed in writing and once imposed, cannot be condoned except with the explicit and written approval of concerned NMRC HOD/ED.
- 56.4 The Employer at his discretion may inform the Contractor, the quantum of penalty imposed on the contract for violation of environmental requirements on monthly basis. The contractor shall not transfer the penalty to its sub-contractor.
- 56.5 In case of violation of environmental requirements at a particular location, the Contractor shall be issued Yellow Card on first violation in addition to the penalty imposed. The card shall be issued by NMRC. This warning card shall be withdrawn after satisfactory compliance of the violation.
- 56.6 Red card shall be issued in case of repeat environmental violation carried out at the same location. The construction head of the contractor may be demobilised in case of fifth Red Card issue for similar violation at the location. In the fifth violation of environmental requirements at the same location, responsibility of the Contractor's staff will be fixed by the contractor's by the Contractor's management and the person found responsible for repeated violation may be demobilized from site. However, the employer reserves the right to fix the responsibility on the person heading the contract.

57.0 Environmental Awards

- 57.1 The following categories will be considered for awards as per the scheme in practice of Employer
- i) Best Environmentally managed Underground contract
 - ii) Best Environmentally managed Elevated contract
 - iii) Best Environmentally managed Batching plant
 - iv) Best Environmentally managed Casting yard
 - v) Best Environmentally managed Depot/Track/Staff Quarter/other contract
- 57.2 The above categories may increase or decrease at the sole discretion of the employer

	NOIDA METRO RAIL CORPORATION LTD.
APPENDIX NO.: 01	

Memorandum of Understanding between Noida Metro Rail Corporation (NMRC) and the Contractor for safe and environment friendly execution of contract work

This Memorandum of Understanding is made and executed by and between Noida Metro Rail Corporation Ltd. (NMRC), a Company registered under the Companies Act 1956 and having its registered office at Block-III, 3rd Floor, Ganga Shopping Complex, Sector-29, Noida -201301, District Gautam Budh Nagar, Uttar Pradesh, India or their authorized representative(s), hereinafter referred to as “EMPLOYER” (which expression shall wherever the context so requires or admits be deemed to mean and include its successors in business and assigns) of the one party

AND

M/s _____ having its registered office at _____ hereinafter referred to as the “CONTRACTOR” (which expression shall wherever the context so requires or admits be deemed to mean and include its successors in business and assigns) of the other party

WITNESSETH THAT

WHEREAS the EMPLOYER gives highest importance to the occupational safety & health and environment during execution of work, seeks cooperation from the CONTRACTOR in this endeavour.

Thus, this Memorandum of Understanding is for promoting the safety & health and environment aspects required to be followed at workplace/site and will be applicable to any site job to be done by the CONTRACTOR

AND

WHEREAS the CONTRACTOR has read all the terms and conditions of the EMPLOYER and whereas the CONTRACTOR has studied the following documents:

- (a) Tender Documents, including Notice Inviting Tender, General Conditions, Special Conditions,
- (b) Conditions of Contract on Safety & Health and Environment.
- (c) Building and Other Construction Workers (Regulations of Employment and Conditions of Service) Act 1996, Central Rules 1998 and subsequent Uttar Pradesh Government Rules, Building and Other Construction Workers Welfare Cess Act 1996 and Rules 1998 and Uttar Pradesh Building and Other Construction Workers' Welfare Board Rules and
- (d) Indian Electricity Act 2003 and Rules 1956.
- (e) Corresponding International / Bureau of Indian Standard Codes.
- (f) Environment Protection Act 1986 and its subsequent amendments.
- (g) Waste Management Rules 2016 and its subsequent amendments.
- (h) The Air (Prevention and Control of Pollution) Act, 1981 and its subsequent amendments
- (i) The Water (Prevention and Control of Pollution) Act, 1974 and its subsequent amendments.
- (j) C & D waste Rules 2016 and its subsequent amendments
- (k) The Noise Pollution (Regulation and Control) Rules, 2000 and its subsequent amendments
- (l) Hazardous and other Wastes (Management & Trans-boundary Movement) Rules, 2016
- (m) Solid Waste Management Rules, 2016
- (n) E-Waste (Management) Rules 2016
- (o) Batteries (Management & Handling) Rules, 2001 and amendment 2010

The amendments to any of the above rules and any other rules & regulations or procedures, circulars, notices & advices laid down by the EMPLOYER from time to time.

Now it is hereby AGREED AND DECLARED by and between the EMPLOYER and the CONTRACTOR as follows:

- Clause - I The CONTRACTOR shall abide by the terms and conditions stipulated in Condition of Contract on Safety & Health & Environment.

- Clause - II The CONTRACTOR shall undertake full responsibility for safe and environment friendly execution of job at work place/site and safety of his personnel and adjoining road users during work.

- Clause - III Without giving any prior notice, the EMPLOYER shall from time to time be entitled to add/or amend any or all terms and conditions with a view to improving construction related environment, and occupational health of personnel & safety of work, with immediate effect and the same shall be binding on the CONTRACTOR. The contractor agrees to implement all such amendments, which shall be laid down by the EMPLOYER.

Clause - IV Besides following the guidelines, safety and environment rules and regulations, safety and environment codes given in various safety and environment procedures/documents mentioned above, the CONTRACTOR shall also prepare detailed method statement which includes job safety and environment analysis wherever there are complicated and hazardous/high risk working involved and get it approved from Employer before execution of work.

Clause - V Any negligence or violation in implementing any of the provision of the conditions of contract on Safety & Health & Environment shall be viewed seriously and the contractor is liable to compensate the employer for the loss of reputation. The cost of damage shall be fixed on case-to-case basis.

In witness thereof the Parties hereto by representatives duly authorised have executed this Memorandum of Understanding on _____ day of _____ 20____.

Signed on

Signed on

For and on behalf of NMRC

For and on behalf of (Contractor)

Signature:


Signature:

Name:

Name:

Title:

Title:

	NOIDA METRO RAIL CORPORATION LTD.
APPENDIX NO.: 02	

Safety, Welfare, Occupational Health and Environment requirements as per BOCW Act 1996 and Rules 1998 and DBOCW Rules 2002, and Similar Rule Of UP Government

(This list has been prepared in chronological order with primary importance to Section of Act and secondary importance to Rules)


- S - Refers relevant Sections in BOCWA
 R - Refers relevant Rules in BOCWR
 C - Refers relevant Chapter No. in BOCWR

Sl. No.	Items	Relevant Sections / Rules in BOCWA and BOCWR and DBOCW & Similar Rule Of Uttar Pradesh
1.	Registration of establishment	S – 7, R – 23 to 27
2.	Display of registration certification at workplace	R – 26 (5)
3.	Hours of work	S – 28 R – 234 to 237
4.	Register of overtime	S – 28; S – 29 R – 241(1) Form XXII
5.	Weekly rest and payment at rest	R – 235
6.	Night shift	R – 236
7.	Maintenance of workers registers and records	S – 30 R – 238
8.	Notice of commencement and completion	S – 46 R – 239
9.	Register of persons employed as building workers	R – 240
10.	Muster roll and wages register	R – 241(1) (a); Form XVI and XVII
11.	Payment of wages	R – 248
12.	Display of notice of wages regarding	R – 249

13.	Register of damage or loss	R – 241(1)(a); Form XIX, XX, XXI
14.	Issue of wages book	R – 241(2)(a); Form XXIII
15.	Service certificate for each workers	R – 241(2)(b); Form XXIV
16.	Display an abstract of BOCWA and BOCWR	R – 241(5)
17.	Annual return	R – 242; Form XXV
18.	Drinking water	S – 32
19.	Latrines and Urinals	S – 33 R – 243
20.	Accommodation	S – 34
21.	Creches	S – 35
22.	First-aid boxes	S – 36 R – 231 and Schedule III
23.	Canteens	S – 37 R – 244
24.	Food stuff and other items served in the canteens	R – 245
25.	Supply of tea and snacks in work place	R – 246
26.	Food charges on no loss no profit basis	R – 247
27.	Delhi BOCW welfare Board Rules	R – 250 to 296 & Similar Rule Of Uttar Pradesh
28.	Safety committee	S – 38 R – 208
29.	Safety officer	S – 38 R – 209 and Schedule VII
30.	Reporting of accidents and dangerous occurrences	S – 39 R – 210
31.	Procedure for inquiry in to the causes of accidents	R – 211
32.	Responsibility of employer	S - 44 R – 5
33.	Responsibility of Architects, Project engineer and Designers	R – 6
34.	Responsibility of workmen	R – 8

35.	Responsibility for payment of wages and compensation	S – 45
36.	Penalties and Procedures	S – 47; S – 55
37.	Excessive noise, vibration etc	R – 34
38.	Fire Protection	R – 35
39.	Emergency action plan	R – 36
40.	Fencing of motors	R – 37
41.	Lifting of carrying of excessive weight	R – 38
42.	Health, Safety and Environmental Policy	R – 39
43.	Dangerous and Harmful Environment	R – 40
44.	Overhead protection	R – 41
45.	Slipping, Tripping, Cutting, Drowning and Falling Hazards	R – 42
46.	Dust, Gases, Fumes, etc	R – 43
47.	Corrosive substance	R – 49
48.	Eye Protection	R – 45
49.	Head Protection and other protection apparel	R – 46; R – 54
50.	Electrical Hazards	R – 47
51.	Vehicular traffic	R – 48
52.	Stability of structure	R – 49
53.	Illumination	R – 50; R – 124
54.	Stacking of materials	R – 51
55.	Disposal of debris	R – 52
56.	Numbering and marking of floors	R – 53
57.	Lifting appliances and gears	C – VII; R – 55 to 81
58.	Runways and Ramps	C – VIII; R – 82 to 85
59.	Working on or adjacent to water	C – IX; R – 86 & 87
60.	Transport and earthmoving equipments	C – X; R – 88 to 95
61.	Concrete work	C – XI; R – 96 to 107
62.	Demolition	C – XII; R – 108 to 118
63.	Excavation and Tunnelling works	C – XIII; R – 119 to 168

64.	Ventilation	R – 153
65.	Construction, repair and maintenance of step roof	C – XIV; R – 169 to 171
66.	Ladders and Step ladders	C – XV; R – 172 to 174
67.	Catch platform and hoardings, chutes, safety belts and nets	C – XVI; R – 175 to 180
68.	Structural frame and formworks	C – XVII; R – 181 to 185
69.	Stacking and unstacking	C – XVIII; R – 186 & 187
70.	Scaffold	C – XIX; R – 188 to 205
71.	Cofferdams and Caissons	C – XX; R – 206 to 211
72.	Explosives	C – XXI; R – 212 & 213
73.	Piling	C – XXII; R – 214 to 222
74.	Medical Examination for building and other construction worker, Crane operator an Transport vehicle drivers	R – 81; R – 223(a)(iii) and Schedule XII
75.	Medical examination for occupational health hazards	R – 233(a)(iv)
76.	Charging of workers for Medical Examination	R – 223(b)
77.	Occupational health centres and Medical officers	R – 225 and Schedule X & XI
78.	Ambulance van & room	R – 226 & 227 and Schedule IV & V
79.	Stretchers	R – 228
80.	Occupational health service for building workers	R – 229
81.	Medical examination for occupational health hazards	R – 223(a)(iv)
82.	Emergency care services and emergency treatment	R – 232
83.	Power of experts and agencies	Central Rule 250 Delhi Rule 297 & Similar Rule Of Uttar Pradesh
84.	Power of inspectors	Central rule 251 Delhi Rule 298 & Similar Rule Of Uttar Pradesh

	NOIDA METRO RAIL CORPORATION LTD.
APPENDIX NO.: 03	

SITE SAFETY AND HEALTH PLAN	
Contract No	
Contractor Name	
Project Name	

1	Project Highlights <ul style="list-style-type: none"> i. Title of the content ii. Contractor Number iii. Brief scope of work iv. Location map/ key plan v. Period of the project
2	Safety & Health Policy
3	Site Organisation Chart Chart indicating reporting of Safety & Health personnel
4	Roles & Responsibility Individual responsibility of the <ul style="list-style-type: none"> i. Project Manager ii. Construction Manager iii. Construction Supervisors iv. Safety & Health Committee Members v. Safety & Health In-charge vi. Site Engineers vii. First Line Supervisors viii. Sub-contractors
5	Safety & Health Committee <ul style="list-style-type: none"> i. Details - Chairman, Members, Secretary and Employer's representative, ii. Procedures for effective conduct of meeting
6	Safety & Health Training
7	Subcontractor Evaluation, Selection and Control
8	Safety & Health Inspection
9	Safety & Health Audit

10	Accident Investigation and Reporting Procedures
11	Occupational Health Measures
12	Labour Welfare Measures
13	Risk assessment and mitigation procedures
14	Safe Work Procedures <ul style="list-style-type: none"> i. Work at Height ii. Structural Steel Erection iii. Launching of segments iv. Floor, Wall Openings and Stairways v. Welding, Cutting and Bracing vi. Lifting appliances vii. Operation/Maintenance of Electrical Equipments viii. Operation/ Maintenance of Mechanical Equipments ix. Excavation x. Fire Prevention xi. Handling of Hazardous Chemicals and Solvents xii. Ionising Radiation xiii. Lighting xiv. Abrasive Blasting etc.
15	Work Permit System
16	List of standard job specific PPEs to be used in the site
17	Maintenance of Regime for construction Equipment and Machinery
18	Traffic management Plan
19	Housekeeping Schedule
20	Emergency Management
21	Visitors and Security arrangement



NOIDA METRO RAIL CORPORATION LTD.

APPENDIX No. 04

MINIMUM MANPOWER REQUIREMENTS OF SAFETY ORGANIZATION BASED ON CONTRACT VALUE

	1	2	3	4	5	6
Category	Chief Safety Manager	Senior Safety Manager	Junior Safety Manager	Safety Steward	Senior Safety (Electrical) Engineer	Junior Safety (Electrical) Engineer
Category A	1	1@	Refer Note 1&	Refer Note 1	1	Refer Note 2
Category B,C,D & E	1 (For Category B only)	1	Note 5 For Category E Contrcat only		-	Note 6 For Category E Contrcat only

	7	8	9	10
Category	*Junior Safety (Fire) Manager / **Senior Safety (Fire) Manager	Occupational Health officer with Necessary Nursing Assistants (Refer Note3)	(Traffic) Manager (Refer Note 4)	Labour Welfare Officer
Category A	1**	1 (FT)#	1	1 for Every 500 Workmen with Support Staff
Category B, C, D & E	1*	1 (PT)		1 for Every 500 Workmen

@ One each for Viaduct/Tunnel, Station and Launching/Erection activity

In tunneling contracts of value above 500 crore, 2 Full time Doctor shall be required to be mobilized for ensuring round the clock presence.

Note 1: One in each shift at every active site, as per following scale:

- a. Two adjoining Stations and Viaduct in between
- b. Each Tunnelling activity include cross passage/ launching work.
- c. Casting yard

Note 2: Adequate, qualified and trained Electrical Engineers / supervisors to be deployed at each worksite at each shift.

Note 3: (FT) means Full-time and (PT) means Part Time. The frequency and duration of visit of Occupational Health officer shall be decided by NMRC.


Note 4: Requirement of Traffic Manager is applicable to contracts where the work has to be executed either below or over the right-of-way like Viaduct, Tunnel Contracts.

Note 5: One (1) number or as decided by Engineer as adequate Junior Safety Manager is required for Electrical Contracts which fall under category "E"

Note 6: Junior safety (Electrical) Engineer is required as per the work program submitted by the Contractor subject to approval by engineer

Mobilisation schedule of Chief and Senior Safety Manager

- i. After award of contract, at least one senior safety manager shall be mobilised within 4 weeks and remain on the project till taking over by NMRC.
- ii. Chief Safety Manager shall be required to be mobilised by 8 weeks after award of Contract and shall remain on the project till opening of line/ROD.

	NOIDA METRO RAIL CORPORATION LTD.
<u>APPENDIX- 4A ENVIRONMENT</u>	

Minimum manpower requirement of Environmental personnel based on contract category and contract value

Category of Contract	Contract value (in Cr. Rs.)	Chief Environment Officer (L-1)	Senior Environment Officer (L-2)	Environment Officer (L-3)	Housekeeping Manager (Refer Note 1)
Category A	More than 500	01	01	01	01
Category B	100 - 500	00	01	01	01
Category C	Up to 100	00	00	01	01
Category D	More than 500	00	01	01	01
	Up to 500	00	01	00	
Category E		00	00	00	01

Note 1: Housekeeping Manager supported by required supervisors and workmen

The Environmental Personnel shall be deployed till the issuing of taking over certificate by the Employer.



NOIDA METRO RAIL CORPORATION LTD.

APPENDIX No. 04 B

Roles & Responsibilities for category-“E” contracts only

S.No	Designation	Duties
1	Senior Safety Manager	Sr. Safety Manager/Engineer will head it's SH&E Organisation. He will be discharging the role of a guide and adviser to the contractor's management for achieving compliance to contractual and statutory obligation on Safety, Health and Environmental provisions. He will coordinate and conduct Internal SH&E Inspection, SH&E Report and other submissions to NMRC like Method Statements etc, SH&E Orientation and other Training and Communication, External SH&E Audit by NMRC approved agency, Monthly SH&E Committee meetings, closure of NMRC SH&E Non-conformance observations, Accident/Incident Reporting and Investigation, devising Emergency Preparedness plans and their executions etc.
2	Jr. Safety Manager	The Jr. Safety Manager will assist Sr. Safety Manager in discharging his responsibilities as mentioned at Sl. no-1.
3	Safety Steward	Safety Steward shall be responsible for all site related safety issues for the site assigned to him. He shall ensure that all the work is carried out in line of prescribed method statements, work permit and other required safety, health and Environment compliances. He shall be responsible for taking dust control measures etc at site to ensure check on environmental degradation.
4	Jr. Safety Electrical Engineer	Coordinating and conducting all Electrical Safety functions at work site including provisioning of safe worthy Electrical Power Generation, distribution and consumption appliances and fittings of appropriate IP ratings along with in-built safety arrangement like circuit breaker as per contract clause and monitoring their regular upkeep and maintenance, Electrical safety training, Electrical work permit etc.
5	Jr. Safety (Fire) Manager	Coordinating and conducting all Fire Safety and Fire lighting functions at work site including provisioning of adequate Fire Fighting Equipments and monitoring their maintenance, fire fighting training, hot work permit etc
6	Occupational Health Officer	Coordinating and conducting all Health and Occupational Safety functions at work site including Pre-employment Medical Examination, regular Medical examination during the currency of contract, Medical First aid facilities at work site, regular monitoring of work environment from the health risk to workforce, Medical First Aid and Emergency management training etc.
7	Sr. Safety (Traffic) Engineer	He shall ensure that all traffic related compliances are met out at site.
	Barricade Manager	He shall ensure that all barricading related compliances are met out at site.
\$	Housekeeping Manager	He shall ensure that all construction material, equipments etc are properly stacked and arranged and all sites remains clean in all respects.
10	Labour welfare officer	Coordinating and ensuring all statutory and contractual compliances related to labour laws and basic amenities at worksite and labour camps, payment of wages, issue of identity cards, post-accident relief and compensation etc as well as training on labour laws to management staff and workers.




NOIDA METRO RAIL CORPORATION LTD.

APPENDIX No.05

MINIMUM QUALIFICATION AND EXPERIENCE FOR SAFETY, ELECTRICAL, TRAFFIC ENGG. AND OCCUPATIONAL HEALTH PROFESSIONALS

Sl. No	Designation	Qualification	Experience (in years)
1	Chief Safety Manager	<p>The Chief Safety Manager (For Category-A contract) shall have qualified in any of the following:</p> <ul style="list-style-type: none"> i) B.E/B. Tech in Engineering* along with full time Degree / Diploma in Safety from a recognized institution/body ii) Two year duration Full time regular programme of M.E. in Industrial Safety from recognised institution/body iii) B.E. in Fire and Safety Engg. from recognised institution/body <p>*Preferably from Civil/Mechanical/Electrical Engineering Discipline</p>	10 years {for all category except (iii) where it shall not be less than 12 years}; at least 5 year experience shall be in the capacity of Chief/ Senior Safety Officer of similar project of equivalent scale
		<p>The Chief Safety Manager (For Category-B contract) shall have qualified in any of the following:</p> <ul style="list-style-type: none"> a) As stated in Sl. No:1 (b) Any of the following categories: <ul style="list-style-type: none"> i) B.Sc.(with Physics/Chemistry/Maths stream) with one year Full Time Safety diploma from a recognised institution/body ii) Full time regular Three Years duration Diploma in Engg* with one year Full Time Safety diploma from a recognised institution/body <p>*Preferably from Civil/Mechanical/Electrical Engineering Discipline</p>	- 7 years for category (a) - 10 years for category (b)
2	Senior Safety Manager	<ul style="list-style-type: none"> (a) As stated in Sl. No:1 (b) Any of the following categories: <ul style="list-style-type: none"> i) B.Sc.(with Physics/Chemistry/Maths stream) with one year Full Time Safety diploma from a recognised institution/body ii) Full time regular Three Years duration Diploma in Engg* with one year Full Time Safety diploma from a recognised institution/body <p>*Preferably from Civil/Mechanical/Electrical Engineering Discipline</p>	- 7 years for category (a) - 10 years for category (b)

3	Junior Safety Manager	(a) As stated in Sl. No:1 (b) As stated in Sr. 2 (b) (c) Any Graduate along with one year Full Time Safety diploma from a recognized institution/body	- 1 years for category (a) - 5 years for category (b) - 7 years for category (c)
4	Safety Steward	Senior Secondary School qualified with minimum Six Months duration Certificate Course in Safety.	1 year in construction sector
5	Senior Safety (Electrical) Manager	Degree in Electrical Engineering + Govt. recognized Electrical License holder	7 years in construction sector
6	Junior Safety (Electrical) Manager	Full Time regular Three years duration Diploma in Electrical Engineering + Govt. recognized Electrical License holder	3 years in construction sector
7	Senior Safety (Fire) Manager	Shall have qualified in any of the following: i) B.E. (Fire) from Recognized University/Institution ii) Graduate with any Govt. recognized diploma in Fire Safety	7 (for category (i) and 10 (ii) years in construction sector
8	Junior Safety (Fire) Manager	Any Diploma holder with any Govt. recognized diploma in Fire Safety.	3 years in construction sector
9	Occupational Health Officer	MBBS with Govt. recognized degree/diploma in Industrial/ occupational health	1 years in construction sector
10.	Senior Safety (Traffic) Engineer	Govt. recognized PG Degree / Degree / Diploma in Traffic/Transportation Engineering or Planning	2 years in construction sector
11.	House Keeping Squad - Manager	Any Diploma in Engineering or any Graduate	2 years in construction sector
12.	Barricade Manager	Any Diploma in Engineering or any Graduate	2 years in construction sector
13.	Labour Welfare Officer	Any Degree with Govt. Recognized Degree / Diploma / P G Diploma in Labour Welfare related fields like Law, Personnel / Industrial Relations etc.	2 years in construction sector

	NOIDA METRO RAIL CORPORATION LTD.
<u>APPENDIX- 5A</u> <u>ENVIRONEMNT</u>	

MINIMUM QUALIFICATION AND EXPERIENCE FOR ENVIRONMENTAL PROFESSIONALS

Sl. No	Designation	Minimum Qualification (any one of the following)	Relevant Experience (in years)
1.	Chief Environment Officer	i) B.E./B.Tech with Post Graduation/ Diploma in Environment from a recognized institution/body or B.E./B.Tech in Environment from a recognized institution/body Or	5 years in construction sector
		i) B.Sc with M.Sc in Environment Science from a recognized institution/body	6 years in construction sector
2.	Senior Environment Officer	i) B.E./B.Tech with Post Graduation/ Diploma in Environment from a recognized institution/body or B.E./B.Tech in Environment from a recognized institution/body Or	3 years in construction sector
		ii) B.Sc with M.Sc in Environment Science from a recognized institution/body	4 years in construction sector
3.	Environment Officer	ii) B.E./B.Tech with Post Graduation/ Diploma in Environment from a recognized institution/body or B.E./B.Tech in Environment from a recognized institution/body Or	1 year in construction sector
		iii) B.Sc with M.Sc in Environment Science from a recognized institution/body	2 years in construction sector
4.	Housekeeping Manager	Diploma in any branch of Engineering or any Graduate	2 years in construction sector
5..	Environment Warden	Plus 2 or equivalent	With or without experience
6.	Document Controller	Any graduate	2 years in construction sector

	NOIDA METRO RAIL CORPORATION LTD.
APPENDIX NO. 06	

MINIMUM REQUIREMENTS OF SAFETY & HEALTH MONITORING AND AUDIO-VISUAL EQUIPMENTS

1. For the purpose of minimum requirements of Audio-visual and Other equipment the contracts are categorized into the following groups:

Contract Value (Initial awarded value of contract)	Group
More than 500 Cr (Civil)	A
Between 100 to 500 Cr (Civil)	B
Less than 100 Cr (Civil)	C
Track Contracts	D
Pre-Engineered Building (PEB), E&M and Systems Contracts	E

2. Every contractor falling into the above groups shall provide the following minimum required audio-visual aids for conducting weekly review, monthly safety committee and other post review meeting of all fatal and major incidences effectively. These audio-visual equipments are a must for conducting periodical in-house safety presentations in the training programmes.
3. In addition to the above portable handheld digital sound level meter (SLM) and portable handheld digital lux meter are also to be provided.

SI.No	Safety & Health monitoring and Audio-Visual Equipment details	Safety & Health monitoring and Audio-Visual equipment required for			
		Group D & E Contract	Group C Contract	Group B Contract	Group A Contract
1.	Portable handheld Digital Sound Level Meter (SLM)	1	1	1	1
2.	Portable handheld Digital Lux Meter	1	1	1	1
3.	ELCB/RCCB Tester (Digital	1	1	1	1

4.	Earth Resistance Tester (Digital)	1	1	1	1
5.	Portable Gas Monitor	1	1	2	2
6.	Breath Analyser	1	1	2	2
7.	Portable loudspeaker (for toolbox talk and emergency purpose)	1	1	2	6
8.	Lamination Machine	1	1	1	1
9.	Machine for Spiral Binding	1	1	1	1
10.	Accident investigation Kit containing the following:	1	1	1	2
a)	Chalk piece for marking				
b)	Measuring tape for measuring <ul style="list-style-type: none"> • Flexible tape – 2m length • Metal Foot long scale and • Metal tape – 30m 				
c)	Equipment tags				
d)	Multipurpose Flashlight				
e)	Barrier tape of 20m length				
f)	Accident investigation Forms and checklists				
g)	Enough Paper for witness recording and other noting				
h)	Emergency Phone Numbers list				



NOIDA METRO RAIL CORPORATION LTD.

APPENDIX No. 07

Topics for First day at work Safety & Health orientation training of Workmen

1. **Safety Measures at site:**
 - Working at Height
 - Scaffolding/temporary erection
 - Electricity
 - Working near edges
 - Excavation & Demolition
 - Use of Hand Tools & Power Tools
 - Tunneling Operation
 - Plant & Machinery
 - Material Handling
 - Traffic Management
 - Site housekeeping
 - Fire Safety
 - Welding/Cutting etc
 - Machine and Area Guarding
 - Lifting operations and working with heavy loads
2. **Personal Protective Equipment**
 - Use & Storage of PPEs
3. **Health**
 - Site welfare facilities
 - Potential health hazards
 - Medical facilities
 - First Aid/CPR
4. **Duties of the contractor**
 - Brief outline of the responsibilities of the Contractor by law
 - Details of Contractor's accident prevention policy
 - NMRC's SHE manual
 - Building and other Constructions Welfare Law
5. **Employee's Duties**
 - Brief outline of responsibilities of employee under law
 - Explanation of how new employees fit into the Contractor's plan for accident prevention. (reporting of near miss).

Note: This is a sample list; other topic can also be included in first day induction training



NOIDA METRO RAIL CORPORATION LTD.

APPENDIX- 7A

ENVIRONMENT

Induction Training Topic - Environment

1. Contractor's Environment Policy
2. Avoidance of Nuisance
3. Environmental Sanitation
4. Dust Control Measures
5. Water Pollution and Control
6. Occupational noise mitigation
7. Waste Management and Disposal
8. Key legal requirements

Note: This is a sample list; other topic can also be included in first day induction training



NOIDA METRO RAIL CORPORATION LTD.

APPENDIX No. 08

ID Card Format

(85 mm x 55mm)

Front side of ID Card:

NMRC Project	
Contractor Logo	Name & Address of Main / Sub
Name: Designation: Blood Group: Valid up to: Safety Inducted:	Photo
	Authorised Signatory

Backside of ID Card


Employee Address: _____ _____ _____
<ol style="list-style-type: none">1. This card is the property of "XX" (Main / Sub / Labour Contractor) and must be returned on demand and on transfer / cancellation of employment.2. A change will be levied for replacement of the card due to loss or theft
Main contractors' Address

	NOIDA METRO RAIL CORPORATION LTD.
APPENDIX No. 10	

Safety & Health Training details for Managers and Supervisors

<p>1. The Law and Safety Statutory requirement Appropriate regulations Duties of employer and employee</p>	<p>2. Policy and Administration Effect of incentive on accident prevention Human relations Consultation Safety Officer: duties, aims, objectives</p>
<p>3. Safety and the Supervisor Safety and efficient production go together Accidents affect morale and public relations</p>	<p>4. Principles of Accident Prevention Attitudes of management, supervision and operations Methods of achieving safe operations Accident and injury causes</p>
<p>5. Site Inspection The role of management Hazard Identification Procedure Records results Follow-up procedures Feedback</p>	<p>6. Human Behavior Motivating agencies Individual behavior Environmental effects Techniques of persuasion</p>
<p>7. Site housekeeping Site organization Relationship of site housekeeping to accident occurrence Site access Equipment storage Material stacking Materials handling</p>	<p>8. Health Medical examination Hazard to health on site Sanitation and welfare Protective clothing First Aid/CPR</p>
<p>9. Personal Protective Equipment Eye, face, hands, feet and legs Respiratory protective equipment Protection against ionizing radiation</p>	<p>10. Electricity Appreciation of electrical hazards Power tools Arc welding Low voltage system Lighting and power system on sites ELCB, RRCB, Grounding/Ground fault circuit interrupters (GFCIs)</p>
<p>11. Oxygen and Acetylene Equipment Cylinder storage and maintenance Condition and maintenance of valves, regulators, and gauges Condition and maintenance of hoses and fittings Pressures</p>	<p>12. Equipment Accidents related to moving parts of machinery Appreciation of principles of guarding Importance of regular maintenance</p>

13. Transportation	14. Excavations
Transport to and from site Hazard connected with site transport Competent drivers Dumpers Tipping trucks Movement near excavations	Method of shoring Precautions while shoring Precautions at edge of excavations Removal of shoring Sheet steel piling
15. Working platforms, Ladders, and Scaffolding	16. Cranes and other Lifting Machines
Hazards connected with the use of ladders Maintenance and inspection Type of scaffold Overloading Work on roofs Fragile material Openings in walls and floors Use of safety belts and nets	Licensing, certification and training required for operation of cranes Slinging methods Signaling Access to crane(s) Maintenance and examination Ground conditions Hazards and accident prevention methods connected with the use of different types of cranes/heavy equipment Crane Lift Plan for all lifts
17. Lifting Tackle	18. Fire Prevention and Control
Slings - single and multi-legged Safe working loads (SWLs) Safety hooks and eyebolts Cause of failure Maintenance and examination	Principle causes determining fire Understanding fire chemistry Fire fighting equipment Fire fighting training
19. Communications	
Effective methods of communication (particular interest to non-English speaking workers) Method and preparation of reports Safety committees Safety meeting	

	NOIDA METRO RAIL CORPORATION LTD.
<u>APPENDIX- 10A</u>	
<u>ENVIRONMENT</u>	

Contents of Environmental Training Programme

Module for workers

SI No	Training Topics	Description	Duration
1	Overview of Environment Management	What are the main environmental factors getting effected during metro construction, aspect impact analysis, brief about NMRC environmental management plan, different sources of air, noise and soil pollution through this project, organization chart of KEC and NMRC for environment management, compliance with environmental legislation, company's policy for environment.	2.5 Hrs
	* Environmental Issues in project context		
	*Brief details of NMRC Work culture and how it is different from the others		
	* Roles and Responsibilities of Workmen in nvironmental management/Workmen contribution in Env. Management		
	* Briefing of Environmental Organization and their roles		
2	Environmental Sanitation	5S methods, importance of housekeeping and its implementation in every department, water sanitization methods (disinfection methods), methods to irradiate malaria and dengue (do's and don'ts), refuse disposal, collection. Importance of bio toilets and its use, government initiation and efforts for sanitation & our responsibility for the same. Detailed discussion on COVID 19	2.5 Hrs
	*House Keeping, Disposal of Waste		
	*Pest Control (Anti Malaria/ Dengue prevention measures)		
	*Personal Hyeigine (Bio Toilets)		
3	Health Impacts of Environmental Pollution	Details of harmful effects of construction on human body, respiratory disorders, bronchitis, asthma, hearing impairment (acute and chronic), diarrhoea, contamination of land and water sources nearby etc, importance of use of PPEs while working, proper use of Ear Plugs, Nose	2 Hrs.
	*Health Effect of Air Pollution (Dust)		
	*Health Effect of Noise Pollution		
	*Health Effect of Water Pollution		

	*Use of PPEs	Masks , Hand Gloves	
4	Waste Management	Management of rebar scrap, metal scrap, C&D Waste, Concrete Waste, Wooden Scrap, Muck, Excavated soil, Hazardous waste oil-soaked cotton used filters, debris. colour code system for a dust bin & collection & disposal process of food and other waste.	2 Hrs
	*Type of waste generated in Construction Project		
	*Details of Color coded dust bins		
	*Collection and disposal process of food waste		
5	On Job Briefing of different categories of workmen	Job responsibilities of TM operators and helpers, Environmental concerns during operations, spillage control, dust pollution, storage and disposal and recycle of concrete, (muck disposal), cleaning, disposal of hazardous waste generated during daily maintenance , use of chute cover during transportation of concrete ,Yellow and Red Card Warning System	2 Hrs
	* Trade specific Env Training		
	*Env. Training of TM Operators and Helpers		
	*Env. Training of Bar Bending and Cutting Workmen		
	*Env. Training of P&M technicians like mechanic, electricians etc.		
*Env. Training of Civil Supervisors and Foremen	Introduction to environment, hazards and importance of control (excavation, bar bending, concreting etc), zero discharge, noise pollution and control, water pollution and control, air pollution and control, sewer management, spillage control, raw material storage, chemical storage(spill containment kit/ MSDS), environmental mock drill Collection and disposal of excavated muck, soil, debris and C&D Waste . Disposal of polymer mixed soil. Yellow and Red Card Warning System		

	"Env. Training of Housekeeping Gang	Introduction to housekeeping, 5S methods, importance of housekeeping and its implementation in every department, waste segregation and disposal, use of PPE's, colour coding of bins, chemical material and waste handling, checklist maintenance, Collection and disposal of excavated muck, soil, debris and C&D Waste . Disposal of toe dust and domestic waste, Stacking and storage of materials at site.	
6	Training on Environmental Overview	Cover up summary of all training topics, assessment paper, reward for a workman and what do and don't related to environment on project site .Penalty system.	1 hr
	Summary of Training		
	Penalty System of Project		
	Reward system of Workmen		
	Do's and Don'ts		

Module for staff

SL No	Training Topics	Description	Duration
1	Overview of Environmental Management	What are the main environmental factors getting effected during metro construction, aspect impact analysis, brief about NMRC environmental management plan, different sources of air, noise and soil pollution through this project, organization chart of KEC and NMRC for environment management, compliance with environmental legislation, company's policy for environment. Roles and responsibilities of CEO, VP's, middle management and workmen to control environmental pollution	2 Hrs
	"Environmental issues in project context and their mitigation measures		
	*Brief Details of NMRC Project, Why NMRC Projects are different than others in Env implementation		
	*Identification of Environmental issues Air Pollution, NoisePollution, Soil Contamination		
	* Brief of Client and Company's Environmental Organization		
	* Roles and Responsibilities of Individual staff related to Env Management		
2	Policy Framework and Legal Requirement	Environmental Policy	2 Hrs
	* Environmental Policy Overview (Includes Both of NMRC and KEC)	Environment Protection Act, 1986 and Rules 1986	

	* Brief details of Environmental Management Plan of Project	Air (Prevention and control of Pollution) Act, 1981 and Rules 1981	
	*Legal Requirements (Project Related activities and Legal concerns)	Water (Prevention and Control of Pollution) Act, 1974 and Rules 1974	
	Includes all Air, Water and Noise Acts and Rules along with NGT Guidelines and GRAP, Uttar Pradesh Tree Prevention Act	The Noise Pollution (Regulation & Control) Rules, 2000	
		Hazardous and other Wastes (Management & Trans-boundary Movement) Rules, 2016	
3	Environmental Mitigation Measures Air Pollution & Dust Control Noise Pollution Water Pollution Waste Management C&D Waste, Hazardous Waste etc. Top Soil Preservation	Different sources of air, noise, water and soil pollution, ways of minimization of pollution and briefs about monitoring measures and details about their control plans (bag filters, ESP, use of PPE's, waste water treatment through aerobic and anaerobic process), segregation of waste, storage and disposal methods, hazardous waste disposal methods, top soil preservation methods through restoration and reclamation of land	3 Hrs
	This module will cover the requirements as per COCs and Individual staffs Roles an Responsibility related to implementation		
4	Environmental Sanitation	5S methods, importance of housekeeping and its implementation in every department, water sanitization methods (disinfection methods), methods to eradicate malaria and dengue (do's and don'ts), refuse disposal, collection, importance of bio toilets and its use, government initiation and efforts for sanitation & our responsibility for the same.	1 Hr.
	House Keeping, Disposal of Waste		
	Pest Control (Anti Malaria/ Dengue prevention measures)		
	Personal Hyeigine (Bio Toilets)		
5	Health Effects of Construction Activities	Details of harmful effects of construction on human body, respiratory disorders, bronchitis, asthma, hearing impairment (acute and chronic), diarrhoea, contamination of land and water sources nearby etc. importance of use of PPEs while working	1 Hr.
	Health Effect of Air Pollution (Dust)		
	Health Effect of Noise Pollution		
	Health Effect of Water Pollution		
	Use of PPEs		
6	Requirement of ISO 14001:2015 and Green Building Certification	Basics of ISO 14001:2015, clause 4 to clause 10, roles and responsibilities of staff contribution in Iso certification	1 Hr.

	This module will cover the staff's contribution in ISO Certification and IGBC certification like management and maintenance of records		
7	Climate Change and Resource Management	Details about GHG emissions, Global warming, long term impacts of climate change CDM measures to be taken, best practices followed in industries, initiatives for GRI reporting	1 Hr.
	This module will cover the impact of climate change and its impact		
8	Summary Environmental Management in Phase IV	Distribution of roles and responsibilities for weekly inspections and internal audits, submission of weekly reports, formation of environmental champions within the organization, importance of management review and SHE committee meetings, do's and don'ts, encouragements to employees through awards, and penalty for violation.	1 Hr.
	Briefing about Weekly Inspection and Quarterly Environmental Audits		
	SHE Committee Meetings		
	Dos and DONTs of Project in connection with Environmental Management		
	Award and Penalty System (Includes Yellow and Red Card System)		
	Briefing about Weekly Inspection and Quarterly Environmental Audits		

All training topics will be covered both through theory and video demonstration

	NOIDA METRO RAIL CORPORATION LTD.
APPENDIX No. 11	

Experts / Agencies for Safety & Health and Environment Services

Sl. No.	Organization	Services
Crane and Lifting Appliance Testing, Certification, Crane Safety Training and associated services		
1.	INTENCO Engineering Certifications LLP K – 10, South Extension, Part – 2, New Delhi – 110 049 Phone: 011 – 26254761, 26258130 Mobile: 9312260130 E-mail: info@intenco.in	
2.	Boss Technical Services A-2/295, Pankha Road, Janakpuri, New Delhi-110058 Mobile: 9811144107 E-mail: bosstechnical@yahoo.co.in	
3.	KR Bedmutha Techno Associates Pvt Ltd A-2A/120, Janakpuri, New Delhi- 110058 Tel: 011-25504438, 25504438 E-mail: Bedmutha_124@sify.com Website: www.krbta.com	

4.	<p>Meenal Engineers & Consultants 308, Agarwal Chamber-IV 27, Veer Savarkar BlockVikas Marg, Delhi- 110092. Tel: 0120-4132552, 4101552, Mobile: 9811191052 E-mail: pk_bansal25@yahoo.co.in Website: www.meenalengineers.com</p>
<p>SHE Services like ISO Certification, External SHE Audits, Consultancy services and SHE Training</p>	
1.	<p>Bureau Veritas India Pvt. Ltd., B-21 & 22, First Floor, Sector-16, NOIDA-201 301 (U.P.) Phone: 0120 – 2515055, Fax: 0120 - 2515248 E-mail: enp.delhi@in.bureauveritas.com</p>
2.	<p>Quality Growth Services Pvt.Ltd. H-13, Kirti Nagar, New Delhi – 110 015 Fax: 011 – 25431737 / 25438598 / 25918332 E-mail: qgs@qgspl.com Website:www.qgspl.com</p>
3.	<p>EQMSINDIA PVT. LTD. E-49, 1stFloor, Dazzle House, Jawahar Park, Main Vikas Marg,Laxmi Nagar, Delhi 110092 Phone: 91-11-220 17639/2204 4754 Fax: 91-91 2201 5150 E-mail: eqms@eqmsindia.org</p>

4.	<p>Vexil Business Process Services Pvt. Ltd. 10184, 3rdFloor (Landmark Inn) Main Arya Samaj Road, KarolBagh, New Delhi – 110 005 Mobile: 9350232711, 98102832201, 9350232714 E-mail: info@vexilbps.com Website: www.vexilbps.com</p>
5.	<p>SGS India Pvt. Ltd 226, Udyog Vihar Phase-I GURGAON- 122016 E-mail: brahmpal.upadhyay@sgs.com Website: www.sgs.com, Mobile: 08588839832</p>
6.	<p>American System Registrar 657, 2ndFloor, Sector-15, Part-1, Gurgaon, HARYANA- 122001. Phone: 0124-4271365, Fax: 0124-4271366 Mobile: 09811653069</p>
7.	<p>Quality Austria Central Asia Pvt Ltd82, Okhla Industrial Area Phase-III New Delhi- 110020 Tel: 011-46465100, Fax: 46465101 E-mail: marketing@qualityaustriaindia.comWeb: www.qualityaustria.com</p>
8.	<p>BSI India The Mira Corporate Suites (A-2) Plot 1&2, Ishwar Nagar, Mathura Road, New Delhi-110065 www.bsigroup.co.in</p>

9.	<p>Allied Boston Consultants India Pvt Ltd A-2/60, Second Floor, Shiv Arcade, Acharya Niketan, Mayur Vihar Phase-I Delhi-110091 Tel: 011-22702467, Fax: 011-22753084 E-mail: vishal.khosla@abcipl.co.in Website: www.abcipl.com</p>
10.	<p>TUV SUD South Asia Pvt Ltd C-153/1, Phase-I, Okhla Industrial area New Delhi-110020 Tel: 011-30889797, Fax 30889595 Website: www.tuv-sud.in</p>
11	<p>URS Certification Ltd F-3, Sector-6, Noida -201301, India Tel: +91-120 4516264-65 Fax+91-120 4297916 Email: www.ursindia.com</p>
SHE Trainings and Audits	
1.	<p>Premier Safety & Health Solutions A- 703, Ramkrishan Apts Plot-12, Sector-23 Dwarka, New Delhi- 110075 Tel: 28050074, Mob: 935088832, 981007254 E-mail: contact@pshs.in, Website: www.pshs.in</p>
2	<p>URS Certification Ltd F-3, Sector-6, Noida -201301, India Tel: +91-120 4516264-65 Fax+91-120 4297916 E-mail: www.ursindia.com</p>

SHE Trainings for Workers and Staff	
1	<p>Construction Industry Development Council 801, 8thFloor, Hemkunt Chambers,89, Nehru Place, New Delhi – 110 019 E-mail: cidc@cidc.in,cidcindia@yahoo.com</p>
2.	<p>Delhi Productivity Council 1E/10, Swami Ramtirath Nagar</p>
3.	<p>Indian Building Congress Sector-VI, RK Puram,New Delhi-110022 Tel: 26169531, 26170197, Fax: 26196391 Website: www.ibc.org.in</p>
4.	<p>Manipal City & Guilds Skills Training Pvt Ltd 256, Ground Floor, Okhla Industrial Estate Phase- 3 New Delhi-110020, Tel: 9313927236E-mail: rajesh.ratnam@indiaskills.com Website:www.indiaskills.com</p>
5.	<p>Labournet Services India Pvt Ltd. A- 1/55, Second Floor, Safdarjung Enclave, NEW DELHI-110029. Mobile: 9899151343 E-mail: munish@labournet.in Website: www.labournet.in</p>
6.	<p>Renyge Technologies H-13, Second Floor, Kirti NagarNew Delhi-110015 Tel: 9811653069, 9811029466</p>

7.	<p>SHELP Consultants 241, L-Extn, Mohan Garden, Uttam Nagar, New Delhi- 110059 Mob: 9717273812, 9958331125</p>
8.	<p>Dolphin Fire EHS Consultants (P) Ltd 10, Shanti Vihar, Near Karkardooma Court New Delhi-110092. Tel: 011- 42147100, Fax: 22374819 Mob: 9310464046 E-mail: sachin@dolphinehs.com Web: www.dolphinehs.com</p>
9.	<p>Centre for Occupational and Environmental Health Ground Floor, BL Thareja Block Maulana Azad Medical College, New Delhi-110002 Ph:011- 23233519,23221515, Telefax: 011-23214731 E-mail: ivps_coeh@yahoo.co.in, joshitk45@yahoo.co.in</p>
10.	<p>Arbrit Safety & Engineering Solutions Private Ltd 510, 5thFloor, Laxmi Deep Building, Distt Centre Laxmi Nagar, Delhi-110092 Ph: 011-45636440, Mobile: 9873916087 Website: www.arbritonline.com Kerala (Corporate) Office: Arbrit Safety & Engineering Solutions Private Ltd Building No. 34/1810D, 3rdFloor Poomkudy House, Edappally Cochin-682024, Kerala Ph: 0484-2753060, Mobile: 09447063682</p>

Agencies for Specialized SHE Training		
1..	<p>HSRTC, PENTASAFE, 201, 2ndFloor, Town Centre, Andheri Kurla Road, Marol, Andheri (East), Mumbai-400059 Phone: 022-2850 2210/20/50 Fax: 022-2850 2260 E-mail: training@penta-safe.com Website: www.penta-safe.com</p>	<p>Training for Height Safety</p>
2.	<p>St. Johns' Ambulance Red Cross Road New Delhi – 110 001</p>	<p>First-aid Training</p>
3.	<p>Institute of Driving Training & Research, Wazirabad Road, Adjoining Loni Road flyover. New Delhi – 110 094 Phone: 011 – 22813474, 22815833 Fax: 011 - 22811131 & Institute of Driving Training & Research, Sarai Kale Khan ISBT New Delhi</p>	<p>Defensive Driving Training for Vehicle Drivers.</p>

<p>4.</p>	<p>Institute of Road Traffic Education College of Traffic Management Aravali Hills, Surajkund Badhkal Road, Sector-43, Faridabad, Haryana-121001 Regd. Office: B- 128-130 DDA Sheds, Okhla Industrial Area Phase-I, NEW DELHI-110020. Tel: 011-26816868, Fax: 26817965 Mob: 9350232056, Web: www.irte.com E-mail: training@irte.com</p>	<p>Defensive Driving Training for Vehicle Drivers.</p>
<p>5.</p>	<p>L & T Eutectic 32, Sivaji Marg New Delhi – 110 015 Phone: 011 - 51419538, 51419539 Fax: 011 - 51419600 Website: www.lnteutecticwelding.com</p>	<p>Training for Gas Cutting/ WeldingSafety</p>
<p>6.</p>	<p>Modicare Foundation 4 Community Centre, New FriendsColony, New Delhi – 110 065 Phone: 011 – 5167235059 Fax: 011 – 26915469 E-mail: nivedita@modi.com nivedita@gmail.com Website: www.modicarefoundation.org</p>	<p>HIV / AIDS awareness</p>

7..	Manitowoc India Pvt Ltd 2 nd Floor, Plot No 117, Sector-44 Gurgaon-122001. HARYANA Website: www.manitowoc.com	Crane and Lifting Operations
8.	Quench Technologies 1/168/1-A, BappaRawal Market, Lampur Road Narela, DELHI-110040 Mobile: 09212415534 E-mail: quenchtch@gmail.com	Fire Fighting Training
9.	Youngman India Private Ltd Youngman Group UK D2, Udhog Kendra Ext-1, Near Noida Phase-II Ecotech III, Greater Noida Mob: 9810282787 E-mail: vjain@youngmangroup.com Web: www.youngmangroup.com	Training for Height Safety

	NOIDA METRO RAIL CORPORATION LTD.
APPENDIX NO.: 11A	

Responsibility of Contractors in respect of Worker’s Amenities and other facilities.

S.No	Type of Contract	Provision	Civil (Main Contractor	Finishing Contractor	Track Contractor	Other System Contractor
1.	Under-ground	Housekeeping	Civil will be responsible for general site, Tunnel & Viaduct cleaning (except for removal of material pertaining to System contractors) and will identify separate designated dump areas for each contractor for material to be deposited prior to removal.	Not Applicable	Yes Inside tunnel at all time after access	Once technical room is handed over, the principal system contractor for that room will take over responsibility for cleaning the room.
	Elevated		In case any system contractor fails to remove his material, the Engineer/Engineer's representative (NMRC Employee) of civil contract along with the Engineers/ Engineer's representative (NMRC Employee) of respective system wide contractors shall inspect the site jointly and prepare a joint note. After written notice of minimum three days to system contractor to remove his material thereafter civil Engineer may instruct civil Contractor to remove it and the cost of the same shall be borne by the system contractor as mutually agreed upon by the NMRC Engineers of various system wide contractors and civil. Civil will hand over the rooms to respective system contractors in properly cleaned condition and after providing proper lockable door & keys in a secured condition.	*Yes At Stations at all time	Yes At viaduct at all time after access	Other system contractors to continue their work following a mutually agreed and responsible sequence on sharing basis without hampering/ damaging the work of any other system contractor. System wide contractor shall be responsible only for cleaning of room/area after taking over the room/ area from Civil.


S.No	Type of Contract	Provision	Civil (Main Contractor)	Finishing Contractor	Track Contractor	Other System Contractor
2.	Under-ground	Security	<p>Civil in general will be responsible for Establishing an overall site security system to the approval of the Engineer. The system should ensure that no person from any agency working at site may take out/ bring in material without written authorization from the respective contractor's nominated site in charge and civil security-in-charge.</p> <p>The verification of any person removing material from site or bringing any material to site shall be sole responsibility of the contractor to whom the material belongs.</p> <p>The system once approved by the Engineer of civil contractor shall be binding on all system contractors.</p> <p>In case civil contractor is demobilized before completion of system wide contractors work, the Engineer/ Engineer's representatives (NMRC employee) of civil contract along with the Engineer/ Engineer's representatives (NMRC employee) of system wide contractors shall decide to entrust the responsibility to the system wide contractor generally having the largest scope of remaining work</p>	Not Applicable	Yes Inside tunnel at all time after access	Other system contractors have to provide prior authorization in case they have to bring-in/ remove any material from work site. No loading/ unloading of material shall be allowed without prior authorization.
	Elevated		<p>*Yes At Stations at all time</p>	Yes At viaduct at all time after access	In case civil contractor is demobilized before completion of system wide contractors work, the Engineer/ Engineer's representatives (NMRC employee) of civil contract along with the Engineer/ Engineer's representatives (NMRC employee) of system wide contractors shall decide to entrust the responsibility to the system wide contractor generally having the largest scope of remaining work	

S.No	Type of Contract	Provision	Civil (Main Contractor)	Finishing Contractor	Track Contractor	Other System Contractor	
3.	Under-ground	Toilets	<p style="text-align: center;">Yes</p> <p>Till access to system contractors. After access to system contractors, on cost sharing basis as per *a and *b.</p>	<p style="text-align: center;">Not Applicable</p>	<p style="text-align: center;">Yes</p> <p>Inside tunnel at all time after access</p>	<p style="text-align: center;">*Yes</p> <p>,At all work locations at all time or on cost sharing basis as per *a and *b.</p>	
	Elevated		<p style="text-align: center;">Yes</p> <p>Till access to Finishing and /or System contractors. After access to system contractors, on cost sharing basis as per *a and *b.</p>	<p style="text-align: center;">*Yes</p> <p>At Stations at all time</p>	<p style="text-align: center;">Yes</p> <p>At all time after access</p>	<p style="text-align: center;">*Yes</p> <p>At all work locations at all time</p>	
4.	Under-ground	Illumination	General lighting	Civil to provide general lighting to all common/ general areas of the work site till permanent lights become functional in that area or issuance of Taking over certificate whichever is earlier	Not Applicable	Yes	Task lighting will be the responsibility of of the various agencies/ system contractors.
			Emergency Backup				
			Task lighting				
	Elevated		General lighting		*Yes	At Stations at all time for it's own requirement	
			Emergency Backup				
			Task lighting				

S.No	Type of Contract	Provision	Civil (Main Contractor)	Finishing Contractor	Track Contractor	Other System Contractor
5.	Under-ground	Worker Rest Room	<p style="text-align: center;">Yes</p> <p>Till access to system contractors.</p>	<p style="text-align: center;">Not Applicable</p>	<p style="text-align: center;">Yes</p> <p>Inside tunnel at all time after access</p>	<p style="text-align: center;">*Yes</p> <p>At all work locations at all time</p>
	Elevated		<p style="text-align: center;">Yes</p> <p>Till access to Finishing and /or System contractors.</p>	<p style="text-align: center;">*Yes</p> <p>At Stations at all time</p>	<p style="text-align: center;">Yes</p> <p>At all work locations at all time after access</p>	<p style="text-align: center;">*Yes</p> <p>At all work locations at all time</p>

Note: (*)

- a. In situations where more than one contractor is working at Station, Viaduct, Tunnel etc. and the main/civil contractor work force has been drastically reduced, the common facilities of Housekeeping, Security, Illumination, Workers amenities like Toilets, Rest Room etc. shall be arranged through sharing of resources and cost.
- b. In case civil contractor is demobilized before completion of system wide contractors work, the Engineer/ Engineer's representatives (NMRC employee) of civil contract along with the Engineer/ Engineer's representatives (NMRC employee) of system wide contractors shall decide to entrust the responsibility to the system wide contractor generally having the largest scope of remaining work.
- c. Later the dismantling of Worker's amenities and Restoration of area would be the responsibility of finishing contractor

	NOIDA METRO RAIL CORPORATION LTD.
<u>APPENDIX-12</u> <u>ENVIRONMENT</u>	

Environmental Inspection Checklist

Report No.:	Inspection Date:	Inspected by :
Inspection Area:		
Participants:		

Sl. No	Item	Compliance		Photograph	Observation & Recommendation	Action	
		Yes	No			By whom	Target date
1.0	ENVIRONMENTAL SANITATION						
1.1	Regular housekeeping done at site						
1.2	Materials are properly stored						
1.3	Construction equipments and tools are kept properly						
1.4	Designated storage area for all materials as per requirement						
2.0	CONTAINMENT OF AIR POLLUTION						
2.1	Site is properly barricaded						
2.2	Dust generating materials are stored properly as per requirement given in the contract document						
2.3	construction equipment/ instruments/ construction material/debris/soil are not kept outside barricaded area						
2.4	Nearby roadways are clean from dust/Muck/debris						
2.5	Wheel washing facility is provided near the exit gate						
2.6	Wheel washing facility is in working condition						
2.7	Soil & debris stored in the site fully covered						
2.8	Regular water sprinkling						
2.9	Batching plant and / or casting yard area kept clean and neat						
2.10	Sufficient number of openings with exhaust fans are provided at cement storage area						
2.11	Proper PPEs are provided to workmen involved in manual cement handling						
2.12	Conveyor belt used for carrying aggregate are fully covered						
2.13	Access roads and internal circulation roads are well laid and maintained						

2.14	Stack height of DG set is as per norms						
2.15	Regular cleaning of toe dust						
2.16	Vehicle carrying construction materials, debris, muck etc are properly cleaned and covered						
3.0	CONTAINMENT OF WATER POLLUTION						
3.1	Water meters are provided as per requirements and are functional						
3.2	Waste water from site is not discharged into sewer without approval						
3.3	Waste water from RO reject, curing etc is put to effective use						
3.4	Transit Mixer washing facility /Beton washing provided at casting yard/batching plant						
3.5	Transit Mixer washing facility provided at casting yard/batching plant is functional						
3.7	Drainage system is functional						
3.8	Refuse/ excavate muck are not stored near the drains						
3.9	Site and adjacent areas are free from water logging						
3.10	Water consumption is recorded regularly						
4.0	CONTAINMENT OF NOISE						
4.1	Construction plant & equipments are serviced regularly						
4.2	Acoustic enclosures are provided for DG sets and maximum permissible sound pressure level is within 75dB(A) at one meter distance from the enclosure						
5	WASTE MANAGEMENT						
5.1	Adequate number of colour coded dust bins are available						
5.2	All waste items are deposited in refuse containers						
5.3	Bins are Emptied regularly						
5.4	No refuse is burnt at site						
5.5	Waste materials are properly stored at designated areas only						
5.6	C&D waste is not disposed along river bed, drainage & wet land						
5.7	Regular disposal of all types of waste as per law						
5.8	Availability of drip pans to prevent leakage and spill.						
5.9	No oil stains on ground						
5.10	Spill absorption material available						

Senior Environment Officer

Chief Environment Office



NOIDA METRO RAIL CORPORATION LTD.

APPENDIX No. 13

DAYS TO BE OBSERVED FOR CREATING SAFETY & HEALTH AND ENVIRONMENT AWARENESS

Dates as decided by MORTH, GOI	Road Safety Week (Subjected to confirmation from Ministry of Road Transport and Highway (MORTH), Govt. of India every year.)
16 th February	Kyoto Protocol Day
March	Red Cross Month
May 1 to 7	Emergency Preparedness Week
4 th March	National Safety Day
22 nd March	World Water Day
7 th April	World Health Day
14 th April	Fire Safety Day
April 18 to 22	Earth Week
20 th April	Earth Day
20 th April	Noise Awareness Day
28 th April	ILO World Day for Safety and Health at Work Day
5 th June	World Environmental Day
12 th June	World Day against Child Labours
9 th July	Occupational Health Day
17 th October	World Trauma Day
1 st December	World AIDS Day

	NOIDA METRO RAIL CORPORATION LTD.
APPENDIX No. 14	

Minimum Requirements of Safety & Health and Environment Communication Posters / Signages / Video

- For the purpose of Minimum requirements of Safety & Health and Environment Communication Posters / Signages / Video the contracts are categorized into the following groups:

Contract Value (Initial awarded value of contract)	Group
More than 500 Cr (Civil)	A
Between 100 to 500 Cr (Civil)	B
Less than 100 Cr (Civil)	C
Track Contracts	D
Pre-Engineered Building (PEB), E&M and Systems Contracts	E

- Every contractor falling into the above groups shall prepare a Safety & Health and Environment Communication Plan as a part of site specific Safety & Health Plan and Environment Plan and shall include the following minimum requirement of Posters / Signages / Video as applicable. In case readymade posters are available in any of the category from National Safety Council, Loss Prevention Association of India or any other safety related organisations they may procure the same and display it. In case the same is not available then the contractors' shall make necessary arrangements to get the posters designed and printed on their own.

All the above are to be detailed in the Site Safety & Health and Environment Plans and get an approval from the Employer before displaying the posters.

A. Table No.: 1 - Minimum No. of Posters

SI.No	SHE Poster Title	Minimum No. of concepts in each title	No. of Posters / Signage / Video			
			Group A Contract	Group B Contract	Group C Contract	Group D Contract
1.	Safety Culture	5	Each 10	Each 50	Each 75	Each 100
2.	Daily Safety Oath	1 English & 1	Each	Each 200	Each	Each 1000

		Hindi	100		500	
3.	Mandatory PPE Usage					
a)	Signages to display the messages like PPE ZONE, NO PPE ZONE, HARD HAT AREA etc.	2 types of sizes made up of metal sheet to be mounted at different locations	Each 25	Each 50	Each 75	Each 200
b)	Helmet	5	Each 25	Each 50	Each 75	Each 200
c)	Shoe	5	Each 25	Each 50	Each 75	Each 200
d)	Goggles & Ear Protection	5	Each 25	Each 50	Each 75	Each 200
e)	Full Body Harness	5	Each 25	Each 50	Each 75	Each 200
f)	Hi-Vi Jacket	5	Each 25	Each 50	Each 75	Each 200
4.	Emergency Management Plan	5	Each 25	Each 50	Each 75	Each 200
5.	Working at Heights	10	Each 25	Each 50	Each 75	Each 200
a)	Ladder, Stairway, Scaffold - Signages to display the messages like SAFE, UNSAFE, FIT FOR USE, AVOID USE etc.	5 types of sizes made up of metal sheet to be mounted at different locations	Each 25	Each 50	Each 75	Each 200
6.	Site Electricity	5	Each 25	Each 50	Each 75	Each 200
7.	Crane Safety	5	Each 25	Each 50	Each 75	Each 200
8.	Slings	5	Each 25	Each 50	Each 75	Each 200
9.	Rigging Procedures	5	Each 25	Each 50	Each 75	Each 200
10.	Excavation	5	Each 25	Each 50	Each 75	Each 200
11.	Occupational Health (Mosquito Control, HIV/AIDS awareness, Dust Control, Noise Control, No Smoking/Spitting, etc.)	10	Each 25	Each 50	Each 75	Each 200
12.	First – Aid	3	Each 25	Each 50	Each 75	Each 200
13.	Labour Welfare Measures (Payment of Minimum Wages, Avoidance of Child labour, Signing in the	5	Each 25	Each 50	Each 75	Each 200

	Muster Roll, In case of accidents-what to do? etc					
14.	Importance of “Safety Handbook”	1	25	50	75	200
15.	Traffic Safety (Speed limit, safe crossing and working within barricaded area etc.)	5	Each 25	Each 50	Each 75	Each 200
16.	Environmental Topics <ul style="list-style-type: none"> - Environmental Sanitation - Dust Control - Waste Management - Water Conservation - Tree Protection - General Environmental Awareness - Measures against noise pollution etc 	5	Each 25	Each 50	Each 75	Each 200
17.	Video in Hindi on PPE usage – 15 minutes duration	1	-	-	-	1

Note 1: Items mentioned under 17 is **video**. Items under 3 (a) and 5 (a) are **metal signage boards** and all other items are **posters**.

Table No.: 2 – Size of Posters / Signages

Sl. No	Item	Size
1.	Posters – Standard	17”x22” –135 GSM 4 Colour Printing
2.	Posters – Special (Wherever required)	17”x22” card laminated Medical First Aid (MFA) Poster
3.	Posters - Mega size (Wherever required)	32”x40” Flex MFA Poster
4.	First-Aid Booklet	6”x4”
5.	Safety Handbook	6”x4”
6.	Signages	Small : 12”x6” Big : 24”x12”

7.	Road Traffic Sign Boards	Strictly as per Indian Road Congress (IRC) specifications
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Table No.: 3 – Safety Signage Colour (as per IS 9457)

Sl.No	Type of signage	Colour
1	Mandatory	Blue
2	Danger	Yellow
3	Prohibitory	Red
4	Safe conditions	Green

	NOIDA METRO RAIL CORPORATION LTD.
APPENDIX No. 15	

SCAFFOLD CHECKLIST

<u>Contract No.</u>	<u>Contractor Name</u>	<u>Location</u>
<u>Tag No.</u>	<u>Date</u>	<u>Purpose</u>

<u>S. No</u>	<u>Description</u>	<u>Observation (Yes/No)</u>	<u>Remark</u>
<u>A.</u>	<u>Check the Base of the Structure</u>		
<u>1</u>	<u>Has the scaffold been erected in accordance with the design of a qualified person?</u>		
<u>2</u>	<u>Are base plates provided?</u>		
<u>3</u>	<u>Has the maximum load capacity of the scaffold been communicated to all affected employees?</u>		
<u>4</u>	<u>Is the ground level firm, or have proper supports been placed under the structure?</u>		
<u>5</u>	<u>Is the base away from all excavation, drain covers, man holes etc.?</u>		
<u>B.</u>	<u>Check the Structure</u>		
<u>1</u>	<u>Are the vertical tubes in plumb and correctly spaced?</u>		
<u>2</u>	<u>Are the standards joints staggered?</u>		
<u>3</u>	<u>Are adequate bracing provided?</u>		
<u>4</u>	<u>Is the structure securely tied back?</u>		
<u>5</u>	<u>Is there an access tower free standing without support?</u>		
<u>C.</u>	<u>Check the Working Platform</u>		
<u>1</u>	<u>Is the working platform closely i.e no gaps between the boards?</u>		
<u>2</u>	<u>Is the working platform at least 450 mm wide?</u>		
<u>3</u>	<u>Is a guard-rail, knee-rail and toe board provided above the platform and securely fixed?</u>		
<u>4</u>	<u>Are all the material stored on the platforms properly secured or not?</u>		
<u>5</u>	<u>Are openings in working platform kept safety covered/fenced?</u>		
<u>6</u>	<u>Is there a provision of anchoring safety belts lanyards to be tied to guy ropes?</u>		
<u>D.</u>	<u>Check the Access</u>		
<u>1</u>	<u>Are existing access ways (stairs, walkways, ladders) etc. left clear?</u>		


Observation if any:

<u>Inspected & Signed By</u>	<u>Inspected & Signed By</u>	<u>Inspected & Signed By</u>
<u>Safety Officer</u>	<u>Certified Scaffolder</u>	<u>Site In-charge</u>

	NOIDA METRO RAIL CORPORATION LTD.
APPENDIX NO.: 16	


Maximum Permissible Age of Construction Plant and Machinery

S.No	Construction Plant & Machinery	Maximum permissible age
1	Mobile Crawler Cranes	15 years
2	Gantries	15 years
3	Mobile Tyre Mounted Hydraulic Cranes	10 years
4	Launching Girders	10 years
5	Piling Rigs	5 years
6	All other plant and machinery like Transit mixture, Trailers, Dumpers, Boom Placer Excavators, Pressure vessel including Air Compressors, Diesel Generator Sets, and locomotive etc.	10 years.

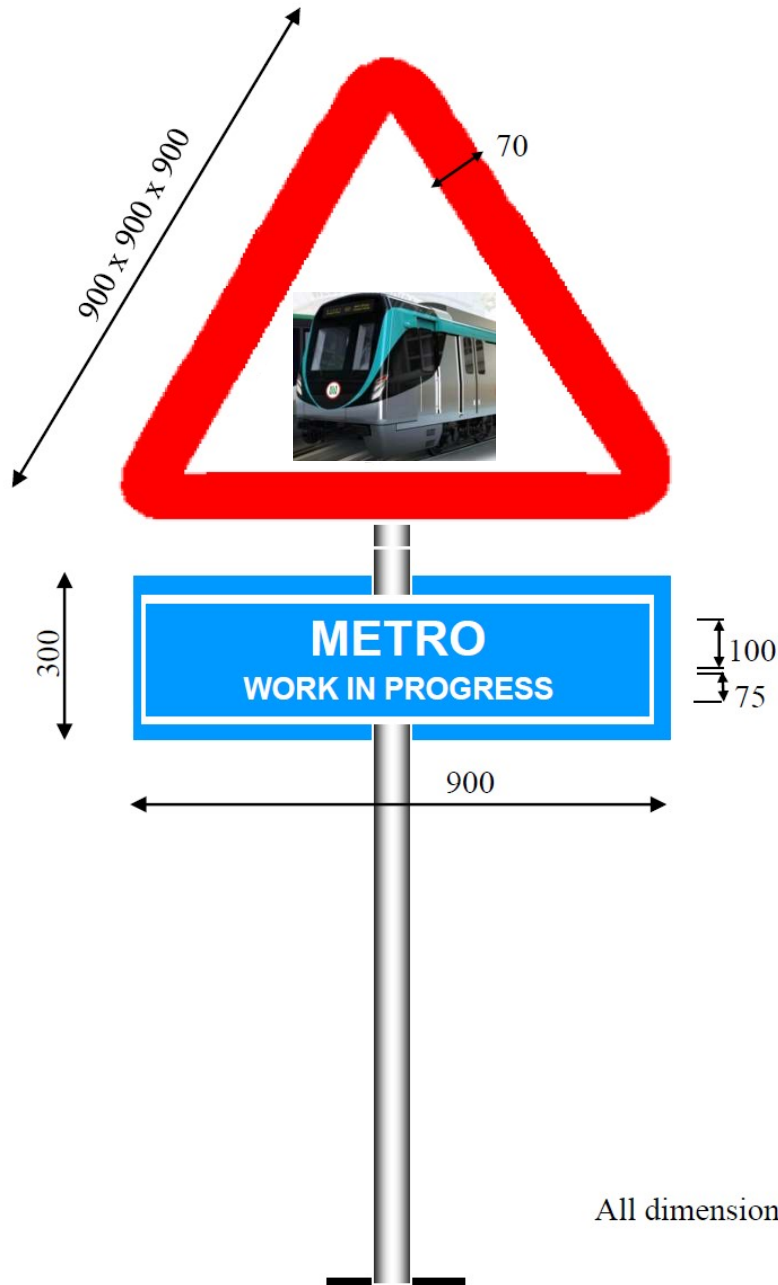
	NOIDA METRO RAIL CORPORATION LTD.
APPENDIX No. 17	

MINIMUM LIGHTING REQUIREMENTS

S.N.	Facility or Function	Luminance – lx (lm/ft ²)
1.	Administrative areas (offices, drafting and meeting rooms, etc.)	540 (50)
2.	Construction areas <ul style="list-style-type: none"> - general indoor - general outdoor - tunnel and general underground work areas (minimum 110 lux required at tunnel and shaft heading during drilling, mucking and scaling) 	 55 (5) 33 (3) 55 (5)
3.	Access ways <ul style="list-style-type: none"> - exit ways, walkways, ladders, stairs 	110 (10)
4.	Maintenance / Operating areas / shops <ul style="list-style-type: none"> - vehicle maintenance shop - carpentry shop - outdoors field maintenance area - refueling area, outdoors - shops, fine details work - shops, medium detail work - welding shop 	 325 (30) 110 (10) 55 (5) 55 (5) 540 (50) 325 (30) 325 (30)
5.	Mechanical/electrical equipment rooms	110 (10)
6.	Hoists, Elevators, freight and passenger	215 (20)
7.	Warehouses and storage rooms/area <ul style="list-style-type: none"> - indoor stockroom, active/bulk storage - indoor rack storage - outdoor storage 	 110 (10) 270 (25) 33 (3)
8.	Health Centers and First aid stations and infirmaries	325 (30)
9.	Toilets, wash and dressing rooms	110 (10)
10.	Work areas – general (not listed above)	325 (30)
11.	Parking areas	33 (3)
12.	Visitor areas	215 (20)
13.	Laboratories	540 (50)

	NOIDA METRO RAIL CORPORATION LTD.
	APPENDIX No. 18

WARNING TRAFFIC SIGN





NOIDA METRO RAIL CORPORATION LTD.

APPENDIX NO.: 19


**WORKPLACE POLICY ON HIV/AIDS PREVENTION & CONTROL FOR WORKMEN
ENGAGED BY CONTRACTORS**

“Being mobile in and of itself is not a risk factor for HIV infection. It is the situations encountered and the behaviours possibly engaged in during mobility or migration that increase vulnerability and risk regarding HIV / AIDS.”

UNAIDS, Technical update on ‘Population, Mobility and AIDS’, February 2001, p.5

Noida Metro Rail Corporation (NMRC) recognizes HIV / AIDS as a developmental challenge and realizes the need to respond to it by implementing regular HIV / AIDS prevention programmes and creating a non-discriminatory work environment for HIV infected workmen engaged by contractors. For the purpose of making conscientious, sensitive and compassionate decision in addressing the realities of HIV / AIDS, NMRC has established these guidelines based on ILO code of practice on HIV / AIDS.

- ▶ Creating awareness through professional agency using IEC (Information, Education and Communication) package specially designed for migrant workers.
- ▶ Institutional capacity building by training the project implementation team, Safety & Health and Environment Officers, establishing linkages for efficient diagnosis and treatment of the affected workers, effective monitoring of implementation and documentation for further learning.
- ▶ Establishing peer educators by selecting them in consultation with contractors and training them through professional agencies so that they become focal point for any information, education and awareness campaigns among the workmen throughout the contract period.
- ▶ Promotion of social marketing of condoms through Uttar Pradesh State Aids Control Society (UPSACS).

	NOIDA METRO RAIL CORPORATION LTD.
APPENDIX NO.: 20	

LIST OF AGENCIES FOR SAFETY PPEs

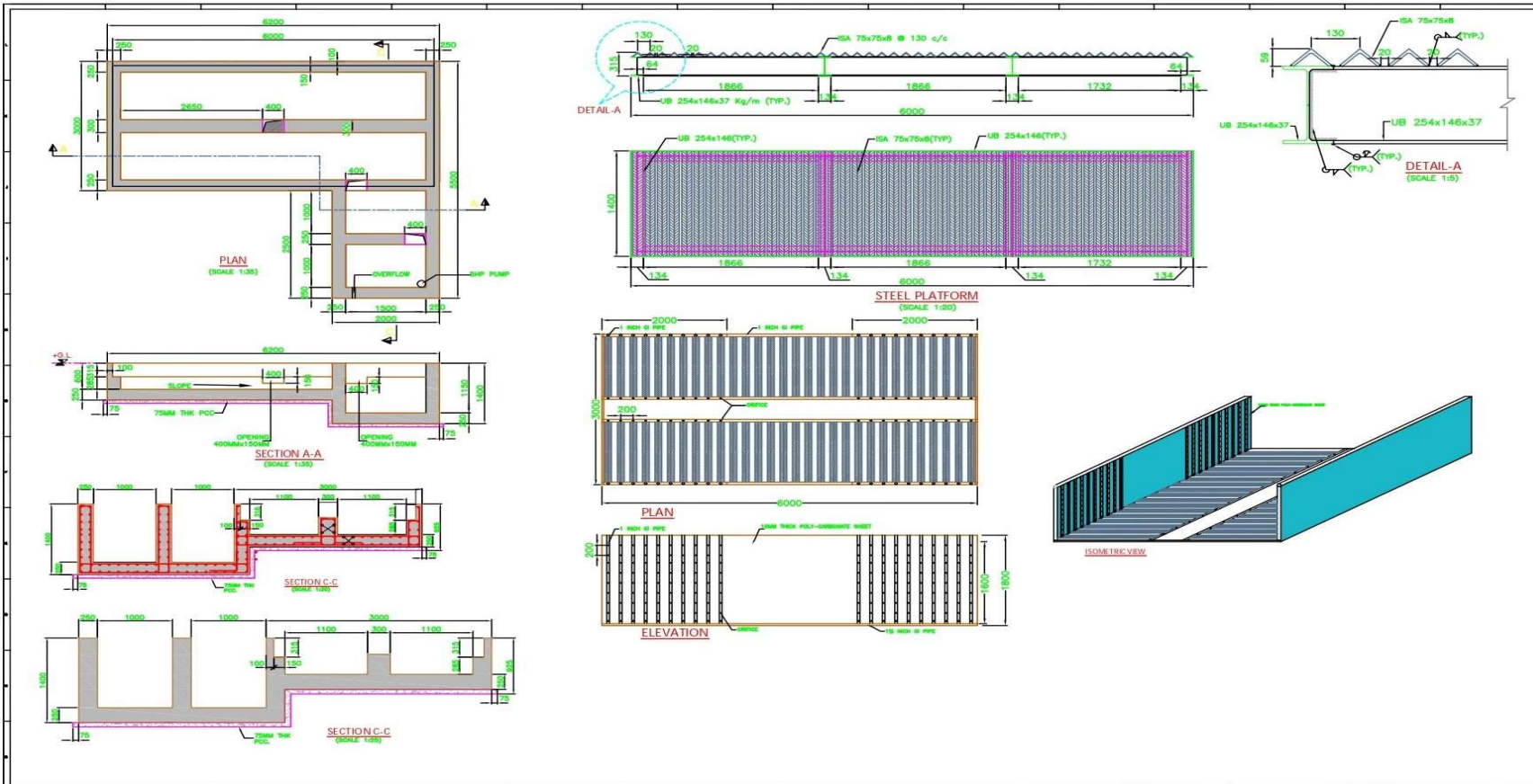
Serial Number	Item	Relevant Standard (Shall Comply to any one of the Standard)	Vendor List
1.	Safety Shoes (Staff & Worker)	IS:15298 (Part-I) IS: 15298 (Part-II) EN: 20345	Bata, Liberty, Tiger, Allen Cooper, Acme, Karam, UFS & JCB
2.	Gumboot	IS: 15298 (Part-II)	Abrigo, Duckback, Acme & Liberty
3.	Industrial Helmet	IS:2925 & EN: 397	Karam, Acme, Venus, Joseph Leslie, Udyogi, UFS & 3M
4.	Rubber Hand Gloves	EN: 388 EN: 374 & EN: 420	DPL, Udyogi, Ansell, Honeywell & ATLAS
5.	Cotton Hand Gloves	EN: 388 & EN: 420	Abrigo, Midas, Udyogi, Atlas, UFS & ATG
6.	Full Body Harness	EN: 361 & IS: 3521	Karam, Abrigo, Honneywell, 3M, UFS & DBA SALA
7.	Lanyard	EN: 355, EN 354 & IS: 3521	Karam, Honneywell, 3M, Abrigo, UFS & DBA Sala
8.	Fall Arrester	EN: 353	Karam, Honneywell, 3M, Abrigo, UFS & DBA Sala
9.	Retractable Block	EN: 360	Karam, Honneywell, 3M, Abrigo, UFS & DBA Sala
10.	Safety Eye wear	EN: 166 & IS: 5983	Karam, Abrigo, Venus, Udyogi, Honeywell, UFS & 3M
11.	Nose Mask	IS: 9473 & EN: 149	3M, Venus, Joseph Leslie, Abrigo & Procef
12.	High Visibility Vest	EN: 471	Reflecto Safe, Udyogi, Acme, UFS & Bright Eye
13.	Safety Net	IS: 11057 IS: 5175	Tuff, Gurware, ACME & UFS
14.	Ear Plug	EN: 352	Venus, Karam, 3M & Honeywell
15.	Traffic Management Items like Barricade, Barriers	-	Cosmos, Acme, Frontier, Pioneer & Nilkamal
16.	Traffic Cone		Dark Eye, Nilkamal & Acme, Aktion
17.	Breathing Apparatus	NFPA 1852	Honeywell, Joseph Leslie, Drager & MSA




NOIDA METRO RAIL CORPORATION LTD.

APPENDIX – 21

Representative Diagram of Wheel Washing Facility




	NOIDA METRO RAIL CORPORATION LTD.
<u>APPENDIX – 22</u>	
<u>ENVIRONMENT</u>	

Waste Management Plan & Data Sheet

Waste Management Plan					
S.No	Waste Type	Unit	Estimated Quantity that is likely be generated during the currency of the contract	Proposed Storage facility details (Location and maximum quantity that will be stored at the facility)	Proposed disposal method
1	Construction and Demolition Waste				
	a. Concrete waste	MT			
	b. Demolition Waste	MT			
	c. Bentonite/Polymer mixed soil	CUM			
	d. Good earth	CUM			
2	Hazardous Waste				
	a. Waste oil	Litres			
	b. Oil filters	Nos			
	c. Air filters,	Nos			
	d. Cartridges etc.	Nos			
	e. Other (if any)				
3	Recyclable waste				
	Paper, plastic, wood, bottles, rubber etc.	Kg			
4	Bio degradable waste				
	Food waste, vegetable waste etc	Kg			

5	Metal Scrap	Ton			
6	E -Waste	Nos/Ton			
7	Miscellaneous (eg: wood waste, safety helmet, packing materials etc)				

Prepared by:	Reviewed by: (Chief Environment Officer)	Approved by: (Project Manager)
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	<p>NOIDA METRO RAIL CORPORATION LTD.</p>
<p><u>APPENDIX- 23</u></p> <p><u>ENVIRONMENT</u></p>	

(Size of Board 6' x 4', Back Ground Colour Yellow, Letters Black)

C&D Waste Display Board (as per C&D Waste Management Rules, 2016)

The Construction/Demolition site is authorised by.....

Vide file no.; dated.....

Name and address with contact number of Contractor/Developer:


- 1) Address of the site
- 2) Area/Length
- 3) Date of initiation of the project(dd/mm/yy)
- 4) Scheduled completion date of the project (dd/mm/yy)
- 5) Date of completion/disposal/clearing of the site (dd/mm/yy)
- 6) Estimated waste (TPD)
- 7) Total estimated waste(MT) for the entire project
- 8) Nature of waste (concrete/iron/plastic/sand/soil) (TPD)

Material	Generated	Recycled	Reused	Disposed
Sand				
Concrete				

- 9) Identified waste disposal site
- 10) Mode of utilisation of waste (recycle/reuse/convert to construction material)
- 11) Mode of disposal
- 12) Mode of handling and transportation (manual/ mechanical/pneumatic)-(by road/rail)
- 13) Dust mitigation measures at the site(Water sprinkling/ curtain/ barriers etc)
- 14) Reason of delay in disposing waste(if any)
- 15) Accident reported (if any)

Name of agency Owner

Tel no.:

	NOIDA METRO RAIL CORPORATION LTD.
APPENDIX NO.: 24	

Applicability of Part-I Environmental Requirements

Sl. No	Item	Clause	Category A Contracts			Category B Contracts			Category C Contracts			Category D Contracts (Track Contract)			Category E Contracts (E&M Contract)	
			CE	SEO	E	CE	SE	E	CE	SE	E	Cost Cr	CE	SE		E
1.	Legal Requirements	3.3.2	Applicable			Applicable			Applicable			Applicable			Applicable	
2.	ISO Certification	3.4	Applicable			Applicable			Applicable (not contract specific)			Applicable (not contract specific)			Applicable (not contract specific)	
3.	Submission of Site Environmental Plan	4.2	Applicable			Applicable			Not Applicable			Not Applicable			Not Applicable	
4.	Staffing	6.2 & Annexure-4A	CE ○ 1	SEO 1	E ○ 1	CE ○ 0	SE ○ 1	E ○ 1	CE ○ 0	SE ○ 0	E ○ 1	Cost Cr Up to 500 >500	CE ○ 0	SE ○ 1	E ○ 1	No separate staff (designated Environment officer from contractor staff)
5.	12 Hr Training on Env	10.2	Applicable			Applicable			Not Applicable			Applicable			Applicable only for RSS works	
6.	External Environmental Audit	12.2.2	Applicable			Applicable			Not Applicable			Applicable			Applicable only for RSS work	

7.	Monthly/Quarterly Environment Report	14.2	Applicable (Monthly)	Applicable (Monthly)	Applicable (Quarterly)	Applicable (Monthly)	Applicable (Quarterly)
8.	Installation of CCTV Cameras	20.0	Applicable	Applicable	Applicable	Applicable	Applicable


NOTE:

CEO – Chief Environmental Officer

SEO – Senior Environmental Officer

EO – Environmental Officer

RSS - Receiving Sub Station

	NOIDA METRO RAIL CORPORATION LTD.
FORM No. : SF/01	
<u>Hazard Identification, Risk Assessment & Control Measures</u>	

Contactor Company Logo		Company Name					Corridor							
Date:		Activity:					Assessment Team:							
Revision No:														
Hazard Identification				Risk Assessment & Control Measures										
S. No	Task/ Activity	Hazards	Possible Consequences	Existing Control Measures	Severity Level of Hazard (S)	Likelihood of Occurrence of Hazard (L)	Risk Rating (RL) = S x L	Risk Level (L/M/H)	Additional Control measures	Severity Level of Hazard (S)	Likelihood of Occurrence of Hazard (L)	Risk Rating (RL) = S x L	Residual Risk Level	Action By
1.														

Conducted By:
Name & Signature, Designation

Reviewed By:
Name & Signature, Designation
(Chief Safety Manager)

Approved By:
Name & Signature,
(Project Manager)


Risk Assessment & Control Measures

The risk assessor can assign values for the Severity of Hazard and likelihood of Occurrence of Hazard (taking into account the frequency and duration of exposure) on a scale of 1 to 5, then multiply them together to give the Risk Rating & decide risk level.

A. Severity of Hazard (S)			B. Likelihood of Occurrence of Hazard (L)		
Rating	Condition	Examples	Rating	Condition	Examples
1	Trivial/Negligible	Adverse event leading to minor injury not requiring first aid. (discomfort, slight bruising, self-help recovery)	1	Remote	Almost Never
2	Minor	Minor injury or illness, first aid treatment required, <3 days absence, < 3 days extended hospital stay (small cut, abrasion, basic first aid need)	2	Unlikely	Occurs rarely
3	Moderate	Significant injury requiring medical treatment e.g. Fracture and/or counselling. Agency reportable, >3 Days absence, 3-8 Days extended hospital Stay (strain, sprain, incapacitation > 3 days)	3	Possible	Could occur, but uncommon
4	Major/ Serious	Major injuries/long term incapacity or disability (loss of limb) requiring medical treatment and/or counselling (fracture, hospitalisation > 24 hrs, incapacitation > 4 weeks)	4	Likely	Recurrent but not frequent
5	Fatal/Extreme	Incident leading to death or major permanent incapacity. Event which impacts on large number of patients or member of the public (single or multiple)	5	Very Likely/ Almost uncertain	Occurs frequently

RISK Matrix	Trivial	Minor	Moderate	Major/ Serious	Fatal/ Extreme
Very Likely/ Almost Certain	1	2	3	4	5
Likely	2	2	3	8	10
Possible	3	6	9	12	15
Unlikely	4	8	12	16	20
Remote	5	10	15	20	25

Risk Rating & Level = A x B		
Low Risk (1 - 8)	Medium Risk (9 - 12)	High Risk (15 - 25)
Continue, but review periodically to ensure controls effective	Continue, but implement additional reasonably practicable controls where possible and monitor regularly	STOP THE ACTIVITY Identify new controls. Activity must not proceed until risks are reduced to a low or medium level

	NOIDA METRO RAIL CORPORATION LTD.
<u>SAMPLE FORM No. SF-02</u> <u>ENVIRONMENT</u> <u>ASPECT/IMPACT ANALYSIS FORM</u>	

Contract:		Name of Contractor	Identification:-
		ASPECT/IMPACT ANALYSIS	Rev No:
			Revision Date :
RA- Routine Activity	N- Normal	LC-Legal Concern	Sc-Scale of Impact: 1 to 4 (With 1 having lowest & 4 having highest weightage)
NRA- Non Routine Activity	Ab- Abnormal	BC-Business Concern	Se-Severity of Impact: 1 to 4 (With 1 having lowest & 4 having highest weightage)
	E-Emergency	IPC-Interested Party Concern	P-Probability of Occurrence: 1 to 4 (With 1 having lowest & 4 having highest weightage)
AP-Air Pollution	WP-Water Contamination	NP- Noise Pollution	D- Duration of Impact: 1 to 4 (With 1 having lowest & 4 having highest weightage)
LC-Land Contamination	DNR-Depletion of Natural Resources	SI=Sc + Se + P + D,	Significant Impact (SI) ≥ 10

SIGNIFICANT & NON-SIGNIFICANT IMPACTS																		
S.NO	Activities/Process	RA/ NRA	N/ AB/E	Aspect	Impact	LC	BC	IPC	Sc	Se	P	D	Risk= S+S+P+D	SI/ NSI	Existing Control	Additional Control	Legal App.	Remarks

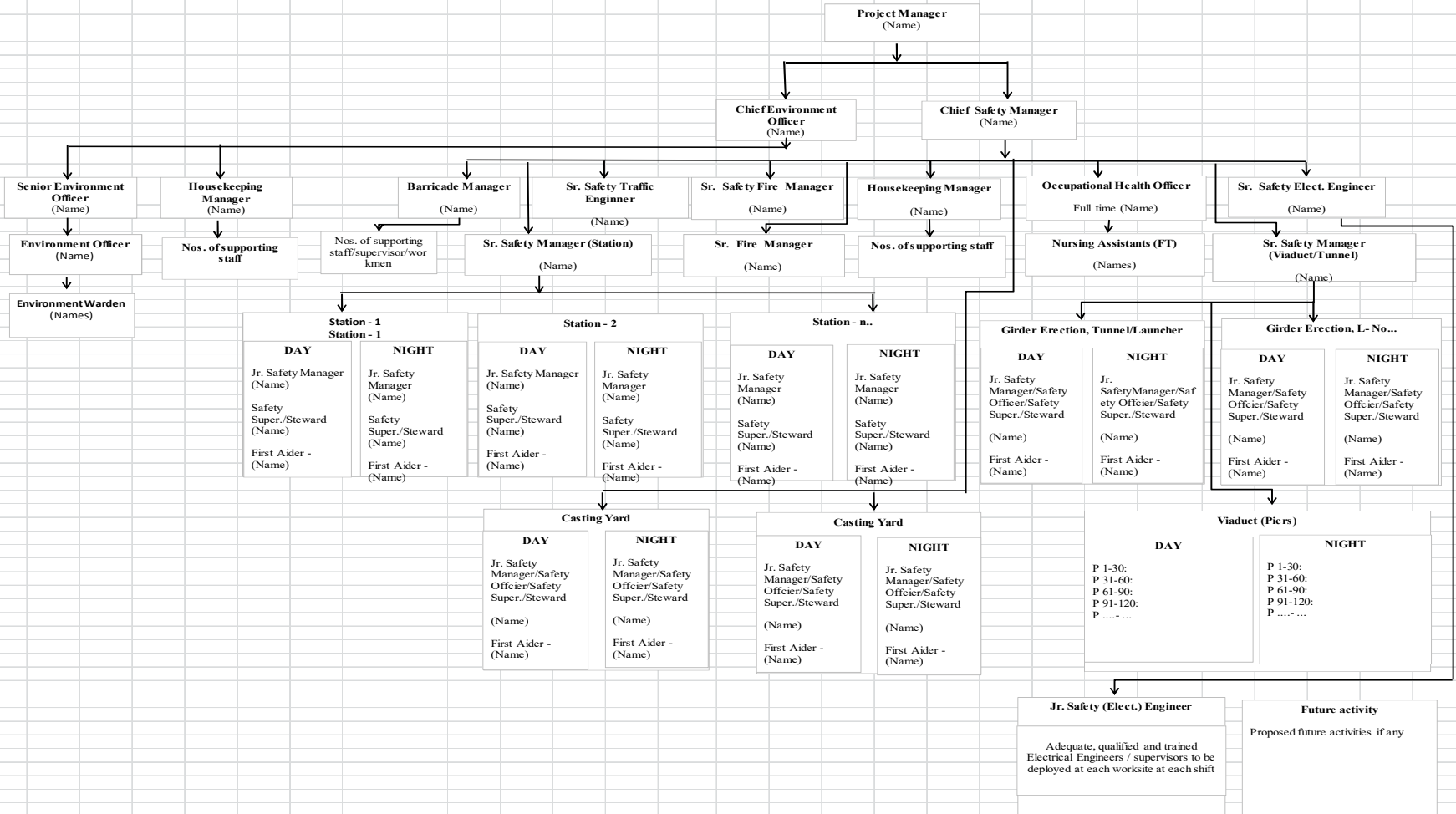
Conducted By:
Name & Signature, Designation

Reviewed By:
Name & Signature, Designation
(Chief Environment Officer)

Approved By:
Name & Signature, Designation
(Project Manager)



NOIDA METRO RAIL CORPORATION LTD.
Contractor's Model Safety & Health and Environment Organization Chart



	NOIDA METRO RAIL CORPORATION LTD.
FORM No. : SF/04	

FORMATION OF SITE SAFETY & HEALTH AND ENVIRONMENT COMMITTEE	
Contract No	
Contractor Name	
Contract Title	

<u>CIRCULAR</u>
<p><u>Committee</u></p> <p>The following SHE Committee is constituted with immediate effect:</p> <p>Chairman:</p> <p>Members:</p> <ol style="list-style-type: none"> 1) 2) 3) 4) 5) <p>Secretary:</p>
<p><u>Periodicity</u></p> <p>The committee will meet at least once in a month on the day (specify date)</p>
<p><u>Agenda</u></p> <p>Secretary will circulate agenda of the meeting at least two days in advance of the schedule date of the meeting.</p>
<p><u>Circulation</u></p> <p>Gist of the meeting will be minute in the standard format and circulated to the following:</p> <ol style="list-style-type: none"> 1. Chairman 2. Members 3. NMRC Representatives 4. Others concerned
<p>Date: _____</p> <p style="text-align: right;">Signed By: _____</p> <p style="text-align: right;">CHAIRMAN</p>

	NOIDA METRO RAIL CORPORATION LTD.
FORM No. : SF/05	

<i>Meeting No.</i>		<i>Date of Meeting</i>	
<i>Location of Meeting</i>			

S. No.	Members Presents	Invitees	Members Absent

Complete Report Sent to

	No. of copies	Department	Organisation
	02	CPM office Safety and Environment Department	NMRC
	01	Civil	(Contractor Name)
	01	Mechanical	(Contractor Name)
	01	Electrical	(Contractor Name)
	01	Planning	(Contractor Name)
	01	Administration	(Contractor Name)
	01	Store	(Contractor Name)
	(xx)	(xxxxxx)	(xxxxxxx)


Description of Minutes of Safety & Health and Environment Committee Meeting

<i>No.</i>	<i>Description of Meeting</i>	<i>Action by</i>	<i>Target Date</i>
1	Complaints received from Client		

2	Review of MOM of previous Meeting		
3	NCR's observation from Third party		
4	Reportable Accident/Incident Cases		
5	Future Jobs and Specific Requirements		
6	Status of Implementation of Safety Plan		
7	Sub-Contractor Performance		
8	Analysis of First Aid Cases		
9	Needs for any specific System/Training/PPEs Resources		
10	Observation of Safety & Health and Environment Committee during last Safety Inspections		


Next Safety & Health and Environment Meeting is scheduled on: (Date should be mentioned according to Meeting scheduled day)

Date:	Chief Safety & Chief Environment Officer (Signature & Name)
Date: Manager	Project (Signature & Name)

		NOIDA METRO RAIL CORPORATION LTD.					
		FORM No. : SF/06					
Company Logo		<u>WEEKLY SAFETY INSPECTION Cum COMPLIANCE REPORT</u>		Compliance Report No. xxxx/year			
Client	M/s NOIDA METRO RAIL CORPORATION LTD.	Inspection Report No.		Xxxx/year			
Contractor	M/s xxxx xxxx xxxx xxxx	Inspection Date		xx.xx.xxxx			
CC No.	Xx	Inspection Time		xx.xx hrs			
Corridor	xxxxx – xxxxx (Line – xx)	Locations/stretch		Station/LG/Tunnel/Viaduct/Casting/Batching/Depot/Any Other			
Inspection Attended By	Contractor						
	NMRC/GC						
Observation No	Location/Pier	Observations with Recommendations & Photograph		Concerned Person with designation & Targeted Date	Compliance Photograph	Compliance date	Remarks, if any
001			Photograph	xx.xx.xxxx			

(Signature)
 (Name)
 (Chief Safety Manager)

(Signature)
 (Name)
 (Project Manager/Leader)

	NOIDA METRO RAIL CORPORATION LTD.
FORM No. : SF/07	
MARS AUDIT REPORT	


MONTHLY SAFETY & HEALTH AUDIT SCORE

Contract No.	Contractor :	
Audit No.	From:	To:
For the Month of :		
Audit Team :	Contractor's Representatives	NMRC Representatives
Headed by:		
Assisted by:	1.	1.
	2.	2.
	3.	3.


SUMMARY SAFETY & HEALTH

Contract No.		Contractor:			
For the Month of :					
Audit Dates : From :			To :		
	Section	% Score Attained		Code of criticality	
		By Contractor	By NMRC	By Contractor	By NMRC
1.	SAFETY & HEALTH Administration				
2.	SAFETY & HEALTH Training & SAFETY & HEALTH communication				
3.	SAFETY & HEALTH Inspection and Audits				
4.	Hazard Identification, Risk Assessment and Emergency Preparedness				
5.	Reporting of Accidents and Dangerous Occurrence and Investigation				
6.	Housekeeping				
7.	Working at Height				
8.	Lifting Appliances and Gears				
9.	Construction Machinery / Hand tools and power tools				
10.	Site Electricity				


11.	Fire prevention				
12.	Welding and Cutting				
13.	Excavations and Trenching				
14.	Tunneling Operations and Work in Confined Spaces				
15.	Traffic Management				
16.	Personal Protection Equipment				
17.	Industrial Health and Hygiene (Lighting and Ventilation)				
18.	Welfare Amenities				
19.	Batching Plant and Casting Yard				
Overall Audited Score Attained					
Contractor Chief Safety Manager:		Designation:	Signature:		Date:
NMRC Execution Representative:		Designation:	Signature:		Date:

 NOIDA METRO RAIL CORPORATION LTD.											
Contract No.:			Contractor's Name:								
A – Total score			B – To be Awarded by contractor			C – To be awarded by Employer					
1.0 SAFETY & HEALTH Administration											
1.1 SAFETY & HEALTH Organisation			A	B	C	1.1a SAFETY & HEALTH Organisation			A	B	C
Adequacy level of SAFETY & HEALTH personnel			10			SAFETY & HEALTH manpower from outsourcing agency			10		
Qualification level of SAFETY & HEALTH Personnel			10			SAFETY & HEALTH personals reports to SAFETY & HEALTH manager			10		
Employer's approval for each SAFETY & HEALTH personal			10			SAFETY & HEALTH manager reports to Project Manager			10		
Intimation of SAFETY & HEALTH personals vacancy to Employer			10			Facilities and equipment gave to the SAFETY & HEALTH personnel			10		
SAFETY & HEALTH personal lies with the main contractor			10			SAFETY & HEALTH personnel can stop any unsafe act			10		
Sub total			50			Sub total			50		
1.2 SAFETY & HEALTH Committee			A	B	C	1.3 Construction SAFETY & HEALTH Committee			A	B	C
Is site and construction SAFETY & HEALTH Committee formed			10			Does construction SAFETY & HEALTH committee meet at least weekly			10		
Does PM Chairman of SAFETY & HEALTH Committee			10			Do all sub contractors attend			10		
Committee members under gone monthly inspection			10			Is agenda cover all the points			10		
Does site SAFETY & HEALTH committee meet at least monthly with 21 days time gap			10			Minutes of the meeting send to all committee members			10		
Are Incident Reports discussed			10			Minutes displayed in the notice board			10		
Sub total			50			Sub total			50		
1.4 ID card and first day at work			A	B	C	1.5 Designer's role			A	B	C
Is ID card issued to all persons			10			Whether designers were informed about clause 5.0 of Conditions of Contract on SAFETY & HEALTH			10		
Is ID card as per standard			10			Whether designers provide SAFETY & HEALTH risk at the drawing itself.			10		
Authority signed all ID cards			10			Whether hierarchy of risk control is indicated by the designer			10		
All worker undergone orientation training			10			Participation of designer in monthly SCM			10		
SAFETY & HEALTH hand book issued to all personnel			10			Detailed supplementary information about SAFETY & HEALTH risk of the design given by designer.			10		
Sub total			50			Sub total			50		
1.6 SAFETY & HEALTH submittals to Employer			A	B	C	1.6a SAFETY & HEALTH submittals to Employer			A	B	C
Daily reporting of workmen			10			External SAFETY & HEALTH audit report			10		
Monthly SAFETY & HEALTH report			10			Electrical safety audit report			10		
SAFETY & HEALTH committee meeting minutes			10			Air monitoring report			10		


SAFETY & HEALTH inspection report	10			Noise monitoring report	10		
Monthly internal SAFETY & HEALTH audit score report	10			Accident, Incident and dangerous occurrence reporting	10		
Sub total	50			Sub total	50		
1.7 Visitors to site	A	B	C		A	B	C
Visitor got the permission from Employer	10						
Contractor have visitor PPEs	10						
Responsible accompanied with visitor	10						
Does visitor entering hazardous area	10						
Visitor register maintain at site office	10						
Sub total	50						
Contractor's Observations:				Employer's Observations:			
Section Scores				Section % Score			
				100			

	NOIDA METRO RAIL CORPORATION LTD.						
Contract No.:		Contractor's Name:					
2.0 SAFETY & HEALTH Training and SAFETY & HEALTH Communication							
2.1 Training Policy	A	B	C	2.2 Induction Training	A	B	C
training policy in SAFETY & HEALTH Plan	10			training take place in first week	10		
policy implementation	10			Induction Handout	10		
Does it includes sub contractors	10			Project related brief	10		
training policy publiSAFETY & HEALTHd	10			Management participation	10		
PM understand training policy	10			Attendance records kept	10		
Sub total	50			Sub total	50		
2.3 Toolbox Talks	A	B	C	2.4 Supervisor Training	A	B	C
Held on daily basis	10			recognized programmes	10		
Presented by supervision/safety officer	10			Project related brief	10		
System monitored by management	10			Senior management participation	10		
Employee involvement	10			Achievement test	10		
Attendance records kept	10			Attendance records kept	10		
Sub total	50			Sub total	50		
2.5 Follow up training	A	B	C	2.6 Driver/Plant Operator Training	A	B	C
Follow up training organized	10			Driver/PO training take place	10		
take place after six months	10			Defensive driving training to all drivers	10		
Project related training	10			Certification of Drivers and Operators	10		


Attendance records kept	10			Records Maintenance	10		
Workers participation towards training	10			Refre SAFETY & HEALTH training to all drivers	10		
Sub total	50			Sub total	50		
2.7 Promotional activities	A	B	C	2.8 SAFETY & HEALTH posters	A	B	C
I Safety promotional programme	10			Adequacy of Posters	10		
Incentive schemes used	10			numbering of posters	10		
Subcontractors involvement in promotion	10			topics covers in posters	10		
Rewarding of Workers	10			visibility of posters at site	10		
Management's participation	10			maintenance of posters	10		
Sub total	50			Sub total	50		
2.9 SAFETY & HEALTH Signage	A	B	C				
Isignage in correct colours	10						
Adequate number of signs	10						
Suitable positioning of signs	10						
Signs in Hindi and English	10						
signage maintaining regularly	10						
Sub total	50						
Contractor's Observations:				Employer's Observations:			
Section Scores				Section % Score			
				100			

	NOIDA METRO RAIL CORPORATION LTD.						
Contract No.:		Contractor's Name:					
3.0 SAFETY & HEALTH Inspection and Audit							
3.1 Planned General Inspection	A	B	C	3.2 Routine Inspection	A	B	C
Monthly contractor and subcontractors site SAFETY & HEALTH committee Inspection	10			Operator Daily Inspection of plant and equipment	10		
Weekly SAFETY & HEALTH inspection by supervisors	10			Monthly Inspection of electrical hand tools	10		
Daily SAFETY & HEALTH inspection by site SAFETY & HEALTH team	10			Quarterly Inspection of temporary electrical systems	10		


Employer's and contractor's representative involved in this SAFETY & HEALTH inspection	10			Weekly Inspection of scaffold by scaffolding supervisor	10		
Records maintenance	10			Half-yearly inspection of lifting appliances and gears by competent person	10		
Sub total	50			Sub total	50		
3.3 Specific Inspection	A	B	C	3.4 SAFETY & HEALTH Inspection	A	B	C
Before a heavy lifting operation	10			Contractor prepare checklist for all activity	10		
Before & after entry into confined space	10			Checklist mentioned in contractor SAFETY & HEALTH plan	10		
Before & after a welding & gas cutting	10			All inspection reports registered	10		
Before concreting/formwork	10			Inspection reports sent to Employer	10		
All high-risk processes inspected by competent supervisor	10			Planned and Routine Inspection used for discussion in SAFETY & HEALTH Committee Meeting	10		
Sub total	50			Sub total	50		
3.5 MARS	A	B	C	3.6 Electrical safety audit	A	B	C
Performed once in a month	10			Covered all areas	10		
Project Manager accompanied this audit	10			Performed once in a month	10		
Conducted at least 7 days prior to Monthly SAFETY & HEALTH Committee meeting	10			Team comprising of senior SAFETY & HEALTH (Elect) engineer	10		
Audit Report will be sent to Employer	10			Audit Report will be sent to Employer	10		
Corrective actions taken	10			Corrective actions taken	10		
Sub total	50			Sub total	50		
3.7 External Audit (General)	A	B	C	3.8 External Audit	A	B	C
Conducted by external agencies	10			Contents and coverage	10		
Auditors ISO qualified and competent	10			Available documents	10		
Approval of the Employer	10			Qualification of audit team members	10		
Audit report as per ISO/OHSAS standard	10			checklist	10		
Conducted on a quarterly basis	10			Status of NCR of external audit	10		
Sub total	50			Sub total	50		
3.9 Audit Report	A	B	C				C
Audit report as per ISO/ILO standard	10						
Audit conformity / non-conformity report to the Employer	10						
Report contents and coverage	10						
Corrective action by contractors	10						
Initial audit for checking the adequacy of implementation	10						
Sub total	50						
Contractor's Observations:				Employer's Observations:			
Section Scores				Section % Score			
				100			

 NOIDA METRO RAIL CORPORATION LTD.											
Contract No.:			Contractor's Name:								
4.0 Hazard Identification, Risk Assessment and Emergency Preparedness											
4.1 Policy for Identifying Hazards			A	B	C	4.2 Risk Assessment			A	B	C
Procedure for identifying hazards			10			risk assessment carried out			10		
list of significant hazards			10			formal process			10		
Procedure for Risk Assessment			10			Work sheets used			10		
Whether any schedule or hierarchy made			10			records kept in site office			10		
Ranking of hazards			10			planning of control measures			10		
Sub total			50			Sub total			50		
4.3 Method Statements			A	B	C	4.4 Permit to work in use			A	B	C
Method Statements produced			10			Is there a procedure for Permits to work			10		
contain clear instruction			10			Issued by Authorized person			10		
given to work supervisors			10			Issued for defined period			10		
Is correct information given to workers			10			Workers instructed			10		
Step by step description of task			10			Are records kept of Permits issue			10		
Sub total			50			Sub total			50		
4.5 Emergency Preparedness Plan			A	B	C	4.6 Emergency control centre			A	B	C
Is there description within Safety Plan			10			Available of first-aid box			10		
Is it up to date			10			Public addressing system			10		
Is it well published			10			Emergency phone numbers			10		
Does Project Manager have copy			10			Emergency alarm			10		
Exercise within past three months			10			Employees name list			10		
Sub total			50			Sub total			50		
4.7 Communication system			A	B	C	4.8 Plan Details			A	B	C
Public addressing system			10			Details of emergency co-ordinator			10		
Emergency power supply			10			Designated personnel with Tel. Nos.			10		
Mobile phone in Emergency care centre			10			Are telephone numbers up to date			10		
Warning boards			10			Emergency response team identified			10		
Records maintained for usage and maintenance of communication systems			10			Functions of Team identified			10		
Sub total			50			Sub total			50		
4.9 Requirements			A	B	C	4.10 First Aid			A	B	C
Link to Police			10			Is First Aid included in Safety Plan			10		
Link to Fire Services			10			Are adequate no. of First aiders appointed			10		
Link to Ambulance and Hospital			10			Record keep of qualification			10		
Communication to employees			10			First aid boxes supplied			10		
Displayed on Notice Boards			10			First aid boxes properly equipped			10		
Sub total			50			Sub total			50		

Contractor's Observations:				Employer's Observations:			
Section % Scores				Section % Score			
				100			

										
NOIDA METRO RAIL CORPORATION LTD.										
Contract No.:			Contractor's Name:							
5.0 Reporting of Accidents and Dangerous Occurrences and Accident Investigations										
5.1 Reporting to Employer				A	B	C	5.2 Reporting to Govt. organisation			
Verbal information				10			Reporting to Regional Labour Commissioner			
Written information within 24 hrs				10			Reporting to welfare board			
Delay in reporting				10			Reporting to director general			
Are all accidents identified and recorded				10			Reporting to police station			
Are AFR rates calculated				10			Reporting to District Magistrate			
Sub total				50			Sub total			
5.3 Incident Reporting				A	B	C	5.4 Follow up Action			
Is there a proper reporting procedure				10			Does Senior Manger review all reports			
Is the procedure communicated to all				10			Is result of investigation published			
Are reports available for inspection				10			Are workers advised of remedial action			
Do reports accurately describe incident				10			Are failure in Management recognized			
Is standardised form used				10			Whether statistics report prepared			
Sub total				50			Sub total			
5.5 Procedure for investigation				A	B	C	5.6 Incident Investigation			
Made Photographs and sketches				10			Are witness statement taken			
Examine involved equipment				10			Is the chain of events identified			
Interviewed the eye-witnesses				10			Is specific sub contractor identified			
Consulted expert opinion				10			Investigation kit available			
Safety & Health conditions				10			Investigation report made available to Employer			
Sub total				50			Sub total			

Contractor's Observations:			Employer's Observations:		
Section % Scores			Section % Score		
			100		

 NOIDA METRO RAIL CORPORATION LTD.											
Contract No.:			Contractor's Name:								
6.0 Housekeeping											
6.1 Procedure			A	B	C	6.2 Organisation			A	B	C
Is it mentioned in SAFETY & HEALTH plan			10			Adequacy of housekeeping personnel			10		
Responsibility classified			10			Is housekeeping personnel trained			10		
Housekeeping round the clock			10			Employer's approval for housekeeping personnel			10		
Reporting of housekeeping personals to SAFETY & HEALTH Manager			10			Intimation of vacancy to Employer			10		
Housekeeping persons provided no. / badge			10			Persons provided with suitable logistics / aid			10		
Sub total			50			Sub total			50		
6.3 Housekeeping squad			A	B	C	6.4 Barricades			A	B	C
Housekeeping plan			10			Dimension of the board			10		
Member list			10			NMRC logo			10		
Job allocation and time allocation			10			Sequential Numbering			10		
Periodicity of housekeeping			10			Availability of protruding parts			10		
Documentation of housekeeping			10			Regular cleaning and painting			10		
Sub total			50			Sub total			50		
6.5 Access / Egress way			A	B	C	6.6 Dustbins			A	B	C
Free from debris			10			Lumbar with protruding nails			10		
Unprotected opening			10			Unprotected projection			10		
Free from obstructions			10			Scattered unused materials			10		
Slippery condition			10			Spill of bentonite			10		
Spillage of water or oil			10			Fencing and guarding of equipments			10		
Sub total			50			Sub total			50		
6.7 Housekeeping at worksites			A	B	C	6.8 Housekeeping at roads			A	B	C
Lumbar with protruding nails			10			Tyre cleaning of vehicles			10		
Unprotected projection			10			Parking of construction vehicles at road			10		
Scattered unused materials			10			Water logging or bentonite spill on road			10		
Fencing and guarding of equipments			10			Roads kept clean			10		
Stacking and storing of materials			10			Position of barricades lying at roads			10		
Sub total			50			Sub total			50		
6.9 Storage of cylinders			A	B	C				A	B	C
Full / empty separated			10								

Gases separated	10						
Protected from weather	10						
Contents labelled	10						
MSDS available for each gas	10						
Sub total	50						
Contractor's Observations:				Employer's Observations:			
Section % Scores				Section % Score			
				100			

	NOIDA METRO RAIL CORPORATION LTD.
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Contract No.:	Contractor's Name:
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7.0 Working at Height


7.1 Organisation and planning	A	B	C	7.2 Fragile surface	A	B	C
Adequate number of trained personnel	10			Suitable working platform	10		
Supervision	10			Guard rails	10		
Planning emergency and rescue	10			Crawling boards	10		
Work permit system	10			Warning notice	10		
Refresher training	10			Work permit system to work	10		
Sub total	50			Sub total	50		

7.3a Scaffolding	A	B	C	7.3b Scaffolding	A	B	C
Is scaffolding included in SAFETY & HEALTH Plan	10			Scaffolds constructed for correct use	10		
Are scaffolding erected and dismantled by competent workmen	10			Are scaffolds constructed of sound material without patent defect	10		
Are records kept of inspections	10			No unsuitable material	10		
Security fixed or buttressed	10			Working platforms fully boarded	10		
Working platforms free from rubbish	10			Guardrails and mid rails fitted	10		
Sub total	50			Sub total	50		


7.3c Scaffolding	A	B	C	7.4a Ladders	A	B	C
Secure ladder access provided	10			Are ladders specified in Safety Plan	10		
Toe board provided	10			Is there a system for checking ladders	10		
'Safe for Use' board erected	10			Are records kept of weekly checks	10		
Availability of base plate	10			Using of Bamboo ladders	10		
Free from rust / corrosion / debris	10			Painting of ladders	10		
Sub total	50			Sub total	50		

7.4b Ladders	A	B	C	7.5 Guardrails	A	B	C
Safety procedure followed	10			Present at all working platforms	10		
Rubber bush in aluminium ladder	10			Securely attached	10		


Landing properly	10			Sound material	10		
Climbing procedure	10			Designed as per standard	10		
Rungs at proper intervals	10			Maintained properly	10		
Sub total	50			Sub total	50		
7.6 Harnesses	A	B	C	7.7 Safety net	A	B	C
Is use of harnesses specified in SAFETY & HEALTH Plan	10			Approved type	10		
Are harnesses of full body type	10			Good construction	10		
Are secure anchorage points used	10			Adequate number to issue	10		
Has instruction on correct use been given	10			Testing	10		
Maintenance and inspection	10			Maintenance	10		
Sub total	50			Sub total	50		
Contractor's Observations:				Employer's Observations:			
Section % Scores				Section % Score			
				100			

	NOIDA METRO RAIL CORPORATION LTD.						
Contract No.:		Contractor's Name:					
8.0 Lifting Operations and Gears							
8.1 Certification	A	B	C	8.2 ASLI / Other Indicators	A	B	C
Procedure is available in SAFETY & HEALTH Plan	10			Free from damage	10		
Fitness / Test Certificates available	10			In operable conditions	10		
Daily inspection records maintained	10			Overload device tested	10		
Load chart for lifting appliances	10			Overload device operable	10		
Employer's approval for lifting appliances	10			Bypass key made available to SAFETY & HEALTH I/C	10		
Sub total	50			Sub total	50		
8.3 Wire Ropes	A	B	C	8.4 Safety Hooks	A	B	C
Free from damage	10			Free from damage	10		
Lubricated	10			Safety latch fitted	10		
Correctly anchored	10			Safety latch in operable condition	10		
Splicing method	10			Other form of hook closure	10		
Inspection & Testing	10			Test certificates	10		
Sub total	50			Sub total	50		
8.5 Slings, Chains & Shackles	A	B	C	8.6 Outriggers (Mobile Cranes)	A	B	C
Properly stored when not in use	10			Outriggers locked in position	10		
In good condition without defects	10			Jacks in good condition	10		
Marked with safe working load	10			Jacks firmly supported	10		
Bulldog clips correct fit/number	10			Wheels clear/not supporting load	10		
Correctly used	10			Chassis level	10		


Sub total				50			Sub total				50						
8.7 Operator and Operator cabin				A	B	C	8.8 Rigging requirement				A	B	C				
Licence for HMV				10			Rigger qualification & experience				10						
Competent & skilled				10			Load assessment				10						
Medical fitness certificate				10			Type of slings to be used				10						
Portable fire extinguisher				10			Hocks & lifting assessment				10						
Defensive driving at IDTR				10			Overhead power line				10						
Sub total				50			Sub total				50						
8.9 Alarms & signals				A	B	C	8.10 Accessories & controls				A	B	C				
Overload alarm				10			Side & rear view mirror				10						
Over hoist alarm				10			Clutch & brake				10						
Reverse horn				10			Swing & Extension control				10						
Pressure indicators				10			Illumination				10						
Outtrigger extension alarm				10			Maintenance				10						
Sub total				50			Sub total				50						
Contractor's Observations:						Employer's Observations:											
Section % Scores									Section % Score						100		

 NOIDA METRO RAIL CORPORATION LTD.													
Contract No.:				Contractor's Name:									
9.0 Construction Machinery / Hand tools and power tools													
9.1 Machinery Fencing				A	B	C	9.2 Maintenance				A	B	C
All moving parts effectively guarded				10			All maintenance properly maintained				10		
Fencing not removed				10			No maintenance whilst M/c in motion				10		
Is procedure in SAFETY & HEALTH Plan				10			Records of maintenance kept				10		
Warning board				10			Work Permit System				10		
Emergency stop switch				10			Use of 'Lock Out and Tag Out' (LOTO)				10		
Sub total				50			Sub total				50		
9.3 Air Receivers				A	B	C	9.4 Wood working machines				A	B	C
Fitted with pressure relief valve				10			Top guard fitted				10		
Annual test carried out				10			Working space				10		
All couplers with safety chains/wired				10			Guards to protect all drive belts				10		
Condition of hoses				10			Emergency stop switch				10		
Noise level under permissible limit				10			Push stick used				10		
Sub total				50			Sub total				50		
9.5 Grinding machine				A	B	C	9.6 General				A	B	C
Appropriate guards fitted				10			Is procedure in SAFETY & HEALTH plan				10		


Correct size wheel/disc fitted	10			All operator medically fit and above 21 yrs	10		
Spindle speed marked on M/s	10			Unauthorized riding on plant	10		
Name plate for equipment specification	10			Inspection and maintenance record	10		
Test and maintenance	10			Portable fire extinguisher	10		
Sub total	50			Sub total	50		
9.7 Safe Operating Procedure	A	B	C	9.8 Requirements	A	B	C
Available for all machines	10			Manufacturer specification	10		
Available in the working area	10			Control switch	10		
Operator trained	10			GFCI / RCCB and other safety devices	10		
Operator know the same	10			IP 44 plugs, sockets & connectors	10		
Updated regularly	10			Guarding	10		
Sub total	50			Sub total	50		
9.9 Maintenance and Inspection	A	B	C	9.10 PPE	A	B	C
Daily inspection	10			Ear protection	10		
Lubrication	10			Hand Protection	10		
Pneumatic and hydraulic pressure	10			Eye protection	10		
Record maintenance	10			Apron	10		
Label displayed in the equipment itself.	10			Nose / face mask	10		
Sub total	50			Sub total	50		
Contractor's Observations:				Employer's Observations:			
Section % Scores				Section % Score			
				100			

	NOIDA METRO RAIL CORPORATION LTD.						
Contract No.:			Contractor's Name:				
10.0 Site Electricity							
10.1 Power assessment	A	B	C	10.2 Distribution Panels	A	B	C
Load calculation for power requirement	10			Panel secure box to IP 44	10		
Employer's approval for execution of the job	10			All cables enter box through glands	10		
Is small capacity diesel generator present	10			ELCB or RCCB/ GFCI fitted	10		
Noise from diesel generator	10			Proper earth connection and earth pit	10		
Sub-contractor's power requirement by main contractor	10			Warning signs in appropriate position	10		
Sub total	50			Sub total	50		
10.3 Cables	A	B	C	10.4 Work on site	A	B	C
All cables free from damage	10			Site electricity covered in the SAFETY & HEALTH Plan	10		
Cables lying on the ground / water	10			Name posted on Main Distribution Board	10		


Cable joints made by IP 44 connectors	10			Single line & Schematic diagram submitted	10		
Correct storage when not in use	10			Employer's Approval for execution	10		
Colour coding	10			GFCI provided	10		
Sub total	50			Sub total	50		
10.5 Electrical professional	A	B	C	10.6 Earth Pit	A	B	C
Sufficient numbers	10			As per standard	10		
Professionally qualified	10			Wet condition	10		
Roles and responsibilities defined	10			Pouring 5 litre water per week	10		
Valid license to electrical persons	10			Earth pipe free from corrosion	10		
Training	10			Earth resistance	10		
Sub total	50			Sub total	50		
10.7 Plugs, Sockets and outlets	A	B	C	10.8 Voltage / Current	A	B	C
Are all plugs, sockets and outlets IP 44 type	10			Check voltage / current limit	10		
Colour coding of plugs and sockets	10			Rating clearly marked on all equipments	10		
All cables fitted with IP 44 Plugs	10			Monitored continuously	10		
All equipments connected with plugs	10			Mismatch of cable and equipments ratings	10		
All equipments free from defects	10			Properly earthed	10		
Sub total	50			Sub total	50		
10.9 Maintenance	A	B	C	10.10 Correct Disc. / Revolutions	A	B	C
Regular inspections carried out	10			Information plate on tool	10		
Records kept	10			Information on Disc/Cutter	10		
Suitable guards/security fenced	10			Compatibility between Tool and Disc	10		
Faults actioned	10			Operator trained/competent to fit Disc	10		
Record maintaining	10			Safety check on condition	10		
Sub total	50			Sub total	50		
Contractor's Observations:				Employer's Observations:			
Section % Scores				Section % Score			
				100			

	NOIDA METRO RAIL CORPORATION LTD.						
Contract No.:		Contractor's Name:					
11.0 Fire prevention							
11.1 Fire fighting personnel	A	B	C	11.2 Requirements	A	B	C
Adequacy of Fire fighting personnel	10			Emergency plan	10		


Professionally qualified	10			Fire excavation plan	10		
Employer's approval	10			Mock drill	10		
Intimation of vacancy to Employer	10			Nearest fire brigade phone numbers	10		
Adequate no of trained persons	10			Reporting of fire accident to Employer	10		
Sub total	50			Sub total	50		
11.3 Combustible material	A	B	C	11.4 Fire Extinguisher	A	B	C
Used in site	10			Adequate numbers	10		
Handling of combustible material	10			Appropriate type	10		
Stored in separate place	10			Easily accessible	10		
Spillage of materials	10			Frequency of recharge	10		
Location of burning site	10			Maintenance and inspection	10		
Sub total	50			Sub total	50		
11.5 Fir fighting equipments	A	B	C		A	B	C
Sufficient quantity of water supply	10				10		
Fire hose and nozzle	10				10		
Fire alarm	10				10		
Condition of fire hydrants	10				10		
Sufficient no. available	10				10		
Sub total	50				50		
	A	B	C		A	B	C
Contractor's Observations:				Employer's Observations:			
Section % Scores				Section % Score			
				100			

	NOIDA METRO RAIL CORPORATION LTD.						
Contract No.:		Contractor's Name:					
12.0 Welding & Cutting							
12.1 Gas Welding / Cutting	A	B	C	12.2 storage of cylinders	A	B	C
Is procedure in Safety Plan	10			Is procedure in Safety Plan	10		
Are cylinders in cylinder-trolley	10			Storage in upright position	10		
Are pressure gauges fitted and operable	10			Full/empty segregated	10		
Are flashback arresters fitted	10			Different gases separated	10		
Are non return valves fitted	10			Contents labelled	10		
Sub total	50			Sub total	50		
12.3 Condition of cylinders	A	B	C	12.4 Hose	A	B	C
No damage by misuse	10			Colour coding	10		

No rust/corrosion	10			Hose clip and clamp	10		
Protected from weather	10			Is it free from leak and damage	10		
Colour coding proper	10			Hose lying on the ground	10		
MSDS available	10			Joints if any	10		
Sub total	50			Sub total	50		
12.5 Electric Arc Welding	A	B	C	12.6 Transformer	A	B	C
Are welding machines in good order	10			Presence of voltmeter and ammeter	10		
Welding leads free from defect	10			Separate main power switch	10		
Welding return free from defect	10			Ground connection	10		
Electrode holder properly insulated	10			Specification plate or board	10		
Dipping electrode in water when it is hot	10			Protected from weather	10		
Sub total	50			Sub total	50		
12.7 Electrical Cable	A	B	C	12.8 Work Area	A	B	C
Cable lying on ground / water	10			Area clear of flammable substances	10		
IP 44 cable connectors instead of insulation tape	10			Smoking inside the work area	10		
Damaged and exposed wires	10			Fire extinguisher fitted	10		
Separate earthing connection from work piece to transformer	10			Welding screens available	10		
Electrical protection devices ELCB, RCCB etc	10			Ventilation and fume extraction	10		
Sub total	50			Sub total	50		
12.9 PPE for welder, cutter and helper	A	B	C		A	B	C
Face and eye protection	10						
Gauntlet gloves	10						
Safety footwear	10						
Nose mask	10						
Ear muff / plug	10						
Sub total	50						
Contractor's Observations:				Employer's Observations:			
Section % Scores				Section % Score			
				100			

	NOIDA METRO RAIL CORPORATION LTD.						
Contract No.:			Contractor's Name:				
13.0 Excavations and Trenching							
13.1 Planning	A	B	C	13.2 Access/Egress	A	B	C
Are excavations covered in Safety Pan	10			Suitable ladders provided	10		
Examined by competent person	10			Ladders properly secured	10		
Records of inspection maintained	10			Alternative ladders available	10		
Underground cable and pipelines	10			Staircase for excavation more 1.5 m depth	10		
Backfilling and removal of trench	10			Guardrail for staircase.	10		
Sub total	50			Sub total	50		

13.3 Shoring	A	B	C	13.4 Barriers and Warnings	A	B	C
Shoring as soon as earth is removed	10			Rigid barrier around excavation	10		
Suitable support	10			Suitable warning notices	10		
Regular monitoring	10			Regularly checked by supervisor	10		
Proper repair under taken	10			Warning light & signs	10		
Material stacked properly on removal	10			Emergency exit board	10		
Sub total	50			Sub total	50		
13.5 Soil	A	B	C	13.6 Underground Services	A	B	C
Not closer than 1 metre	10			Checks made with Utility providers	10		
Properly stacked	10			Safe digging procedures in use	10		
Excavator clear of personnel	10			Supervision has service plans	10		
Storage of Excavated materials	10			Dewatering procedures	10		
Logistics for excavated soil	10			Line of dewatering	10		
Sub total	50			Sub total	50		
13.7 Undermining Nearby Structures	A	B	C	13.8 Portable Electrical Equipment	A	B	C
Survey carried out	10			Are as per standard	10		
Temporary support provided if required	10			Proper repair and condition	10		
Vibration measured	10			Rating voltage more than 24 V	10		
Regular monitoring	10			Double insulation	10		
Sufficient clearance provided	10			Open bare wires	10		
Sub total	50			Sub total	50		
13.9 Ventilation and Illumination	A	B	C	13.10 Signals & Communication	A	B	C
Are as per standard	10			Audio, Video signals	10		
Exhaust fan arrangement	10			Walkie-talkie / radio /mobile phones	10		
Temperature management	10			Head protection	10		
Gas monitoring systems	10			Arm protection	10		
Lighting arrangement	10			Leg protection	10		
Sub total	50			Sub total	50		
Contractor's Observations:				Employer's Observations:			
Section % Scores				Section % Score			
				100			

	NOIDA METRO RAIL CORPORATION LTD.						
Contract No.:		Contractor's Name:					
14.0 Tunnelling and Confined Space operations							
14.1 Procedure	A	B	C	14.2 Equipments	A	B	C
Procedure in SAFETY & HEALTH Plan	10			Gas monitoring equipment	10		
Permit Work system in use	10			Rescue BA equipment	10		
Only properly trained operatives	10			Full body harness for each worker	10		


Existing underground cables and pipelines	10			Tripod and lifeline	10		
Refresher training	10			Resuscitation Equipment	10		
Sub total	50			Sub total	50		
14.3 Access and Egress	A	B	C	14.4 Procedure	A	B	C
Proper staircase and lift	10			Inform to Director General before 30 days	10		
Guardrail for staircase	10			Emergency power generator	10		
Staircase made of sound material	10			Watertight bulkhead doors at entrance	10		
Free from defects	10			Reflective jackets for workers	10		
Emergency exit	10			Dewatering procedures	10		
Sub total	50			Sub total	50		
14.5 Warning / Communication systems	A	B	C	14.6 Electrical equipment	A	B	C
Telephone / walkie-talkie	10			Flame proof electrical equipment	10		
Emergency Alarm	10			Portable tools more than 24 V	10		
Warning for Exit way and electrical panel boards	10			Double insulation / earthing condition of portable equipment	10		
High visibility waist	10			Transformer used in without compressed air	10		
Warning lights	10			Bare conductor or semi enclosed fuse	10		
Sub total	50			Sub total	50		
14.7 Illumination and Ventilation	A	B	C	14.8 Compressed air	A	B	C
Illumination / ventilation levels	10			Adequacy of air supply	10		
Air circulation	10			Emergency power supply	10		
Level of oxygen / other toxic gas	10			Flame proof equipment	10		
Temperature level (not more than 29° C)	10			Available in man-locks and medical-locks	10		
Emergency power supply for luminaries	10			Hoses free from damage	10		
Sub total	50			Sub total	50		
14.9 Fire Prevention	A	B	C	14.10 Health and Welfare	A	B	C
Adequate water supply	10			Man-lock and medical-lock	10		
Fire alarm	10			Drinking water	10		
Flammable materials inside work areas	10			Medical officer	10		
Water outlet points	10			First-aid room	10		
Inspection and maintenance	10			Shelter room	10		
Sub total	50			Sub total	50		
Contractor's Observations:				Employer's Observations:			
Section % Scores				Section % Score			
				100			

	NOIDA METRO RAIL CORPORATION LTD.		
Contract No.:	Contractor's Name:		


15.0 Traffic management											
15.1 Traffic marshals			A	B	C	15.2 Vehicle operators			A	B	C
Sufficient numbers			10			Driving licence			10		
Professionally qualified or trained			10			Medically fitness			10		
Medically fit			10			Defensive driving training			10		
Driving licence			10			Refresher training			10		
Familiar with traffic signs			10			Fire fighting training			10		
Sub total			50			Sub total			50		
15.3 Traffic control devices			A	B	C	15.4 Barricades			A	B	C
Cons			10			Erected around the construction site			10		
Drums			10			Free from defects and protruding parts			10		
Delineators			10			Numbered			10		
Traffic cylinders			10			Painted and maintained in good condition			10		
Traffic signs and barricades			10			Barricade register			10		
Sub total			50			Sub total			50		
15.5 Barricades			A	B	C	15.6 Regulatory Signs			A	B	C
Barricade inspector & supervisor appointed			10			Approval from police and traffic authorities			10		
Retro reflective strips shape and size			10			Warning signs			10		
Reflective strips placed at a angle at bottom			10			Red light / flag indicator			10		
Minimum gap between retro reflective strips 1000 mm			10			Design as per employer's approval			10		
One red light / blinker per barricade			10			Material made of reflective type.			10		
Sub total			50			Sub total			50		
15.7a Vehicle			A	B	C	15.7b Vehicle			A	B	C
Vehicle number and company name			10			Brakes in good working order			10		
Inspection stickers & license plate			10			Are wiper blades in good condition			10		
Seat belts			10			Rear view mirrors			10		
Two reflective triangles on rear side			10			Speedometer			10		
Fog lights (front & rear)			10			Vehicle's horn and reverse alarm			10		
Sub total			50			Sub total			50		
15.8 Heavy motor vehicles			A	B	C	15.9 Operator cabin			A	B	C
Automatic safe load indicator			10			Made of fire resistance material			10		
Load chart of the vehicle			10			Protection from vibration			10		
Fitness certificate			10			Weather protection			10		
Manufacturer details			10			Adequate ventilation			10		
Marking of safe working load			10			Suitable fire extinguisher			10		
Sub total			50			Sub total			50		
Contractor's Observations:						Employer's Observations:					
Section % Scores						Section % Score			100		

 NOIDA METRO RAIL CORPORATION LTD.											
Contract No.:			Contractor's Name:								
16.0 Personal Protective Equipment											
16.1 Head Protection			A	B	C	16.2 Foot Protection			A	B	C
Use enforced			10			Use enforced			10		
As per standard			10			Suitable type			10		
In good condition			10			Toecaps effective			10		
Colour and company logo			10			Fair condition			10		
Available for issue			10			Available for issue			10		
Sub total			50			Sub total			50		
16.3 Eye protection			A	B	C	16.4 Hearing Protection			A	B	C
Use enforced			10			Use enforced			10		
As per standard			10			As per standard			10		
Suitable type			10			Suitable type			10		
Good condition			10			Available for issue			10		
Available for issue			10			Noise levels monitored			10		
Sub total			50			Sub total			50		
16.5 Respiratory Protection			A	B	C	16.6 Protective Gloves			A	B	C
Use enforced			10			Use enforced			10		
As per standard			10			As per standard			10		
Suitable type			10			Correct type for operation			10		
Good condition			10			Good condition			10		
Available for issue			10			Available for issue			10		
Sub total			50			Sub total			50		
16.7 High-Visible Waist			A	B	C	16.8 Fall Protection			A	B	C
Use enforced			10			Use enforced			10		
As per standard			10			As per standard			10		
In good condition			10			In good condition			10		
Warning signs displayed			10			Warning signs displayed			10		
Available for issue			10			Available for issue			10		
Sub total			50			Sub total			50		
16.9 PPE for visitors			A	B	C				A	B	C
Use enforced			10								
10% PPEs for visitors in site office			10								
In good condition			10								
Colour and company logo			10								
Available for issue			10								
Sub total			50								


Contractor's Observations:			Employer's Observations:		
Section % Scores			Section % Score	100	

	NOIDA METRO RAIL CORPORATION LTD.													
Contract No.:			Contractor's Name:											
17.0 Industrial Health & Hygiene and Lighting & Ventilation														
17.1 Medical examination				A	B	C	17.2 Occupational Health Centre				A	B	C	
All worker under gone				10			Construction medical officer & qualification				10			
Covered all testes as per standard				10			Availability nurse & sweeper				10			
Conducted by qualified person				10			Floor area minimum 15 m ² with two rooms				10			
Confidential report for all workers				10			Adequate equipment				10			
Frequency of medical test maintained				10			Medical emergency equipments				10			
Sub total				50			Sub total				50			
17.3 First-aid				A	B	C	17.4 Ambulance van and room				A	B	C	
Equipped with all items as per standard				10			Equipped with all items as per standard				10			
Sufficient numbers				10			Availability and numbers				10			
First-aid room facility				10			Maintained in good repair				10			
First-aid & his qualification				10			Equipped with standard facilities				10			
Register for first-aid				10			Record of all cases of accident & sickness				10			
Sub total				50			Sub total				50			
17.5 Mosquito breeding				A	B	C	17.6 Alcohol and drugs & HIV / AIDS prevention							
Water retain on the site				10			Employee working under the influence of alcohol / drugs					10		
Periodic interval				10			Smoking at public worksites					10		
Still waters				10			Smoking at public worksites					10		
Posters				10			HIV / AIDS awareness training provided					10		
Usage of insecticides				10			Workers participation / co-operation					10		
Sub total				50			Sub total					50		
17.7 Noises				A	B	C	17.8 Vibration					A	B	C
Are procedures for noise evaluation in the Safety Plan				10			Monitoring method					10		
Are noise assessments carried out				10			Frequency of monitoring					10		
Are noise zones identified				10			Vibration limits					10		
Is correct PPE provided				10			Report maintenance					10		
Usage of PPE				10			Control plan					10		
Sub total				50			Sub total					50		
17.9 Radiation				A	B	C						A	B	C

Method statement	10						
Approval from Employer	10						
Use and storage of radioactive substance	10						
Disposal of radioactive substance	10						
Appropriate PPE	10						
Sub total	50						
Contractor's Observations:				Employer's Observations:			
Section % Scores				Section % Score			
				100			

 <p style="text-align: center;">NOIDA METRO RAIL CORPORATION LTD.</p>										
Contract No.:					Contractor's Name:					
18.0 Welfare amenities										
18.1 Toilets / Urinals				A	B	C	18.1a Toilets / Urinals			
Enough no available				10			Is it properly illuminated			
Separate for men and women				10			Is it having separate and ample water facility			
Access within 500m from worksite				10			Is it having proper drainage system			
Is it properly cleaned				10			Water leaking or spillage			
Is it washed regularly				10			Records kept and available			
Sub total				50			Sub total			
18.2 Drinking water				A	B	C	18.3 Canteen			
Quantity is sufficient				10			Is canteen available			
Quality is good				10			Is it neat and clean			
Laboratory test done				10			Is the flooring dust free			
Access within 200m from worksite				10			Is the cost 'no loss and no gain' basis			
Is it 6m away from toilets and urinals				10			Lighting, ventilation and water facility			
Sub total				50			Sub total			
18.4 Labour Accommodation				A	B	C	18.5 Creaches			
Cooking, bathing, washing and lavatory facilities				10			Is it free from mosquito and other biological agent			
Is it free from mosquito and biological agent				10			In-charge to keep the children.			
Is it properly illuminated and ventilated				10			Is it properly illuminated and ventilated			
Is it adequate for all				10			Is it adequate for all			
Is it neat, clean and hygiene				10			Is it neat, clean and hygiene			
Sub total				50			Sub total			
18.6 Shelter				A	B	C	18.7 Illumination			
Adequate to all workers				10			Minimum illumination requirement			
Is it properly illuminated and ventilated				10			Minimum 50 lux at work place			
Is it neat, clean and hygiene				10			Minimum 30 lux on trolley tracks			
Is it free from mosquito and biological agent				10			Minimum 10 lux elsewhere			
Drinking water and Toilet facilities				10			Adequate Emergency lighting provided			

Sub total				50	Sub total				50		
18.8 Ventilation				A	B	C					
Oxygen level less than 19.5				10							
Air circulation of 6m ³ /min for each building worker employed underground				10							
Free air flow movement in work place				10							
Ventilation system in operation				10							
Maintenance records kept and available				10							
Sub total				50							
Contractor's Observations:						Employer's Observations:					
Section % Scores						Section % Score 100					

 NOIDA METRO RAIL CORPORATION LTD.												
Contract No.:			Contractor's Name:									
19.0 Batching Plant and Casting Yard												
19.1 General				A	B	C	19.2 Layout			A	B	C
Is procedure in Safety Plan				10			Plan of layout			10		
All operators medically fit/over 18				10			Drainage system			10		
No unauthorized riding on plant				10			Welfare amenities			10		
Daily inspections / recorded				10			Plan for vehicle moving area			10		
Equipped with all				10			Barricade			10		
Sub total				50			Sub total			50		
19.3 Material Handling & dust protection				A	B	C	19.4 PPE			A	B	C
Handling of cement bag				10			Hand protection			10		
Loading and unloading cement				10			Respiratory protection			10		
Handling of launching segments				10			Head protection			10		
Is dust level under permissible limit				10			Foot protection			10		
Monitoring				10			Ear protection			10		
Sub total				50			Sub total			50		
19.5 Traffic management				A	B	C	19.6 Welfare facilities			A	B	C
Barricades				10			Toilet			10		
Warning boards				10			Drinking water			10		
Traffic marshals				10			Canteen			10		
Delineators				10			Shelter			10		
Lane warning				10			Labour accommodation			10		
Sub total				50			Sub total			50		

19.7 Fitness certificate	A	B	C			
Crane	10					
Hydra and all equipment	10					
Ropes and chains	10					
Hooks and shackles	10					
Rigger & Operator	10					
Sub total	50					
Contractor's Observations:				Employer's Observations:		
Section % Scores				Section % Score 100		

	NOIDA METRO RAIL CORPORATION LTD	SF 08
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ELECTRICAL SAFETY AUDIT CHECKLIST			
Contract No			
Contractor			
Name Of Site			
Audit No			
Audited By		Date	

A. WHETHER DOCUMENTS AVAILABLE FOR THE FOLLOWING:

SI.No	Points	Clause No	Observations	Comments
1	Electrical Safety education Programs		Yes/No	
2	Electrical Safety Motivation and Promotion programs		Yes/No	
3	Approval for procurement of new electrical equipment in consultation with Safety Dept.		Yes/No	
4	Electrical accident & dangerous occurrences reporting, analysis, investigation and rating		Yes/No	
5	Inspected list of Electrical duty personal protective equipments (PPE).		Yes/No	
6	i) Standard Operating Procedures (SOPs) for the each type of electrical equipment		Yes/No	
	ii) Standard Maintenance Procedures (SMPs) for the each type of electrical equipment		Yes/No	
7	Electrical isolation system for maintenance of Main panels, DBs, SDBs. (LOTO)		Yes/No	
	Work permit system available for all kind of electrical operations		Yes/No	
8	i) Electrical single line diagram for the electrical installations		Yes/No	
	ii) Schematic diagram for each site with the location of equipment, DBs, SDBs, earth pit, etc.		Yes/No	
	iii) The list and detail of the equipment for all temporary Electrical installation and equipments		Yes/No	
9	Evaluation of competency of electrical personnel		Yes/No	

B. ELECTRICAL SAFETY AUDITS, CHECKS, INSPECTIONS, STUDIES & TESTS

SI.No	Points	Clause No	Observations	Comments
1	Is there an internal Electrical Safety audit & inspection system? If so		Yes/No	

	(i) Is there a formal procedure for it?		Yes/No	
	(ii) What is the frequency?			
	(iii) Produce a copy of the last internal Electrical Safety audit report			
	(iv) The recommendations of Electrical Safety inspections carried out were done		Yes/No	
	(v) Produce a copy of the last internal Electrical Safety inspection report and it's compliance			

C. GENERAL

1	Is any overhead line/Underground cable crossing your site?		Yes/No/NA	
	Is there any work need to be carried out nearby that?		Yes/No	
	If so, are the workers trained to do so?		Yes/No	
	Is precaution measures taken?		Yes/No	

D. ELECTRICAL INSTALLATIONS

1	Do all Electrical installations confirm to relevant standards and codes of practice?		Yes/No	
2	Are you using Fire resistant/ Flame retardant cables for the tunnels? (Give Details)		Yes/No/NA	
3	Have you had any oil cooled transformers having oil quantity exceeding 2300 liters? If so:		Yes/No	
	Have you segregated these transformers from adjoining cubicles by means of baffle walls/wired-glass windows in steel frame?		Yes/No	
	Have you provided appropriate soak pits for soaking up of leakages of oil?		Yes/No	
4	Have your motors are having over current protection systems and single phase preventor?		Yes/No	
5	Have battery-charging room?		Yes/No	
	Is the battery charging room area well ventilated to prevent accumulation of hydrogen evolved?		Yes/No	
	Is the area is free of ignition source?		Yes/No	
	Is the battery chargers inspected regularly?		Yes/No	
	Is the eye wash station provided within 50 feet?		Yes/No	
6	Do you use High Rupture Capacity (HRC) fuses?		Yes/No	
7	Do you use Auto Circuit breakers for circuit breakers carrying current above 30 A and not depend on fuses only?		Yes/No	
8	Do you have automatic circuit breaker trips?		Yes/No	
	If so: Do you set the circuit breaker trips below the HRC-Fuse current level?		Yes/No	
9	Have you install lightning arrestor as per requirement?		Yes/No	

E. DBs & SDBs

1	Are all panel, Plugs and sockets of IP44 type?		Yes/No	
2	Is earth conductor continued up to DB/SDB?		Yes/No	
3	Are suitable CBs provided at main & sub-boards?		Yes/No	
4	Are they having clear access?		Yes/No	

F. ELCB

1	Whether the connections are routed through ELCB?		Yes/No	
2	Is the ELCB tester available?		Yes/No	
3	Are the ELCB/GFCI /RCCB numbered and tested?		Yes/No	
	(j) Mention the frequency.			
	(ii) Is ELCB /RCCB sensitivity maintained well within 30 mA and corresponding tripping time?		Yes/No	
	(iii) Is test results recorded in a logbook countersigned by Site in-charge/Safety personnel? (Submit those details)		Yes/No	

G. DG SETS

Sl.No	Points	Clause No	Observations	Comments
1	Are they provided as per norms? (access, foundation, spacing)		Yes/No	
2	Are flammable materials away from it?		Yes/No	
3	Are they provided with sufficient stack height?		Yes/No	
	Is the joints and top of the stack as per standard?		Yes/No	
4	Are loading of oil is done with the provision of drip tray?		Yes/No	
5	Are the cotton wastes from cleaning of fuel leakage tray disposed properly?		Yes/No	
6	Whether the noise is monitored and controlled?		Yes/No	
7	Is it given with clear notification of emergency switch?		Yes/No	
8	Are they having insulation mat before their panel?		Yes/No	
9	Are the earth pits of DG maintained properly?		Yes/No	
10	Whether you are having any portable generators?		Yes/No	

1	Is sufficient illumination maintained throughout the site? (Details of illumination)		Yes/No	
2	Are the lighting poles provided without causing any hazard?		Yes/No	
3	Are the plugging arrangements made properly?		Yes/No	
4	Have the bulbs given proper protection?		Yes/No	
5	Is the positioning of such lights supervised?		Yes/No	
6	Emergency lighting provided wherever required (emergency operations/exits/tunnels/access areas)		Yes/No	

7	Is tunnel lighting installed as per standard?		Yes/No	
	Is proper illumination maintained?		Yes/No	
	What is the checking frequency of emergency light fittings to the normal fittings?			
	How frequent lighting arrangement is checked?			

H. CABLES

1	Mention the frequency of cable checking.			
2	Are cables received from other site / previous site checked for insulation resistance before putting them into use?		Yes/No	
3	Are welding cables routed properly above the ground and without overlapping with cables?		Yes/No	
4	Is any improper joining of cable wires prevailing at site?		Yes/No	
5	Whether all flexible cords with a conductor cross sectional area greater than 1.5 mm ² ?		Yes/No	
6	Are all cables taken underground are armoured?		Yes/No	
7	Is mechanical protection given for armoured cable?		Yes/No	
8	Is convenient means of suspension above 6m of ground is given for cable crossing open area of span over 3m?		Yes/No	
9	Are there any loose connections?		Yes/No	

I. EARTHING

1	Is neutral earthing ensured at the source of power (Main DB at Gen. or Transformer)?		Yes/No	
2	Whether the continuity & tightness of earth conductor are checked?		Yes/No	
3	Mention the gauge of earth conductor used at site.			
4	Mention the value of earth resistance maintaining at site. (Provide the details)			
5	Whether Electrical equipments earthed by suitable means?		Yes/No	
6	Whether the barricades are earthed?		Yes/No	
7	Whether all the temporary structures were earthed?		Yes/No	
8	Is min. distance of 3 m between the earth pits maintained?		Yes/No	

J. ELECTRICALLY OPERATED MACHINES

1	Are all metal parts of Electrical equipment's & light fittings / accessories grounded?		Yes/No	
2	Is motors of electrical equipment double earthed		Yes/No	
3	Are instructions and operating manuals available?		Yes/No	

4	All handheld power tools have auto cut-off switch?		Yes/No	
5	Are portable power-tools made double insulated and marking towards that visibly exists at all tools?		Yes/No	
6	Are damaged equipments labeled “Do Not Use” and red tag on it?		Yes/No	
7	Are the vibrating tools provided with vibration mountings?		Yes/No	
8	Are blades, bits, and other cutting parts sharp and well fixed, and not worn, cracked or loose?		Yes/No	
9	Are tools stored in a dry and safe place?		Yes/No	
10	Whether the workers using vibrating tools given job transfer accordingly?		Yes/No	
11	Are there signs of overheating?		Yes/No	
12	Are the welding carried out in designated place?		Yes/No	
13	Are the welding cables are maintained / checked properly?		Yes/No	
14	Whether the welding work to be carried out in confined space?		Yes/No	
	If so, Is every welding personnel trained so?		Yes/No	
15	Is the distance between the workplace and welding transformer maintained? (i.e., kept under the vision of operator)		Yes/No	
16	Is suitable fire extinguisher ready to use?		Yes/No	
17	Are the welding rods are properly disposed?		Yes/No	
18	Are the ON & OFF is provided with Clear indication?		Yes/No	

K. ELECTRICAL INSTRUMENTS

1	All instruments properly calibrated and labeled (check calibration schedule and records)		Yes/No	
2	Equipment designed to permit lockout protection		Yes/No	
3	Circuit breakers adequate for circuit protection or not		Yes/No	
	Emergency disconnect switches properly marked		Yes/No	

L. HOUSE KEEPING

1	Are all Electrical area floors and stairways in good condition (no damages, lean and non-slippery)		Yes/No	
2	Do you have proper system to deal with spillage of hazardous chemicals (diesel, petrol, oil and etc) giving details of covering to neutralize/absorb/contain hazards of spills, collecting and disposal of the neutralized/absorbed spillage etc? (Give a copy)		Yes/No	

M. ELECTRICAL PPEs

1	Is there a laid down system of availability, use and maintenance of Electrical Personal Protective Equipments (PPEs)		Yes/No	
2	Are there adequate Electrical PPEs made available and workmen do use them, wherever required?		Yes/No	
3	Are Electrical PPEs selected in consultation with workmen using the same and the Safety department?		Yes/No	
4	Are there sufficient Electrical insulation mats of ISI marking for specified voltage conditions available?		Yes/No	
5	Is Resuscitator for Electrical Shock treatment available?		Yes/No	

N. ELECTRICAL MAINTENANCE

1	Is there any system of monitoring and predicting equipment condition and undertake Electrical Preventive Maintenance? (Give Details)		Yes/No	
2	Is there a system of scheduled Electrical Maintenance and overhauling? (Give Details)		Yes/No	
	Do you have a codified system of recording Electrical Maintenance activities?		Yes/No	

O. TRAINING

1	Is training conducted on electrical safety?		Yes/No	
	Does training include general rules to be followed at site?		Yes/No	
	Whether it is given based on standard/safe working practices?		Yes/No	
	Are they are informed about necessity of reporting injuries and electrical hazards?		Yes/No	
2	Is the documentation and records of such training program maintained? Provide them		Yes/No	
3	Are the training provided to the electrical equipment operators?		Yes/No	
4	Whether refresher training is given to the operators?		Yes/No	
	What is the frequency?			
5	Is the training given to the operators when it is differ from their regular activities?		Yes/No	
6	Whether supervisory courses given electrical engineers?		Yes/No	
7	Cardio pulmonary resuscitation (CPR) training provided to electricians? If so		Yes/No	

	a) Course details			
	b) Name of the trainer			
	c) Course contents			
	d) Course duration			

P. TOOLBOX TALK / PEP TALK

1	Is task specific tool box talk is provided?		Yes/No	
	Provide the details of previous such activities.		Yes/No	


Q. WARNING SIGNS

1	Warning/Danger signs displayed at DG, DBs, SDBs, etc?		Yes/No	
2	Are they informative/realistic/animated?		Yes/No	
3	Are they given in the language understandable to the concerned workers?		Yes/No	
4	Is information on "FIRST AID FOR ELECTRICAL SHOCK (CPR)" is displayed in the site?		Yes/No	

The inspection has been done in my presence and observations are noted.

Sr. Safety & Health (Electrical) Manager

Chief Safety & Health Manager

	NOIDA METRO RAIL CORPORATION LTD.
FORM No. : SF/09	
MONTHLY SAFETY AND HEALTH REPORT	

INDEX

S. No.	Particular	Format No.	Page No.
1.	Monthly Man-Hours and Accident/Incident Details		
2.	Safety & Health and Environment Committee Details		
3.	Details of Safety & Health Training Conducted in the Month		
4.	Details of Safety & Health Inspection		
5.	Details of Safety & Health Internal Audit Like Electrical, Mars		
6.	Safety & Health Communication Activities Undertaken in the Month		
7.	Toolbox Talk Details		
8.	PPE Details		
9.	Details Of IP 44 Panel Boards, Light Poles, Welding & Cutting M/C, Lifting Appliances, Tools & Tackles		
10.	Lux Monitoring Details		
11.	Housekeeping Details		
12.	Barricade Maintenance Details		
13.	Number of Critical Excavation Details		
14.	Health & Welfare Activities		
15.	Safety & Health Activities Planned For The Next Month		

1. Monthly Man-Hours And Accident/Incident Details

NOIDA METRO RAIL CORPORATION		REF: SF 010	
CONTRACTORS MONTHLY ACCIDENT STATISTICS REPORT			
Name of Contractor: M/s xxxxx		Contract No. : CC – xx	
Report for the Month ending : Month/Year Commencement date : xx.xx.xxxx Schedule completion date : xx.xx.xxxx			
S. No	ACCIDENT STATISTICS SUMMARY	FOR MONTH	CUMMULATIVE
1	Number of Man-Hours worked		
2	Number of Man-Days worked		
3	Number of Reportable Fatal Accident		
4	Number of Reportable Non-Fatal Accident		
5	Number of Dangerous Occurrences		
6	Number of Man-hours lost		
7	Number of Man days lost		
8	<i>Frequency Rate (LTIFR) - Number of Reportable Lost Time Injuries</i> $\left\{ \frac{(3) \oplus (4)}{(1)} \right\} \times 100000$		
9	<i>Severity Rate (SR)</i> $\left\{ \frac{\text{Total Nos. of Man days Lost}}{\text{Total Man hours Worked}} \right\} \times 100,000$		
10	<i>Incident Rate (IR)</i> $\left\{ \frac{\text{Total no. of Accidents}}{\text{Total no of persons employed}} \right\} \times 1000$		
11	<i>Average Number of Personnel Daily</i> i. Staff ii. Worker includes sub-contractor:		
REMARKS (if any): Number of days worked in a Month– xx Number of hours of shift - xx hrs			
<div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="width: 30%;">Signed:</div> <div style="width: 40%; text-align: center;"> (Name) Chief SHE Manager </div> <div style="width: 20%;">Date :</div> </div> <div style="display: flex; justify-content: space-between; align-items: flex-end;"> <div style="width: 30%;">Signed:</div> <div style="width: 40%; text-align: center;"> (Name) Project Director/Manager </div> <div style="width: 20%;">Date :</div> </div>			

2.0 Safety & Health and Environment Committee Details: Minutes of SHE Committee Details (SF 05)

Meeting No.		Date of Meeting	
Location of Meeting			

S. No.	Members Presents	Invitees	Members Absent
Complete Report Sent to			
	<i>No. of copies</i>	<i>Department</i>	<i>Organisation</i>
	02	CPM office Safety and Environment Department	NMRC
	01	Civil	(Contractor Name)
	01	Mechanical	(Contractor Name)
	01	Electrical	(Contractor Name)
	01	Planning	(Contractor Name)
	01	Administration	(Contractor Name)
	01	Store	(Contractor Name)
	(xx)	(xxxxxx)	(xxxxxxx)

Description of Minutes of SHE Committee Meeting			
<i>No.</i>	<i>Description of Meeting</i>	<i>Action by</i>	<i>Target Date</i>
1	Complaints received from Client		
2	Review of MOM of previous Meeting		
3	NCR's observation from Third party		
4	Reportable Accident/Incident Cases		

5	Future Jobs and Specific Requirements		
6	Status of Implementation of Safety Plan		
7	Sub-Contractor Performance		
8	Analysis of First Aid Cases		
9	Needs for any specific System/Training/PPEs Resources		
10	Observation of HSE Committee during last Safety Inspections		

Next SHE Meeting is scheduled on: (Date should be mentioned according to Meeting scheduled day)

3.0 Details of Safety & Health Training Conducted in the Month

A. General Internal Training Status

S. No	Date	Location	Topic	Duration	Delivered by	No. of Attendee

B. 84 hrs Training Status

Batch No	Start date	Strength Attending		Total trained till date (96 hrs)		Present Strength at site		Trainer & Agency Name
		Worker	Staff	Worker	Staff	Worker	Staff	

4.0 Details of Safety & Health Inspection

A. Brief details of inspection

Type of Inspections	Daily General Inspection	Weekly Scheduled inspection	Plant & Machines (Specific)	Electrical Audit	Night Inspection
No. of Inspection Conducted					
Type of Inspections	Temporary Structures (Specific)	Launchers Inspection			
No. of Inspection Conducted					

B. Details of NCR Status (Medium & High risk only)

S. No	Observation Date	Observation	Location	NCR No.	NCR Issued Date	NCR Closed Date

5.0 Safety & Health Internal Audit Details

A. Electrical Safety Audit Summery

No.	Description	Observation	Action taken	Target Date	Compliance status
A	Availability of Documents				
A.1-10					
B	Electrical Safety Audits, Checks, Inspections, Studies & Test				
B.1 – 2					
C	General				
C. 1-2					
D	Electrical Installations				

D. 1-9					
E	DBs & SDBs				
E.1-4					
F	ELCB/GFCI				
F.1-3					
G	DG Sets				
G.1-10					
H	Lighting/Illumination				
H.1-6					
I	Cables				
I.1-12					
J	Earthing				
J.1-8					
K	Electrically Operated Machines				
K.1-24					
L	Electrical Instruments				
L.1-3					
M	Housekeeping				
M.1-6					
N	Electrical PPEs				
N.1-5					
O.	Electrical Maintenance				
O.1-3					
P.	Training				
P.1-11					
Q.	Tool Box Talk/Pep				

	Talk				
Q.1-2					
R.	Warning Signs				
R.1-4					

B. Monthly Audit Rating Score

<i>Month:</i>		<i>Audit Date:</i>			
<i>S No</i>	<i>Field</i>	<i>% Score attained</i>		<i>Code of Criticality</i>	
		<i>By Contractor</i>	<i>By NMRC</i>	<i>By Contractor</i>	<i>By NMRC</i>
1	Safety & Health and Environment Administration				
2	Safety & Health and Environment Training and Safety & Health and Environment Communication				
3	Safety & Health and Environment Inspection and Audit				
4	Hazard Identification, Risk Assessment and Emergency Preparedness				
5	Reporting of Accidents and Dangerous Occurrences and Accident Investigations				
6	Housekeeping				
7	Working at Height				
8	Lifting Operations and Gears				
9	Construction Machinery / Hand tools and power tools				
10	Site Electricity				

11	Fire prevention				
12	Welding & Cutting				
13	Excavations and Trenching				
14	Tunnelling and Confined Space operations				
15	Traffic Management				
16	Personal Protective Equipment				
17	Industrial Health & Hygiene and Lighting & Ventilation				
18	Welfare amenities				
19	Environmental management				
20	Batching Plant and Casting Yard				
	Overall Audit Score Attained				
	<i>Team head/Contractor</i>	Name	Designation		Date
	<i>NMRC Representative</i>	Name	Designation		Date

6.0 Safety & Health Communication activities under taken in the month indicating the number of posters displayed and balance availability in stock

S.No	Date	Location	Type of Activity	Topic	Displayed at	Total at site	Balance available
			Poster				
			SHE Policy				

			HIV aids Policy				
			Others				

7.0 Toolbox Talks details

<i>S. No</i>	<i>Date</i>	<i>Topic</i>	<i>Location</i>	<i>Shift</i>	<i>Delivered by</i>	<i>No. of attended</i>	<i>Persons at site</i>

8.0 PPE Details: Quantity purchased, issued and stock available

<i>S No</i>	<i>Type of PPE</i>	<i>Last Month Stock</i>	<i>Quantity purchased</i>	<i>Quantity Issued</i>	<i>Balance Available</i>
1	Safety Helmet				
2	Welding Face Shied				
3	Welding Goggles				
4	Safety goggles				
5	Ear Plugs				
6	Ear Muff				
7	Dust/Nose Mask				
8	Gas Mask				
9	High Visibility Vest				
10	Welding Apron				
11	Hand Gloves for hot work				
12	Rubber hand gloves for Solvent				
13	Rubber Hand gloves for				

	Electrical				
14	Cotton Hand gloves				
15	Leather Hand Gloves				
16	Gum Boot				
17	Safety Shoes				
18	Self Contained Breathing Apparatus				

** The items in above list can be exceed subject to PPE only.*

9. Details of IP 44 Panel boards, Power Operated Equipments, Lifting Tools & Tackles

A. IP 44 Panels

S No	Date	Location	Panel/ Pole ID No.	Rated Voltage & Current	Inspection Date	ELCB/RCC B/ MCCB & Rating	Tripping Current & Time	Frequency of testing

B. Power Operated Equipments

S No	Date	Location	Equipment Type	Supply Phase & Voltage	Equipment ID No.
1			Welding Machine		
2			Gas Cutting		
3			Drill Machine		
4			Grinding Machine		
5			Breaking Machine		
6			Re-bar cutting Machine		
7			Re-bar bending machine		
8			Air Compressor		

9			Grinding Machine		
10			Power Pack		

C. Lifting Appliances & Lifting Tools & Tackles (All lifting appliances, Lifting gears and tools & tackles)

S.No	Location	Type/Make/ Model of cranes	Capacity/ SWL in present configuration	Reg. No./ Sr. No. / Chasis No.	Manufactured Year	Own/hired (Renting agency)	Certification (both issued-expired dates)

10. Monthly Lux Meter Study details (As per NMRC CoC)

S No	Date	Location	Sub-Location	Standard Value (Lx)	Measured Value (Lx)	Time of Monitoring

* All values should be in Lux

Remarks: (Control Measures in case of low lux level)

11. Housekeeping Details

S No	Date	Location	Sub-Location	Type of Activities	No. of Persons deployed

12. Barricade Maintenance Details

S No	Date	Location	Board Nos.	Type of Activities	No. of Persons deployed

13. Number of Critical Excavations (depth > 1.5 metre/loose soil)

<i>S No</i>	<i>Date</i>	<i>Location</i>	<i>Excavation Dimension (LxBxD)</i>	<i>Purpose of Excavation</i>	<i>Safety Measure</i>


14. Health & Welfare Activities


<i>S No</i>	<i>Date</i>	<i>Location</i>	<i>Type of Activities</i>	<i>Persons attended, if any</i>

15. Safety & Health Activities Planned for Next Month

<i>S No</i>	<i>Proposed Date</i>	<i>Location</i>	<i>Type of Activities</i>	<i>Remarks</i>

(can be include – training, communication, promotional etc.)

	NOIDA METRO RAIL CORPORATION LTD.		
FORM No. : SF/10			
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 Manhours Worked		
2.	<i>Number of Mandays Worked</i>		
3.	<i>Number of Reportable Fatal Accidents</i>		
4.	<i>Number of Reportable Non-Fatal Accidents</i>		
5.	<i>Number of Dangerous Occurrences</i>		
6.	<i>Number of Manhours Lost</i>		
7.	<i>Number of Mandays Lost</i>		
8.	<i>Frequency Rate (LTIFR) - Number of Reportable Lost Time Injuries</i> $\left\{ \frac{(3) \oplus (4)}{(1)} \right\} \times 100000$		
9	<i>Severity Rate (SR)</i> $\left\{ \frac{\text{Total Nos. of Man days Lost} \times 100,000}{\text{Total Man hours Worked}} \right\}$		
10	<i>Incident Rate (IR)</i> $\left\{ \frac{\text{Total no. of Accidents}}{\text{Total no of persons employed}} \times 1000 \right\}$		
11.	<i>Average Number of Personnel Daily</i> iii. <i>Staff</i> iv. <i>Worker includes sub contractor:</i>		
REMARKS: Number of days worked in a Month– xx Number of hours of shift - xx hrs			
Signed:		Chief safety & Health Manager:	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 LTD.
<u>FORM No. : SF/11</u> <u>ENVIRONMENT</u>	

Environmental Monitoring Report Format for Air and Noise

Air Monitoring Report

Parameter: **PM₁₀**
Unit : **µg/m³**
CPCB Standard
Value: **100 µg/m³**

Location	Date	Measured Value	Base line value if any
Location 1	First fortnight monitoring date		
Location 1	Second fortnight monitoring date		
Location 2	First fortnight monitoring date		
Location 2	Second fortnight monitoring date		


Noise Monitoring Report

Day Time

Location	Category of Area/Zone	National Standard (Day time) Leq dB(A)	Baseline value (Day time), Leq dB(A)	Noise levels (Day time) Leq dB(A)
Location 1				
Location 2				

Night Time


Location	Category of Area/Zone	National Standard (Night time) Leq dB(A)	Baseline value (Night time), Leq dB(A)	Noise levels (Night time) Leq dB(A)
Location 1				
Location 2				

	NOIDA METRO RAIL CORPORATION LTD.
<u>SAMPLE FORM No. SF-12</u>	
<u>ENVIRONMENT</u>	

Monthly Waste Management Record

S.No	Waste Type	Unit	Quantity Generated		Quantity Disposed off		Adopted/Proposed disposal method
			For the month	Till date	For the month	Till date	
1	Construction and Demolition Waste						
	a. Concrete waste	MT					
	b. Demolition Waste	MT					
	c. Bentonite/Polymer mixed soil	CUM					
	d. Good earth	CUM					
2	Hazardous Waste						
	a. Waste oil	Litres					
	b. Oil filters	Nos					
	c. Air filters,	Nos					
	d. Cartridges etc.	Nos					
3	Recyclable waste						
	Paper, plastic, wood, bottles, rubber etc.	Kg					
4	Bio degradable waste						
	Food waste, vegetable waste etc	Kg					
5	Metal Scrap	Ton					
6	E –Waste	Nos/ Ton					
7	Miscellaneous (any other)						

Prepared by:	Reviewed by: (Chief Environment Officer)	Approved by: (Project Manager)
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	NOIDA METRO RAIL CORPORATION LTD.
SAMPLE FORM No. SF-13 ENVIRONMENT - WATER CONSUMPTION RECORD	


RAW WATER CONSUMPTION DETAILS

S. No	Source of Water	Quantity Consumed for the month (KL)	Quantity Consumed till date(KL)
1	Ground Water Extracted		
2	Jal Board Supply		
3	STP treated Water		
4	Water Tanker		
5	Water bottles		
6	Dewatered water		
Total (A)			

Breakup of Raw Water Consumption Detail

S. No.	Particular	Quantity Consumed for the month (KL)	Quantity Consumed till date(KL)
1	Raw Water		
	a. Consumed in RO Plant		
	b. Used for Sprinkling		
	c. Used for wheel washing		
	d. Used for domestic purpose like drinking, toilets, labour camps, office cleaning		
	e. Curing		
	f. Stone cutting		
	g. TM washing		
	h. Any other use		
	Total (B)		
2	R O treated water		
	a. Used in Concrete Production		
	b. Used for curing		
	c. Used for drinking		
	Total (C)		
3	R O Reject Water		
	a. Used in wheel washing		
	b. Used for sprinkling, road cleaning, barricade board washing		
	c. Used in toilet		
	d. Any other purpose		
	Total (D)		

Prepared by:	Checked by: (Chief Environment Officer)
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	NOIDA METRO RAIL CORPORATION LTD.
<u>SAMPLE FORM No. SF-14</u> <u>ENVIRONMENT – FLY ASH CONSUMPTION DETAILS</u>	

Details on Fly Ash (If applicable)

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.

Fly Ash utilization in tones in Building Materials and Products for the FY-_____

Contract No. :

Name of Contractor :

Details regarding utilization of fly ash in road/flyover construction projects:

S.No.	Item of work	Total quantity of material used (tones)	Quantity of Fly ash used (tones)	Quantity of Soil/Earth any other material used (tones)	% fly ash used against total quantity of material used	Source of fly ash
1.	Filling of depressions					
2.	Filling of flyover embankments					
3.	Others, pls. specify					
Remarks:						

Details regarding utilization of fly ash in Land reclamation / filling of low lying areas:

S. No.	Item of work	Total quantity of material used (tones)	Quantity of Fly ash used (tones)	Quantity of Soil/Earth any other material used (tones)	% fly ash used against total quantity of material used	Source of fly ash
1.	Filling of low-lying areas					


Remarks:

Details regarding utilization of fly ash based products in building construction projects:

S.No.	Building materials or products	Total quantity of building materials or products used	Quantity of fly ash based products/bidg. Materials used	Quantity of conventional building material used non-flyash based)	Percentage of fly ash based building material/products used against total quantity of building materials or products used	Details of supplier of fly ash based building materials / products
1.	Bricks, blocks, tiles, etc. (to be given in numbers)					
2.	Paving blocks, paving tiles, checker tiles, mosaic tiles, roofing sheets, pre-cast elements, etc. (to be given in numbers)					
3.	Cement (to be given in No. of bags/weight/any other)					
4.	Concrete, mortar and plaster (to be given in Volume as m ³ /any other)					

Remarks:


Prepared by:	Checked by: (Chief Environment Officer)
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	NOIDA METRO RAIL CORPORATION LTD.
<u>SAMPLE FORM No. SF-15</u>	
<u>ENVIRONMENT</u>	

Raw Material Consumption Details

S.No.	Particular	Unit	Quantity Consumed	
			For the month	Till date
1	Concrete	CUM		
2	Cement	MT		
3	Sand	MT		
4	Aggregate	MT		
5	Reinforcement	MT		
6	Admixtures	Litres		
7	Diesel	Litres		
8	Electricity	kWh		


Prepared by:	Checked by: (Chief Environment Officer)
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	NOIDA METRO RAIL CORPORATION LTD.
<u>SAMPLE FORM No. SF-16</u>	
<u>ENVIRONMENT</u>	

WEEKLY INSPECTION REPORT FORMAT

Sl. No	Location	Relevant Clause	Observation & Recommendation	Photographs	Concerned person/Deptt	Target Date	Remarks
1.							
2.							

Prepared by:	Reviewed by: (Chief Environment Officer)	Approved by: (Project Manager)
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	NOIDA METRO RAIL CORPORATION LTD.
FORM No. : SF/17	
ACCIDENT/DANGEROUS OCCURRENCE REPORT FORM	Accident No.
Name of Contractor	Contract No.
<p>Instructions:</p> <ol style="list-style-type: none"> 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	
<p>Name : _____ Date of Birth : _____, Age _____</p> <p>Male <input type="checkbox"/> Female <input type="checkbox"/></p> <p>Address : _____</p> <p>_____</p> <p>Job Title : _____ Name of Employer : _____</p>	
Part B : Details of The Accident	
<p>Date : _____ Time : _____ Location : _____</p> <p>Describe the task the injured person was doing at the time of the accident:</p> <p>Describe in details how the accident happened (Attach, sketch, plan photographs etc.):</p> <p>Was any plant or machinery involved yes/no : if yes give details:</p> <p>Name of Witnesses:</p>	
<p>Part C : Details of the Inquiry</p> <p>What was the Injury ? (eg. Fracture, Lacerations)</p> <p>What part of the body was injured?</p> <p>Was the injury : Fatal <input type="checkbox"/> Major Injury <input type="checkbox"/> Minor Injury <input type="checkbox"/></p> <p>Was the injured person sent to ; First Aid <input type="checkbox"/> Doctor <input type="checkbox"/> Hospital <input type="checkbox"/> Home <input type="checkbox"/></p>	
Part D : Certification	
<p><i>I have checked the above information and can confirm that it is a true record of the accident</i></p>	
Signed _____ Signed _____	Chief Safety Manager _____ Project Manager _____
Date _____ Date _____	_____ _____

Note: The initial report shall be followed by the detail Accident Analysis report comprising photographs, witness statements, fact analysis, Corrective & Preventive Action taken, etc.



NOIDA METRO RAIL CORPORATION LTD.

FORM No. : SF/18

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 LTD.

FORM No. : SF/19

WEEKLY FIRE FIGHTING EQUIPMENT CHECK

NAME OF CONTRACTOR

CONTRACT NO

SITE / LOCATION

DATE OF CHECK

**FIRE POINT
NUMBER**

**EXTINGUISHERS
GOOD ORDER**

IN

**ACCESS
TO
EXTINGUISHERS**

SIGNAGE

YES

NO

CLEAR

OBSTRUCTED

CORRECT

INCORRECT


FIRE POINT NUMBER	EXTINGUISHERS GOOD ORDER		IN	ACCESS TO EXTINGUISHERS		SIGNAGE	
	YES	NO		CLEAR	OBSTRUCTED	CORRECT	INCORRECT

COMMENTS:

CHECK CARRIED OUT BY:

NAME: _____ SIGNATURE _____

POSITION: _____ DATE: _____

	NOIDA METRO RAIL CORPORATION LTD.
FORM No. : SF/20	
PERMIT TO WORK – CONFINED SPACES	
NAME OF CONTRACTOR	CONTRACT NO
PERMIT NO.	DATE / /
PART 1: Initiator	
Issue to (Name of Person carried out work) _____ 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 _____	
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 _____	
PART 3: Authorization	
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.	
Date: _____ Time of Issue: _____ Date: _____ Time of Expiry _____	
Signed _____	
Counter signed by Safety Manager:	
Name: _____ Signed _____ Time _____ Date _____	
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 detailed above, and that all gear, tools and other equipment have been removed.	
Signed _____ Time _____ Date _____	
PART 4. Cancellation	
I acknowledge receipt of the clearance of the Permit	
THIS PERMIT IS NOW CANCELLED	
Signed _____ Date _____ Time _____	

NOTE: Kindly attached duly signed detailed checklist for Safety measures



NOIDA METRO RAIL CORPORATION LTD.

FORM No. : SF/21

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 apparatus.

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 acknowledge return of authorised Key Nos _____

Signature of person responsible for issue of permit _____

Time _____ Date _____

	NOIDA METRO RAIL CORPORATION LTD.
FORM No. : SF/22	
PERMIT TO WORK – HOT WORK	
NAME OF CONTRACTOR	CONTRACT NO
PERMIT No. HW: _____	Date _____
Part 1: Initiator Issue to (Name of person) _____ Section _____ Details of Hot Work _____ Location _____ Work to be carried out _____	
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 _____	
Part 3: Authorization 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 _____ Signed _____ Time _____ Date _____	
Part 4: 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 _____ _____	
Part 5 : Cancellation I acknowledge receipt of the clearance of this Certificate. This certificate is now cancelled Signed _____ <p style="text-align: center;">Being the Authorized Person</p> Time _____ Date _____	

NOTE: Kindly attached duly signed detailed checklist for Safety measures



NOIDA METRO RAIL CORPORATION LTD.

FORM No. : SF/23

PERMIT TO WORK – LIFTING PERMIT

SECTION – A: Details of Lifting Crew, Crane Configuration & Load Calculation

NAME OF CONTRACTOR

CONTRACT NO.

PERMIT No. _____ Date _____ Time _____

Location _____ Activity being performed _____

Part - 1: Details of Lifting Crew

Name of Lifting Engineer: _____

Name of Operators: _____

Names of Riggers: _____

Name of Signalman: _____

Part – 2: Crane Details

Crane Make, Model & Year: _____ Max. Lifting Capacity: _____

Maximum Boom Length: _____ Maximum Radius: _____

Outrigger full extension (in mtr.): _____ Percentage of deration in crane capacity: _____

Automatic Safe Load Indicator: _____ Over Hoist Cut-off Limit Switch: _____

Part – 3: Load Details

Description of the Load: _____ Lifting points on Load: _____

Rigging Manner of load: _____ Dimension of Load: _____

Part – 4: Load Calculation (_____ % of Load chart referred/followed)

a) Crane Boom Length: _____, b) Crane Boom Radius: _____, c) Rope Diameter(mm): _____

d) No. of falls: _____, e) Deration in capacity: _____, f) Counter weight: _____

g) SWL (after deration): _____, h) Weight of Load: _____, h) Rigging Weight: _____

i) Hook Block Weight: _____, j) Total Weight to be lift: _____.

k) Safety margin in crane capacity: (SWL of crane on lifting configuration – Load to be lifted) _____

l) Outriggers extension (in mtrs) _____

Part 5 : Receipt

I (**Name of Lifting Engineer**) hereby declare that the load calculation as mentioned in Part – 4 of this permit shall not exceeds in any circumstances and work shall be carried out in safe manners. In addition, the checklist along with lifting sketches as mentioned in section B of this permit shall be followed and also attached. All measures have been adopted to ensure the stability & rigidity of the cranes as well as rigging. All safety devices of the crane are in proper working order. Section A shall be treated as invalid without section B.

Name: _____ Signed _____ Time _____ Date _____

Part – 6: Clearance from Safety Department

I (**Name of Safety In-charge**) also checked the above load calculation which is within the crane lifting configuration for safe lifting operation.

Name: _____ Signed _____ Time _____ Date _____

SECTION – B: Safety Checklist & Sketch

Part - 7: Safety Measures Checklist

S No.	Measures/particulars	Yes/No/Avl./other
1	Crane use for lifting is suitable as per site condition and type of lifting	
2	Are lifting crew trained for lifting operation	
3	Is crane set up on compacted and firm ground condition	
4	Are crane outriggers fully extended and placed on metal plate	
5	Are condition of lifting gears free from any type of defects	
6	Is condition of lifting appliance operator cabin in good condition and not no hindrance to any thing	
7	Is adequate means of communication between lifting crew arranged	
8	Is underground utilities presents, if yes, mentioned measures to overcome & crane stability (mentioned in Method Statement)	
9	Is any power cable/OHE cable available, if yes, then measures to encounter that (mentioned in Method Statement)	
10	Safe means of access arranged	
11	Safe working platform arranged	
12	Measures for working at height adopted	
13	Traffic diversion along with provision of traffic marshal arranged	
14	Is wind velocity check and under acceptable limit as recommended by manufacturer	
15	Is copy of approved method statement available	
16	Is Automatic Safe Load Indicator working and cut-off switch provided & working	
17	All certificate & document like TPI, Load chart etc. available	
18	Is proper arrangement of illumination done & level of lux maintained	
19	Is rigging done by taking consideration of CG of load w.r.t crane hook	
20	Swing area of crane properly barricaded	
21	Other system of crane like control lever, fail safe device, boom, winch etc. are in good condition or working properly	
22	Is tag line to control the load is provided	
23	Any other measures	

Part – 8: Lifting Sketch
(this sketch shall be site specific and reflects all hazards/obstruction along with dimension)

Part 9 : Final Authorization

I (**Name of Lifting Engineer**) hereby declare that the load calculation as mentioned in Part – 4 of section A and measures as mentioned in part 7 of section B shall be ensured. In addition, arrangement for safe lifting, public safety, traffic diversion, working at height, means of access etc has been adopted.

Name: _____ Signed _____ Time _____ Date _____

Part – 10: Clearance from Safety Department

I (**Name of Safety In-charge**) certify that, measures for safe lifting have been adopted at site.

Name: _____ Signed _____ Time _____ Date _____

11: Clearance Certificate (By Lifting Engineer)

I declare that all persons under my charge have been withdrawn and warned that it is no longer safe to work at site, and that all gear, tools and other equipment have been removed.

_____ Signed _____ Time _____ Date _____

Part 12 : Cancellation (Being the Authorized Person)

I acknowledge receipt of the clearance of this Permit

This permit is now cancelled

Name: _____ Signed _____ Time _____ Date _____



NOIDA METRO RAIL CORPORATION LTD.

FORM No. : SF/24

PERMIT TO WORK – TANDEM LIFTING PERMIT

SECTION – A: Details of Lifting Crew, crane configuration & Load calculation

NAME OF CONTRACTOR

CONTRACT NO.

PERMIT No. _____ Date _____ Time _____

Location _____ Activity being performed _____

Part - 1: Details of Lifting Crew

Name of Lifting Engineer: _____

Name of Operators: _____

Names of Riggers: _____

Name of Signalman: _____

Part – 2: Crane Details

Crane – 1:

Crane Make, Model & Year: _____

Max. Lifting Capacity: _____

Maximum Boom Length: _____

Maximum Radius: _____

Outrigger full extension (in mtr.): _____

Percentage of deration in crane capacity: _____

Automatic Safe Load Indicator: _____

Over Hoist Cut-off Limit Switch: _____

Crane – 2:

Crane Make, Model & Year: _____

Max. Lifting Capacity: _____

Maximum Boom Length: _____

Maximum Radius: _____

Outrigger full extension (in mtr.): _____

Percentage of deration in crane capacity: _____

Automatic Safe Load Indicator: _____

Over Hoist Cut-off Limit Switch: _____

Part – 3: Load Details

Description of the Load: _____ Lifting points on Load: _____

Rigging Manner of load: _____ Dimension of Load: _____

Part – 4: Load Calculation

Crane – 1:

a) Crane Boom Length: _____

b) Crane Boom Radius: _____

c) Rope Diameter(mm): _____

d) No. of falls: _____

e) f) Counter weight: _____

f) Weight of Load: _____

g) Rigging Weight: _____

h) Hook Block Weight: _____

i) Total Weight to be lift: _____

j) Total weight to be lift on crane 1: _____

Crane – 2:

a) Crane Boom Length: _____

b) Crane Boom Radius: _____

c) Rope Diameter(mm): _____

d) No. of falls: _____

e) f) Counter weight: _____

f) Weight of Load: _____

g) Rigging Weight: _____

h) Hook Block Weight: _____

i) Total Weight to be lift: _____

j) Total weight to be lift on crane 2: _____

k) SWL (as per 75% of Load Chart): _____ l) SWL (after deduction of 15% on 75% chart): _____ m) Safety margin in crane capacity: (j – l) _____ n) Outriggers extension (in mtrs): _____	k) SWL (as per 75% of Load Chart): _____ l) SWL (after deduction of 15% on 75% chart): _____ m) Safety margin in crane capacity: (j – l) _____ n) Outriggers extension (in mtrs): _____
--	--

Part 5 : Receipt

I (Name of lifting engineer) hereby declare that the load calculation as mentioned in Part – 4 of this permit shall not exceeds in any circumstances and work shall be carried out in safe manners. In addition, the checklist along with lifting sketch as mentioned in section B of this permit shall be followed and also attached. All measures have been adopted to ensure the stability & rigidity of the cranes as well as rigging. All safety devices of the crane are in proper working order. Section A shall be treated as invalid without section B.

Name: _____ Signed _____ Time _____ Date _____

Part – 6: Clearance from Safety Department

I (Name of Safety In-charge) also checked the above load calculation which is within the crane lifting configuration for safe lifting operation.

Name: _____ Signed _____ Time _____ Date _____

SECTION – B: Safety Checklist & Sketch

Part - 7: Safety Measures Checklist

S No.	Measures/particulars	Yes/No/Avl./other
1	Crane use for lifting is suitable as per site condition and type of lifting	
2	Are lifting crew trained for lifting operation	
3	Is crane set up on compacted and firm ground condition	
4	Are crane outriggers fully extended and placed on metal plate	
5	Are condition of lifting gears free from any type of defects	
6	Is condition of lifting appliance operator cabin in good condition and not no hindrance to any thing	
7	Is adequate means of communication between lifting crew arranged	
8	Is underground utilities presents, if yes, mentioned measures to overcome & crane stability (mentioned in Method Statement)	
9	Is any power cable/OHE cable available, if yes, then measures to encounter that (mentioned in Method Statement)	
10	Safe means of access arranged	
11	Safe working platform arranged	
12	Measures for working at height adopted	
13	Traffic diversion alongwith provision of traffic marshal arranged	
14	Is wind velocity check and under acceptable limit as recommended by manufacturer	
15	Is copy of approved method statement available	
16	Is Automatic Safe Load Indicator working and cut-off switch provided & working	
17	All certificate & document like TPI, Load chart etc. available	
18	Is proper arrangement of illumination done & level of lux maintained	
19	Is rigging done by taking consideration of CG of load w.r.t crane hook	
20	Swing area of crane properly barricaded	
21	Other system of crane like control lever, fail safe device, boom, winch etc. are in good condition or working properly	
22	Is tag line to control the load is provided	
	Any other measures	

Part – 8: Lifting Sketch

(this sketch shall be site specific and reflects all hazards/obstruction along with dimension)

Part 9 : Final Authorization

I (**Name of Lifting Engineer**) hereby declare that the load calculation as mentioned in Part – 4 of section A and measures as mentioned in part 7 of section B shall be ensured. In addition, arrangement for safe lifting, public safety, traffic diversion, working at height, means of access etc has been adopted.

Name: _____ Signed _____ Time _____ Date _____

Part – 10: Clearance from Safety Department

I (**Name of Safety In-charge**) certify that, measures for safe lifting have been adopted at site.

Name: _____ Signed _____ Time _____ Date _____

11: Clearance Certificate (By Lifting Engineer)

I certify that all persons under my charge have been withdrawn and warned that it is no longer safe to work at site, and that all gear, tools and other equipment have been removed.


_____ Signed _____ Time _____ Date _____

Part 12: Cancellation (Being the Authorized Person)

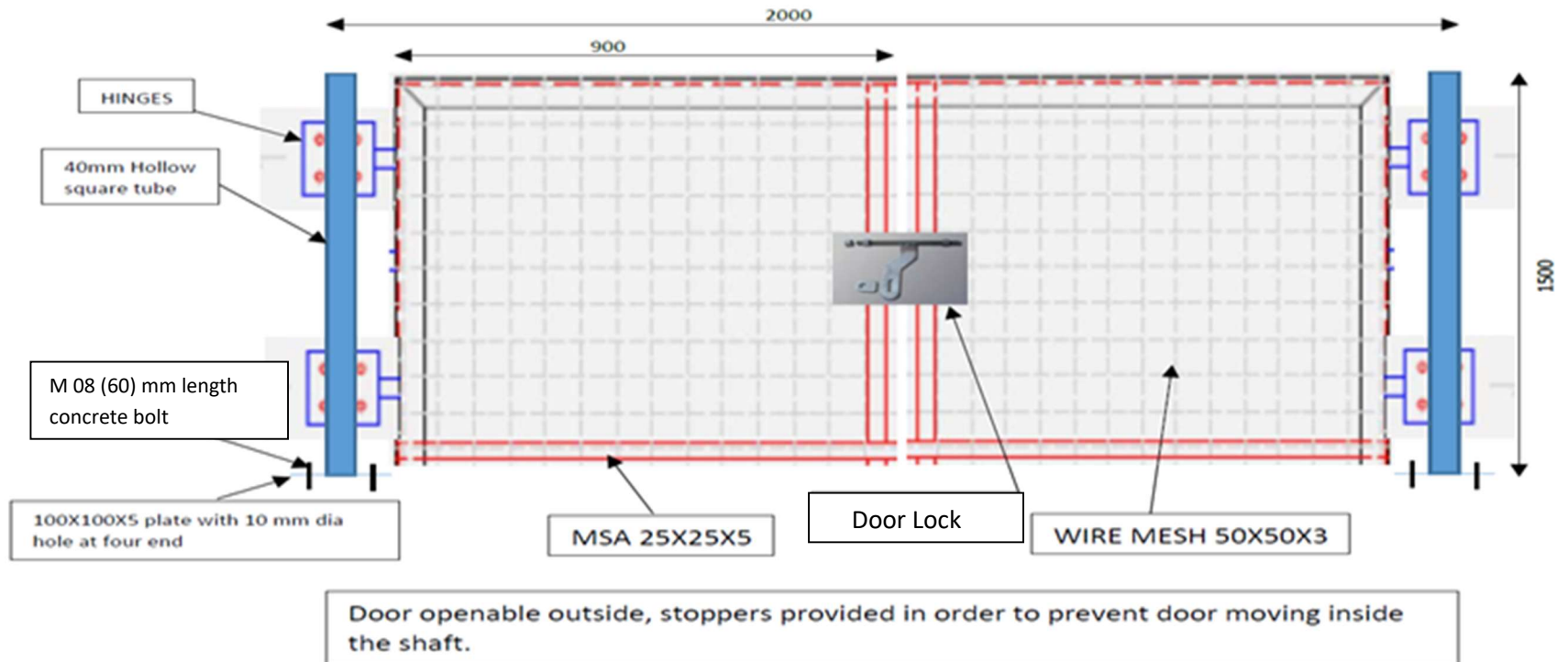
I acknowledge receipt of the clearance of this Permit

This permit is now cancelled

Name: _____ Signed _____ Time _____ Date _____

	NOIDA METRO RAIL CORPORATION LTD.
Sample Drawing -1 Fall Protection arrangement for Wall Opening	

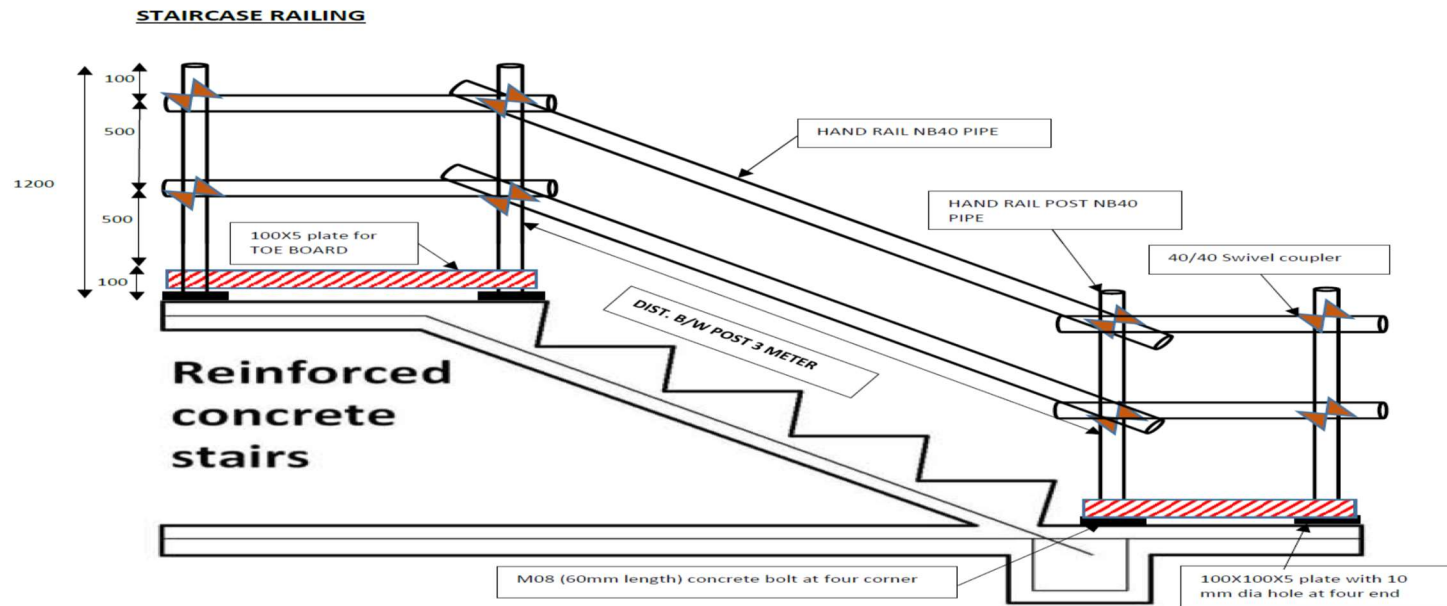
LIFT WALL OPENING – FALL PROTECTION DESIGN





NOIDA METRO RAIL CORPORATION LTD.

Sample Drawing -2
Fall Protection arrangement for Edges

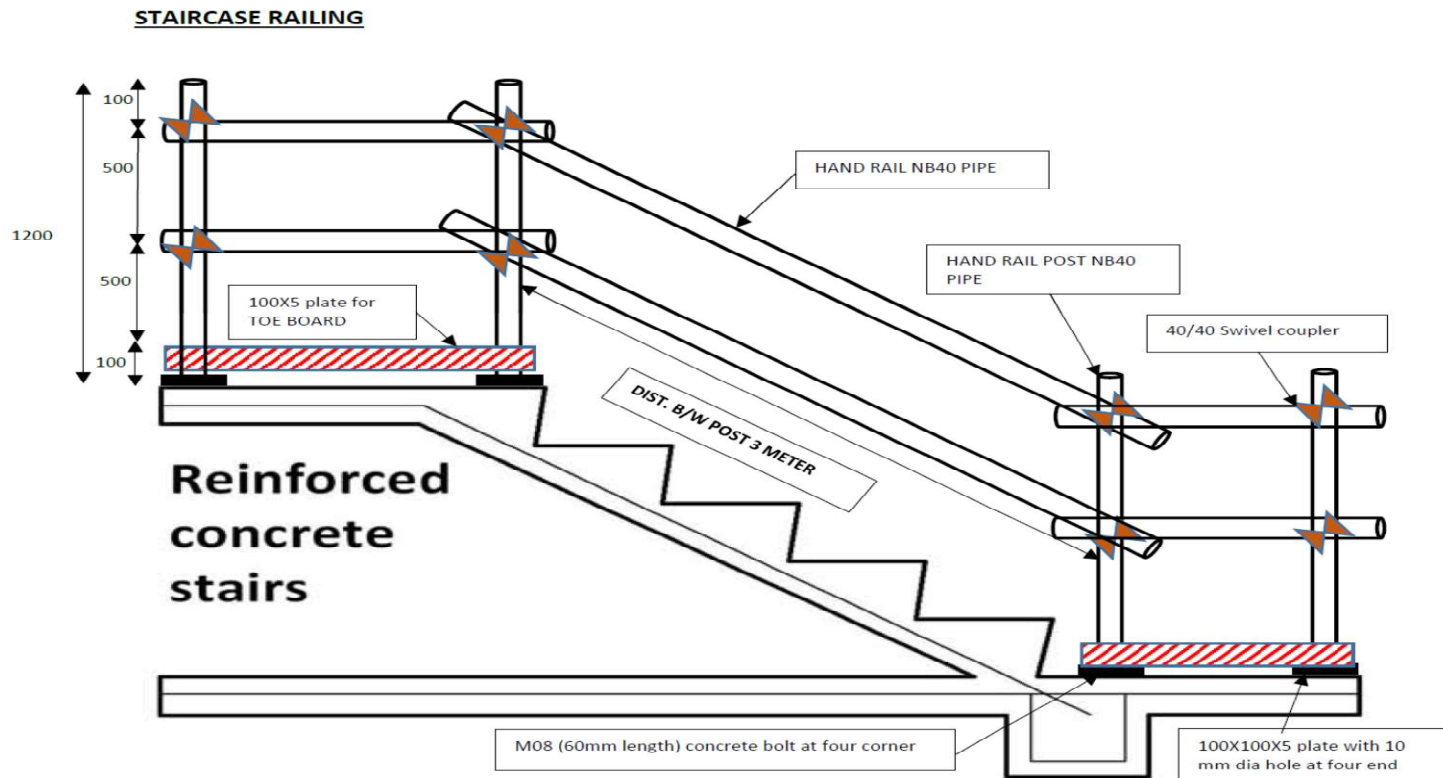




NOIDA METRO RAIL CORPORATION LTD.

Sample Drawing -3

Fall Protection arrangement for Staircases





NOIDA METRO RAIL CORPORATION LTD.

Sample Drawing -4
Essential components of Scaffold Working Platform

