SECTION - 8C

SAFETY, HEALTH AND ENVIRONMENT (SHE) MANUAL

SAFETY HEALTH & ENVIRONMENT (SHE) MANUAL

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PART – I - SHE MANAGEMENT

1.0 GENERAL

1.1 SCOPE

1.1.1 This document defines the principal requirements of the Employer on Safety, Health and Environment (SHE) associated with the contractor / sub-contractor and any other agency to be practiced at construction worksites at all time

1.2 DEFINITION / LANGUAGES

1.3 DEFINITIONS AND ABBREVIATIONS

a) Environment- The total surroundings of an organism including water, air and land and other living Creatures.
b) Environmental Pollutant means any solid, liquid or gaseous substance present in such concentration as may be or tend to be injurious to environment.
c) Environmental Pollution means the presence in the environment of any environmental pollutant.
d) Nuisance is an annoyance, which results from any construction activity that affects the material comfort and quality of life of the inhabitants of the area surrounding the construction site.
e) Monitoring is the use of direct or indirect reading field instrumentation to provide information regarding the levels of pollutants released during construction.
f) Construction Site is the contract limits for construction. It shall be all the area within the limits of the work as shown on the Plans. Construction site shall also include staging, and debris disposal areas and transportation routes to and from these areas.
g) Noise is any unwanted sound disturbance of the environment around the area of construction operations.
h) Decibel is a measure on a logarithmic scale of the magnitude of a particular quantity (such as sound pressure, sound power) with respect to a standardized reference quantity.
i) A - weighted Noise levels in Decibels (referenced to 20 micro-Pascal) as measured with A-weighting network of standard sound level meter, abbreviated dB (A).
j) Energy Equivalent Level (Leq) is the level of a steady noise which has the same energy as the fluctuating noise level integrated over the period of measurement. L max is the maximum Noise Level during the period of measurement.
k) L10 and L90 is the percentile exceeding levels of sound which exceeds 10% and 90% of the time of measurement.
l) Waste is unwanted surplus substances arising from the application of all construction operations and any substance or article which is required to be disposed.
m) Suspended Particulate Matter is abbreviated as SPM and measured in µg/m3.
n) Environmental Quality Management Manual is abbreviated as EQM.
o) Air Monitoring and Control Plan is abbreviated as AMCP.
p) Noise Monitoring and Control Plan is abbreviated as NMCP.
q) Ministry of Environment and Forests, Government of India is abbreviated as MOEF.
r) Central Pollution Control Board, New Delhi is abbreviated as CPCB.
s) Karnataka State Pollution Control Board as KSPCB:

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1.3.1 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 Karnataka Rail Infrastructure Development Ltd., (K-RIDE).
vi. Chief Safety Officer means an officer nominated by who is overall responsible for monitoring all SHE functions prescribed in this document.
vii. BOCWA means Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996
viii. BOCWR means Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Central Rules, 1998
ix. DG means Director General of Ministry of Labour, Govt. of India.
x. BOCWWCA means Building and Other Construction Workers' Welfare Cess Act, 1996
xi. BOCWWCR means Building and Other Construction workers welfare Cess rules 1998
xii. Building and other construction workers' (Regulation of Employment and Condition of service) Karnataka rules, 2006.
xiii. Notifications (Central and state) - collection of cess. xiv)The Factories Act, 1948.

1.4 APPLICATION OF THIS DOCUMENT

1.4.1 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.

1.5 PURPOSE OF THIS DOCUMENT

1.5.1 The objective of these guidelines is to ensure that adequate precautions are taken to avoid accidents, occupational illness and harmful effects on the environment during construction.

1.5.2 This document:

i) Describes the SHE interfaces between Employer and the Contractor.
ii) Details the processes by which the contractor shall manage SHE issues while carrying out the work under the contract.
iii) Describes by reference, the practices and procedures as given in the K-RIDE Project Safety, Health & Environment manual for best SHE performance.

1.5.3 These requirements shall be read together with K-RIDE Project SHE Manual, OHSAS 18001-1999 Occupational Health and Safety Management System and ISO 14001: 2004 Environmental Management Systems. Definition of key terms used in these requirements related to OHSAS 18001 and ISO 14001 standards are found in K- RIDE's Project SHE Manual.

2.0 'SHE' TARGETS AND GOALS

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2.1 The SHE targets, goals and aim for the Works are to achieve:

i) Zero total recordable injuries.
ii) Zero reportable environmental incidents
iii) All personnel inducted in accordance with the approved contractor SHE plan
iv) Total compliance of conducting inspections and audits as per approved SHE plan
v) 100% incident recording and reporting
vi) 100% adherence of usage of appropriate PPEs at work.
vii) Executing construction work with least disturbance to the environment, adjoining road users and traffic.

3.0 COMPLIANCE

3.1 MEMORANDUM OF UNDERSTANDING (MOU)

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

3.2 K-RIDE'S SHE POLICY AND MANAGEMENT SYSTEMS

3.2.1 The construction works shall be undertaken in accordance with K-RIDE's SHE Policy and Management Systems as amended from time to time provided in Project SHE Manual.

3.3 INDIAN STATUTORY REQUIREMENTS

3.3.1 Primary statutory regulations

3.3.1.1 Contractor shall develop thorough understanding about Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act 1996,Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Central Rules 1998, the building & other construction workers welfare cess act 1996 and Building and Other Construction Workers welfare Cess rules 1998, Building and Other Construction Workers [Regulation of Employment & Conditions of Service] (Karnataka) Rules, 2006, Notification [Central & State] - Collection of Cess, 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 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, cess & welfare, medical facilities and safety requirements are given in Appendix No. 2. It is an indicative one and not a limiting list.

3.3.2 In addition, the construction works shall be undertaken in accordance with all applicable legislation and Indian statutory requirements as amended from time to time listed below but not limiting to:

i. Electricity Act 2003 and Rules therein
ii. National Building Code of India, 2016
iii. Factories Act, 1948.
iv. Motor Vehicles Act 1988 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 therein
vii. Gas Cylinder Rules, 2016

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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 therein
xi. Minimum Wages Act, 1948 and Rules therein
xii. Contract Labor Act, 1970 and Rules therein
xiii. Child and Adolescent Labour (Prohibitions & Regulations) Act, 1986 and Rules therein
xiv. Environment Protection Act, 1986 and Rules therein
xv. Environmental Impact Assessment Notification- 2006
xvi. Notification for use of fly ash, 2017.
xvii. National Green Tribunal Act, 2010
xviii. Air (Prevention and control of Pollution) Act, 1981
xix. Water (Prevention and Control of Pollution) Act, 1974
xx. The Noise Pollution (Regulation & Control) Rules, 2000
xxi. Notification on Control of Noise from Diesel Generator (DG) sets, 2002
xxii. Recycled Plastic Usage Rules, 1998
xxiii. Notification, Central Ground Water Board, Act January 1997
xxiv. Manufacture, Storage & Import of Hazardous Chemicals Rules, 1989
xxv. The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act 2013 along with the Rules and Regulations therein.
xxvi. The Hazardous Waste (Management & Handling) Rules, 1989
xxvii. Karnataka Preservation of Trees Act, 1976 & Rules therein, Batteries (Management and Handling) Rules, 2001
xxviii. Fly ash utilization notification, Sept 1999 as amended in August 2003
xxix. Guidelines of Karnataka Urban Arts Commission
xxx. Mysore Tramway Act.
xxxi. Workman Compensation Act, 1923 along with allied Rules
xxxii. Indian Railway Manual of AC Traction Maintenance and Operation
xxxiii. IRP Way Manual
xxxiv. Code on Wages 2019, as and when notified by the Government.
xxxv. Code on Social Security 2020, as and when notified by the Government.
xxxvi. Industrial Relations Code, 2020, as and when notified by the Government.
xxxvii. Occupational Health, Safety and Working conditions code, 2020, as and when notified by the
xxxviii. Government.

3.3.3 Employees Compensation Act, 1923 along with allied Rules

3.3.3.1 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.

3.3.4 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 of men and materials.

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

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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 SHE and every contract shall aim to achieve ISO certifications listed below during the currency of the contract:

OHSAS 18001-1999: Occupational Health and Safety Management System. ISO 14001-2004: Environmental Management Systems.

3.4.2 The process of certification shall start immediately after the award of the work and complete within reasonable time. 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.

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

4.0 CONTRACTOR SHE POLICY AND PLAN

4.1 The contractor as per Section 39 of the BOCW Act shall formulate a SHE policy and get it approved by DG respectively and display it at conspicuous places at work sites in Kannada, Hind/ and other languages understood by the majority of construction workers.

4.2 Within 4 weeks of the notification of acceptance of the tender, the Contractor shall submit a detailed and comprehensive Contract specific SHE Plan. The SHE Plan shall include detailed policies, procedures and regulations which, when implemented, will ensure compliance of the contract provisions. The SHE Plan shall include the following but not be restricted to:

i) A statement of the Contractor's policy, organization and arrangements for SHE

ii) The name(s) and experience of person(s) within the Contractor's proposed management who shall be responsible for coordinating and monitoring the Contractor's SHE performance;

iii) The number of SHE 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 SHE 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 SHE 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;

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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 SHE related matters, and

xi) A statement of the Contractor's procedure for reporting and investigating accidents, dangerous occurrences or occupational illnesses

4.3 The Contractor shall, from time to time and as necessary are required by the Employer to produce supplements to the SHE Plan such that it is at all times a detailed, comprehensive and contemporaneous statement by the Contractor of his site safety, industrial health and environment obligations, responsibilities, policies and procedures relating to work on Site. Any and all submissions of supplements to the SHE Plan shall be made to the Employer in accordance with the agreed procedures.

4.4 If at any time the SHE plan is, in the Employer's opinion, 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 Employer may instruct the Contractor to revise the SHE plan 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 SHE Plan or the Employer's acceptance or rejection of the SHE Plan 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 practices throughout the execution of the Work.

4.6 The Contractor shall adhere to the SHE Plan 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 SHE Plan and comply with its provisions.

4.7 The details of contents to be covered in the site SHE plans are given in Appendix No 3.

5.0 DESIGNER'S ROLE

5.1 DESIGNER'S ROLE IN SAFETY, HEALTH AND ENVIRONMENT

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.

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. The overall design process does not need to be dominated by a concern to avoid all risks during the

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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.

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) consider if the hazard can be prevented from arising so that the risk can be avoided (e.g., alter the design to avoid the risk);
ii) if this cannot be achieved, the risk should be combated at source (e.g., ensure the design details of items to be lifted include attachment points for lifting);
iii) failing this, priority should be given to measures to control the risk that will protect all people;
iv) only as a last resort should measures to control risk by means of personal protection be assumed (e.g., use of safety harnesses).

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

5.4.1 In case of situations where the designers have carried out the design work and concluded that there are risks, which are 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.

5.4.2 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 like scaffold, false work, launching girder, earth retaining structures etc. shall have its design calculations included in the method statements in addition to health and safety risks. Employers' designer or his approved proof check consultants as applicable as per the contract conditions shall approve all these designs.

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.

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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

6.0 CONTRACTOR SHE ORGANIZATION

6.1 Education and Experience

6.1.1 The contractor shall appoint the required SHE personnel as prescribed in General Instruction K-RIDE/SHE/CEO/001 (enclosed at the end) based upon the statutory requirement and establish the safety organization based upon the contract value. The minimum educational qualification and the work experience are given in General Instruction K-RIDE/SHE/CEO/002

6.1.2 In order to effectively interact on labour welfare matters with the Employer and the statutory authorities enforcing the labour welfare legislations every contractor shall employ a full time Labour Welfare Officer duly qualified and experienced as per clause 6.1.1.

6.2 Conduct and Competency

6.2.1 The conduct and functioning of the contractor SHE personnel shall be monitored by the Employer. Any default or deficiency shall attract penalty as per details given under penalty clause 56.0 of this document.

6.2.2 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' SHE performance, the Employer shall remove that person from the site without any procedural formalities.

6.3 Approval from Employer

6.3.1 The name, address, educational qualification, work experience and health condition of each personnel deployed for SHE jobs shall be submitted to the Employer in the format prescribed for the purpose for comments and approval well before the start of the work. Only on approval by the Employer these personnel are authorized to work. In case any of the SHE personnel leaves the contractor the same shall be intimated to the Employer. The contractor shall recruit new personnel and fill up the vacancy.

6.4 Responsibility of SHE personnel

6.4.1 For all works carried out by the contractor and his sub-contractors, the responsibility of ensuring the required SHE 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 SHE manpower for all the works executed by all contractors. Necessary conditions shall be included in all sub-contract documents executed by the main contractor.

6.5 Employment status of SHE personnel

6.5.1 No contractor shall engage SHE manpower from any outsourcing agencies in which case the effectiveness would be lost. All SHE manpower shall be on the payroll of the main contractor only and not on the payroll

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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.

6.6 Reporting of SHE personnel

6.6.1 All SHE personnel are to report to the Chief SHE Manager who shall report directly to the Chief 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.

6.7 Inadequate SHE personnel

6.7.1 In case if the contractor fails to provide the minimum required manpower as illustrated in General Instruction K-RIDE/SHE/CEO/001 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, providing the same like paper advertisement or manpower consultant charges, etc. shall also be at the cost of contractor.

6.8 Prohibition of performance of other duties

6.8.1 As per Schedule VII/ of BOCWR no SHE personnel shall be required or permitted to do any work which is unconnected to, inconsistent with or detrimental to the performance of the SHE duties for respective category mentioned in General Information K-RIDE/SHE/CEO/001.

6.9 Facilities to be provided to SHE personnel

6.9.1 As per schedule VII/ of BOCWR, the contractor shall provide all SHE personnel with such facilities, equipment and information that are necessary to enable him to dispatch his duties effectively

6.9.2 The minimum Employer's requirements of such facilities / equipment's to be provided for SHE personnel are given in the General Instruction K-RIDE/SHE/CEO/003

7.0 CONTRACTOR SHE COMMITTEE

7.1 All employees should be able to participate in the making and monitoring of arrangements for safety, industrial 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 Terms of Reference

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

i) To establish company safety policies and practices
ii) To monitor the adequacy of the contractor's site SHE plan and ensure its implementation
iii) To review SHE training

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iv) To review the contractor's monthly, SHE report.

v) To identify probable causes of accident and unsafe practices in building or other construction work and to suggest remedial measures.

vi) 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.

vii) To go round the construction site with a view to check unsafe practices and detect unsafe conditions and to recommend remedial measures for their rectifications including first-aid medical and welfare facilities.

viii) Committee team members should perform a site inspection before every committee meeting and to monitor SHE inspection reports.

ix) 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

x) 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.

xi) 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.

xii) To review the last safety 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 Form No 5001

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

Chairman	Project Manager
Secretary	SHE Manager (In-charge)
Members	Labour Welfare Officer In charge of plant and machinery In charge of site electrics In charge of stores Senior Managers/ Engineers heading different sub functions Sub - contractor's representative Labour Contractor's representative Workers' representative Co-contractor representative SHE staffs
Employer's Representatives	K-RIDE SHE in charge and other representatives

7.5 Construction SHE Committee meeting shall be conducted at least once in a week with the minimum members listed below:

Chairman	Project Manager
Secretary	SHE Manager (In-charge)

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Members	i.	Labour Welfare Officer
	ii.	In charge of Plant and Machinery
	iii.	In-charge of site electricity
	iv.	Senior Managers / Engineers heading different sub functions
	v.	Sub- Contractor's representative
	vi.	Labour Contractor's representative
	vii.	Workers' representatives
	viii.	All SHE 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 provision of security, lighting, toilet, drinking water etc. and sharing the maintenance cost of the same etc.

7.6.2 The general principle for sharing the cost 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.

7.8.2 The agenda should broadly cover the following:

i) Confirmation of minutes
ii) Chairman's review/overview of site SHE performance / condition
iii) Previous month SHE statistics
iv) Incident and Accident Investigation / dangerous occurrence / near miss report
v) Site SHE inspection
vi) Sub-contractors' SHE issues
i) Safety presentation by Members
ii) Report from Employer
viii) Matters arising
ix) Any other business

7.9 Minutes of the meeting

7.9.1 The Minutes of the meeting shall be prepared as per the format provided at Form No SF 002 and sent to all members within 2 working days preferably by mail/fax followed by hardcopy. Safety Committee meeting minutes shall also be displayed in the notice board for wider publicity to all concerned.

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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 and propose suitable disciplinary action including provisions of monitory penalty as per the relevant contract clauses, the Employer shall ensure that the same is implemented.

8.0 ID CARD AND FIRST DAY AT WORK, SHE ORIENTATION TRAINING

8.1 The Contractor shall ensure that all personnel working at the site receive an induction SHE training 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. The training shall cover the contents as given in the General Instruction K-RIDE/SHE/CEO/004.

8.2 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 General Instruction K-RIDE/SHE/CE0/005

8.3 Contractor shall also issue personnel SHE handbook in a language known to the workers, which provides information on SHE 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.

9.0 SITE TRAINING

9.1 The behavior of people at all levels of the contractor is critical for SHE performance.

9.2 The contractor shall organize quality SHE training to engage Managers, supervisors and other personnel in behavioral change and improve safety performance.

9.3 The Contractor shall analyze 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 SHE 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 SHE- related training, showing the training frequency and interval between refresher courses
vii) Timely, competent delivery of training courses

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9.4 The contractor shall arrange behavioral-based training programs for all the executives to identify recognize and eliminate unsafe act and unsafe conditions.

9.5 The minimum Employer's requirement of training needs for various categories of employees are given in general instruction K-RIDE/SHE/CE0/006

9.6 The contents of SHE training to Managers/Supervisors as given in general instruction K-RIDE/SHE/CE0/007 shall be conducted.

9.7 The refresher-training program to all employees shall be conducted once in six months.

9.8 Toolbox talk as given in the Employer's Project SHE manual shall be conducted to all high-risk workmen every day.

9.9 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.

9.10 Every employee including workman shall take safety Oath daily without fail.

9.11 All vehicle drivers including heavy vehicle operators shall be trained on defensive driving at Central Training Institute KSRTC, Shanthinagar Bangalore, or any other driving institute registered under Motor Vehicles Act.

9.12 All the above listed training programs except at clause 9.11 shall be organized by the contractor only after taking approval from the Employer for the training faculty / organization, content and durations.

9.13 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.

10.0 SHE INSPECTION

10.1 The contractor shall evolve and administer a system of conducting SHE inspections and other risk management analysis on a periodical basis.

10.2 The purpose of SHE inspection is to identify any variation in construction activities and operations, machineries, plant and equipment and processes against the SHE Plan and its supplementary procedures and programs.

10.3 Following SHE inspections program shall be adopted.

i. Planned General Inspection
ii. Routine Inspection
iii. Specific Inspection
iv. Other Inspection

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10.3.1 Planned General Inspection

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

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

i) Monthly contractor and sub-contractors site safety committee Inspection.
ii) Weekly safety inspection by construction supervisors (Contractors and Sub-contractors).
iii) Daily safety inspection by contractor site SHE team.

10.3.2 Routine Inspection

10.3.2.1 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 scaffold by scaffolding supervisor
iii) Monthly Inspection of electrical hand tools by competent electrical supervisor
iv) Quarterly Inspection of temporary electrical systems by competent electrical supervisor
v) Half-yearly inspection of lifting machinery, lifting appliances, equipment and gears by Govt. approved competent person.

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

10.3.3 Specific Inspection

10.3.3.1 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.
ii) Inspection performed before and after a welding and gas cutting operation.
iii) 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.

10.3.4 Other Inspection

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Other inspections include the following:

i) Mandatory Inspections by Labour Department of Government.
ii) K-RIDE site SHE management team

10.3.5 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. The formats provided in the Project SHE manual may be referred.

10.3.6 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.

11.0 SHE AUDIT

11.1 General

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

11.1.2 Project Manager holds the ultimate responsibility in ensuring implementation of SHE audit program during the construction work.

11.2 Monthly Audit Rating Score (M A R S)

11.2.1 Monthly Audit Rating Score (MARS) will be performed once in a month. A team consisting of Project manager and Employer representative based on the pre-designed score-rating format will conduct it. The details of the pre-designed monthly audit score rating formats are given in the Project SHE manual.

11.2.2 This Monthly SHE Audit Rating Score (MARS) report will enable the Employer to evaluate the general compliance by the Contractor with the Conditions of Contract, the Employer's Project SHE Manual and the Contractor's site specific SHE Plan.

11.2.3 Monthly Audits will be conducted in accordance with K-RIDE Guidelines. The Project Manager accompanied by the Employer's representatives shall carry out the Audit. The Contractor's senior manager and SHE in-charge should also be invited to attend.

11.2.4 Timing

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

11.2.5 Evaluation

11.2.5.1 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:

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Overall Audit rating = Actual Score Achieved X 100
Maximum Possible Score

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

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

11.2.6 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.

11.3 Monthly Electrical Safety Audit

11.3.1 A team comprising of contractor's senior SHE (Electrical) engineer and Employer's representative shall conduct monthly electrical safety audit covering the following and submit the report to Employer.

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 IP44 DBs arrangement.
v) Electrical protection devices - selection, installation and maintenance.
vi) Earth or ground connection and earth pit maintenance details
vi) Education and training of electrical personnel undertaken
vii) 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.

11.4 External SHE audits

11.4.1 External SHE audits are to be conducted by external agencies that are competent with ISO qualified auditors with the prior approval of the Employer.

11.4.2 Areas of competence of Audit team

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11.4.2.1 Practical understanding of BOCW Act and Rules, statutory requirements on health/medical and welfare of workmen, construction hazards and its prevention and control, traffic management, electrical safety, rigging, safety of construction equipment and environment management.

11.4.2.2 Audit shall be conducted as per the guidelines of ISO, ILO, and national standards. Audit report shall also be presented as per the above formats.

11.4.3 External SHE audit shall be conducted on a quarterly basis throughout the currency of the contract.

11.4.4 Targets of SHE Audit:
The contents and coverage of the external audit shall include the following items

11.4.4.1 SHE management

i) Organization
ii) Communication and Motivation
iii) Time office
iv) Inspection
v) Emergency preparedness
vi) Budget allocation
vii) Education and Training
viii) Work permit system

11.4.4.2 Technical

i. Building and Structure
ii. Construction operational safety
iii. Material safety
iv. Hand tools and Power tools
v. Electrical system
vi. Safety Appliances
vii. Fire prevention and control
viii. Housekeeping
ix. Maintenance and Machinery safety
x. First-aid and Medical Facilities
xi. Welfare measures
xii. Environmental Management

11.4.5 Audit Documents

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

i. SHE policy
ii. SHE manual
iii. SHE Rules and Regulation
iv. SHE organization chart
v. Annual SHE objectives / programs
vi. Accident / near miss statistics and analysis
vii. SHE Training program / records for all personnel
viii. Operating manuals and maintenance manual of all equipment's

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ix. Safe worthiness certificates of all lifting appliances and gears
x. Medical fitness record for all personnel
xi. Risk identification, assessment and control details
xii. Environmental management reports
xiii. Emergency management records including mock drill

11.4.6 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 SHE legislations rules and regulations and K-RIDE 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.

11.4.7 Reporting

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

11.4.8 Report contents

i. Executing summary - based on the finalized checklists as written the findings to the Employer by the audit team members, 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 2 - weeks, 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.

11.4.9 Conformity Report & Action by Employer

11.4.9.1 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.

11.4.9.2 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.

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11.4.9.3 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.

11.4.10 Failure of contractor to conduct External SHE Audit

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

12.0 SHE COMMUNICATION

12.1 The Contractor shall take every effort to communicate the Safety, Occupational health and Environment management measures through posters campaigns / billboards / banners / glow signs being displayed around the work site as part of the effort to rise 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.

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

13.0 SHE SUBMITTALS TO THE EMPLOYER

13.1 The Contractor's SHE management should send the following reports to the Employer periodically:

i. Daily Reporting of total no of workmen (as given in Clause 13.2)
ii. Monthly SHE Report (as given in Clause 13.3)
iii. SHE Committee Meeting Minutes (as given in Clause 7.9.1)
iv. SHE Inspection Reports
v. SHE Audit Reports
    a. Monthly Audit Rating Score (MARS) report
    b. External SHE Audit
    c. Electrical Safety Audit
vii) Air and Noise Quality monitoring report

13.2 Daily Reporting of total number of workmen

13.2.1 The Contractor shall report to the Employer the total number 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 SHE Manager of the contractor and reporting shall be through tele-fax / 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 hours after starting of the shift, penalty shall be levied as per relevant clause.

13.3 Monthly SHE Report

13.3.1 The Contractor shall prepare a monthly SHE report consisting of the following and submit 3 copies within 7th of next month to the Employer as specified in the Project SHE manual.

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i) Monthly man-hour details as specified in the Project SHE manual
ii) Monthly accident / incident details as specified in the Project SHE manual
iii) SHE committee details
iv) Details of SHE training conducted in the month
v) SHE Inspection
vi) SHE internal audit details like electrical audit etc.
vii) SHE Communication activities under taken in the month indicating the number of posters displayed and balance availability in stock.
viii) Air quality / Noise monitoring details
ix) Toolbox talks details
x) PPE details: Quantity purchased, issued to the workmen and stock available.
xi) Details on IP 44 panel boards, lighting poles, welding and cutting equipment's, Ladders, Hoists, tools & tackles.
xii) Monthly Lux meter study results
xiii) Housekeeping
xiv) Barricade maintenance details
xv) No of critical excavations
xvi) xvi) Health & Welfare activities
xvii) Safety walk conducted by Contractors' Project Manager in the month
xviii) SHE Activities Planned for next month

14.0 ACCIDENT REPORTING AND INVESTIGATION

14.1 Reporting to Employer

14.1.1 All accidents and dangerous occurrences shall immediately be informed verbally to the Employer. 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.

14.1.2 Reports of all accidents (fatal / injury) and dangerous occurrences shall also be sent within 24 hours as per format provided in the Employer's Project SHE manual.

14.1.3 No accident / dangerous occurrences are exempted from reporting to the Employer.

14.1.4 Any willful delay in verbal and written reporting to the Employer shall be penalized as per relevant clause.

14.2 Reporting to Govt. organizations

14.2.1 In addition to the above verbal and written reporting to the Employer, as per Rule 210 of BOCWR, notice 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 4B hours or more immediately following the accident;
c. shall forthwith be sent by telegram, telephone, fax, 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 Labor Commissioner, 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

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iv. the next of kin or other relative of the worker involved in the accident;

14.2.2 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

14.2.3 In case of an accident-causing minor injury, first-aid shall be administered and the injured worker shall be immediately transferred to a hospital or other place for medical treatment.

14.2.4 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 14.2.1 and 14.2.2 above within 72 hours of such death.

14.2.5 Reporting of dangerous occurrences:

14.2.5.1 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;

14.2.6 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;

14.2.7 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.

14.3 Accident investigation

14.3.1 General

14.3.1.1 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.

14.3.1.2 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.

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14.3.1.3 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.

14.3.2 Procedure of Incident Investigation

14.3.2.1 It is important after any accident or dangerous occurrence that information relating to the incident is gathered in an organized way. The following steps shall be followed:

a. Take photographs and make sketches
b. Examine involved equipment, workplace 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.

14.3.2.2 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.

14.3.2.3 The next stage is to proceed with the follow-up action

a. Report on the findings and conclusions
b. Formulate preventive measures to avoid recurrence
c. Publicize the findings and the remedial actions taken

14.4 Employers' independent incident investigation

14.4.1 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.

14.4.2 The contractor shall take every effort to preserve the scene of accident till the Employer completes the investigation.

14.4.3 All persons summoned by the Employer in connection to witness recording shall obey the instructions without delay. Any willful suppression of information by any person shall be removed from the site immediately and / or punishable as per relevant penalty clause.

15.0 EMERGENCY PREPAREDNESS PLAN

15.1 The Contractor shall prepare as required under Rule 36 of BOCWR, an Emergency Response Plan for all work sites as a part of the Contractor SHE Plan. The plan shall integrate the emergency response plans of the Contractor and all other subcontractors. The Emergency Response Plan shall be submitted for approval to the Director General. It shall detail the Contractor's procedures, including detailed communications arrangements, for dealing with all emergencies that could affect the Site. This includes where applicable, injury, sickness, evacuation, fire, chemical spillage, severe weather and rescue.

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15.2 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.

15.3 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.

15.4 Contractors shall require to tie-up with the hospitals and fire stations located in the neighborhood for attending to the casualties promptly and emergency vehicle kept on standby duty during the working hours for the purpose.

15.5 Contractor shall conduct an onsite emergency mock drill once in every month for all his workers and his subcontractor's workers.

15.6 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 K-RIDE, telephonically initially and followed by a written report, shall be made by the contractor.

16.0 EXPERTS/AGENCIES FOR SHE SERVICES

16.1 Contractors may utilize the services of experts/agencies empaneled under Rule 250 of BOCWR for the purpose of training, internal audit and any other SHE services with prior approval of the Employer.

16.2 As an aide to contractors, a list of experts/agencies and the offered service are given in General Instruction K-RIDE/SHE/CEO/010 for ready reference. In addition to it if the contractor would like to use any expert/agencies' services for any SHE 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.

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PART - II - SAFETY

17.0 Housekeeping

17.1 Housekeeping is the act of keeping the working environment cleared of all unnecessary waste, thereby providing a first-line of defense against accidents and injuries.

17.2 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"

17.3 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.

17.4 General Housekeeping shall be carried out by the contractor and ensured at all times at Work Site, Construction Depot, Batching Plant, Labour Camp, Stores, Offices and toilets/urinals. Towards this the Contractor shall constitute a special group of housekeeping personnel as per General Instruction K-RIDE/SHE/CEO/001. This group shall ensure daily cleaning at work sites and surrounding areas and maintain a register as per the approved format by the Employer.

17.5 Adequate time shall be assigned to ensure that good housekeeping is maintained. Team of housekeeping squad shall carry out this.

17.6 The contractor shall be responsible to provide segregated containers for disposal of debris at required places and regular cleaning of the same.

17.7 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.

17.8 The structure dimension of the barricade, material and composition, its colour scheme, K-RIDE logo and other details shall be in accordance with specifications laid down in tender document.

17.9 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.

17.10 Lumber with protruding nails shall be bent or removed and properly stacked.

17.11 All surplus earth and debris are removed/disposed of from the working areas to officially designated dumpsites. Trucks carrying sand, earth and any pulverized materials etc. in order to avoid dust or odor impact shall be covered while moving.

The tires of the trucks leaving the site shall be cleaned with water, wherever the possibility of spillage on carriageways meant for regular road traffic exists.

17.12 No parking of trucks/trolleys, cranes and trailers etc. shall be allowed on roads, which may obstruct the traffic movement.

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17.13 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.

17.14 Water logging or bentonite spillage on roads shall not be allowed. If bentonite spillage is observed on road endangering the safety of road users, the contractor shall be penalized as per relevant clause.

17.15 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.

17.16 Flammable chemicals / compressed gas cylinders shall be safely stored.

17.17 Unused/surplus cables, steel items and steel scrap lying scattered at different places within the working areas shall be removed to identified locations(s).

17.18 All wooden scrap, empty wooden cable drums and other combustible packing materials, shall be removed from work place to identified location(s).

17.19 Empty cement bags and other packaging material shall be properly stacked and removed.

17.20 The Contractor shall ensure that all his sub-contractors maintain the site reasonably clean through provisions related to house keeping

18.0 WORKING AT HEIGHT

18.1 Definitions

18.1.1 "Access" and "egress" include ascent and descent.

18.1.2 "Fragile surface" means a surface, which would be able to fail if any reasonably foreseeable loading were to be applied to it.

18.1.3 "Line" includes rope, chain or webbing

18.1.4 "Personal fall protection" means -

a. a fall prevention, work restraint, work positioning, fall arrest or rescue system, other than a system in which the only safeguards are collective safeguards; or
b. Rope access and positioning techniques;

18.1.5 "Work at height" means -

a. Work in any place, including a place at or below ground level;
b. Obtaining access to or egress from such place while at work, except by a staircase in a permanent workplace,

Where, if protective measures were not taken, a person could fall a distance liable to cause personal injury;

18.1.6 "Work equipment" means any machinery, appliance, apparatus, tool or installation for use at work (whether exclusively or not) and includes

a. A guard-rail, toe-board, barrier or similar collective means of protection
b. A working platform

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c. A net, airbag or other collective safe guard for arresting falls.
d. Personal fall protection system
e. Ladders

18.1.7 "Working platform"

a. means any platform used as a place of work or as a means of access to or egress from a place of work;
b. Includes any scaffold, suspended scaffold, cradle, mobile platforms, trestle, gangway, gantry and stairway which is so used

18.2 Organization 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.

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

18.4 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.

18.5 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.

18.6 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 clause 18.15.

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.

18.7 Where the measures taken under clause 18.6 do not eliminate the risk of a fall occurring, every contractor shall

a) so far as is reasonably practicable, provide sufficient work equipment to minimize –
   i) the distance and consequences; or
   ii) where it is not reasonably practicable to minimize the distance, the consequences, of a fall; and

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b) Without prejudice to the generality of clause **18.4** 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.

18.8 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 **18.5** and **18.6**.

18.9 Fragile surfaces

18.9.1 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.

18.9.2 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 minimize the distances and consequences of his fall.

18.9.3 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

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b) Where that is not reasonably practicable, such persons are made aware of it by other means.

18.10 Falling objects

18.10.1 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.

18.10.2 Where it is not reasonably practicable to comply with the requirements of 18.9, 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.

18.10.3 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.

18.10.4 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.

18.11 Danger areas

18.11.1 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 unauthorized persons from entering such area; and

b) Such area is clearly indicated.

18.12 Inspection of work equipment

18.12.1 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.

18.12.2 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 jeopardize 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.

18.12.3 Without prejudice to paragraph 18.12.1, the contractor shall ensure that a working platform

a) Used for construction work; and

b) From which a person could fall 2 meters 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.

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

18.12.5 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,

18.13 Inspection of places of work at height

18.13.1 The contractor shall so far as be 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.

18.14 Duties of persons at work

18.14.1 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.

18.14.2 Every workman 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

18.15 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

i. be stable and of sufficient strength and rigidity for the purpose for which it is intended to be or is being used;

ii. where applicable, rest on a stable, sufficiently strong surface;

iii. 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;

iv. possess suitable and sufficient means for preventing a fall;

v. 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;

vi. be so constructed and used, and maintained in such condition, as to prevent, so far as is reasonably practicable -

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i) the risk of slipping or tripping; or
ii) any person being caught between it and any adjacent structure;

vii. where it has moving parts, be prevented by appropriate devices from moving inadvertently during work at height.

18.16 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
a) be of sufficient dimensions, of sufficient strength and rigidity for the purposes for which they are being used, and otherwise suitable;
b) be so placed, secured and used as to ensure, so far as is reasonably practicable, that they do not become accidentally displaced; and
c) 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 millimeters 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 millimeters.

iv) 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.

18.17 REQUIREMENTS FOR ALL WORKING PLATFORMS

i. Every working platform 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.

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f) Have suitable base plates and properly footed thereby

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.

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.

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 recognized 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.

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x) The dimension's 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 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) any other risks which the assembly, dismantling or alteration of the scaffolding may entail.

18.18 Requirements for Collective Safeguards for Arresting Falls

i. Collective safeguard area by safety net, airbag or other collective safeguard for arresting falls

ii. A safeguard shall be used only 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.

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.

18.19 Requirements for personal fall protection systems

i) A personal fall protection system shall be used only if
a) a risk assessment has demonstrated that

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i) the work can so far as be 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 minimize 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 from a personal fall protection system.

18.20 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) Only metal ladders shall be allowed. Bamboo ladders are prohibited.

3) 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.

4) A ladder shall be so positioned as to ensure its stability during use

5) 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.

6) 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.

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7) 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.

8) No interlocking or extension ladder shall be used unless its sections are prevented from moving relative to each other while in use.

9) A mobile ladder shall be prevented from moving before it is stepped on.

10) Where a ladder or run of ladders raises a vertical distance of 9 meters or more above its base, there shall, where reasonably practicable, be provided at suitable intervals sufficient safe landing areas or rest platforms.

11) 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.

19.0 OVERHEAD PROTECTION

All contractors shall provide overhead protections as per Rule 41 of BOCWR

i) Overhead protection should be erected along the periphery of every building which is under construction and the building height shall be 15m or above after construction.

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 200 to its horizontal sloping into the building.

iii) Overhead protection shall not be erected more than a height of 5m from the base of the building.

iv) Areas of inadvertent hazard of falling of material shall be guarded or barricaded or roped-off thereby by the contractor.

20.0 SLIPPING, TRIPPING, CUTTING, DROWNING AND FALLING HAZARDS

As per Rule 42 of BOCWR,

i) All places should be free from dust, debris or similar materials.

ii) Sharp projections or any protruding nails or similar objects shall be suitably guarded or shall even be avoided to make the place safe to work.

iii) Contractor shall not allow workmen to work or use platforms, scaffolds/passageways or any walkways, which has water, or oil or similar substances spilt and has a slipping hazard, unless it is cleaned off or covered or sanded or saw dusted or make it safe with any suitable material.

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

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hazard. If the Employer considers, the contractor shall provide well-equipped boat or launch, manned with trained personnel at the work place.

v) Open side or opening where worker, equipment, vehicle or lifting appliance may fall at a building or outside shall be guarded suitably except in places of free access by reasons of nature of work.

vi) Suitable safety net shall be provided at places of material / man falling is possible in accordance with national standards.

21.0 LIFTING APPLIANCES AND GEAR

21.1 Lifting appliances means a crane, hoist machinery, derrick, winch, gin pole, sheer legs, jack, hoist drum, slewing machinery, slewing bearing fasteners, luffing machinery sheaves, pulley blocks, hooks or other equipment used for lifting materials, objects or building workers and lifting gears means ropes, chain slings, shackles, hooks, lifting lugs, wire ropes, lifting eyebolts and events and other accessories of a lifting appliance.

21.2 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

21.3 The contractor shall ensure that a valid certificate of fitness issued as per clause 21.5 is available for all lifting appliances including synchronized 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.

21.4 The laminated photocopies of fitness certificate issued by competent person, 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 visible surface of the lifting appliances.

21.5 All lifting appliances and loose gears shall be clearly marked for its safe working load and identification by stamping or other suitable means.

21.6 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.

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21.7 Test and periodical examination of lifting appliances and gears

21.7.1 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 same competent person for ensuring its safety shall also be done.

21.7.2 Contractors can utilize the services of any competent person as defined in Factories Act, 1948 and approved by Chief Inspector of Factories with the permission of the Employer.

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

21.8 Automatic safe load indicators

21.8.1 As stipulated in Rule 78 of BOCWKR 2006, no lifting appliances gear or any other material handling appliance is used, if:

i. the Inspector having jurisdiction is not satisfied with reference to a certification of test or examination or to an authenticated record maintain as provided under these rules; and
ii. in the view of such Inspector, the lifting appliance, lifting gear or any other material handling appliance is not safe for use in building or other construction work; and
iii. no pulley block is used in building or other construction work unless the safe working load and its identification are clearly marked on such block.

21.9 Qualification of operator of lifting appliances and of signaler etc.

21.9.1 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 or to give signals to work as an operator of a rigger or derricks unless he

i) is above twenty-one years of age and possesses a valid heavy transport vehicle driving license as per Motor Vehicles Act, 1988 and Rules therein.
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 VI/ of BOCWR.

21.10 General requirements of appliances

21.10.1 Outdo level

21.10.1.1 One of the most severe effects of being out of fit level is that side loads develop in the boom. Because of side loads all mobile cranes lose capacity rapidly as the degree of out-of-level increases and therefore.

21.10.2 Boom

i. The boom is one of the more critical elements of the crane and must be in perfect condition at all time. No boom section with a bent lattice member shall be allowed

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ii. All welds shall be crack and corrosion free
iii. No member of the boom shall be bent
iv. All telescopic boom shall be free from cracks, rust, flaking or cracked paint, bulges, greases or varnishes

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

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

21.10.5 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.

21.11 Mandatory rigging requirements

21.11.1 Rigging shall be done under experienced and qualified rigger only.

21.11.2 The primary requirement in rigging shall be to assess the weight of load before attempting any lift.

21.11.3 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.

21.11.4 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.

21.11.5 Hand spliced slings up to 32mm diameter shall not be used at site for any lifting purpose.

21.11.6 No load shall be slewed over public areas without stopping the pedestrians and road traffic first.

21.11.7 Requirements of outriggers
i. All outriggers shall be fully extended and at all tires are clear of the ground
ii. Heavy duty blocking having large bearing area shall be necessary to prevent sinking of floats

21.11.8 All loads shall have tag-lines attached in order to ensure that the load can be controlled at all times.

21.11.9 No close working to any live overhead power line is permitted without the operation of a strict Permit to Work.

21.11.10 Minimum lighting is to be ensured at all lifting operations.

21.12 Failure to do any of the above shall attract penalty from the Employer as per relevant clause

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22.0 LAUNCHING OPERATION

22.1 As launching operation is one of the riskiest job, the contractor shall take utmost precaution at all stages like; planning, establishing casing 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.

22.2 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 and project SHE manual. 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 in 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 with valid registration, license, 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 at specified locations as directed by the employer on defensive driving.
viii. Drivers shall also have undergone proper medical examination as per relevant clause mentioned under 'Medical Facilities'.
ix. The segments shall rigidly be 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.
xi. All the time from erection to dismantling the area between the two piers wherein launching is in progress shall always be barricaded.
xii. Unloading of segments from trucks, lifting of segments, shifting of segments, gluing shall be done under the direct supervision of the approved engineer of the contractor.
xiii. Auto launching shall be done only after approval from the Employer. After every auto launching the stability of launching girder shall be ensured.
xiv. The vertical deflection of launching girder shall be monitored at all critical stages like with/without loads and after every auto launching.
xv. 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.
xvi. Test certificate for all lifting gears including Mac-alloy bars shall be maintained at a location closer to the launching girder itself so that it can be referred during all inspections.
xvii. Adequate lighting at all-time shall be ensured in the entire area of operation.
xviii. Access to drinking water & toilet shall be ensured to all workmen engaged for launching process. xix) Proper access ladders/stairways shall be maintained for safe ascending / descending of workmen / engineers.

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

23.0 CONSTRUCTION MACHINERY

A large number of men and machinery are deployed by the contractors for Construction work, bridge rebuilding etc. It is therefore essential that adequate Safety measures are taken for safety of trains as well the workforce.

The following Measures should invariably adopt:

i) The contractor shall not start any work without the presence of K-RIDE Supervisor or his representative and contractor's supervisor at site.
ii) Wherever the road vehicles and/or machinery are required to work in the close vicinity of railway line, the work shall be so carried out that there is no infringement to the railway's schedule of dimensions. For this purpose, the area where road vehicles and/or machinery are required to ply, shall be demarcated and acknowledged by the contractor.

Special care shall be taken for turning / reversal of vehicles / machinery without infringing the Running track. Barricading shall be provided wherever justified and feasible as per site conditions.

iii) The look out and whistle caution orders shall be issued to the trains and speed restriction imposed where considered necessary. Suitable flagmen/ Detonators shall be provided where necessary for protection of trains.
iv) The supervisor / workmen should be counselled about safety measures.

A competency certificate to the contractor's supervisor as per Proforma Annexed shall be issued by APM which will be valid only for the work which it has been issued.

v) The unloaded ballast / rails / sleepers / other P. Way materials after unloading Along track should be kept clear off moving dimensions and stacked as per the specified heights and distance from the running track.
vi) Supplementary site instructions, wherever considered necessary, shall be issued by the Engineer in Charge of K-RIDE.

The Engineer in-charge shall approve the methodology proposed to be adopted by the contractor, with a view to ensure safety of trains, passengers and workers and he shall also ensure that the methods and arrangements are actually available at site before start of the work and the contractor's supervisors and the workers have clearly understood the safety aspect and requirements to be adopted / followed while executing the work. There shall be an assurance register kept at each site, which will have to be signed by both i.e., K-RIDE Supervisor or his representative as well as contractor's supervisor as a token of their having understood the safety precautions to be observed at site."

23.1 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, 1B0° 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.

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23.2 Safe worthiness certificate

23.2.1 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 equipment's or authorized persons / firms approved by Employer before induction to any site.

23.2.2 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 equipment's were used etc. as its minimum content.

23.3 Reverse Horns

23.3.1 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 banks man.

23.4 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, etc.
ii) No passengers shall be carried, unless specific seating has been provided in accordance with the manufacturers' recommendations.
iii) Working on gradients beyond any equipment's capability shall not be allowed.
iv) Prevention of dumper and dump truck accidents should be managed by providing wheel stops at a sufficient distance from the edges of excavations, spoil heaps, pits, etc.
v) The manufacturer's recommended bucket size must not be exceeded in excavators.
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 tires 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 1800 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 stabilizers 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 stabilize 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

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23.5 All wood working machines shall be fitted with suitable guards and devices such as top guard, riving knife, push stick, guards for drive belts and chains, and emergency stop switch easily accessible by the operator.

23.6 Penalty

23.6.1 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.

24.0 MACHINE AND GENERAL AREA GUIDING

24.1 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.

25.0 MANUAL LIFTING AND CARRYING OF EXCESSIVE WEIGHT

25.1 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

25.2 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.

26.0 SITE ELECTRICITY

26.1 Competency of Electrical personnel:

26.1.1 The contractor shall employ qualified and competent electrical personnel as specified in general instruction K-RIDE/SHE/CE0/001.

26.2 Assessment of power

26.2.1 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.

26.2.2 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.

26.2.3 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.

26.2.4 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.

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

26.3 Work on site

26.3.1 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.

26.4 Strength and capability of electrical equipment

26.4.1 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.

26.5 Adverse or hazardous environments

26.5.1 Electrical equipment, which may reasonably foreseeably 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, vapors 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.

26.6 Distribution system:

26.6.1 The contractor shall provide distribution system for control and distribution of electricity from a main AC supply of 50Hz for typical appliances,

i) Fixed plant - 400V 3 phase
ii) Movable plant fed via trailing cable over 3.75 kW - 400 3 phase
iii) Installation in site buildings - 230V single phase
iv) Fixed flood lighting - 230V single phase
v) Portable and hand tools - 115V single phase
vi) Site lighting - 115V single phase
vii) Portable hand lamps - 115V single phase

26.7 Electrical protection circuits

26.7.1 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.

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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.

26.7.2 Appropriate electrical protection shall be provided for all circuits, against over load, short circuit and earth fault current.

26.7.3 The contractor shall provide sufficient ELCBs (maintain sensitivity 30 mA) / RCCBs for all the equipment's (including Potable equipment's), electrical switchboards, distribution panels etc. to prevent electrical shocks to the workers.

26.7.4 All protection devices shall be capable of interrupting the circuit without damage to any equipment's and circuits in case of any fault may occur.

26.7.5 Rating of fuses and circuit breakers used for the protection of circuits should be coordinate with equipment power ratings.

26.7.6 Protection against lightning shall be ensured to all equipment kept in open at sites.

26.7.7 Cables:

Before starting any excavation work adjacent to existing track, the contractor shall ensure that necessary permissions has been obtained and required precautions have been taken for doing such work in terms Joint Procedure Order (JPO). The penalties mentioned in the following JPO shall be levied on the contractor if such event occurs. The JPO is reproduced below:

"JOINT PROCEDURE ORDER FOR UNDERTAKING DIGGING WORK IN THE VICINITY OF UNDERGROUND SIGNALING, ELECTRICAL AND TELECOMMUNICATION CABLES"

a. A number of Engineering works in connection with gauge conversion/doubling/third line are in progress on various railways, which require extensive digging work near the running track, in close vicinity of the working S&T cables carrying vital safety circuits as well as electrical cables feeding the power supply to cabins. ASM room, RR/ Cabin, Intermediate Block Huts (IBH) etc. Similarly, S&T organization under open line or construction units under CAO/C, are executing various Signaling and Telecom works requiring digging of earth for laying of cables or casting of foundations for the erection of signal posts etc. RailTel is also executing the work of lying of quad cable and OFC on various Railways as a part of sanctioned works for exclusive use of Railways for carrying voice and data i.e., administrative and control communication, PRS, FOIS etc. or shared by RailTel Corporation of India Ltd. On certain sections, digging is also required for lying of electrical cable and casting of foundation for the erection of OHE masts by Electrical Dept. Generally, contractors employed by these organizations execute these works.

b) However, while carrying out these works near working signaling, telecommunication and electrical cables, at times, cable cuts take place due to JCB machines working along the track or during the digging work being done by contractors carrying out the Civil Engineering Works. Similarly, such cable cuts are also resulting due to works undertaken by S&T or Electrical departments. Such cable faults result in the failure of vital signaling and telecommunication circuits & electrical installations.

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c) Henceforth, the following joint procedure shall be followed by Engineering, Electrical and S&T (and RailTel organization, wherever such works are being done by them) officers of the respective divisions and by the construction organization, while carrying out any digging work near to existing signaling & telecommunication and electrical cables, so that the instances of cable cut due to execution of works, can be controlled and minimized.

1. S&T Department (and RailTel, where they have laid the cables) and Electrical department shall provide a detailed cable route plan showing exact location of cable at an interval of 200m or wherever there is change in alignment so that the same is located easily by the Engineering official/contractor. In addition, S&T department and Electrical department shall also provide cable markers along the alignment of the cable. Sr. DSTE/DSTE or Sr. DEE/DEE of the divisions or Dy. CSTE/C or Dy.CEE/C shall make these cable route plans available to the Sr.DEN/DEN or Dy. CE/C, as the case may be, within 15 days in duplicate. Sr.DEN/DEN or Dy. CE/C will send copies to their field unit i.e. AEN/SE/P. Way & Works.
2. Before taking up any digging activity on a particular work by any agency, Sr. DSTE/DSTE or Sr.DEE/DEE of the section shall be approached in writing by the concerned Engg. or S&T or Electrical officer for permitting to undertake the work. Sr. DSTE/DSTE or Sr.DEE/DEE, after ensuring that the concerned executing agencies including the contractor have fully understood the S&T and Electrical cable route plan shall permit the work in writing within 7 days of the request by concerned department.
3. After getting the permission from S&T or Electrical department as the case may be, the relevant portion of the cable route plan shall be attached to the letter through which concerned Engineering issues permission to the contractor. Official for commencement or work and ensuring that the contractors have fully understood the cable route plan and precautions to be taken to prevent damage to the underground cables. The contractor shall be asked to study the cable plan and follow it meticulously to ensure that the safety of the cable is not endangered. Such a provision, including any penalty for default, should form part of agreement also. It is advisable that a suitable post of SE/Sig or SE/Tele or SE/Electrical (TRD or G) shall be created chargeable to the estimates of doubling/gauge conversion, which can help Engineering. Agencies in the execution of the work. However, basic responsibility will be of the department executing the work and the Contractor. Creation of posts is not mandatory.
4. The SE/P. Way or SE/Works shall pass on the information to the concerned SE/Sig SE/Tele or SE/Electrical (TRD or G) about the works being taken up by the contractors in their sections at least 3 days in advance of the day of the Work. In addition, Engineering control shall also be informed by SE/P. Way or SE/Works, who in turn shall pass on the information to the test room/network operation Centre of RailTel/TPC/Electrical control.
5. On receiving the above information, SE/Sig or SE/Tele or SE/Electrical (TRD or G) shall visit the site on or before the date of taking up the work and issue permission to the contractor to commence the work after checking that adequate precautions have been taken to avoid the damage to the cables. The permission shall be granted within 3 days of submission of such requests.
6. The name of the contractor, his contact telephone number, the nature of the work shall be notified in the Engineering control as soon as the concerned Engineering officials issue the letter authorizing commencement of work to the contractor. Test room shall be given copies. Test room shall collect any further details from the Engineering Control and shall pass it on to S&T/RailTel & Electrical officials regularly. In case the supervisors of concerned departments do not turn up on the day as advised in terms of para 4 and 5 above, the works of contractor should not be stopped on this account.

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7. In case of works being taken up by the State Government, National Highway Authority etc., the details of the permission given i.e., the nature the work, kilometer etc. be given to the Engineering control including the contact person's number so that the work can be done in a planned manner. The permission letter shall indicate the contact numbers of Test room/network Operating Centre of RailTel/TPC/Elect. Control.
8. Where the nature of the work taken up by the Engineering department is such that the OFC or other S&T cables or Electrical cables is to be shifted and relocated, notice of minimum one week shall be given so that the Division/RailTel/Construction can plan the works properly for shifting. Such shifting works shall in addition, for security and integrity of the cables, be supervised by S&T supervisors/RailTel supervisors/Electrical Supervisors.
9. The concerned SE/P. Way/SE/Works/SE/Sig/SE/Tele/SE/Electrical (TRD or G) or RailTel supervisors supervising the work of the contractor shall ensure that the existing emergency sockets are not damaged in view of their importance in providing communication during accident/emergency.
10. In case of minor nature of works where shifting of cable is not required, in order to prevent damage to the cable, the Engineering contractor shall take out the S&T or optical fiber cable or Electrical cable carefully from the trench and place it properly alongside at a safe location before starting the earthwork under the supervision of SE/Sig or SE/Tele or SE/Electrical (TRD or G). The cable shall be reburied soon after completion of excavation with proper care including placement of the brick over the cable under the supervision of S&T or Electrical supervisors. However, the work will be charged to the concerned Engineering works. The responsibility for ensuring availability of SE (Signal), SE (Electrical) as per para 4 and 5 above lies with the respective department. The contractor will go ahead with the shifting of cables as per the program decided and he will not be held responsible for any cable cut.
11. In all the sections where major project is to be taken up/going on RailTel/S&T department shall deploy their official to take preventive/corrective action at site of work. As regards Electrical Department, the official may be deputed on need basis.
12. No new OFC or quad cable shall be laid close to existing track. It shall be laid close to the Railway boundary on one side of the Railway track to the extent possible to avoid any interference with the future works (doubling etc.). It shall be ensured in the new works of cable laying that the cable route is properly identified with electronic or concrete markers. Wherever multiple cables are laid in a trench, RFID markers may be provided for easy identification of the cable. Henceforth, wherever cable laying is planned, before undertaking the cable laying work, the cable route plan of the same shall be prepared by the Dy. CSTE/A or Dy.CEE/C and shall be got approved from the concerned Sr. DSTE/DSTE or Sr.DEE/DEE and also from the concerned Dy. CE/C for new lines and from the concerned Sr.DEN for all other projects including GC etc., to avoid possible damages in future. Such approvals shall be granted within 15 days of the submission of the request.
13. The works of excavating the trench and lying of the cable should proceed in quick succession, leaving a minimum time between the two activities.
14. In case damage caused to OFC/Quad cable or Electrical cable during execution of the work, the contractor is liable to pay a penalty for damaging the cable. Penalty shall not be levied in case of the following

    a) Detailed cable route plan as per clause C-1 not provided by concerned department or cable is not protected as per laid down procedures.
    b) The alignment of the cable does not tally with the information provided to the contractor.
    c) The cable depth is found to be less than 800 mm from normal ground level.

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d) No representative of S&T department/RailTel was available at site guarding the cables on the fixed pre-determined date and time.

26.8 Penalty to be imposed for damages to cable shall be as under: -

Cable damaged	Penalty per location
Only Quad cable or Signaling cable	Rs.1.00 Lakh
Only OFC	Rs.1.25 Lakh
Both OFC & Quad	Rs.1.50 Lakh
Electrical Cable	Rs.1.00 Lakh

Necessary debit in this regard shall be raised on the department undertaking the work who shall in turn levy the penalty on the defaulting contractor. S&T department shall raise the debits in case of damage to OFC or Quad or Signaling cable and Electrical department shall raise the debits in case of damage to Electrical cable.

15. Railways will not lodge FIR with RPF in case of works being executed by authorized contractors of Railways who have been duly permitted to execute the works in accordance with this JPO. Joint note by the supervisors of the concerned department shall be prepared and the responsibility of the cable cut should be decided without involving RPF. The joint note deciding the fact whether the contactor should be penalized shall be completed in a day's time from the occurrence of cable cut. In all other cases, when the cable is cut by an agency that was not permitted to execute any work, FIR should be lodged with RPF.

16. While giving permission for taking up the works, concerned departments may note that earthwork by engineering contractors will normally be done by machines except in a few isolated locations where the quantity of earth work is very less.

17. Railways shall make necessary correction in their future contract so that this JPO can also be enforced contractually.

18. In case of damages to OFC, RailTel should be paid 5/6th of the penalty recovered. RailTel shall raise demands on the S&T department in this regard.

19. All types of signaling & OHE bonds i.e. rail bond, cross bond and structure bond shall be restored by the contractor with a view to keep rail voltage low to ensure safety of personnel.

20. Above joint circular shall be applicable for construction as well as open line organization of Engineering, S&T and Electrical.

21. S&T cable and electrical cable route plan should be prepared by the concerned S&T and Electrical officers respectively and got approved as stipulated in para C-12 before undertaking the work. The completion cable route plan should be finalized block section by block section as soon as the work is completed.

22. All cable laying works shall be executed as per laid down technical specifications, such as protection measures/protective cover, compaction of refilled material etc.

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26.8.1 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.

26.8.2 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.

26.8.3 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.

26.8.4 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

26.8.5 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.

26.8.6 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.

26.8.7 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.

26.8.8 Cables carrying a voltage to earth in excess of 65V other than supply for welding process shall have metal armor 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 armor should be in addition to the earth core in the cable and shall not be used as the protective conductor.

26.8.9 Armoured cables having an over-sheath of polyvinyl chloride (PVC) or oil resisting and flame retardant compound shall be used whenever there is a risk of mechanical damage occurring

26.9 Plugs, socket-outlets and couplers:

26.9.1 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 in accordance with BS EN60529.

26.9.2 Only plugs and fittings of the weatherproof type shall be used and they should be colour coded in accordance with the internationally recognized standards for example as detailed as follows:

(a) 110 volts: Yellow.
(b) 240 volts: Blue.
(c) volts: Red.

26.10 Connections

26.10.1 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.

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26.10.2 No loose connections or tapped joints shall be allowed anywhere 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.

26.11 Portable and hand-held equipment's:

26.11.1 The contractor shall ensure the use of double insulated or all-insulated portable electrical hand equipment may be used without earthing (i.e., two core cables), but they shall still be used only on 110V because of the risk of damage to trailing leads.

26.12 Other equipment's:

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

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

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

26.12.4 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.

26.13 Work on or near live conductors

26.13.1 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.

26.14 Inspection and Maintenance

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

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

26.14.3 25 KV AC 50 Hz single phase Traction:

a. Induction effect of 25 KV AC 50 Hz single phase Traction

I. The attention of all staff is drawn to the fact that under 25 kVA ac 50 Hz single phase traction, there is heavy induction on all metallic structures and conductors in the vicinity of the track. The induction is two - fold.

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Electro- static, which results from the high potential of 25 kVA on the OHE system.
Electro- magnetic, which is proportional to the currents passing from the sub - station to the OHE to the locomotives /EMUs and back partly through the earth.

II. The voltage induced is quite appreciable on overhead conductors running parallel to the tracks depending on the length of parallelism.

This explains why most of the overhead telecommunication's lines are replaced by underground cables. Special protective measures are required to reduce the adverse effects of induction.

III. In a railway yard, voltage of the order of 200 volts may be induced on yard lighting mains situated B m away from the center of a double line track, of it runs parallel to the 25 KV lines for a distance of about 270 m; it could be several thousand volts when parallelism is much longer. In such a case, a dangerous voltage due to induction will exist even after power supply to the line has been switched off. No one shall therefore attempt to work on any overhead line running alongside the electrified tracks without taking special precautions of earthing on both sides of the work. Before a section is electrified, the necessary modifications to distribution lines in all stations and yards should be carried out, so as to limit the induced voltage within permissible values, but this by no means limits the need for earthing the lines on both the sides of the working party. Earthing should be done individually by each working party as close to the work spot as possible. The distance between the two earths shall not exceed 1 km.

IV. Such inductive effects occur on large metallic structures such as fencings, structural steelwork of platforms running parallel to the track. They will therefore, have to be earthed suitably to afford safety.

V. Inductive effects also show themselves on any metallic conductor, such as metallic clothes-lines, power lines and lines belonging to private parties running parallel and close to the electrified tracks.

Wide publicity should be given to the effects of induction so that special precautions are taken by the private parties.

b. General Precautions

The precautions laid down below must be followed under all circumstances in sections equipped for 25 kVA as single phase, 50 Hz traction.

i. No work shall be done above or within a distance of 2 m from the live OHE without a "permit-to- work."

ii. No part of a tree shall be nearer than 4 m from the nearest live conductor. Any tree or branches likely to fall on live conductor should be cut or trimmed periodically to maintain this clearance. Cutting or trimming should be done by the OHE staff themselves or through an agency manage and supervised by them

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iii. Work for trimming of trees should also be done in the presence of authorized OHE staff or supervisor to maintain the safe clearance of 4mt. Any dispute regarding cutting of trees may be done on contract basis or departmentally of the terms & conditions of concerning department.

iv. No fallen wire or wires shall be touched unless power is switched off and the wire or wires suitably earthed. In case the wires drop at a level crossing, the Gate-keeper shall immediately make arrangements to stop all road traffic and keep the public away.

v. As far as possible closed wagons shall be used for material trains. In case open or hopper wagons are used, loading and unloading or such wagons in electrified tracks shall be done under the supervision of an Engineering Official not below the rank of a APM who shall personally ensure that no tool or any part of the body of the worker comes within the 'danger zone' i.e., within 2 m of the OHE.

vi. Permanent Way staff should keep clear of the tracks and avoid contact with the rails either when approaching or reaching the work-spot when an electrically hauled train is within 250m.

vii. When unloading rails alongside the tracks, it should be ensured that rails do not touch each other to form a continuous metallic mass of length greater than 300m.

c. Safety precautions on Electrified Sections (Chapter-IV), Electrical Accidents (Chapter-V) Fire Pre cautions (Chapter-VI) of Indian Railways AC Traction Manual Volume - I, as applicable may be followed.

d. The Training and Competency Certificates (Chapter XII) of Volume-II, Part-/ of Indian Railway AC Traction Manual may be followed.

e. Power Blocks and Permit to Work are required to be taken in case of construction work going on in the vicinity of electrified line as per applicable Para of Chapter -V/ of volume-II, part - / of Indian Railway AC Traction Manual

27.0 LIGHTING

27.1 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.

27.2 Selection of Luminaries:

The contractor shall select the luminaries as per the area requirement indicated below:

	Type of Lighting	Area of Requirement	Luminaries
1.	Area Lighting	Workmen and vehicles to move about in safely.	Shovel type: non-symmetrical Symmetrical or non- symmetrical tungsten halogen

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2.	Beam flood lighting	Concentrated light over an area from a relatively great distance.	Portable flood light (Conical beam) Wide angle flood (fan shaped beam) Medium or narrow angle flood (Conical beam)
3.	Dispersive lighting	Lighting for indoor	Dispersive (Mercury florescent) Cargo cluster Florescent trough
4.	Walkway lighting	Lighting for stairways, ladder ways, corridors, scaffold access routes, etc.	Well glass unit Bulkhead unit (tungsten filament) Bulk head unit (Florence
5.	Local lighting	Lighting on sites and fittings are generally accessible to operatives	PAR (Parabolic Aluminis Reflector) lamp cluster Festoons (with or without shades) Adjustable florescent wo lamp Portable flood lamp (mounted on own cable drum)

27.3 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.

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

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

27.6 Lamp holders not fitted with a lamp should be capped off.

28.0 HAND TOOLS AND POWER TOOLS

28.1 General

28.1.1 The contractor is wholly responsible for the safe condition of tools and equipment used by his employees and that of his sub-contractors.

28.1.2 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.

28.1.3 All hand tools and power tools shall be duly inspected before use for safe operation.

28.1.4 All hand tools and power tools shall have sufficient grip and the design specification on par with national/international standards on anthropometrics.

28.2 Hand tools

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28.2.1 Hand tools shall include saws, chisels, axes and hatches, hammers, hand planes, screw drivers, crow bars, and nail pullers.

28.2.2 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, chiseling 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.

28.3 Power tools

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

28.3.2 The contractor shall ensure that

i. Electric tools are properly grounded or / and double insulated.
ii. GFCIs/ 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 equipment's, which gives out more noise as mentioned in clause 43.0 of 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 needs 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 plane 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 1800 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.

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xvii. Push sticks shall be provided and properly used to hold the job down on the table while the heels move 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 vapors 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.

29.0 WELDING, GOUGING AND CUTTING

29.1 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 to protect the valve when the cylinder is not connected for use.

29.2 Hose clamp or clip shall be used to connect hoses firmly in both sides of cylinders and torches.

29.3 All gas cylinders shall be fixed with pressure regulator and dial gauges

29.4 Non-return valve and Flashback arrester shall be fixed at both end of cylinder and torch.

29.5 Domestic LPG cylinders shall not be used for Gas welding and Cutting purpose.

29.6 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.

29.7 Use firewatchers if there is a possibility of ignition unobserved by the operator (e.g. on the other side of bulkheads).

29.8 Oxygen cylinders and flammable gas cylinders shall be stored separately, at least 6.6 meters (20 feet) apart or separated by a fire proof, 1.5 meters (5 feet) high partition. Flammable substances shall not be stored within 15 meters of cylinder storage areas.

29.9 Transformer used for electrical arc welding shall be fixed with Ammeter and Voltmeter and also fixed with separate main power switch.

29.10 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.

29.11 Use a low voltage open circuit relay device if welding with alternating current in constricted or damp places.

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29.12 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.

29.13 Avoid being in contact with water or wet floors when welding. Use duckboards or rubber protection.

29.14 All electrical installations shall meet the IS: 5571: 1997 and NFPA 70 for gas cylinder storage area and other hazardous areas.

29.15 The current for Electric arc welding shall not exceed 300 A on a hand welding operation.

30.0 DANGEROUS AND HARMFUL ENVIRONMENT

As per Rule 40 of BOCWR,

a) 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.

b) No worker shall be allowed into any confined space or tank or trench or excavation wherein there is given off any dust, fumes / vapors or other impurities which is likely to be injurious or offensive to the worker, or in which explosive or poisonous or noxious or gaseous material or other harmful articles have been carried or stored or in which dry ice has been used as a refrigerant, which has been fumigated or in which there is a possibility of oxygen deficiency, unless all practical steps have been taken to remove such dust, fumes, other impurities and dangers which may be present and to prevent any further ingress thereof, and such work place or tank or trench or excavation shall be certified by the responsible person to be safe and fit for the entry of such workers.

31.0 FIRE PREVENTION, PROTECTION AND FIGHTING SYSTEM

31.1 The contractor shall ensure that construction site is provided with fire extinguishing equipment sufficient to extinguish any probable fire at construction site. An adequate water supply is provided at ample pressure as per national standard.

31.2 Recharging of fire extinguishers and their proper maintenance should be ensured and as a minimum should meet Indian National Standards

31.3 All drivers of vehicles, foreman, supervisors and managers shall be trained on operating the fire extinguishers and firefighting equipment.

31.4 The contractor shall also give consideration to the provision of adequate firefighting arrangements within the underground and tunneling operations including the provision of Fire Service compatible hose connections and emergency lighting

31.5 As per Rule 79 (A (7) of The Building and Other Contract Workers (Regulation of Employment and conditions of service) (Karnataka) Rules 2006, all lifting appliances operators shall be provided a cabin which shall be equipped a suitable portable fire extinguisher.

31.6 Combustible scrap and other construction debris should be disposed of site on a regular basis. If scrap is to be burnt on site, the burning site should be specified and located at a distance no less than 12 meters from any construction work or any other combustible material.

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31.7 Every fire, including those extinguished by contractor personnel, shall be reported to the Employer representatives.

31.8 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.

32.0 CORROSIVE SUBSTANCES

32.1 As per Rule 44 of BOCWR, 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.

33.0 DEMOLITION

33.1 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 is 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 life 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
viii) 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.

34.0 EXCAVATION AND TUNNELLING

34.1 Excavation

34.1.1 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.
ii. Where banks of an excavation are undercut, adequate shoring is provided to support the material or article overhanging such bank.

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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. metal ladders 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.

34.2 Tunneling

34.2.1 The contractor shall inform in writing to the Director General within 30 days, prior to the commencement of any tunneling work.

34.2.2 The contractor shall appoint a responsible person for safe operation for tunneling work as per Rule 121 &125 of BOCWR.

34.2.3 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 tunneling work as per Rule 136 of BOCWR.

iv. All portable electrical hand tools and inspection lamp used in underground and confined space at an excavation or tunneling 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 tunneling

vii. Adequate number of water outlets provided for firefighting 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 tunneling 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.

34.3 Warning signs and notices:

34.3.1 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 tunneling, shall be displayed or erected at conspicuous places in Hind/ and in a language understood by majority of such building workers at such building such excavation or tunneling work

ii) such warning signs and notices with regard to compressed air working shall include

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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.

35.0 WORK PERMIT SYSTEM

35.1 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.

35.2 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
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.
viii. Heavy lifting operations and lifting operations closer to live power line

35.3 The permit-to-work system should be fully documented, laying down:

i. How the system works;
ii. The jobs it is to be used for;
iii. The responsibilities and training of those involved; and iv. How to check its operation;

35.4 A Work Permit authorization form shall be completed with the maximum duration period not exceeding 12 hours.

35.5 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.

35.6 Format of Work Permits i.e., Cold Permit (for all works other than Hot or Excavation/ tunneling and Electrical Isolation), Hot Work, Electrical Isolation are given at the end of this document as Form No SF 003, SF 004 & SF 005 respectively. These are indicative and can be suitably modified depending upon site condition.

36.0 TRAFFIC MANAGEMENT

36.1 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.

36.2 All construction workers should be provided with high visibility jackets with reflective tapes as most of viaduct /tunneling 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.

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36.3 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 behavior through construction zones.

36.4 Legal permission

36.4.1 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.

36.4.2 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

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

36.6 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.

36.7 Regulatory signs

36.7.1 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.

36.8 Warning signs

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

36.8.2 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.

36.8.3 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.

36.9 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.

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36.9.1 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 with IRC: 79 - Recommended Practice for Road Delineators.

36.9.2 Traffic cones and cylinders

36.9.2.1 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-reflectorized red and white band shall be used wherever required.

36.9.3 Drums

36.9.3.1 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.

36.9.4 Barricades

36.9.4.1 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.

36.9.4.2 The structure dimension of the barricade, material and composition, its colour scheme, K-RIDE logo and other details shall be in accordance with specifications laid down in tender document.

36.9.4.3 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.

36.9.4.4 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 or red light blinker should be placed at the top of each barricade.

36.9.5 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

36.9.6 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.

36.9.7 Safety Fencing:

Before commencing any work close to the running track, the Contractor shall provide safety fencing and obtain the specific permission of Engineer to commence the work in that stretch. The fencing shall be for an as per relevant scheduled item. The Contractor shall maintain the safety fencing in good working condition throughout the period until the work in a given stretch is completed. The Contractor will be paid for providing safety fencing along the track as per the relevant scheduled item.

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36.9.8 Tow away vehicle

36.9.8.1 The contractor shall make arrangements keeping tow away van / manpower to tow away any breakdown vehicle in the traffic flow without losing any time at his cost.

36.9.9 Cleaning of road

36.9.9.1 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.

37.0 WORK TO ADJACENT RAILWAYS

37.1 Whenever work is to be conducted in close proximity to the live railways then the following measures shall need to be addressed:

Provision of IRPWM (Indian Railways Permanent Way Manual) related to block protection; safety precaution for protection of track must be followed.

a. Works which is executed within 3.5 mtr from center line of existing Indian Railway track should be executed under block protection and with permit to work from concerned railway
b. For works to be executed between 3.5 mtr to 6 mtr. from center line of existing Indian Railway track work to be executed after erection of fencing as per approved plan.
c. For works to be executed beyond 6 mtr from center line of existing Indian Railway track, it must be ensured that no vehicle / construction equipment infringes demarcation line marked at 3.5 mtr from center of existing railway track.
d. All utilities, signaling cables, signaling equipment, pipelines, gate lodges, staff quarters etc., coming in the alignment must be shifted / relocated as per approved plan before undertaking earth-work Program.
e. During earth-work if any signaling cable not identified earlier got damaged it should be immediately reported to Railway and immediate action should be taken for repair of the same to avoid interruption to traffic.
f. Any material unloaded along the track should be kept clear of moving dimensions and stacked at minimum 3.5 mtr from track center of running track.
g. Movement of vehicle / working of machineries should not be permitted during night. In case night working is to be adopted proper fencing at 3.5 mtr from track center of running track should be erected to ensure that no infringement of moving dimension takes place. Suitable lighting arrangements should also be done.
h. Working in existing railway station area for modification of existing siding / line must be done after approval of plan and with permit to work from Railway.
i. Modification to road surface at existing level crossings which may cause interruption to road traffic should be executed as per approved plan with the approval of concerned local authorities.
j. Launching of girders for construction of ROB / rail flyover / modification to existing ROBs should be done as per approved plan and scheme with permission to work from Railway / road authorities.
k. For construction of new bridge over major drain / drain / nallaha / rajakaluve / extension of existing bridge over canal approval of respective authorities should be taken before undertaking work.

37.2 The work of formation in banks and cuttings throughout the length of doubling is adjacent to track under running traffic. Many of the bridges on the proposed double line are to be constructed either as extensions or just adjacent to the existing bridges under running traffic. The work of Installation of Track throughout the

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length of doubling is adjacent to track under running traffic. The work of Installation of Track and Signals in the Station yards including alterations to the existing Track and Signals has to be done adjacent to or in replacement of the existing Track and Signals which are under running traffic. The contractor shall ensure that the safety of the running lines and running traffic is not endangered, because of his work.

37.2.1 Any traffic/traction blocks, temporary speed restrictions and caution orders required in this connection shall also be got sanctioned from the Railway authorities well in advance, through the Engineer. The Railways may sanction the same for specific sites within the overall recovery time available in the Railway's time table. The contractor shall have to schedule his programme according to the convenience of the Railways. No claim from the contractor for any delay/inconvenience/loss on this account shall be entertained by the Employer.

37.2.2 The contractor shall provide at site at his own cost, all protection measures including exhibition and lighting of all Temporary Engineering Signals as per Railway rules, instructions and norms. All lights provided by the contractor shall be screened so as not to interfere with any signal light on the Railways or with any traffic or signal lights of any local or other authority.

37.3 Ancillary and Temporary works

The Contractor's proposals for erection of all ancillary and temporary works shall be in conformity with the proposals submitted along with the tender and modifications thereto as approved by the Engineer.

The Contractor shall submit drawings, supporting design calculations where called for by the Engineer and other relevant details of all such works to the Engineer for approval at least one month before he desires to commence such works. Approval by the Engineer of any such proposal shall not relieve the contractor of his responsibility for the sufficiency of such works.

The contractor shall, at his own cost, design and provide any temporary arrangements including relieving/service girders required in connection with the above said works and remove the same, when no longer required. These arrangements shall conform to Railway norms. The contractor shall obtain all necessary approvals and sanctions of the concerned Railway authorities including Commissioner of Railway Safety through the Engineer/ Employer in advance and well in time.

The contractor shall ensure and be entirely responsible for proper design, fabrication, provision and upkeep of all temporary arrangements and all associated activities so as not to endanger safety of any assets, running track, traffic and traveling public and for following all extent instructions, norms, practice and procedures laid down by Railway authorities in this respect, which may be ascertained from the Railways through the Engineer.

If required, Railways may, in order to ensure the safety of the running track, post at site Regular Railway staff to watch the efficacy and safety of temporary arrangements and protection measures round the clock for the period the same exist in the running line and till the running line is restored back to normal. Railways may also supervise the insertion, maintenance and removal of the temporary arrangements. The cost of such staff shall be borne by the Employer.

Notwithstanding the above, the contractor shall not, however, be relieved of his responsibility and obligation as aforesaid.

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Save as provided in (e) above, the contractor shall bear the cost of complying with all safety requirements. No extra payment will be made for complying with the safety provisions under this chapter and the cost of all such elements to meet the safety requirements shall be deemed to be included in the Bill of Quantities.

37.3.1 The contractor remains fully responsible for ensuring safety. In case of any accident, the Contractor shall bear cost of all damages to his equipment and men and also damages to Railway and its passengers.

Suitable barricading to forewarn road vehicle driver shall be provided by the contractor. The luminous tape, strung on bamboo or steel poles can be considered for such barricading. Barricading arrangement should be got approved by the Engineer.

37.4 Indemnity by Contractor

The Contractor shall indemnify and save harmless the Railway/Employer/Engineer from and against all actions, suit proceedings, losses, costs, damages, claims, and demands of every nature and description brought or recovered against the Railways/ Employer/Engineer by reason of any act or omission of the contractor, his agents or employees, in the execution of the works or in his guarding the same. All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the actual loss or damage sustained, and whether or not any damage shall have been sustained.

38.0 BATCHING PLANT AND CASTING YARD LAYOUT

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.
x. Non-adherence to any of the above provision shall be penalized as per relevant penalty clause.

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39.0 PERSONAL PROTECTIVE EQUIPMENTS (PPEs)

39.1 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, etc.)
iv. Personal fall protection (Full body harness, Rope-grape fall arrester, etc.)
v. Eye Protection (Goggles, Welders glasses, etc.)
vi. Hand Protection (Gloves, Finger coats, etc.)
vii. Respiratory Protection. (Nose mask, SCBAs, etc.)
viii. Hearing Protection (Ear plugs, Ear muffs, etc.)

39.2 The PPEs and safety appliances provided by the contractor shall be of the standard as prescribed by Bureau of Indian Standards (BIS). If materials conforming to BIS standards are not available, the contractor as approved by the Employer shall procure PPE and safety appliances.

39.3 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 / tunneling 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.

39.4 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
i. Hard hat with company Logo ii. Safety boots iii. Hi-visibility **waistcoat** covering upper body and meeting the following requirement as per BS EN 471:1994: 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	i. Hard hat with reflective tape ii. Safety boots iii. Hi-visibility **jacket** covering upper body and meeting the following requirements as per BS EN 471:1994: 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.

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g. Waistcoat shall have a side adjustable fit and a side and front tear-away feature on Vests made of nylon.	f. The bottom strip shall be at a distance of 5cm from the bottom of the vest.

39.4.1 Color coding for helmets

Safety Helmet Colour Code (Every Helmet should have the LOGO* affixed /painted)	Person to use
White	K-RIDE staffs
Grey	All Designers, Architect, Consultants, etc.
Violet	Main Contractors (Engineers / Supervisors)
Blue	All Sub-contractors (Engineers /Supervisors)
Red	Electricians (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

Notes: 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.

39.5 In addition to the above any other PPE required for any specific jobs like, welding and cutting, working at height, tunneling etc. shall also be provided to all workmen and also ensure that all workmen use the PPEs properly while on the job.

39.6 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.

39.7 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.

39.8 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.

39.9 Damage to Railway Property or Life or Private Property

39.9.1 The contractor shall be responsible for all risks to the works and for the trespass and shall make good at his own expense all loss or damage whether to the works themselves or to any other property of the Railway

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or the lives of persons or property of others from whatsoever cause in connection with the works until they are taken over by the Employer and this although all reasonable and proper precautions may have been taken by the Contractor, and in case the Railway/Employer/Engineer shall be called upon to make good any costs, loss or damages, or to pay any compensation, including that payable under the provisions of Workmen's compensation act or any statutory amendments thereof to any person or persons sustaining damages as aforesaid, by reason of any act, or any negligence or any omissions on the part of the contractor, the amount of any costs or charges including costs and charges in connection with legal proceedings, which the Railway/Employer/Engineer may incur in reference thereto, shall be charged to the contractor. The Railway/Employer/Engineer shall have the power and right to pay or to defend or compromise any claim of threatened legal proceedings or in anticipation of legal proceedings being instituted consequent on the action or default of the contractor, to take such steps as may be considered necessary or desirable to ward off or mitigate the effect of such proceedings, charging to Contractor, as aforesaid, any sum or sums of money which may be paid and any expenses whether for reinstatement or otherwise which may be incurred and the propriety of any such payment, defence or compromise, and the incurring of any such expense shall not be called in question by the Contractor.

39.9.2 Safety of Public

i. The Contractor shall be responsible to take all precautions to ensure the safety of the Public whether on Public or Railway property and shall post such look out men as may in the opinion of the Engineer be required to comply with regulations pertaining to the work.
ii. The Contractor shall provide effective barricading using G.I. corrugated sheets around foundation pits, trenches, erection sites, demolition sites etc., to prevent accidents and injuries to the public. He shall erect barricading duly leaving safe passage for the movement of the public as per the directions of Engineer.
iii. No payment will be made for providing such barricading and the rates quoted by the Contractor shall be inclusive of such safety measures.

39.9.3 Reporting of Accidents

The Contractor shall report to the Engineer details of any accidents as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition, notify the Engineer and the Employer immediately by the quickest available means.

39.9.4 Life-saving Appliances and First-aid Equipment

The Contractor shall provide and maintain upon the Works sufficient, proper and efficient life-saving appliances and first-aid equipment to the approval of the Engineer and in accordance with the requirements of ILO Convention No. 62. The appliances and equipment shall be available for use at all time

39.9.5 Security Measure

i. Security arrangements for the work shall be in accordance with general requirements and the contractor shall conform to such requirements and shall be held responsible for the action or inaction on the part of his staff, employees and the staff and employees of his subcontractors.
ii. Contractor's as well as Sub Contractor's employees and representatives shall wear identification Badges (cards), uniforms, helmets, gum boots and other safety/protection gadgets/accessories provided by the Contractor. Badges shall identify the Contractor and show the employee's name and number and shall be worn at all times while at site.

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ii. All vehicles used by the contractor shall be clearly marked with the Contractor's name or identification mark.

iii. The contractor shall be responsible for security of works for the duration of the contract and shall provide and maintain continuously adequate security personnel to fulfill these obligations. The requirements of security measures shall include, but not be limited to, maintenance of Law and Order at site, provision of all lighting, guard, flagmen, and all other measures necessary for protection of works within the colonies, camps and elsewhere at site, all materials delivered to the site and all persons employed in connection with the works continuously throughout working and non-working periods including nights, Sundays and holidays, for the duration of the contract. However, at work sites in close proximity of traffic corridors where public and traffic are likely to come close to the work area, suitable barricading as proposed by contractor and approved by Engineer shall be provided.

iv. No separate payment will be made for providing security measures and will be deemed included in the quoted lumpsum price.

39.9.6 Contractor will have to comply the instructions circulated for Safety on Worksites Specially Doubling Works being implemented on Indian Railways as per relevant letters and any subsequent instructions on this issue.

It is presumed that bidders have gone through the Indian Railway's policies including any subsequent instructions on this issue if any, before quoting the rates.

39.9.7 Ensuring Safety at work site

Ensuring safety at work site while carrying out of doubling works is of paramount importance.

39.9.8 Following measures must be ensured:

1. Fencing as per specification lay down along the track at specified distance from centerline of existing track. The fencing should be maintained until the track is handed over to Railways. Accordingly, at locations where it has been broken/stolen away, the same should he restored expeditiously.

2. Contractors to ensure patrolling by Cycle/ Motor Cycle to prevent damage to fencing and to rectify as soon as it is detected.

3. In the stretch where new formation is likely to be used by unauthorized vehicles and likely to create potential unsafe condition, lifting barriers under lock & key at points where contractor's vehicles are required to enter should be provided and the same should be manned to allow entry to only contractor's vehicles and prevent entry of unauthorized vehicles.

4. Other likely entry points on the new formation must be suitably blocked by providing physical obstructions by stacking sleepers or by cross trenches or by erecting fence to prevent entry of unauthorized vehicles. Frequent check exercised to ensure that unauthorized vehicles do not ply.

5. Reducing number and length of such stretches by providing cross-barricades should be done.

6. PMC should be advised to educate his supervisor for each stretch to ensure Safety who should be well conversant safety instructions and should see that the same are not violated. PMC has to be made accountable for lapses on the safety aspects.

7. Periodical formal counseling of all contractor's staff and PMC officials regarding safety instructions and review violations coming to light and taking appropriate action.

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8. Counseling of drivers and operators of machinery regarding safety aspect during routine inspection of PMC official's contractors Engineers.

9. All the driver's/machine operators should have competency certificate issued by PMC after examining their knowledge about safety. Only authorized drivers can play within 6.6 m of the existing track will have to be proposed as found necessary.

10. Necessary caution orders to Drivers of trains wherever required in terms of Railway Board's instructions/PCE circulars.

11. In case work is required to be carried out within 3.5 M of existing running line, K-RIDE should be advised well in time and requested to provide look out men and Railway Supervisors for the site. At such locations, close supervision must be ensured.

In terms of contract conditions, preventing entry of outsiders at the worksites is the responsibility of contractor and this has to be ensured.

40.0 VISITORS TO THE SITE

40.1 No visitor is allowed to enter the site without the permission of the Employer. All authorized 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.

40.2 All Visitors shall be accompanied at all times by a responsible member of the site personnel.

40.3 The contractor shall be fully responsible for all visitors' safety and health within the site.

40.4 As indicated earlier in this Manual, the Engineer 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.

40.5 The criteria against which the audits will be undertaken shall be derived from the clauses within the Environment Protection Requirements (Appendix II/ herein above), contract-specific Site Environmental Plan and previous site inspection results.

40.6 In addition to the quarterly audits by the Engineer, site inspection shall be undertaken by the Contractor's staff to inspect the construction activities in order to ensure that appropriate environmental protection and pollution control measures are properly followed and implemented.

40.7 The frequency of site inspection shall be at least once a week.

40.8 The Contractor shall prepare an 'Environmental Inspection and Action Reporting System' and submit to the Engineer for approval and make amendments as suggested. It shall contain a contract specific comprehensive Environment Inspection checklist as requirement of Site Environmental Plan.

40.9 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.

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40.10 Results of inspection shall be discussed with Engineer and his recommendations on better environmental protection shall be notified to the Contractor for taking immediate action and rapid resolution of identified non-compliance.

40.11 If significant environmental problems are identified or if there is an environmental complaint or as a part of investigation work, then the Engineer shall also carry out Ad hoc site inspection which shall be attended by Contractor's Representative.

40.12 Reporting system

40.12.1 Reporting under the Environmental Management System will contain results of monitoring and inspection programs.

40.12.2 In Site Environmental Plan, the Contractor shall prepare and submit monthly Environmental Quality Management Reports in accordance with Requirements as per Contract.

40.12.3 The monthly report shall include (but not limited to) the following:

i. Executive Summary
ii. Brief mention of construction activities
iii. Monitoring results under AMCP, and NMCP
iv. Interpretation of monitoring results, significance and influencing factors
v. Graphical representation of monitored results over past four reporting periods.
vi. Measures to control spill under SPCP.
vii. Action taken on recommendations under site inspection programme or specific directions.
viii. Summary of complaints, results of investigations and follow-up action
ix. Future key issues.

40.13 Complaint Response Process

40.13.1 Inquiries, complaints and requests for information can be expected from a wide range of individuals and organizations both private and government. The majority of complaints is likely to be received by K-RIDE, although the site offices are also likely to be contacted.

40.13.2 The objective of complaint process is to ensure that public and agency complaints are addressed and resolved consistently and expeditiously.

40.13.3 The Contractor's Site Manager will be notified immediately on receipt of complaint that may relate to environmental impacts. The Site Manager will immediately inform the Engineer and through him the K-RIDE.

40.13.4 Field investigation should determine whether the complaint has merit, and if so, action should be taken to address the impact.

40.13.5 The outcome of the investigation and the action taken shall be documented on a complaint Performa prepared by the Contractor and approved by the Engineer in advance of the works.

40.13.6 Where possible, a formal response to each complaint received shall be prepared by the Contractor within seven days in order to notify the concerned person(s) that action has been taken.

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40.14 Completion of the EQM Programme

40.14.1 The construction of this project will be undertaken as a series of individual construction contracts with necessarily different construction program and completion dates.

40.14.2 The Engineer shall maintain an overview of the 'impact causing potential' of each site or contract and monitoring parameter with a view to maintaining the most cost-effective use of the environmental resources dedicated to the Project.

40.14.3 Termination of EQM should focus on the percentage contract completion status and on the basis of a history of environmental impact arising from the site over a representative period of monitoring.

40.14.4 Justifiable application for termination of EQM shall be put forward by the Contractor to the Engineer, as necessary throughout the construction period.

40.15 Working near running line

40.15.1 The contractor shall not allow any road vehicle belonging to him or his suppliers etc. to ply in railway land next to the running line. If for execution of certain works viz. earth work for parallel railway line and supply of ballast for new or existing rail line, gauge conversion etc., road vehicles are necessary to be used in railway land next to the railway line, the contractor shall apply to the Engineer for permission giving the type & no. of individual vehicles, names & license particulars of the drivers, location, duration & timings for such work/movement. The Railways/Employer/ Engineer or his authorized representative will personally counsel, examine & certify, the road vehicle drivers, contractor's flag men & supervisor and will give written permission giving names of road vehicle drivers, contractor's flag men and supervisor to be deployed on the work, location, period and timing of the work. This permission will be subject to the following obligatory conditions:

40.15.2 Road vehicles can play along the track after suitable cordoning off track with minimum distance of 6 meters from the center of the nearest track. For working of machinery close to the running tracks or plying of road vehicles during night hours, the contractor shall apply to the Engineer in writing for permission, duly indicating the site details in a neat sketch and safety measures proposed to be taken. Subject to the approval of concerned Railway authorities, the Engineer or his authorized representative will communicate permission to the contractor/contractor's representative. The contractor and his men shall strictly adhere to the instructions given along with such permissions.

40.15.3 Nominated vehicles and drivers shall be utilized for work in the presence of at least one flag man and one supervisor certified for such work. In order to monitor the activities during night hours, additional staff may have to be posted based on the need of the individual site.

40.15.4 The Contractor' machinery, equipment and vehicles shall normally operate 6 m clear of track. Any movement/work at less than 6m and upto a minimum of 3.5m clear of track center, shall be carried out only in the presence of a person (including any railway employee) authorized by the Engineer. No part of the road vehicle shall be allowed at less than 3.5m from track center. Cost of such railway employee shall be borne by the Employer.

40.15.5 The Contractor's machinery and equipment like Cranes, Flash Butt Welders, Ballasting machinery, Compactors, Track Laying Systems etc. are required to operate close to the existing line carrying traffic.

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Contractor is fully responsible for operating these machineries without endangering the safety of the running line and traffic.

40.15.6 Safety Fencing:

i) Before commencing any work close to the running track, the Contractor shall provide safety fencing and obtain the specific permission of Engineer to commence the work in that stretch.
ii) The fencing shall be for an as per relevant scheduled item.
iii) The Contractor shall maintain the safety fencing in good working condition throughout the period till the work in a given stretch is completed.
iv) The Contractor will be paid for providing safety fencing along the track as per the relevant item in the Price schedule.

40.16 The contractor's special attention is drawn to Para B26 of Indian Railways Permanent Way Manual introduced under Advance Correction Slip no. 69 dated 23.05.2001, reproduced below which should invariably be complied with "826 Safe working of Contractors -- A large number of men and machinery are deployed by the contractors for track renewals, gauge conversions, doublings, bridge rebuilding etc. It is therefore essential that adequate safety measures are taken for safety of the trains as well as the work force.

The following measures should invariably be adopted:

a) The contractor shall not start any work without the presence of Railway supervisor at site.
b) Wherever the road vehicles and/or machinery are required to work in the close vicinity of railway line, the work shall be so carried out that there is no infringement to the railway's schedule of dimensions. For this purpose, the area where road vehicles and/or Machinery are required to ply, shall be demarcated and acknowledged by the contractor. Special care shall be taken for turning/reversal of road vehicles/machinery without infringing the running track. Barricading shall be provided wherever justified and feasible as per site conditions.
c) The "look out and whistle" caution orders shall be issued to the trains and speed restrictions imposed where considered necessary. Suitable flag men/detonators shall be provided where necessary for protection of trains.
d) The supervisors/workmen should be counseled about safety measures. A competency certificate to the contractor's supervisor as per Proforma annexed shall be issued by AEN which will be valid only for the work for which it has been issued.
e) The unloaded ballast/rails/sleepers/other P. Way materials after unloading along track should be kept clear off moving dimensions and stacked as per the specified heights and distance from the running track.
f) Supplementary site-specific instructions, wherever considered necessary, shall be issued by the Engineer.

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COMPETENCY CERTIFICATE

"Certified that Shri/ _____ P. Way supervisor of M/S _____ has been examined regarding P. Way working on _____ work. His knowledge has been found satisfactory and he is capable of supervising the work safely.

_____

Authorized Representative / K-RIDE

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40.17 The work of formation in banks and cuttings throughout the length of doubling is adjacent to track under running traffic. Many of the bridges on the proposed double line are to be constructed either as extensions or just adjacent to the existing bridges under running traffic. The work of Installation of Track throughout the length of doubling is adjacent to track under running traffic. The work of Installation of Track and Signals in the Station yards including alterations to the existing Track and Signals has to be done adjacent to or in replacement of the existing Track and Signals which are under running traffic. The contractor shall ensure that the safety of the running lines and running traffic is not endangered, because of his work.

40.18 Any traffic/traction blocks, temporary speed restrictions and caution orders required in this connection shall also be got sanctioned from the Railway authorities well in advance, through the Engineer. The Railways may sanction the same for specific sites within the overall recovery time available in the Railway's time table. The contractor shall have to schedule his programme according to the convenience of the Railways. No claim from the contractor for any delay/inconvenience/loss on this account shall be entertained by the Employer.

40.19 The contractor shall provide at site at his own cost, all protection measures including exhibition and lighting of all Temporary Engineering Signals as per Railway rules, instructions and norms. All lights provided by the contractor shall be screened so as not to interfere with any signal light on the Railways or with any traffic or signal lights of any local or other authority.

40.20 Ancillary and Temporary works

(a) The Contractor's proposals for erection of all ancillary and temporary works shall be in conformity with the proposals submitted along with the tender and modifications thereto as approved by the Engineer.

(b) The Contractor shall submit drawings, supporting design calculations where called for by the Engineer and other relevant details of all such works to the Engineer for approval at least one month before he desires to commence such works. Approval by the Engineer of any such proposal shall not relieve the contractor of his responsibility for the sufficiency of such works.

(c) The contractor shall, at his own cost, design and provide any temporary arrangements including relieving/service girders required in connection with the above said works and remove the same, when no longer required. These arrangements shall conform to Railway norms. The contractor shall obtain all necessary approvals and sanctions of the concerned Railway authorities including Commissioner of Railway Safety through the Engineer/ Employer in advance and well in time.

(d) The contractor shall ensure and be entirely responsible for proper design, fabrication, provision and upkeep of all temporary arrangements and all associated activities so as not to endanger safety of any assets, running track, traffic and traveling public and for following all extent instructions, norms, practice and procedures laid down by Railway authorities in this respect, which may be ascertained from the Railways through the Engineer.

(e) If required, Railways may, in order to ensure the safety of the running track, post at site Regular Railway staff to watch the efficacy and safety of temporary arrangements and protection measures round the clock for the period the same exist in the running line and till the running line is restored back to normal. Railways may also supervise the insertion, maintenance and removal of the temporary arrangements. The cost of such staff shall be borne by the Employer.

(f) Notwithstanding the above, the contractor shall not, however, be relieved of his responsibility and obligation as aforesaid.

(g) Save as provided in Para 7 (e) above, the contractor shall bear the cost of complying with all safety requirements. No extra payment will be made for complying with the safety provisions under this

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chapter and the cost of all such elements to meet the safety requirements shall be deemed to be included in the Bill of Quantities.

40.21 The contractor remains fully responsible for ensuring safety. In case of any accident, the Contractor shall bear cost of all damages to his equipment and men and also damages to Railway and its passengers.

40.22 Suitable barricading to forewarn road vehicle driver shall be provided by the contractor. The luminous tape, strung on bamboo or steel poles can be considered for such barricading. Barricading arrangement should be got approved by the Engineer.

40.23 Indemnity by Contractor

The Contractor shall indemnify and save harmless the Railway/Employer/Engineer from and against all actions, suit proceedings, losses, costs, damages, claims, and demands of every nature and description brought or recovered against the Railways/ Employer/Engineer by reason of any act or omission of the contractor, his agents or employees, in the execution of the works or in his guarding the same. All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the actual loss or damage sustained, and whether or not any damage shall have been sustained.

40.24 Damage to Railway Property or Life or Private Property

40.25 The contractor shall be responsible for all risks to the works and for the trespass and shall make good at his own expense all loss or damage whether to the works themselves or to any other property of the Railway or the lives of persons or property of others from whatsoever cause in connection with the works until they are taken over by the Employer and this although all reasonable and proper precautions may have been taken by the Contractor, and in case the Railway/Employer/Engineer shall be called upon to make good any costs, loss or damages, or to pay any compensation, including that payable under the provisions of Workmen's compensation act or any statutory amendments thereof to any person or persons sustaining damages as aforesaid, by reason of any act, or any negligence or any omissions on the part of the contractor, the amount of any costs or charges including costs and charges in connection with legal proceedings, which the Railway/Employer/Engineer may incur in reference thereto, shall be charged to the contractor. The Railway/Employer/Engineer shall have the power and right to pay or to defend or compromise any claim of threatened legal proceedings or in anticipation of legal proceedings being instituted consequent on the action or default of the contractor, to take such steps as may be considered necessary or desirable to ward off or mitigate the effect of such proceedings, charging to Contractor, as aforesaid, any sum or sums of money which may be paid and any expenses whether for reinstatement or otherwise which may be incurred and the propriety of any such payment, defence or compromise, and the incurring of any such expense shall not be called in question by the Contractor.

40.26 Safety of Public

i. The Contractor shall be responsible to take all precautions to ensure the safety of the Public whether on Public or Railway property and shall post such look out men as may in the opinion of the Engineer be required to comply with regulations pertaining to the work.

ii. The Contractor shall provide effective barricading using G.I. corrugated sheets around foundation pits, trenches, erection sites, demolition sites etc., to prevent accidents and injuries to the public. He shall erect barricading duly leaving safe passage for the movement of the public as per the directions of Engineer.

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iii. No payment will be made for providing such barricading and the rates quoted by the Contractor shall be inclusive of such safety measures. The quoted lumpsum price is inclusive for all the above items of work.

40.27 Reporting of Accidents

The Contractor shall report to the Engineer details of any accidents as soon as possible after its occurrence. In the case of any fatality or serious accident, the Contractor shall, in addition, notify the Engineer and the Employer immediately by the quickest available means

40.28 Life-saving Appliances and First-aid Equipment: The Contractor shall provide and maintain upon the Works sufficient, proper and efficient life-saving appliances and first-aid equipment to the approval of the Engineer and in accordance with the requirements of ILO Convention No. 62. The appliances and equipment shall be available for use at all time.

40.29 Security Measure

i. Security arrangements for the work shall be in accordance with general requirements and the contractor shall conform to such requirements and shall be held responsible for the action or inaction on the part of his staff, employees and the staff and employees of his subcontractors.
ii. Contractor's as well as Sub Contractor's employees and representatives shall wear identification Badges (cards), uniforms, helmets, gum boots and other safety/protection gadgets/accessories provided by the Contractor. Badges shall identify the Contractor and show the employee's name and number and shall be worn at all times while at site.
iii. All vehicles used by the contractor shall be clearly marked with the Contractor's name or identification mark.
iv. The contractor shall be responsible for security of works for the duration of the contract and shall provide and maintain continuously adequate security personnel to fulfill these obligations. The requirements of security measures shall include, but not be limited to, maintenance of Law and Order at site, provision of all lighting, guard, flagmen, and all other measures necessary for protection of works within the colonies, camps and elsewhere at site, all materials delivered to the site and all persons employed in connection with the works continuously throughout working and non-working periods including nights, Sundays and holidays, for the duration of the contract. However, at work sites in close proximity of traffic corridors where public and traffic are likely to come close to the work area, suitable barricading as proposed by contractor and approved by Engineer shall be provided.
v. No separate payment will be made for providing security measures and will be deemed to be included in the quoted lumpsum price.

40.30 Contractor will have to comply the instructions circulated for Safety on Worksites Specially Doubling Works being implemented on Indian Railways as per relevant letters and any subsequent instructions on this issue.

It is presumed that bidders have gone through the Indian Railway's policies including any subsequent instructions on this issue if any, before quoting the rates

40.31 Ensuring Safety at work site

Ensuring safety at work site while carrying out of doubling works is of paramount importance. Following measures must be ensured: -

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1. Fencing as per specification laid down along the track at specified distance from center line of existing track. The fencing should be maintained till the track is handed over to Railways. Accordingly, at locations where it has been broken/stolen away, the same should he restored expeditiously.

2. Contractors to ensure patrolling by Cycle/ Motor Cycle to prevent damage to fencing and to rectify as soon as it is detected.

3. In the stretch where new formation is likely to be used by unauthorized vehicles and likely to create potential unsafe condition, lifting barriers under lock & key at points where contractor's vehicles are required to enter should be provided and the same should be manned to allow entry to only contractor's vehicles and prevent entry of unauthorized vehicles.

Other likely entry points on the new formation must be suitably blocked by providing physical obstructions by stacking sleepers or by cross trenches or by erecting fence to prevent entry of unauthorized vehicles. Frequent check should be exercised to ensure that unauthorized vehicles do not ply.

4. Reducing number and length of such stretches by providing cross barricades should be done.

5. PMC should be advised to educate his supervisor for each stretch to ensure Safety who should be well conversant safety instructions and should see that the same are not violated. PMC has to be made accountable for lapses on the safety aspects.

6. Periodical formal counseling of all contractor's staff and PMC officials regarding safety instructions and review violations coming to light and taking appropriate action.

7. Counseling of drivers and operators of machinery regarding safety aspect during routine inspection of PMC official's contractors Engineers.

8. All the driver's/machine operators should have competency certificate issued by PMC after examining their knowledge about safety. Only authorized drivers can ply within 6.6 m of the existing track will have to be proposed as found necessary.

9. Necessary caution orders to Drivers of trains wherever required in terms of Railway Board's instructions/PCE circulars.

10. In case work is required to be carried out within 3.5 M of existing running line, K-RIDE should be advised well in time and requested to provide look out men and Railway Supervisors for the site. At such locations close supervision must be ensured.

In terms of contract conditions, preventing entry of outsiders at the worksites is the responsibility of contractor and this has to be ensured

40.32 Additional Conditions to Safety at Work Spot

To ensure safety at all the work sites all the time, a dedicated Safety officer duly trained as per the provisions of the contract shall be posted by the contractor for each project. Following works will in general be assigned to safety officer.

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1. The Safety officer (in charge) shall be from the permanent rolls of the contractor. He will work under the administrative control of the Project Manager of the contractor.

2. The person from any sub-contractor deputed by the main contractor shall not be designated as Safety officer.

3. The Safety officer shall be overall in charge of the safety methods being undertaken at various work sites. He shall not be given any other task related to the project planning and execution.

4. The Safety officer should be well versed with the safety aspects related to worksites in the vicinity of running railway lines and should impart training to the officials assisting him.

5. The Safety officer shall be given suitable means of transport (depending on the requirement) by the contractor to approach all the work sites frequently and ensure that adequate precautions to ensure safety have been taken. Following items shall be specifically done by the Safety officer.

   a) Ensuring the provision of the safety fencing. Any shortfall shall be made good immediately.
   b) Availability of suitable lookout men at each working site. The lookout men shall be in possession of hooters, safety helmet and retro-reflective jacket to warn the site engineer/supervisor and operators/drivers of the equipment's/vehicles working near the running track.
   c) Arranging issuance of competency certificates by Employer/Engineer with the operator/driver of each equipment/vehicle before deputing for work.
   d) Take assurance from the contractor officials at regular interval of complying with the safety instructions.
   e) Any safety violation to be advised to all concerned and remedial action taken thereof.

6. The Safety officer will frequently counsel the contractor engineers / supervisors / operators / drivers/ lookout men about safety provisions during his day to day inspections and keep a record of the same. The Safety officer will prepare a monthly report of the safety inspections carried out and remedial action taken thereof and send it to the Project Manager of the contractor and the employer/engineer.

7. The contractor should open new sites only after discussing the safety measures to be undertaken with his Safety officer and obtaining the permission from Employer/ Engineer.
8. It shall be the duty of the Project Manager and Safety officer of the contractor that the instructions contained in the agreement related to safety and the same issued by the Railway/Employer/Engineer from time to time are strictly complied with.

Based on the above, it is advised that a thorough review of the safety provisions may be undertaken and it should be ensured that competent safety officers are available at all the work spots

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PART III: OCCUPATIONAL HEALTH AND WELFARE

41.0 PHYSICAL FITNESS OF WORKMEN

41.1 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.

41.2 The contractor shall not permit any employee/workmen to enter the work area under the influence of alcohol or any drugs.

42.0 MEDICAL FACILITIES

42.1 Medical Examination

42.1.1 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: -
   a) Full medical and occupational history.
   b) Clinical examination with particular reference to
      i. General Physique;
      ii. Vision: - Total visual performance using standard Orth orator 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

42.1.2 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.

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42.2 Occupational Health Centre

42.2.1 The contractor shall ensure at a construction site an occupational health center, mobile or static is provided and maintained in good order. Services and facilities shall be provided in the manner laid down in Schedule X of BOCWR. A construction medical officer appointed in an occupational health center, shall possess the qualification as laid down in Schedule X/ of BOCWR.

42.3 Ambulance van and room

42.3.1 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 room and van are maintained in good repair and is equipped with standard facilities specified in Schedule IV and Schedule V of BOCWR, respectively.

42.4 First-aid boxes

42.4.1 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 II/ of BOCWR.

42.5 HIV/ AIDS prevention and control

42.5.1 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: 4.

42.5.2 The Employer will engage a professional agency for implementing the guidelines laid down in the policy and communicate to the contractor.

42.5.3 The Contractor shall extend necessary support to the appointed agency by deputing the workmen to attend the awareness creation programme.

42.5.4 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.

42.5.5 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.

42.5.6 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.

42.5.7 The peer educators will be paid a monthly honorarium as fixed by the Employer for rendering his services in addition to his regular duty.

42.5.8 The total number of peer educators (1 for 100 workers) shall always be maintained by the contractor.

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42.5.9 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.

42.5.10 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.

42.6 Prevention of mosquito breeding

42.6.1 Measures shall be taken to prevent mosquito 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.

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

42.6.3 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.

42.7 Alcohol and drugs

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

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

43.0 NOISE

43.1 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.

43.1.1 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.

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ii) The Contractor shall construct acoustic screens or enclosures around any parts of the Works from which excessive noise may be generated.

43.1.2 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, as given in the project SHE Manual. 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.

43.1.3 The noise monitoring requirements including monitoring locations are given in the project SHE Manual.

43.2 Noise Monitoring

43.2.1 The activities which are expected to cause noise during the construction ofBSRP, include noise from construction equipment, construction activities such as portal construction, boring for piling, earthwork excavation, concreting, viaduct construction (including shifting of launching truss / girder) and removal of spoil and movement of construction vehicles and delivery vehicles, traveling to and from the construction and disposal sites.

43.2.2 The level of impact of these noise sources depends upon the noise characteristics of the equipment and activities involved the construction schedule, and the distance from noise sensitive receptors.

43.2.3 The Noise Monitoring and Control Plan (NMCP) in contract specific site Environmental Quality Management Plan prepared by the Contractor shall establish procedures to monitor construction noise and determine when to apply measures to control noise pollution due to construction activities at work sites.

43.2.4 The NMCP will provide site description, define acceptable noise monitoring equipment, provide siting and operating procedures for noise equipment, and indicate reports and record keeping on noise monitoring data.

43.2.5 The NMCP will provide guidance for construction activity. It shall also address noise performance criteria used in the selection of construction equipment.

43.2.6 The Noise Monitoring and Control Plan shall provide for:

a) Definition of noise-sensitive uses in the zones affected by construction.
b) Calculation of future noise levels at the closest noise-sensitive receptors to the construction activity based on construction activity and ambient noise levels.
c) Evaluation and specification of the noise abatement measures that can be applied to meet the noise objectives.
d) Monitoring construction activity and providing adjustments to noise abatement controls that may be required to increase their effectiveness.
e) Regular reporting
f) Requirements of NMCP:

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(i) It shall specify the nighttime and daytime construction activities, monitoring locations, equipment, procedures, and schedule of measurements and reporting methods to be used.

(ii) It shall contain a scaled plan indicating monitoring location, including measurements to be taken at construction site boundaries and at nearby residential zones.

(iii) a record of the noise characteristics of powered mechanical equipment proposed to be used during day time and night time and of proposed working methods and of potential noise level reduction measures.

(iv) Provisions for immediate notification when measured noise levels exceed allowable limits,

(v) Provide a reporting procedure whereby noise-monitoring data is furnished to the Engineer on a weekly basis.

43.2.7 In defining the requirements of the NMCP, available measures for noise control, such as, the use of equipment with special exhaust silencers or enclosures, and the construction of temporary enclosures or noise barriers around specific construction site activity areas shall be considered. It should also specify the measures to be adopted to counter the impact of noise pollution for public and workers working at site during construction.

43.2.8 If the measured noise levels exceed the noise limits, the noise levels shall be reduced by appropriate abatement measures.

43.2.9 The NMCP will be reviewed on a regular basis and updated as necessary to assure current construction activities are addressed.

43.2.10 The Engineer shall monitor Contractor's performance of tasks specified, and will inspect necessary records, reports and procedures related to the control of noise.

43.2.11 Impact monitoring shall be carried out at noise sensitive receptor locations within 200 feet of the construction site once each week and after a change in construction activity. Construction noise measurements shall coincide with daytime and night time periods of maximum noise generating construction activities.

43.2.12 Noise Monitoring data will be submitted in a Noise Measurement Report Form. It will contain the type of measurement, duration of measurement, distance of monitoring from construction site, and construction equipment working during monitoring period.

43.2.13 appropriate parameter for measuring construction noise impacts shall be the equivalent A-weighted sound pressure level (Leq) measured in decibels (dB). The two statistical sound levels L10 and L90; the level exceeded for 10 and 90 percent of the time respectively, shall also be recorded during monitoring. The L90 may be considered as the ambient level into which the L10 as average peak level intrudes. The Lmax, Leq, L10 and L90 values will be reported in the noise measurement form along with allowable noise limit. The duration of monitoring shall be for a minimum of 30 minutes.

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43.2.14 In no case shall the Contractor expose the public to construction noise levels exceeding 90dBA (slow) or to impulsive noise levels with a peak sound pressure level exceeding 140dB as measured on an impulse sound level meter.

43.2.15 Limit for construction noise is based on the existing ambient noise levels in areas adjoining the construction sites.

43.2.16 The noise levels emanating from any source during construction, shall not exceed 5 dB(A) or more above existing ambient pre-construction noise levels when measured at a point outside the premises of the location of source. The same may be varied from time to time by and at the sole discretion of the Engineer.

43.2.17 Where there are no ambient noise measurements, the construction activities shall be limited to levels measured at a distance of 200 feet from the construction limits or at the nearest affected building, whichever is closer, as given in Table-2.

TABLE-2

ALLOWABLE CONSTRUCTION NOISE

LAND USE	MAXIMUM NOISE LEVELS- Lmax dB (A)	
	Day Time	Night Time
Residential	75	65
Commercial		85
Industrial		90

43.2.18 At the surface of the construction site during night time hours, the Contractor shall use only equipment that operating under full load meets the noise limits specified in Table-3, if a sensitive receptor would be affected.

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TABLE-3

NOISE EMISSION LIMITS FOR CONSTRUCTION EQUIPMENT USED DURING NIGHTTIME HOURS; MEASURED AT 50 FEET FROM CONSTRUCTION EQUIPMENT*

Equipment Category	Lmax Level dB(A)
Backhoe	80
Bar Bender	75
Chain Saw	81
Compactor	80
Compressor	80
Concrete Mixer	85
Concrete Pump	82
Crane	85
Dozer	85
Front End Loader	80
Generator	82
Gradall	85
Grader	85
Paver	85
Pneumatic Tools	85
Scraper	85
Tractor	84

Noise emission limits apply to equipment used at surface of the construction site during Night time hours of 9 p.m. to 6 a.m.

43.2.19 The adjustments for close in equipment noise measurement shall be made in accordance with Table-4.

TABLE - 4

ADJUSTMENTS FOR CLOSE-IN EQUIPMENT NOISE MEASUREMENTS (Measurement Values to be subtracted from Measured Sound)

Distance (Feet)	Level to Estimate Sound Level at 50 Feet dB
19-21	8
22-23	7
24-26	6
27-29	5
30-33	4
34-37	3
38-42	2
43-47	1
48-50	0

TABLE- 5

CONSTRUCTION VIBRATION LIMITS VIBRATION TYPE AND PERMISSIBLE

AGGREGATE DURATION	LIMIT
Sustained (1 hr./day)	0.01 in/sec (80 VdB re 10-6 in/sec)
Transient (<1 hr./day)	0.03 in/sec (90 VdB re 10-6 in/sec)
Transient (<10 min/day)	0.10 in/sec (100 VdB re 10-6 in/sec)

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43.2.20 When Diesel Generator (DG) Sets are used for operation of equipment and machinery, then 'Standards and Guidelines for control of Noise Pollution from Stationery DG Sets', under Environment (Protection) Act, 1986 shall apply.

43.2.21 Should the impact monitoring record noise levels which are:

1. Indicative of a deteriorating situation such that closer monitoring is reasonably indicated, or
2. When in the opinion of the Engineer additional measurements are required in view of deteriorating noise environment, then, the Engineer may require the Contractor to increase the frequency of impact monitoring at any one or more of the monitoring stations until the results indicate an improving and acceptable level of noise.

43.2.22 The Contractor shall submit a copy of monitoring results. The results should represent a statistical evaluation of data for evaluation of trends and comparison with noise emission standards.

43.2.23 Where the Engineer determines that the recorded Noise level is significantly greater than the acceptable levels, the Engineer may direct the Contractor to take effective remedial measures including, but not limited to, reviewing noise sources and modifying working procedures.

43.2.24 The Contractor shall inform the Engineer of all steps taken to investigate cause of exceedance and immediate action taken to avoid further exceedance through written reports and proposals for action under an Event Contingency Plan.

43.3 Control Requirements

43.3.1 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.

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43.3.2 Dust Control and Silicosis Exposure Reduction Strategy:

The Contractor shall ensure proper dust handling at work site as described in the project specific Environment Management Plan and follow Silicosis Exposure Reduction Strategy as described at Annexure-1 at the end of this document.

43.4 Occupational Noise

i. Protection against the effects of occupational noise exposure should be provided when the sound level exceeds the threshold values as provided in Project SHE Manual.
ii. When employees are subjected to sound levels exceeding those listed in the Table, feasible administrative or engineering controls should be utilized as given in this document and K-RIDE's Project SHE Manual.
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 computations, as given in project SHE Manual.

43.5 Vibration Level

43.5.1 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 as given in article project SHE Manual.

44.0 VENTILATION AND ILLUMINATION

44.1 Ventilation

44.1.1 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 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.

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

44.2 Illumination

44.2.1 The contractor shall take every effort to illuminate the work site as per the Employer's requirement illustrated in general instruction K-RIDE/SHE/CEO/011.

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44.2.2 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.

45.0 RADIATION

45.1 The use of radioactive substances and radiating apparatus shall comply with the Govt. regulatory requirements and all applicable legislations.

45.2 Operations involving ionizing radiation shall only be carried out after having been reviewed without objection by the Employers representative and shall be carried out in accordance with a method statement.

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

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

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

46.0 WELFARE MEAURES FOR WORKERS

46.1 Latrine and Urinal Accommodation

46.1.1 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.

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

46.1.3 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

46.1.4 Moving sites

46.1.4.1 In case of works like track lying, 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.

46.1.4.2 In case if the contractor fails 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.

46.2 Canteen

46.2.1 In every workplace wherein not less than 250 workers are ordinarily employed the contractor shall provide an adequate canteen conforming to Section 37 of BOCWA, read with Rule 244 of BOCWR and as stipulated in Rule 247 of BOCWR the changes 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.

46.3 Serving of tea and snacks at the workplace

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46.3.1 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.

46.4 Drinking water

46.4.1 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 liters per workman per day. Quality of the drinking water shall conform to the requirements of national standards on Public Health

46.4.2 While locating these drinking water facilities 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.

46.4.3 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 meters of any washing places, urinals or latrines.

46.5 Labour Accommodation

46.5.1 The contractor shall provide free of charges as near as possible, temporary living accommodation to all workers conforming to provisions of Section 34 of BOCWA. These accommodations shall have cooking place, bathing, washing and lavatory facilities

46.6 Crèche

46.6.1 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 under age of 6 yrs., conforming to the provisions of Section 35 of BOCWA.

PART IV: ENVIRONMENTAL MANAGEMENT

47.0 ENVIRONMENTAL MANAGEMENT

Environment Management during construction shall include implementation of Environment Management plan and compliance of pollution control measures at work sites.

Major Statutory Environmental Acts, Rules, Standards, for the time being enforce and as may be amended or substituted from time to time, are listed below:

i. Environment (Protection) Act, 1986 and Rules therein ii. EIA Notification, 2020
ii. Air (Prevention and Control of Pollution) Act, 1981
iii. Water (Prevention and Control of Pollution) Act, 1974
v. Forests (Conservation) Act, 1980
vi. Coastal Regulation Zone Notification, 2011
vii. The Wetlands (Conservation and Management) Rules, 2010
viii. Karnataka Preservation of tress Act 1976
ix. Noise Pollution (Regulation and Control) Rules, 2000
x. Public Liability Insurance Act, 1991
xi. Explosive Act, 1884

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xii. Hazardous and other Wastes (Management and Transboundary Movement) Rules, 2016
xiii. Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989
xiv. The Petroleum Rules, 2002
xv. Ancient Monuments and Archaeological Sites and Remains (Amendment and Validation) Act, 2010 and
xvi. National Monuments Authority (Condition of Service of Chairman and Members of the Authority and Conduct of Business) Rules, 2011
xvii. Mineral Concession Rules,1960
xviii. National Green Tribunal Act, 2010 and National Green Tribunal (Prevention and Protection) Rules, 2011

47.1 Environmental Monitoring

47.1.1 The Contractor's Environmental Team shall carry out the monitoring of environmental impacts during construction. Representative sensitive receivers in the vicinity of the works shall be monitored for noise and air quality impacts.

47.1.2 For carrying out impact monitoring for noise and air, equipment shall be provided, operated and maintained by the Contractor. The equipment shall be kept in a good state of repair in accordance with the manufacturer's recommendations and maintained in proper working order with sufficient spare equipment available in the event of breakdown to maintain the planned monitoring program.

47.1.3 The calibration of monitoring instruments and their respective calibrators shall be carried out in accordance with the manufacturer's requirements to ensure they perform to the same level of accuracy as stated in the manufacturer's specifications.

47.1.4 Suspended Particulate Matter (SPM) levels shall be measured by following the standard high volume sampling method as set out in High Volume Method for Suspended Particulate, BIS: 5182-1981

47.1.5 24-hour average SPM concentration shall be measured by drawing air through a High Volume Sampler (HVS) fitted with pre-weighted Glass Fiber filter paper at an average flow rate not less than 1.1m3 per minute.

47.1.6 The minimum requirements to the specifications of sound level meter should be as given in IS: 9779-1981

47.1.7 Engineer will undertake baseline monitoring to establish background levels. Action Level of the Contractor shall be based on the results of baseline monitoring program, which will be made available to him prior to start of construction.

47.1.8 The Contractor's monitoring program is summarized in Table -1.

TABLE-1

SUMMARY OF CONTRACTOR'S MONITORING PROGRAMME

Parameter	Noise	Air
Sampling	Day Time (6 AM to 9 PM) Lmax, Leq, L10, L90, L50 Night Time (9 PM - 6AM Lmax, Leq, L10, L90, L50, Ldn	RSPM, SPM 24-hours of the day CO: 12 hrs. from BAM to BPM.

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Parameter	Noise	Air
Frequency At each location	Once a week (when noise generating activities are underway).	Two 24-hour Samples every fifteen days at uniform intervals.
Locations	To be determined by the Contractor based on noise sensitive receptors	To be determined by the Contractor based on air sensitive receptors
Number of Locations	4 Locations	2 Locations
Duration of Monitoring by contractor	During civil Construction	During Civil Construction
Additional Requirements	Adhoc monitoring as required	Adhoc monitoring as required

47.2 Event Contingency Plan

The Contractor shall prepare an Event Contingency Plan under his Site Environmental Plan. The purpose is to provide, in addition to monitoring activities, procedures for ensuring that if any environmental exceedance of limiting values (either accidental or through inadequate implementation of mitigation measures on part of the Contractor) does occur, the cause is quickly identified and remedied, and that the risk of a similar event recurring is reduced.

47.3 Air Quality

47.3.1 The Contractor shall take all necessary precautions to minimize fugitive dust emissions from operations involving excavation, grading, and clearing of land and disposal of waste. He shall not allow emissions of fugitive dust from any transport, handling, construction or storage activity to remain visible in atmosphere beyond the property line of emission source for any prolonged period of time without notification to the Employer.

47.3.2 The Contractor shall use construction equipment designed and equipped to minimize or control air pollution. He shall maintain evidence of such design and equipment and make these available for inspection by Employer.

47.3.3 If after commencement of construction activity, Employer believes that the Contractor's equipment or methods of working are causing unacceptable air pollution impacts then these shall be inspected and remedial proposals shall be drawn up by the Contractor, submitted for review to the Employer and implemented.

47.3.4 In developing these remedial measures, the Contractor shall inspect and review all dust sources that may be contributing to air pollution. Remedial measures include use of additional / alternative equipment by the Contractor or maintenance / modification of existing equipment of the Contractor.

In the event that approved remedial measures are not being implemented and serious impacts persist, the Employer may direct the Contractor to suspend work until the measures are implemented, as required under the Contract.

47.3.5 Contractor’s transport vehicles and other equipment 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 measures including replacement, if required, so as to operate within permissible norms.

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47.3.6 The Contractor shall establish and maintain records of routine maintenance program for internal combustion engine powered vehicles and equipment used on this project. He shall keep records available for inspection by Employer.

47.3.7 The Contractor shall cover loads of dust generating materials like debris and soil being transported from construction sites. All trucks carrying loose material should be covered and loaded with sufficient free- board to avoid spills through the tailboard or sideboards.

47.3.8 The Contractor shall promptly transport all excavation disposal materials of whatever kind so as not to delay work on the project. Stockpiling of materials will only be allowed at sites designated by the Employer. The Contractor shall place excavation materials in the dumping/disposal areas designated in the plans as given in the specifications.

47.3.9 The temporary dumping areas shall be maintained by the Contractor at all times until the excavate is re-utilized for backfilling or as directed by Employer. Dust control activities shall continue even during any work stoppage.

47.3.10 The Contractor shall place material in a manner that will minimize dust production. Material shall be minimized each day and wetted, to minimize dust production. During dry weather, dust control methods must be used daily especially on windy, dry days to prevent any dust from blowing across the site perimeter.

47.3.11 The Contractor shall water down construction sites as required suppressing dust, during handling of excavation soil or debris or during demolition. The Contractor will make water sprinklers, water supply and water delivering equipment available at any time that it is required for dust control use. Dust screens will be used, as feasible when additional dust control measures are needed especially where the work is near sensitive receptors.

47.3.12 The Contractor shall provide a wash pit or a wheel washing and/or vehicle cleaning facility at the exits from work sites such as construction depots and batching plants. At such facility, high-pressure water jets will be directed at the wheels of vehicles to remove all spoil and dirt.

47.3.13 The Contractor shall design and implement his blasting techniques so as to minimize dust, noise, vibration generation and prevention fly rock.

47.3.14 Blasting technique should be consistent not only with nature and quaintly of rock to be blasted but also the location of blasting.

47.3.15 The contractor shall give preference to explosives with better environmental characteristics.

47.3.16 The Contractor shall protect structures, utilities, pavements roads and other facilities from disfiguration and damage as a result of his activities. Where this is not possible, the contractor shall restore the structures, utilities, pavements, roads and other facilities to their original or better, failing which the rectification / restoration work shall be carried out at the risk and cost of the contractor.

47.3.17 The Contractor shall submit to the Employer an Air Monitoring and Control Plan (AMCP) under contract specific Site Environmental Plan to guide construction activity insofar as it relates to monitoring, controlling and mitigating air pollution.

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47.4 Air Monitoring

47.4.1 Construction activities that will generate dust impacts include excavation (including related activities), material handling and stockpiling, vehicular movement, and wind erosion of unpaved work areas.

47.4.2 The impact of fugitive dust on ambient air pollution depends on the quantity generated, as well as the drift potential of the dust particles injected into the atmosphere. Large dust particles will settle out near the source and smaller particles are likely to undergo dispersal over greater distance from the sources and impeded settling. SPM levels will be monitored to evaluate the dust impact during the construction phase of the Project.

47.4.3 The Air Quality Monitoring and Control Plan (AMCP) in contract-specific Site Environmental Plan prepared by the Contractor shall establish procedures to monitor impact air quality and measures to control air pollution including dust suppression due to construction activities at work sites. This plan shall contain description of activities that will cause degradation in air quality, environmental procedures to manage pollutants to minimize the air pollution, monitoring program, record keeping and reporting.

47.4.4 The Engineer shall monitor Contractor's performance of tasks specified, and will inspect necessary records, reports and procedures related to the control of air quality given in AMCP.

47.4.5 Information gathered during the AMCP will be catalogued and maintained by the Contractor and shall be available for review by the Engineer.

47.4.6 The exact location of the air monitoring stations located near air sensitive receptors adjoining the construction sites, such as residences, schools, hotels and hospitals and placement of monitoring equipment thereat shall be agreed with the Engineer prior to commencement of air monitoring program.

47.4.7 Impact monitoring during the course of the Works shall be carried out at the monitoring stations for two days (continuous twenty-four hours) every fifteen days and where there is a perceived air quality problem.

47.4.8 The Contractor shall construct suitable fence, lockable gate, 220V AC power point and suitable access at each air monitoring station. Monitoring stations shall be free from local obstructions or sheltering.

47.4.9 Should impact monitoring record dust levels which are:

i. Indicative of a deteriorating situation such that closer monitoring is reasonably indicated, or
ii. When in the opinion of the Engineer additional measurements are required in view of deteriorating air quality,

Then the Engineer may require the Contractor to increase the frequency of impact monitoring at any one or more of the monitoring stations until the results indicate an improving and acceptable level of air quality.

47.4.10 The Contractor shall keep records of air quality monitoring (including location, date, time). The Contractor shall submit a copy of monitoring results to the Engineer. The results should represent a statistical evaluation of data by calculating maximum, minimum, mean, standard deviation, geometric mean and percentile calculations for evaluation of frequency distribution, trends, and comparison with emission standards.

47.4.11 The National Ambient Air Quality Standards given in Air (Prevention and Control of Pollution) Act, 1981 may be referred by the Contractor for Limit Levels of SPM in ambient air which may be followed in estimating the pollution level caused by Contractor's activities.

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47.4.12 Where the Engineer determines that the recorded dust (TSP) level is significantly greater than the Limit levels, the Engineer may direct the Contractor to take effective remedial measures including, but not limited to, reviewing dust sources and modifying working procedures.

47.4.13 Where the recorded baseline levels exceed the ambient air quality standards, then at such locations the action level is the recorded base line. Contractor shall take all effective remedial measures to contain the levels to their baseline value as a result of his activities. The action level may be varied by and at the sole discretion of the Engineer.

47.4.14 The Contractor shall inform the Engineer of all steps taken to investigate cause of exceedance and immediate action taken to avoid further exceedance through written reports and proposals for action under an Event Contingency Plan.

48.0 WATER QUALITY

48.1 The Contractor shall comply with the Indian Government legislation and the State regulations in existence insofar as they relate to water pollution control and monitoring. A drainage system should be constructed at the commencement of the Works, to drain off all surface water from the work site into suitable drain outlet.

48.2 The Contractor shall provide adequate precautions to ensure that no spoil or debris of any kind is pushed, washed, falls or deposited on land adjacent to the site perimeter including public roads or existing stream courses and drains within or adjacent to the site. In the event of any spoil or debris from construction works being deposited or any silt washed down to any area, then all such spoil, debris or material and silt shall be immediately removed and the affected land and areas restored to their natural state by the Contractor to the satisfaction of the Employer.

48.3 Due to lowering of potable water supplies in Bangalore and subsequent contamination of ground water, 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 Local 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 and this water may subsequently be discharged to the drainage system or, if not re-used, recharged to the ground water at suitable aquifer levels. The Contractor must submit his proposals for approval of Employer, on his proposed locations of dewatering of excavation and collection of water for either construction re-use or recharge directly to aquifers.

The Contractor's recharge proposals must be sufficient for recharging of the quantity of water remaining after deduction of water re-used for construction. During dewatering, the contractor shall monitor ground water levels from wells to ensure that draw down levels do not exceed allowable limits. The Contractor will not be permitted to directly discharge, to the drainage system, unused ground water obtaining from the excavation without obtaining approval of Employer or the Agency controlling the system.

48.4 The Contractor shall ensure that earth, bentonite, chemicals and concrete agitator washings etc. are not deposited in the watercourses but are suitably collected and residue disposed of in a manner approved by local authorities.

48.5 All water and waste products (surface runoff and wastewater) arising on the site shall be collected and removed from the site via a suitable and properly designed temporary drainage system and disposed of at a location and in a manner that will cause neither pollution nor nuisance.

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48.6 Any mud slurry from drilling, tunneling, 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, bentonite etc. The Contractor shall provide treatment facilities as necessary to prevent the discharge of contaminated ground water.

48.7 The Contractor shall discharge wastewater arising out of site office, canteen or toilet facilities constructed by him into sewers after obtaining prior approval of agency controlling the system. A wastewater drainage system shall be provided to drain wastewater into the sewerage system.

48.8 The bentonite mixing, treatment and handling system shall be established by the contractor giving due regard to its environmental impacts. The disposal of redundant bentonite shall be carefully considered whether in bulk or liquid form. The disposal location will be advised and agreed with the relevant authorities.

48.9 The Contractor shall take measures to prevent discharge of oil and grease during spillage from reaching drainage system or any water body. Oil removal / interceptors shall be provided to treat oil waste from workshop areas etc.

48.10 The Contractor shall apply to the appropriate authority for installing bore wells for water supply at site.

49.0 ARCHAEOLOGICAL AND HISTORICAL PREVENTION

49.1 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.

49.2 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.

49.3 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.

50.0 LANDSCAPE AND GREENERY

50.1 As far as is reasonably practicable, the Contractor shall maintain ecological balance by preventing deforestation and defacing of natural landscape. In respect of ecological balance, the Contractor shall observe the following instructions.

50.2 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.

50.3 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 smoothened and graded in a manner to conform to natural appearance of the landscape as directed by the Employer.

50.4 A suggested list of trees / shrubs suitable for planting and landscaping is found in Employer's Project SHE Manual.

51.0 FEELING OF TREES

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51.1 The contractor shall identify the number and type of trees that are require to be felled as a result of construction of works and facilities related to this Project and inform the Employer.

51.2 All trees and shrubbery, which are not specifically require 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 this Project except with the previous permission obtained from the Forest Department.

51.3 The Employer shall arrange permission from the forest department for trees to be felled or translocated.

The Employer will permit the removal of trees or shrubs only after prior approval.

51.4 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 used of protective barriers or other methods approved by the Employer. Trees shall not be used for anchorage.

52.0 FLY ASH

52.1 The Employer may require the contractor to use fly ash as a percentage substitution of cement, in concrete for certain structures and works.

52.2 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.

52.3 The reporting details on consumption of Fly Ash are found in Employer's SHE Manual.

53.0 WASTE

53.1 The contractor is required to develop, institute and maintain a Waste Management Programme (WMP) during the construction of the project for his works, which may include:

i. Identification of disposal sites.
ii. Identification of quantities to be excavated and disposed of.
iii. Identification of split between waste and inert material
iv. Identification of amounts intended to be stored temporarily on site location of such storage.
v. Identification of intended transport means and route.
vi. Obtaining permission, where required, for disposal.

53.2 Such a mechanism is intended to ensure that the designation of areas for the segregation and temporary storage of reusable and recyclable materials are incorporate into the WMP. The WMP should be prepared and submitted to the Engineer for approval.

53.3 The Contractor shall handle waste in a manner that ensures they are held securely without loss or leakage thus minimizing potential for pollution. The Contractor shall maintain and clean waste storage areas regularly.

53.4 The Contractor shall remove waste in a timely manner and disposed of at landfill sites after obtaining approval of the competent authorities namely BBMP, BDA, BMRDA, BWSSB.

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53.5 Burning of wastes is prohibited. The Contractor shall not burn debris or vegetation or construction waste on the site but remove it in accordance with 50.1 above.

53.6 The Contractor shall make arrangement to dispose of metal scrap and other saleable waste to authorized dealer and make available to the Employer on request, records of such sales.

54.0 HAZARDOUS WASTE MANAGEMENT

54.1 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, as amended from time to time shall be disposed of in a manner in compliance with the procedure given in the rules under the aforesaid act.

54.2 Chemicals classified as hazardous chemicals under “Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 incorporated under the provisions of Environment (Protection) Act, 1986 shall be disposed of in a manner in compliance with the procedure given in the rules under the aforesaid act.

54.3 The contractor shall identify the nature and quantity of hazardous waste generated as a result of his activities and shall file a 'Request for Authorization' with Bangalore Pollution Control Board along with a map showing the location of storage area.

54.4 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

54.5 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.

54.6 The contractor shall approach only Authorized Recyclers of Hazardous Waste for disposal of Hazardous Waste, under intimation to the Employer.

54.7 Submittal of all environment related documents and records pertaining to monitoring and trend analysis on key parameters such as but not limited to consumption/efficient use of resources such as energy, water, material such as cement, fly ash, iron and steel, recycle/reuse of waste etc. that shall have demonstrated continual improvement in the implementation of Environmental Management System. Failure to do so the employer shall impose appropriate penalty as indicated under penalty clause.

55.0 ENERGY MANAGEMENT

55.1 The contractor shall use and maintain equipment so as to conserve energy and shall be able to produce demonstrable evidence of the same upon Employer's request.

55.2 Measures to conserve energy include but not limited to the following:

i. Use of energy efficient motors and pumps
ii. Use of energy efficient lighting, which uses energy efficient luminaries
iii. Adequate and uniform illumination level at construction sites suitable for the task
iv. Proper size and length of cables and wires to match the rating of equipment
v. Use of energy efficient air conditioners

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55.3 The contractor shall design site offices maximum daylight and minimum heat gain. The rooms shall be well insulated to enhance the efficiency of air conditioners and the use of solar films on windows may be used where feasible.

PART -V: PENALTY AND AWARDS

56.0 CHARGES TO BE RECOVERED FROM CONTRACTOR FOR UNSAFE ACT OR CONDITION

56.1 K-RIDE is safety conscious organization. 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 K-RIDE. Most of the accidents are avoidable and caused preliminary due to contractors' negligence. Hence K-RIDE shall recover the cost of damages from the contractors for every reportable incident (fatality / injury).

56.2 In addition, every K-RIDE 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 damage our reputation. Because of the non-voluntary compliance of contractors to the condition of contract on SHE and project SHE manual, K-RIDE has been forced to establish safety-enforcing organization. The cost of established such organization is to be recovered from contractors for all observed safety violations at sites.

56.3 The following table indicates the Safety, Health and Environment violation (unsafe act / unsafe condition) and charges to be recovered from contractors.

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SL. NO	TOPIC	UNSAFE ACT/UNSAFE CONDITION	DEDUCTIBLE AMOUNT
1	SHE Policy & Plan	i) SHE policy non-compliance of clause 4.1	Rs.5,000 per single violation, compounded to a maximum of Rs.25,000 at any single
		SHE plan: i. Not as per Employers' content and coverage (clause 4.2, 4.7) ii. Delay in submission (clause 4.2, 4.4) iii. Not updated as per employer's instruction as per clause 4.4 iv. Copies not provided to all required	Rs.1,00,000 per single violation, compounded to a maximum of Rs.2,00,000 at any single instance.
2	SHE Organization	i. Not complying to the minimum manpower requirements as mentioned in General Instruction K- RIDE /SHE/CEO/ 001(clause 6.1.1) ii. Not filling up the vacancies created due to SHE personnel leaving the contractor within 14 days. (clause 6.7) iii. SHE organization not provided with required Audio-visual and other equipment's as per General Instruction K-RIDE / SHE/ CEO/03 (clause 6.9.2) iv. Employing through outsourcing agencies and SHE personal are not in the payroll of the main contractor (Clause 6.5.1) v. Disobedience / Improper conduct of any SHE personnel. (clause 6.2) vi. Chief SHE Manager not reporting directly to CPM of contractor. (Clause 6.6)	Rs.1,00,000 per month for first month and Rs.2,00,000 for subsequent months Rs. 50,000 per month for first month and Rs.1,00,000 for subsequent months For items iii), iv), v) and vi) Rs.50,000 for first violation and Rs.1,00,000 for subsequent violations
3.	SHE Committee	i. Failed to formulate or conduct SHE Committee meeting for any month (clause 7.4) ii. Contractor and Sub-contractor representatives not attending SHE Committee meetings (clause 7.10) iii. Failed to conduct Site inspection before conducting SHE Committee meeting (clause 7.2.1 (viii)) iv. Failed to send SHE Committee Meeting minutes or Agenda to Employer in time (clause 7.8.1, 7.9.1) v. Non-adherence of clause 7.7.1 vi. Non-adherence of clause 7.9	Rs.1,00,000 for the first violation and Rs.5,00,000 for the subsequent violations Rs.5, 000 to the contractor of the member who had not attended the meeting for first violation and Rs. 25,000 for subsequent violations. For item iii), iv), v) and vi) Rs.25,000 for first violation and Rs.50,000 for subsequent violations
4.	ID card	Non-adherence of clause 8.1, 8.2 and 8.3	Rs.1,00,000 for first violation and Rs.2,00,000 for subsequent violations
5.	SHE Training	i. not complying to the requirements as mentioned in conditions of contract on SHE and project SHE manual with regard to: ii. Induction training not given (clause 8.1) iii. Supervisor/engineer/manager training not conducted as per clause 9.6 iv. Refresher training as per clause 9.7 and 9.11 not conducted v. Tool-box talk not conducted as per clause 9.8 vi. Skill development training not conducted as clause 9.9 vii. Daily Safety Oath not conducted as per clause 9.10 viii. Top management behavior based SHE training conducted (clause 9.4)	For item 1 a) to g) Rs.50,000 for first violation on and Rs.1,00,000 for subsequent violations
6.	SHE Inspection	i. Not complying to the requirements as mentioned in conditions of contract on SHE and project SHE manual as per clause 10.0 ii. Noncompliance of clause 10.3.6	Rs.50,000 for first violation and Rs.1,00,000 for subsequent violations
7.	SHE audit	i. Internal Audit: MARS ii. Not conducted as per SHE Plan (clause 11.2.1) iii. Report not sent to Employer (clause 1.2.6) iv. Action not taken for any month (clause 11.2.4)	For item i) to iii) Rs.50, 000 for first violation and Rs.1,00,000 for subsequent violations

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SL. NO	TOPIC	UNSAFE ACT/UNSAFE CONDITION	DEDUCTIBLE AMOUNT
		i. External Audit ii. Not conducted as per SHE Plan (clause 11.4.3) iii. Report not sent to employer (clause 11.4.7) iv. Action not taken for any quarter (clause 11.4.9)	For item iv) to vi) Rs.1,00,000 for first violation and Rs.2,00,000 for subsequent violations
8.	SHE. Communication	i. Important days to be observed for SHE ii. awareness as furnished by employer not observed (clause 12.2) iii. Posters as furnished by Employer not printed iv. and displayed (clause 12.2)	Rs. 10,000 for first violation and Rs. 50,000 for subsequent Violations 2,00,000 per contract
9.	SHE Submittals	i. noncompliance of clause 13.1 ii. Noncompliance of clause 13.2 iii. Noncompliance of clause 13.3	For item i) - Rs.50,000 for first violation and Rs.1,00,000 for subsequent Violations For item ii) and iii) Rs.1,00,000 for first violation and Rs.2,00,000 for subsequent violations
10.	Injury and Incidence reporting	i. Fatal accidents ii. Injury accident iii. Abnormal delay in reporting accidents or willful suppression of information about any accidents / dangerous occurrence as per clause 14.1.4 iv. Non-compliance of the clause 14.4	Rs.5,00,000 for first fatality and Rs.10,00,000 for every subsequent fatality. Rs.1,00,000 for first grievously injured person and Rs.2,00,000 for every subsequent grievously injured person (Grievous Injury as defined by Workmen Compensation Act) Rs.1,00,000 for first violation and Rs.2,00,000 for subsequent violations for items iv) and v) Rs. 50,000 for first violation and Rs.1,00,000 for subsequent violations
11	Emergency Preparedness Plan	Non-compliance of the clause 15.1,15.2, 15.3, 15.4, 15.5 and 15.6	Rs.1,00,000 for non-compliance of any of the clauses
12	Housekeeping	i. Housekeeping maintenance register not properly maintained up to date (clause 17.4) ii. Surrounding areas of drinking water tanks, / taps not hygienically cleaned / maintained (clause 17.4) iii. Office, stores, toilet / urinals not properly cleaned and maintained. (Clause 17.4) iv. Required dustbins at appropriate places not provided / not cleaned. (Clause 17.6) v. Stairways, gangways, passageways blocked. (Clause 17.9) vi. Lumber with protruding nails left as such (clause 17.10) vii. Openings unprotected (clause 17.7) viii. Excavated earth not removed within a reasonable time. (Clause 17.15, 47.8) ix. Truck carrying excavated earth not covered / tires not cleaned. (Clause 17.11) x. Vehicles / equipment's parked / placed on roads obstructing free flow of traffic (clause 17.13) xi. Unused surplus cables / steel scraps lying scattered (clause 17.17) xii. Wooden scraps, empty wooden cable drums lying scattered (clause 17.18) xiii. Water stagnation leading to mosquito breeding (clause 42.6.1)	Rs.10,000 per single violation Compounded to a maximum of Rs.1,00,000 at any single instance

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SL. NO	TOPIC	UNSAFE ACT/UNSAFE CONDITION	DEDUCTIBLE AMOUNT
13	Working at Height / Ladders and Scaffolds	i. Not using or anchoring Safety Belt (clause 18.9) ii. Not using Safety Net (clause 18.18) iii. Absence of life line or anchorage point to anchor safety belt (clause 18.19) iv. Non-compliance of clause 18.17 v. Using Bamboo ladders (clause 18.20) vi. Painting of ladders Improper usage (less than 1m extension above landing point, not maintaining 1:4 ratio) (clause 18.20) vii. Aluminium ladders without base rubber bush (clause 18.20) viii. Usage of broken / week ladders (clause 18.20) ix. Usage of re-bar welded ladders (clause 18.20) x. Improper guardrail, toe board, barriers and other means of collective protection (clause 18.16) xi. Improper working platform (clause 18.17) xii. Working at unprotected fragile surface (clause 18.9) xiii. Working at unprotected edges (clause 20.0)	Rs. 10,000 per single violation Compounded to a maximum of Rs.1,00,000 at any single instance
4	Lifting appliances and gear	i. Non availability of fitness certificate per clause 21.3 ii. Documents not displayed on the machine or not available with the operator as per clause 21.4 iii. Maximum safe working load not written on the machine as per clause iv. Non-compliance of 21.6 v. Non –compliance of 21.7 vi. Automatic safe load indicator not provided or not in working condition as per clause 21.8 vii. Age of the operator less than 21 years or without any license and non-compliance of other item as per clause 21.9 viii. Non-compliance of 21.10 ix. Non-compliance of any of the items mentioned regarding rigging requirements as per clause 21.11 x. Failure to submit method statement in case of all critical lifting clause 21.3 xi. Person riding on crane (clause 23.4 xii. Creating more noise and smoke – clause 43.1.1 xiii. Absence of portable fire extinguisher in driver cabin – clause 31.5 xiv. Fail to guard hoist platform (clause 24.0) xv. No fencing of hoist rope movement is (clause 24.0) xvi. Hoist platform not in the horizontal position (clause 21.2)	Rs. 50,000 per single violation Compounded to a maximum of Rs.5,00,000 at any single instance
15	Launching Operation / Erection	Non-adherence of any of the provisions mentioned in clause 22.2	Rest. 50,000 for first violation and Rs.1,00,000 for subsequent violation
16	Site Electrical safety	i. Non-compliance of clause 26.1.1 ii. Non-compliance of clause 26.2.3, 26.2.4 & 26.2.5 iii. Non-compliance of clause 26.3.1 iv. Non-compliance of clause 26.7, 26.8 and 26.9.1 v. Non-compliance of clause 26.10 and 26.13 vi. Non-compliance of clause 28.3.2 vii. Exposed electric lines (fermentative viii. damage) and circuits in the workplace. (Clause 26.5.1) ix. Inserting of wires directly into the socket x. Improper grounding for the electrical appliances (clause 26.7.1) xi. Electrical cables running on the ground (clause 26.8.5 & 26.8.6) xii. Non-compliance clause 27.0	Rs. 10,000 per single violation Compounded to a maximum of Rs.1,00,000 at any single instance

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SL. NO	TOPIC	UNSAFE ACT/UNSAFE CONDITION	DEDUCTIBLE AMOUNT
17	Hand tools and Power tools	Non-compliance of clause 28.0	Rs. 10,000 per single violation Compounded to a maximum of Rs.1,00,000 at any single instance
18	Gas Cutting	i. Wrong colour coding of cylinder. ii. Cylinders not stored in upright position. (clause 29.1) iii. Flash back arrester, non-return valve and regulator not present or not in working condition. (Clause 29.3 & 29.4) iv. Fail to put cylinders in a cylinder trolley. (Clause 29.1) v. Damaged hose and fail to use hose clamps (clause 29.2) vi. Using domestic LPG cylinders (clause 29.5) vii. Fail to store cylinder 6.6m away from fire prone materials (clause 29.8) viii. VIII. Fire extinguisher not placed in the vicinity during operation (clause 29.6)	Rs.10,000 per single violation Compounded to a maximum of Rs.50,000 at any single instance
19	Welding	i. Voltmeter and Ammeter not working (clause 29.9) ii. Non-availability of separate switch in the transformer (clause 29.9) iii. Improper grounding and return path. (Clause 29.10) iv. Damaged and bare openings in the welding cable. (Clause 29.10) v. Damaged holder (clause 29.10) vi. Fire extinguisher not placed in the (clause 6.5.1)	Rs.10,000 per single violation Compounded to a maximum of Rs.50,000 at any single instance
20	Fire precaution	i. Smoking and open flames in fire prone area (clause 31.6) ii. Using more than 24V portable electrical appliances in the fire prone area (clause 34.2.3) iii. Not proper ventilation in cylinder storage area. (Clause 29.8) iv. Absence of fire extinguishers (clause 31.1) v. Fire extinguishers not refilled once in a year (Clause 31.2) vi. Fire extinguisher placed in a not easily accessible location	Rs.5,000 per single violation Compounded to a maximum of Rs.25,000 at any single instance
21.	Excavation, Tunneling and confined Space	i. Non-compliance of clause 34.1.1 ii. Non-compliance of clause 34.2.3 iii. Non-compliance of clause 34.3	For any item from i) and ii) Rs. 10,000 per single violation Compounded to a maximum of Rs. 50,000 at any single instance. For item iii) - Rs.10,000 per first violation and Rs.50,000 for subsequent violations
22.	Work permit system	i. Non-compliance of clause 35.2 ii. Non-compliance of clause 21.11.9	For item i) and ii) Rs.50,000 per first violation and Rs.1,00,000 for subsequent violations
23.	Traffic Management	i. Non-compliance of clause 36.4.1 ii. Non-compliance of clause 36.8.3 iii. Non-compliance of clause 36.9.2 iv. Non-compliance of clause 36.9.3 v. Non-compliance of clause 36.9.7 vi. Non-compliance of clause 36.9.8	Rs.1,00,000 per first violation and Rs.2,00,000 for subsequent violations

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SL. NO	TOPIC	UNSAFE ACT/UNSAFE CONDITION	DEDUCTIBLE AMOUNT
		i. Barricades (clause 36.9.4) ii. Not cleared iii. Not in alignment iv. Not numbered v. Not painted vi. Red lights / reflectors not working vii. Damages not repaired viii. Not Secured properly ix. Barricade inspector not employed x. Protruding Parts / portion repaired xi. Barricades maintaining register not properly maintained upto date.	Rs.25,000 per single violation Compounded to a maximum of Rs.1,00,000 at any single instance
		b. Contractor Vehicles (clause 36.9.5 & 36.9.6) 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.	Rs.25,000 per single violation Compounded to a maximum of Rs.1,00,000 at any single instance
		i. non-cleaning of tires of dumpers and transit mixers (clause 17.11 & 17.14) ii. Mishandling of bentonite like splashing of bentonite outside specified width of barricading iii. Non-cleaning of tires of dumpers and transit mixers before leaving the site and thereby creating a traffic safety hazard to road users	For item i) and ii) Rs.1,00,000 on first observation. Rs. 2,00,000 on second observation Rs. 3,00,000 on third and subsequent observations
24	Batching plant / Casting yard	Non-adherence of any of the provisions mentioned in clause 38.0.	Rs. 10,000 for single violation compounded to a maximum of Rs.1,00,000 at any single instant
25.	PPE	i. Not having (clause 39.1) ii. Not wearing (or) using and kept it elsewhere (clause 39.1) iii. Using damaged one (clause 39.2) Using wrong type (clause 39.5) iv. Using wrong colour helmet or helmet without logo (clause 39.4.1) v. Using for other operation (e.g. Using safety helmet for storing materials or carrying water from one place to other) (clause 39.5) vi. Not conforming to BIS standard (clause 39.2) vii. Non-compliance of clause 39.6, 39.7 and 39.8	For item vii) Rs. 10,000 for first violation and Rs. 50,000 for subsequent violations For item viii) Rs.50,000 for first violation and Rs.1,00,000 for subsequent violations
26	Occupational health	i. Fail to conduct medical examination to workers (clause 42.1) ii. Absence of ambulance van & room (clause 42.3) iii. Workers not having ID card (clause 8.2) iv. Absence of first-aid person in work site. (Clause 42.4) v. Absence or inadequacy of first-aid box. (Clause 42.4) vi. Misuse of first-aid box. (Clause 42.4) vii. First-aid box not satisfy the minimum Indian standard. (Clause 42.4) viii. Smoking inside the construction site (clause 42.7.2) ix. Drink and drive or work (clause 42.7.1) x. Fumigation / insecticides not sprayed to prevent Mosquito breeding (clause 42.6.3) xi. Non-compliance of clause 44.1 and 44.2	Rs.10,000 per single violation Compounded to a maximum of Rs.1,00,000 at any single instance

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SL. NO	TOPIC	UNSAFE ACT/UNSAFE CONDITION	DEDUCTIBLE AMOUNT
27	Labour Welfare measures	i. Inadequate number of toilets (clause 46.1.1) ii. Toilets not cleaned properly (clause 46.1.3) iii. Absence of water facilities for toilets and washing places (clause 46.1.3) iv. Toilet placed more than 500m from the work site (clause 46.1.3) v. Accommodation not provided as per BOCWA (Clause 46.5.1) vi. Absence of drinking water (clause 46.4) vii. Excessive noise and vibration (clause 43.0) viii. Canteen not provided (clause 46.2) ix. Food stuff no served on no loss no profit basis (clause 46.3) x. Crèche not provided (clause 46.6) xi. Non adherence of labour welfare provisions of BOCWA (clause 3.3.1.2) xii. Fail to register establishment and display the registration certificate at workplace (clause 3.3.1.2) xiii. Absence of worker register and record (clause 3.3.1.2) xiv. Fail to display an abstract of BOCWA and BOCWR (clause 3.3.1.2)	Rs.10,000 per single violation Compounded to a maximum of Rs.50,000 at any single instance
28	Environment Management	i. Tire wash facility not provided (clause 47.12) ii. Spillage from vehicles not arrest (clause 48.9) iii. Air monitoring not practiced (clause 47.17) iv. Noise monitoring nor practiced (clause 43.2.1) v. The values of air monitoring and noise monitoring not within acceptable limits (clause 47.12, 43.2.1) vi. Dust control measures at sites not practiced 9clause 47.13) vii. Improper disposal of debris / residues viii. Non-compliance of clause 53.0 & 54.	Rs. 10,000 per single violation Compounded to a maximum of Rs.50,000 at any single instance.
29.	Working near existing railway track	i. To start work without erecting barricading as per requirement. ii. To start work in station area without permit to work or without approved plan. iii. To launch girder for RFO/ROB without approved plan and work permit. iv. Infringement of moving dimension by any vehicle / construction equipment with running train causing disruption of traffic, injury to passenger / fatal incident	Rs. 5,00,000 for first violation and Rs.10,00,000 for Subsequent violation.

56.4 Without limiting to the unsafe acts and or conditions mentioned above in clause 56.3 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 56.3.

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57.0 STOPPAGE OF WORK

57.1 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 equipment's. In such cases, the contractor shall be informed in writing about the nature of hazards and possible injury / accident.

57.2 The contractor shall not proceed with the work until he has complied with each direction to the satisfaction of Employer.

57.3 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.

58.0 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.

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K-RIDE: RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED

APPENDIX NO 1

Memorandum of Understanding between Karnataka Rail Infrastructure Development Company Ltd. (K-RIDE) and the Contractor for safe execution of contract work

This Memorandum of Understanding is made and executed by and between Rail Infrastructure Development Company (Karnataka) Limited - "K-RIDE" a Company registered under the Companies Act 1956 and having its registered office at Rail Infrastructure Development Company (Karnataka) Limited - 'K-RIDE', 'Samparka Soudha', 1st Floor, (Opp. Orion Mall), Dr. Rajkumar Road, Rajajinagar 1st Block,

Bangalore - 560010 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 endeavor.

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,

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(b) Conditions of Contract on Safety, Health and Environment and Project Safety, Health and Environment Manual.

(c) Building and Other Construction Workers (Regulations of Employment and Conditions of Service) Act 1996, Central Rules 1998 and subsequent Karnataka Government Rules 2006, Building and Other Construction Workers Welfare Cess Act 1996 and Rules 1998 and notification [Central & State] Collection of cess.

(d) Indian Electricity Act 2003 and Rules 1956.

(e) Corresponding International / Bureau of Indian Standard Codes.

The amendments to any of the above rules and any other rules & regulations or procedures, circulars, notices & advices lay 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 and Project Safety, Health & Environment Manual

Clause - II The CONTRACTOR shall undertake full responsibility for safe 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 safety and occupational health of personnel and 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

Clause - IV Besides following the guidelines, safety rules and regulations, safety codes given in various safety procedures/documents mentioned above, the CONTRACTOR shall also prepare detailed method statement which includes job safety analysis wherever there are complicated and hazardous/high risk working involved and get it approved from Employer before

Clause - V Any negligence or violation in implementing any of the provision of the conditions of contract on Safety, Health & Environment and K-RIDE project Safety, Health & Environment Manual shall be viewed seriously and the contractor is liable to compensate the employer for the loss of

In witness thereof the Parties hereto by representatives duly authorized have executed this Memorandum of Understanding on _____ day of _____ 20_____.

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Signed on	Signed On
For and on behalf of KRIDE	For and on behalf of (Contractor)
_____	_____
Signature:	Signature:
Name :	Name :
Title :	Title:

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K-RIDE: Rail Infrastructure Development Company (Karnataka) Limited

APPENDIX NO 2

Safety, Welfare and Occupational Health requirements as per BOCW Act 1996 and Rules 1998 and BOCWKR Rules 2006.

(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
P - Refers to relevant rules in BOCWWCR 1998
K - Refers to relevant rules in BOCWKR 2006

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 XV/ and
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,
14.	Issue of wages book	R - 241(2)(a); Form XXIII
15.	Service certificate for each worker	R - 241(2)(b); Form XXIV
16.	Display an abstract of BOCWA and BOCWR	R - 241(5)
17.	Deduction of welfare cess by the government agencies	P - 4(3)
18.	Annual return	R - 242; Form XXV
19.	Drinking water	S - 32
20.	Latrines and Urinals	S - 33 R - 243
21.	Accommodation	S - 34
22.	Crèches	S - 35

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23.	First-aid boxes	S - 36 R - 231 and Schedule III
24.	Canteens	S - 37 R - 244
25.	Food stuff and other items served in the canteens	R - 245
26.	Supply of tea and snacks in work place	R - 246
27.	Food charges on no loss no profit basis	R - 247
28.	BOCWKR 2006 welfare Board Rules	K - 261 to 267
29.	Safety committee	S - 38 R - 208
30.	Safety officer	S - 38 R - 209 and Schedule VII
31.	Reporting of accidents and dangerous occurrences	S - 39 R - 210
32.	Procedure for inquiry in to the causes of accidents	R - 211
33.	Responsibility of employer	S - 44 R - 5
34.	Responsibility of Architects, Project engineer and Designers	R - 6
35.	Responsibility of workmen	R - 8
36.	Responsibility for payment of wages and compensation	S - 45
37.	Penalties and Procedures	S - 47; S - 55
38.	Excessive noise, vibration etc.	R - 34
39.	Fire Protection	R - 35
40.	Emergency action plan	R - 36
41.	Fencing of motors	R - 37
42.	Lifting of carrying of excessive weight	R - 38
43.	Health, Safety and Environmental Policy	R - 39
44.	Dangerous and Harmful Environment	R - 40
45.	Overhead protection	R - 41
46.	Slipping, Tripping, Cutting, Drowning and Falling Hazards	R - 42
47.	Dust, Gases, Fumes, etc.	R - 43
48.	Corrosive substance	R - 49
49.	Eye Protection	R - 45
50.	Head Protection and other protection apparel	R - 46; R - 54
51.	Electrical Hazards	R - 47
52.	Vehicular traffic	R - 48
53.	Stability of structure	R - 49
54.	Illumination	R - 50; R - 124
55.	Stacking of materials	R - 51
56.	Disposal of debris	R - 52
57.	Numbering and marking of floors	R - 53
58.	Lifting appliances and gears	C - VII; R - 55 to 81
59.	Runways and Ramps	C - VIII; R - 82 to 85

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60.	Working on or adjacent to water	C - IX; R - 86 & 87
61.	Transport and earthmoving equipment's	C - X; R - 88 to 95
62.	Concrete work	C - XI; R - 96 to 107
63.	Demolition	C - XII; R - 108 to 118
64.	Excavation and Tunneling works	C - XIII; R - 119 to 168
65.	Ventilation	R - 153
66.	Construction, repair and maintenance of step roof	C - XIV; R - 169 to 171
67.	Ladders and Step ladders	C - XV; R - 172 to 174
68.	Catch platform and hoardings, chutes, safety belts and nets	C - XVI; R - 175 to 180
69.	Structural frame and formworks	C - XVII; R - 181 to 185
70.	Stacking and unstacking	C - XVIII; R - 186 & 187
71.	Scaffold	C - XIX; R - 188 to 205
72.	Cofferdams and Caissons	C - XX; R - 206 to 211
73.	Explosives	C - XXI; R - 212 & 213
74.	Piling	C - XXII; R - 214 to 222
75.	Medical Examination for building and other construction worker, Crane operator and Transport vehicle drivers	R - 81; R - 223(a)(iii) and Schedule XII
76.	Medical examination for occupational health hazards	R - 223(a)(iv)
77.	Charging of workers for Medical Examination	R - 223(b)
78.	Occupational health centers and Medical officers	R - 225 and Schedule X &XI
79.	Ambulance van & room	R - 226 & 227 and Schedule IV & V
80.	Stretchers	R - 228
81.	Occupational health service for building workers	R - 229
82.	Medical examination for occupational health hazards	R - 223(a)(iv)
83.	Emergency care services and emergency treatment	R - 232
84.	Panel of experts and agencies	Central Rule 250
85.	Power of inspectors	Central rule 251 Karnataka Rules 268

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APPENDIX NO 3

SITE SHE PLAN

Contract No	
Contractor Name	
Project Name	
1	Project Highlights i) Title of the content ii) Contractor Number iii) Brief scope of work iv) Location map/ key plan v) Period of the project
2	SHE Policy
3	Site Organization Chart Chart indicating reporting of SHE personnel
4	Roles & Responsibility Individual responsibility of the vi) Project Manager vii) Construction Manager viii) Construction Supervisors ix) SHE Committee Members x) SHE in charge xi) Site Engineers xii) First Line Supervisors xiii) Sub-contractors
5	SHE Committee xiv) Details - Chairman, Members, Secretary and Employer's representative, xv) Procedures for effective conduct of meeting
6	SHE Training
7	Subcontractor Evaluation, Selection and Control
8	SHE Inspection
9	SHE Audit
10	Accident Investigation And Reporting Procedures
11	Occupational Health Measures
12	Labour Welfare Measures
13	Risk assessment and mitigation procedures

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14	Safe work procedures 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) Work Permit Systems viii) Electrical Equipment's ix) Mechanical Equipment's x) Excavation xi) Fire Prevention xiii) Hazardous Chemicals and Solvents xiv) Ionizing Radiation xv) Lighting xvi) Abrasive Blasting
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 Machine
18	Traffic management
19	Housekeeping
20	Environmental Management
21	Emergency Management
22	Visitors and Security arrangement

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APPENDIX NO 4

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 behaviors 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

K-RIDE: Rail Infrastructure Development Company (Karnataka) Limited recognizes HIV / AIDS as a developmental challenge and realizes the need to respond to it by implementing regular HIV / AIDS prevention programmers 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, K-RIDE 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 & Environment (SHE) Managers, 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 State Aids Control Society.

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GENERAL INSTRUCTION: K-RIDE/SHE/CEO/001

SUGGESTIVE MANPOWER REQUIREMENTS OF SHE ORGANIZATION BASED ON CONTRACT VALUE

	1	2	3	4	5	6
Awarded Contract value (in Cr.)	**Chief SHE Manager**	**Senior SHE Manager**	**Junior SHE Manager**	**Safety Steward**	**Senior SHE (Electrical) Engineer**	**Junior SHE (Electrical) Engineer**
Up to 2	-	-	1	-	-	1
Up to 10	-	1	Refer Note 1	Refer Note 1	1	Refer Note 1
Up to 25	1	Refer Note 1			1	
Up to 100	1				1	
Up to 250	1				1	
More than 250	1				1	

	7	8	9	10	11	12	13
Awarded Contract value (in Cr.)	***Junior SHE (Fire) Manager / **Senior SHE (Fire) Manager**	**Occupational Health officer with Necessary Nursing Assistants (Refer Note 3)**	**Environm-ental Manager**	**Senior SHE (Traffic) Engineer (Refer Note 4)**	**Barricade Maintenance Squad (Refer Note 4)**	**House Keeping Squad**	**Labour Welfare Officer**
Up to 2	-	-	-	-	Refer Note 5	Refer Note 6	-
Up to 10	-	1 (PT)	1	1			1
Up to 25	1*	1 (PT)	1	1			1
Up to 100	1*	1 (FT)	1	1			1
Up to 250	1**	2 (FT)	1	1			1 with support staff
More than 250	2**	2 (FT)	1 with support staff	1			1 with support staff

Note 1: Adequate, qualified and trained SHE Professionals with required support staff to be deployed at each worksite at each shift.

Note 2: Adequate, qualified and trained Electrical Engineers / supervisors to be deployed at each worksite at each shift.

Note 3:(PT) means Part-Time and (FT) means Full-time.

Note 4: Senior SHE (Traffic) Engineer Post and Barricade Manager (including the staff) Posts are applicable to contracts where the work has to be executed either below or over the right-of-way like Viaduct, Tunnel Contracts wherein erection and maintenance of barricades are paramount important.

Note 5: One Barricade Manager supported by required supervisors and workmen

Note 6: One Housekeeping Manager supported by required supervisors and workmen

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GENERAL INSTRUCTION: K-RIDE/SHE/CEO/002

MINIMUM QUALIFICATION AND EXPERIENCE FOR (SHE) SAFETY, ELECTRICAL, ENVIRONMENTAL TRAFFIC ENGG. AND OCCUPATIONAL HEALTH PROFESSIONAL

Sl. No	Designation	Qualification	Experience (in years)
1	Chief SHE Manager	**The Chief SHE Manager shall have qualified in any of the following degree/diploma**: i) Post Graduate Diploma in Industrial Safety & Environmental Management (PGDISEM) from National Institute of Industrial Engineering, Mumbai ii) M.E. in Industrial Safety from NIT, Trichy, Tamil Nadu iii) M.E. in Industrial Safety from Mepco Schlenk Engineering College Sivakasi, Tamil Nadu iv) B.E. in Fire and Safety Engg. From Cochin University of Science and Engg. Cochin, Kerala v) B.E. with advanced Safety Management Diploma from CL/ / RL/ Mumba/ / Chennai / Kolkata and Kanpur. vi) B.E / B.Arch., with one-year Full Time advanced Safety diploma from NICMAR, Hyderabad. vii) B. E / B. Tech with any other equivalent State and Central Govt. recognized full time Degree / Diploma in Safety. viii) International qualifications like CSP (Certified Safety Professional), NEBOSH, MIOSH, MSISO etc.	2 {for all category except (iv) and 5yrs for category (iv)}
2	Senior SHE Manager	**As stated in Sl. No:1 and in addition the following categories:** i) B.Sc. (Physics / Chemistry / Math) with one-year Full Time advanced Safety diploma from NICMAR, Hyderabad ii) B.Sc. / Diploma in Engg. with advanced Safety Management Diploma from CL/ / RL/ / Mumba/ / Chennai / Kolkata and Kanpur. iii) B.Sc. (Physics / Chemistry / Math) with One-year Full Time diploma in Safety Engineering offered by West Bengal State Technical Education Departments and similar courses by other states: iv) Any Graduate or diploma holder with 7 years of work experience in full-fledged SHE department of any Public Sector / Leading Private Sector / MNC / with prior approval of employer on	2 {for category (i), (ii) and (iii) only}

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Sl. No	Designation	Qualification	Experience (in years)
3	Junior SHE Manager	i) Degree in Science / Diploma in Engineering with Govt. Recognized safety diplomas from Correspondence course of NICMAR, Annamalai University, National and State Productivity Councils, Other State Technical Education Boards etc. ii) Any Graduate or diploma holder with 5 years of work experience in full- fledged SHE department of any Public Sector / Leading Private Sector / MNC / with prior approval of employer on a case	2 (for category (i) only)
4	Safety Steward	Any basic qualification with any SHE related certificate courses.	2
5	Senior SHE (Electrical Manager	Degree in Electrical Engineering + Govt. recognized Electrical License holder	2
6	Junior SHE (Electrical) Manager	Diploma in Electrical Engineering + Govt. recognized Electrical License holder	1
7	Senior SHE (Fire) Manager	i) B.E. (Fire) from National Fire Service College, Nagpur ii) B.E (Fire & Safety) from Cochin University iii) Graduate with any Govt. recognized diploma in Fire Safety with 5 years of experience	2 (for category (i) and (ii) only)
8	Junior SHE (Fire) Manager	Any Diploma holder with any Govt. recognized diploma in Industrial Fire Safety.	1
9	Occupational Health Officer	MBBS with Govt. recognized degree // diploma in Industrial / occupational health	1
10	Environment Manager	Govt. recognized PG Degree / PG Diploma / Degree in Environmental Engineering / Science	2
11	Senior SHE (Traffic)	Govt. recognized PG Degree / Degree / Diploma in Traffic / Transportation	1
	Engineer	Engineering or Planning	
12	House Keeping Squad Manager	Any Diploma in Engineering	1
13	Barricade Manager	Any Diploma in Engineering	1
14	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

Note 1: In some extraordinary cases where the candidate had earlier worked in K-RIDE or other MRTS Projects they can be considered for the following posts:

i. Senior SHE Manager
ii. Junior SHE Manager
iii. Safety Steward

Depending upon the qualification and no. of years of experience on a case-to-case basis even if they do not possess the prescribed qualification as listed above.

Note 2: In all other cases other than listed under Note 1 irrespective their earlier experience with MRTS projects the candidates shall qualify as specified above.

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K-RIDE: RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED.

GENERAL INSTRUCTION: K-RIDE /SHE/CEO/003

SUGGESTIVE REQUIREMENTS OF SHE 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			
	Upto 25 Cr	A			
	Upto 100 Cr	B			
	Upto 250 Cr	C			
	More than 250 Cr	D			
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 equipment's are a must for conducting periodical in-house safety presentations in the training programme.				
3.	In addition to the above portable hand held digital sound level meter (SLM) and portable hand held digital lux meter are also to be provided.				
Sl. No	SHE monitoring and Audio-Visual Equipment details	SHE monitoring and Audio-Visual equipment required for			
		Group A Contract	Group B Contract	Group C Contract	Group D Contract
1.	Portable hand held Digital Sound Level Meter (SLM)	1	1	1	1
2.	Portable hand held Digital Lux Meter	1	1	1	1
3.	Laptop Computer with standard configuration including multimedia facilities	1	1	1	1
4.	Colour Printer	1	1	1	1
5.	Computer projector with screen	-	1	1	1
6.	Overhead projector	1			
7.	35mm Camera (For taking accident investigation photos in which case the images cannot be easily altered)	1	1	1	1
8.	Digital camera with flash of minimum 4 mega pixel and video facility	1	1	1	2
9.	Digital still camera with flash of minimum 4 mega pixel	1	2	4	6
10.	Portable loudspeaker (for tool-box talk and emergency purpose)	1	1	2	6
11.	Communication facility like mobile phone, walky-talky etc.	For all supervisors and managers/engineers working in Safety, Health & Environment			
12.	Accident investigation Kit containing the following:	1	1	1	2

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SUGGESTIVE REQUIREMENTS OF SHE MONITORING AND AUDIO-VISUAL EQUIPMENTS					
a)	Chalk piece for marking				
b)	Measuring tape for measuring i) Flexible tape - 2m length ii) Metal Foot long scale and iii) Metal tape - 30m				
c)	Equipment tags				
d)	Multipurpose Flash light				
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				

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GENERAL INSTRUCTION: K-RIDE/SHE/CEO/004

TOPICS FOR FIRST DAY AT WORK SHE ORIENTATION TRAINING OF WORKMEN

1. HAZARD IDENTIFICATION PROCEDURE

Hazards on site:

i. Falls
ii. Earthing work
iii. Electricity
iv. Machinery
v. Handling materials
vi. Transport
vii. Site housekeeping
viii. Fire

2. PERSONAL PROTECTIVE EQUIPMENT

i. What is available?
ii. How to obtain it?
iii. Correct use and care

3. HEALTH

i. Site welfare facilities
ii. Potential health hazards
iii. First Aid/CPR

4. DUTIES OF THE CONTRACTOR

i. Brief outline of the responsibilities of the Contractor by law
ii. Details of Contractor's accident prevention policy
iii. K-RIDE's SHE manual
iv. Building and other Constructions Welfare Law

5. EMPLOYEE'S DUTIES

i. Brief outline of responsibilities of employee under law
ii. Explanation of how new employees fit into the Contractor's plan for accident prevention. (Induction and orientation).

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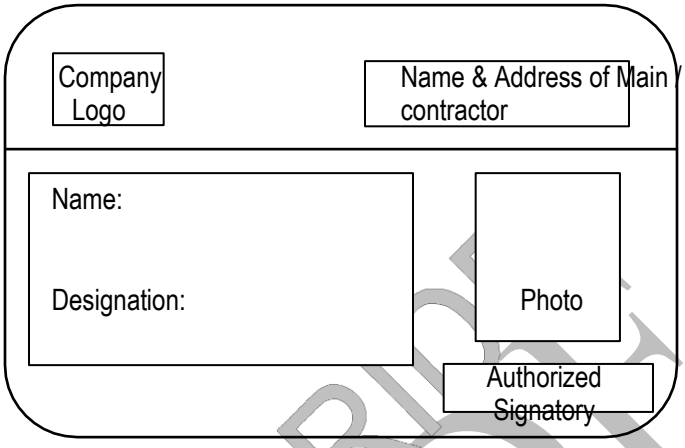
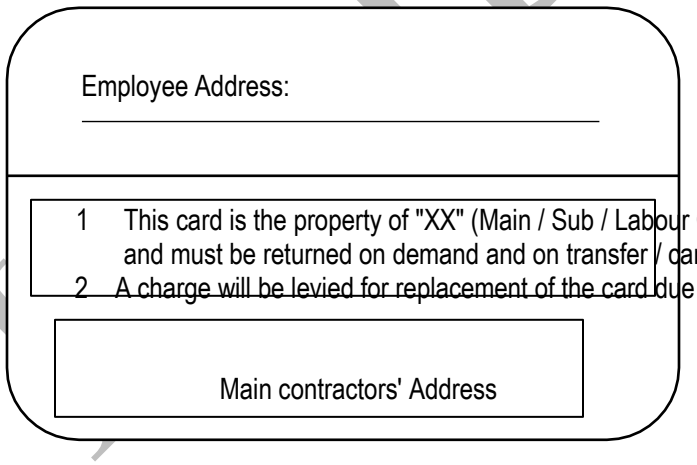
GENERAL INSTRUCTION: K-RIDE/SHE/CEO/005

ID CARD FORMAT

(85 mm x 55mm)
FRONT SIDE OF ID CARD:



BACKSIDE OF ID CARD:



K-RIDE: RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED
GENERAL INSTRUCTION: K-RIDE/SHE/CEO/006

SHE TRAINING DETAILS FOR MANAGERS AND SUPERVISORS

1. The Law and Safety	2. Policy and Administration
i) Statutory requirement ii) Appropriate regulations iii) Duties of employer and employee	i) Effect of incentive on accident prevention ii) Human relations iii) Consultation iv) Safety Officer: duties, aims, objectives
3. Safety and the Supervisor	4. Principles of Accident Prevention
i) i) Safety and efficient production go together ii) Accidents affect morale and public relations	v) Attitudes of management, supervision & operation vi) Methods of achieving safe vii) Operations viii) Accident and injury causes
5. Site Inspection	6. Human Behavior
i) The role of management ii) Hazard Identification Procedure iii) Records results iv) Follow-up procedures v) Feedback	i) Motivating agencies ii) Individual behavior vi) Environmental effects vii) Techniques of persuasion
7. Site housekeeping	8. Health
i) Site organization ii) Relationship of site housekeeping to accident iii) Occurrence iv) Site access v) Equipment storage vi) Material stacking vii) Materials handling	i) Medical examination ii) Hazard to health on site iii) Sanitation and welfare iv) Protective clothing v) First Aid/CPR
9. Personal Protective Equipment	10. Electricity
i) Eye, face, hands, feet and legs ii) Respiratory protective equipment iii) Protection against ionizing radiation	i) Appreciation of electrical hazards ii) Power tools iii) Arc welding iv) Low voltage system v) Lighting and power system on sites vi) vi) ELCB, RRCB, Grounding/Ground fault circuit interrupters (GFCIs)
11. Oxygen and Acetylene Equipment	12. Equipment
i) Cylinder storage and maintenance ii) Condition and maintenance of valves, regulators, gauges iii) Condition and maintenance of hoses and fittings iv) Pressures	i) Accidents related to moving parts of machinery ii) Appreciation of principles of guarding iii) Importance of regular maintenance
13. Transportation	14. Excavations
i) Transport to and from site ii) Hazard connected with site transport iii) Competent drivers iv) Dumpers v) Tipping trucks vi) Movement near excavations	i) Method of shoring ii) Precautions while shoring iii) Precautions at edge of excavations iv) Removal of shoring v) Sheet steel piling
15. Working platforms, Ladders &Scaffolding	16. Cranes and other Lifting Machines

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i) Hazards connected with the use of ladders ii) Maintenance and inspection iii) Type of scaffold iv) Overloading v) Work on roofs vi) Fragile material vii) Openings in walls and floors viii) Use of safety belts and nets	i) Licensing, certification and training required for operation of cranes ii) Slinging methods iii) Signaling iv) Access to crane(s) v) Maintenance and examination vi) Ground conditions vii) Hazards and accident prevention methods conne with the use of different types of cranes/heavy equipment viii) Crane Lift Plan for all lifts
17. Lifting Tackle	18. Fire Prevention and Control
i) Slings - single and multi-legged ii) Safe working loads (SWLs) iii) Safety hooks and eyebolts iv) Cause of failure v) Maintenance and examination	i) Principle causes determining fire ii) Understanding fire chemistry iii) Firefighting equipment iv) Firefighting training
19. Communications	20. Manual Handling
i) Effective methods of communication (particular interest to non-English speaking ii) Method and preparation of reports iii) Safety committees iv) Safety meeting	i) Body posture and procedure for lifting, pushing, pulling, dragging, sitting and walking ii) Ergonomics iii) Stretching exercises

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SHE TRAINING MATRIX

	Management																		Supervisor										Specific											
Types of training		SHE Leadership	SHE Plan	SHE Improvement Plan	Management of Change	SHE Audit & Inspection	SHE Emergency Response & Preparedness	Incident/Accident Investigation & Reporting	SHE Communication	SHE Promotion & Incentives	Traffic Management	Hazard Identification & Risk Analysis	Permit to work system	Confined space entry	scaffolding	Waste Management	Environment Monitoring	Labour welfare measures	Behavioral Based Safety Management (BBSM)	Job/Task Safety Analysis (JSA)	Safety Training Observation Programme (STOP)	Industrial First Aid & CPR	Incident / Accident Investigation & Reporting	Fire fighting	Confined Space Testing & Certification	Scaffold Erection & Inspection	Rigging	Wire Rope Inspection	Crane Inspection	Electrical/Mechanical Isolation	Permit to Work System	Confined Space Working	Explosive Handling & Control	Heavy Lifting Operation	Radiography (X-Ray)	HAZMAT Handling & Control	Welding, Cutting & Bracing	Power Actuated Hand Tool	Electrical/Mechanical Isolation	Roofing Work	Steel erection work	Scaffold Erection/Dismantling	False-work Erection / Dismantling	Painting in Confined Area
Project Manager	•	•	•	•	•,	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•																			
Sr. Construction Manager	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•		•					•							•							
Quality Manager	•	•	•	•	•		•	•	•		•	•	•	•	•	•		•	•	•	•																			
Planning engineer	•	•	•		•	•	•	•	•			•		•							•																			
Construction Manager	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•				•	•	•	•	•										

	Management																			Supervisor												Specific													
Types of training		SHE Leadership	SHE Plan	SHE Improvement Plan	Management of Change	SHE Audit & Inspection	SHE Emergency Response & Preparedness	Incident/Accident Investigation & Reporting	SHE Communication	SHE Promotion & Incentives	Traffic Management	Hazard Identification & Risk Analysis	Permit to work system	Confined space entry	scaffolding	Waste Management	Environment Monitoring	Labour welfare measures	Behavioral Based Safety Management (BBSM)	Job/Task Safety Analysis (JSA)	Safety Training Observation Programme (STOP)	Industrial First Aid & CPR	Incident / Accident Investigation & Reporting	Fire fighting	Confined Space Testing & Certification	Scaffold Erection & Inspection	Rigging	Wire Rope Inspection	Crane Inspection	Electrical/Mechanical Isolation	Permit to Work System	Confined Space Working	Explosive Handling & Control	Heavy Lifting Operation	Radiography (X-Ray)	HAZMAT Handling & Control	Welding, Cutting & Bracing	Power Actuated Hand Tool	Electrical/Mechanical Isolation	Roofing Work	Steel erection work	Scaffold Erection/Dismantling	False-work Erection / Dismantling	Painting in Confined Area
Construction Supervis	•		•	•	•	•	•	•	•	•	•	•	•			•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Construction Forema	•		•				•		•			•	•				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
Machinery Operator	•						•				•					•					•		•			•																	
Material Handler	•						•					•	•		•						•	•	•			•																	
Station Building Workers	•						•						•		•	•					•		•							•			•			•			•		•	•	•
Steel workers	•						•						•		•	•					•		•			•				•			•		•			•	•	•		
Mechanical workers	•						•									•					•		•			•				•			•		•		•	•	•		•
Other Civil workers	•						•									•					•		•			•				•	•	•	•		•	•	•	•	•	•	•	•

	Management																				Supervisor											Specific												
Types of training		SHE Leadership	SHE Plan	SHE Improvement Plan	Management of Change	SHE Audit & Inspection	SHE Emergency Response & Preparedness	Incident/Accident Investigation & Reporting	SHE Communication	SHE Promotion & Incentives	Traffic Management	Hazard Identification & Risk Analysis	Permit to work system	Confined space entry	scaffolding	Waste Management	Environment Monitoring	Labour welfare measures	Behavioral Based Safety Management (BBSM)	Job/Task Safety Analysis (JSA)	Safety Training Observation Programme (STOP)	Industrial First Aid & CPR	Incident / Accident Investigation & Reporting	Fire fighting	Confined Space Testing & Certification	Scaffold Erection & Inspection	Rigging	Wire Rope Inspection	Crane Inspection	Electrical/Mechanical Isolation	Permit to Work System	Confined Space Working	Explosive Handling & Control	Heavy Lifting Operation	Radiography (X-Ray)	HAZMAT Handling & Control	Welding, Cutting & Bracing	Power Actuated Hand Tool	Electrical/Mechanical Isolation	Roofing Work	Steel erection work	Scaffold Erection/Dismantling	False-work Erection / Dismantling	Painting in Confined Area
Electrical workers	•						•									•						•		•			•				•	•		•		•			•	•		•		•
Radiographers	•						•									•						•		•							•	•			•	•						•		
Transportation	•						•				•					•						•		•																				
Drivers																																												
Security Officers	•						•	•			•	•	•		•	•						•	•	•																				
Clerical	•						•									•						•		•																				
Medical Doctor	•	•	•				•	•							•	•		•				•																						
Sr. SHE Manager		•					•								•		•					•																						
Jr. SHE Manager	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•
SHE Supervis	•		•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

K-RIDE: RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED GENERAL INSTRUCTION: K-RIDE/SHE/CEO/008
DAYS TO BE OBSERVED FOR CREATING SHE AWARENESS

1st Monday to Sunday of January	Road Safety Week (Subjected to confirmation from Ministry of Road Transport, Govt. of India every year.)
16th February	Kyoto Protocol Day
March	Red Cross Month
4th March	National Safety Day
7th April	World Health Day
14th April	Fire Safety Day
April 18 to 22	Earth Week
20th April	Earth Day
20th April	Noise Awareness Day
28th April	ILO World Day for Safety and Health at Work
May 1 to 7	Emergency Preparedness Week
5th June	World Environmental Day
12th June	World Day against Child Labors
9th July	Occupational Health Day
17th October	World Trauma Day
1st December	World AIDS Day

K-RIDE

K-RIDE: RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED GENERAL INSTRUCTION: K-RIDE/SHE/CEO/009

MINIMUM REQUIREMENTS OF SHE COMMUNICATION POSTERS / SIGNAGE'S / VIDEO

1. For the purpose of Minimum requirements of SHE Communication Posters / Signage's / Video the contracts are categorized into the following groups:

Contract Value (Initial awarded value of contract)	Group
Up to 25 Cr	A
Up to 100 Cr	B
Up to 250 Cr	C
More than 250 Cr	D

2. Every contractor falling into the above groups shall prepare a SHE Communication Plan as a part of site specific SHE Plan and shall include the following minimum requirement of Posters / Signage's / 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 organizations 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 SHE Plan and get an approval from the Employer before displaying the posters.

TABLE NO 1 - MINIMUM NO. OF POSTERS

Sl. 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 Hindi	Each 100	Each 200	Each 500	Each 1000
3.	Mandatory PPE Usage					
a)	**Signage's** 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-V/ Jacket	5	Each 25	Each 50	Each 75	Each 200

K-RIDE

Sl. 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
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 - **Signage's** to display the	5 types of sizes	Each 25	Each 50	Each 75	Each 200
	messages like SAFE, UNSAFE, FIT FOR USE, AVOID USE etc.	made up of **metal** sheet to be mounted at different locations				
6.	Site Electricity	5	Each 25	Each 50	Each 75	Each 200
7.	Fire and Explosion	5	Each 25	Each 50	Each 75	Each 200
8.	Crane Safety	5	Each 25	Each 50	Each 75	Each 200
9.	Slings	5	Each 25	Each 50	Each 75	Each 200
10.	Rigging Procedures	5	Each 25	Each 50	Each 75	Each 200
11.	Excavation	5	Each 25	Each 50	Each 75	Each 200
12.	Occupational Health (Mosquito Control, HIV/AIDS awareness, Dust Control, Noise Control, No Smoking/Spitting, etc.)	10	Each 25	Each 50	Each 75	Each 200
13.	First – Aid	3	Each 25	Each 50	Each 75	Each 200
14.	Labor Welfare Measures (Payment of Minimum Wages, Avoidance of Child labor, Signing in the Muster Roll, In case of accidents- what to do? etc.	5	Each 25	Each 50	Each 75	Each 200
15.	Importance of "Safety Handbook"	1	25	50	75	200
16.	Traffic Safety (Speed limit, safe crossing and working within barricaded area etc.)	5	Each 25	Each 50	Each 75	Each 200
17.	Environmental Monitoring (Spillage of Muck, hazardous material, Improper drainage, water spray for dust containment etc.)	5	Each 25	Each 50	Each 75	Each 200
18.	Video in Hind/ 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.

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Table No.: 2 – Size of Posters / Signage's

Sl. No	Item	Size
1.	Posters – Standard	17"x22" –135 GSM 4 Color Printing
2.	Posters – Special (Wherever required)	17"x22" card laminated FA Poster
3.	Posters - Mega size (Wherever required)	32"x40" Flex FA Poster
4.	First-Aid Booklet	6"x4"
5.	Safety Handbook	6"x4"
6.	Signage's	Small: 12"x6" Big : 24"x12"
7.	Road Traffic Sign Boards	Strictly as per Indian Road Congress (IRC) specifications

Table No.: 3 – Safety Signage Colour (as per IS 9457)

Sl. No	Type of signage	Color
1	Mandatory	Blue
2	Danger	Yellow
3	Prohibit	Red
4	Safe conditions	Green

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K-RIDE: RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED GENERAL

INSTRUCTION: K-RIDE/SHE/CEO/010

EXPERTS / AGENCIES FOR SHE SERVICES

Sl. No.	Organization	Services
1.	Bureau Veritas Industrial Services (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	• External SHE Audit • SHE Management / Technical Training
2.	Central Labor Institute Post box no: 17851, N.S. Moniker Marg Sion, Mumbai- 400 022 Tel: 022- 4092203 Fax: 022 - 4071986 E-mail: cli@dgfasli.nic.in	• SHE Management / Technical Training
3.	Construction Industry Development Council 801, 8th Floor, Hemkunt Chambers, 89, Nehru Place, New Delhi - 110 019 E-mail: cidc@vsnl.com	• SHE Management / Technical Training
4.	Delhi Productivity Council 1E/10, Swam/ Ramtirath Nagar New Delhi - 110 055 Tel.: 23522835	• SHE Management / Technical Training
5.	Det Norske Veritas AS, 203, Savitr/ Sadan 1, 11 Preet Vihar Community Centre, New Delhi-110 092 Phone: 011-22531502/2253/1503, 22427688/22531278 Fax: 011-2253 0247 Website: www.dnv.com	• External SHE Audit • SHE Management / Technical Training
6.	Dr. A. V. Baliga Memorial trust Link House, Bagadur Shah Zafar Marg Press Area New Delhi - 110 002 Phone: 011 - 23311119	• HIV / AIDS awareness
7.	Dr. Cris Research Centre for Occupational Health & Safety 306, Guru Arjuna Dev Bhawan Ranjit Nagar Complex, New Delhi - 110 008 Phone: 9810040406 Fax: 011 - 25702929 E-mail: team@drcris.com Website: www.drcris.com	• Ambulance Room & Van • Communication Materials • First-aid box • First-aid Training • HIV / AIDS awareness • ID Card • Medical Facilities • SHE Orientation Training
8.	DuPont Safety Resources, E.I. DuPont India Private Limited,	• SHE Management Training

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Sl. No.	Organization	Services
	Arihant Nitco Park 6th Floor, 90, Dr. Radhakrishnan Salai, Mylapore, Chennai-600 004 Phone: 044-2847 2800, 2847 3752 Fax: 044-2847 3800 Mobile: 9381201040 Website: in.dupont.com	
9.	EQMS INDIA PVT. LTD. 304 & 305, 3rd Floor, Rishabh Towers, Plot No. 16, Community Centre, Karkardooma, Delhi - 110092. Phone: 011 - 22374729 / 22374775 Fax: 011- 22374662 E-mail: eqms@eqmsindia.org Website: www.eqmsindia.com	• ISO Certification • SHE Management / Technical Training
10.	Green Cross Consultants 59, 7th Cross, 1st Floor, Ja/ Bharath Nagar, Banglore-560 033 Phone: 080-2549 6782 E-mail: etgrangan@yahoo.com	• SHE Management / Technical Training
11.	HSRTC, PENTASAFE 201, 2nd Floor, Town Centre, Andheri Kurla Road, Marol, Andheri (East), Mumbai-400 059 Phone: 022-2850 2210/20/50 Fax: 022-2850 2260 E-mail: training@penta-safe.com	• SHE Practical Field • Training for Height Safety
12.	Institute of Driving Training & Research, Wazirabad Road, Adjoining Lon/ Road flyover. New Delhi - 110 094 Phone: 011 - 22813474, 22815833 Fax: 011 - 22811131	• SHE Technical Training for • Vehicle Drivers
13.	Institute for Research, Development & Training of Construction Trades & Management An Educational Institute, Society and Trust, 1st Floor, UVCE Alumni Association Building, K.R. Circle, Banglore-560 001 Phone: 080-2229429l22243257 Fax: 080-22243257 E-mail: ubrco@vsnl.com Website: www.instructindia.org	• SHE Technical /Field • Training
14.	International Engineering Company K - 10, South Extension, Part - 2, New Delhi - 110 049 Phone: 011 - 26254761, 26258130 Mobile: 9312260130 E-mail: ashok@intenco.net	• Crane and Lifting appliances and Gears Certification • SHE Practical Field • Training for Crane Safety

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Sl. No.	Organization	Services
15.	L & T Eutectic 32, Sivaji Marg, New Delhi - 110 015 Phone: 011 - 51419538, 51419539 Fax: 011 - 51419600 Website: www.lnteutecticwelding.com	• SHE Practical Field • Training for Welding Safety
16.	Loss Prevention Association of India Ltd. Warden House, Sir P.M. Road, Mumba/ - 400 001 Website: www.lpaindia.org	• SHE Management / Technical Training
17.	MFA Crucial Moments Healthcare Pvt. Ltd., 42, Okhla Industrial Estate, Phase - I/ New Delhi - 110 020 Phone: 011 - 55624000 Fax: 011 - 55624010 E-mail: contact@crucialmoments.net	• First-aid Training
18.	Modicare Foundation 4 Community Centre, New Friends Colony, New Delhi - 110 065 Phone: 011 - 5167235059 Fax: 011 - 26915469 E-mail: nivedita@modi.com nivedita@gmavil.com Website: www.modicarefoundation.org	• HIV / AIDS awareness
19.	National Safety Council HQ and Institute Building 98A, Sector 15, industrial Area C.B.D Belapur, Navi Mumba/ - 400614 Phone: 27579924	• SHE Management / Technical Training
20.	NICMAR (National Institute of Construction Management and Research) 910,9th Floor, Hemkunt Chambers, 89, Nehru Place, New Delhi - 110 019 Phone: 011 - 51618415, 51618417, 51618418 Fax: 011 - 51618416	• SHE Management / Technical Training
21.	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	• ISO Certification
22.	Safety Engineers Association / Safety Educational Trust - India 2/257, First Floor, Dr. Ambedkar Nagar, Manapakkam, Chennai - 600 116 Phone: 044 - 22523461 E-mail: safetrustindia@rediffmail.com	• SHE Management / Technical Training

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Sl. No.	Organization	Services
23.	SHE Management Consultancy & Support Services, 145 A, Pocket-VI, (DDA Flats), Kondli Gharoli, Mayur Vihar-II, Delhi-110 096 Fax: 011-2262 5015 Mobile: 9811153873 E-mail: r_k_p@vsnl.net	• SHE Management / Technical Training
24.	St. Johns' Ambulance Red Cross Road New Delhi - 110 001	• First-aid Training
25.	Vexil Business Process Services Pvt. Ltd. 208, A/4, Savitr/ Nagar, New Delhi - 110 017 Mobile: 9350232714, 98102832201, 9350232716 E-mail: info@vexilbps.com Website: www.vexilbps.com	• Emergency Preparedness Mock drill • SHE Management / Technical Training
26.	Welding Research Institute Bharat Heavy Electricals Ltd. (BHEL) Trichirappalli, Tamil Nadu - 620 014 Phone: 0431 - 2577029, 2577283 Fax: 0431 - 2520770 E-mail: wri@bheltry.co.in	• SHE Practical Field Training for Welding Safety

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K-RIDE: RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED GENERAL

INSTRUCTION: K-RIDE/SHE/CEO/011

MINIMUM LIGHTING REQUIREMENTS

Sl. No.	Facility or Function	Luminance - lx (lm/ft2)
1.	Administrative areas (offices, drafting and meeting rooms, etc.)	540 (50)
2.	**Construction areas** i. general indoor ii. general outdoor iii. 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** i. exit ways, walkways, ladders, stairs	 110 (10)
4.	**Maintenance / Operating areas / Shops** i. vehicle maintenance shop ii. carpentry shop iii. outdoors field maintenance area iv. refueling area, outdoors v. shops, fine details work vi. shops, medium detail work vii. 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** i. indoor stockroom, active/bulk storage ii. indoor rack storage iii. 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)

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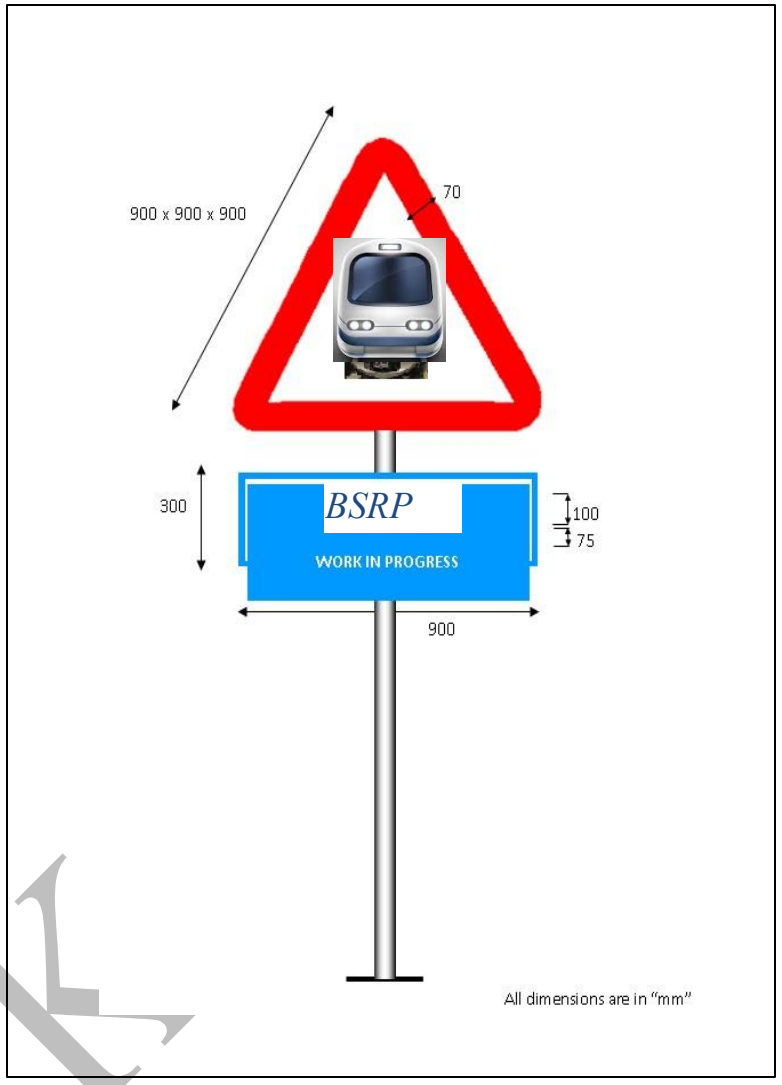
K-RIDE: RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED GENERAL

INSTRUCTION: K-RIDE/SHE/CEO/012

WARNING TRAFFIC SIGN



K-RIDE: RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED

FORM NO: SF/001

FORMATION OF SITE SHE COMMITTEE	
Contract No	
Contractor Name	
Contract Title	

CIRCULAR

Committee

The following SHE Committee is constituted with immediate effect: Chairman:

Members:
1)
2)
3)

Secretary:

Periodicity

The committee will meet at least once in a month on the day (specify date)

Agenda

Secretary will circulate agenda of the meeting at least two days in advance of the schedule date of the meeting.

Circulation

Gist of the meeting will be in minutes in the standard format and circulated to the following under the signature of the secretary

1. Chairman
2. Members

Date: Signed By: ----------

CHAIRMAN

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K-RIDE: RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED

FORM NO: SF/002

MINUTES OF SHE COMMITTEE MEETING	
Contract No.	
Contractor Name	
Contract Title	
Meeting No.	*Date of Meeting*
Location of Meeting	

MEMBERS PRESENT	INVITEES	MEMBERS ABSENT

REPORT SENT TO					
No. of Copies	**Name / Dept.**	**No. of Copies**	**Name / Dept.**	**No. of Copies**	**Name / Dept.**
Prepared by:		Location:		Date:	

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MINUTES OF SHE MEETING				
Item No.	**Description of Discussion**	**Action By**	**Target**	**Remarks**
1	Complaints received from Clients and corrective and preventive action			
2	Review of MOM of previous meeting			
3	NCR's / Observation from third party			
4	First - Aid cases / Reportable accident cases			
5	Future jobs and specific requirement			
6	Status of implementation of Safety plan			
7	Sub-contractor performance			
8	Analysis of first-aid cases			
9	Need for any specific system / training / PPE's / resources			
10	Observation of SHE committee during last walk down			

Next SHE Meeting is scheduled on:

Date:	**Chief SHE Manager (Signature & Name)**
Date:	**Project Manager (Signature & Name)**

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K-RIDE: RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED
FORM NO: SF/003

K-RIDE

COLD WORK PERMIT

(to be used for works other than Hot, Confined Space Entry or Electrical)

S.No.___

Work clearance from_ _____hrs. of date_____ To _____hrs. of date ____(Valid for the shift unless renewed)

Issued to (Department / Section / Contractor) Exact Location of work (Area / Unit / Equipment No. etc.)
Description of work _____

THE FOLLOWING ITEMS SHALL BE CHECKED BEFORE ISSUING THE PERMIT
(Tick mark in the appropriate box. Checklist items marked with asterisk (*) shall be complied by receiver)

Sl No	Item	Done	Not Reqd.	S. No.	Item	Done	Not Reqd.
1	Equipment / Work			1	Equipment water		
2	Surrounding area checked, cleaned and coved			2	Equipment properly steamed / purged		
3	Equipment blinded disconnected / closed isolated / wedge, opened			3	Proper ventilation and lighting provided		
4	Equipment drained and depressurized			4	Area cordoned off & caution boards / tags provided.		
5	Equipment electrically isolated and tagged vide Permit No. -------			5	Gas test: HCs / Toxic etc. HCs = % LEL Toxic gas= ppm		

Remarks:

1. The activity has the following expected residual hazards (Tick the relevant items):

   Lack of Oxygen / H2S, Toxic Gases / Combustible gases / Pyrophoric Iron / Corrosive Chemicals / Steam – Condensate / Others _

2. Following additional PPE to be used in addition to standards PPE (Helmet, Safety Shoes, Hand gloves, Boiler suit) Face Shield/ Apron/ Goggles/ Dust Respirator/ Fresh Air Mask/ Lifeline/ Safety Belt/ Airline/ Earmuff etc.

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3. Additional precaution if any_____

Issuer Name & Designation	Issuer Signature	Receiver Name & Designation	Signature

Clearance renewal:

Date	Time		Additional precautions if any, otherwise mention "NIL"	Issuer's Name, Designation & Signature	Receiver's Name, Designation and Signature
	From	To			

Closing of the work permit:

Receiver: Certified that the subject work has been completed / stopped and area cleared			Issuer: Verified that the job has been completed and area cleared and is safe from any hazard.		
Date & Time	Name & Designation	Signature	Date & Time	Name & Designation	Signature

General Instructions:

1. The work permit shall be filled up carefully and accurately in clear handwriting ensuring that complete information is provided in all the sections / subsections. Sketches should be provided wherever possible to avoid miscommunication.
2. Appropriate safe guards and required personnel protective equipment (PPEs) shall be determined by a careful analysis of the potential hazards and the operations to be performed prior to starting the work.
3. Requirement of standby personnel from Contractor / SHE team if any shall be mentioned in the additional requirement.
4. In case of fire alarm / siren, all work must immediately be stopped.
5. For renewal of work clearance, the issuer shall ensure that the conditions are satisfactory for the work to continue. If the conditions have changed, it may be necessary to issue a new permit or amend the existing permit.
6. This clearance on the same permit can be renewed / extended up to a maximum of seven calendar days.

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7. This permit must be available at work site at all times.

8. This permit shall remain valid for 12 hours of the day of issue / renewal

9. On completion of the work, the permit shall be closed.

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K-RIDE: RAIL INFRASTRUCTURE DEVELOPMENT COMPANY (KARNATAKA) LIMITED

FORM NO: SF/004

K-RIDE
HOT WORK PERMIT
(HOT WORK / ENTRY TO CONFINED SPACE)

S. No._____

Work clearance from_ _____hrs. of date_____ To _____hrs. of date (Valid for the shift unless renewed)

Issued to (Department / Section / Contractor)

Exact Location of work (Area / Unit / Equipment No. etc.) _____

Description of work _____

THE FOLLOWING ITEMS SHALL BE CHECKED BEFORE ISSUING THE PERMIT

(Tick mark in the appropriate box. Checklist items marked with asterisk (*) shall be complied by receiver)

Sl. No.	Item	Done	Not Reqd.	S. No.	Item	Done	Not Reqd.
A	General points			B	For Hot work / Entry to confined Space		
1	Equipment / Work Area inspected			1	Proper ventilation and Lighting provided		
2	Surrounding area checked, cleaned and covered			2	Proper means of exit / escape pro- vided		
3	Sewers, manholes, CBD etc. and hot surfaces nearby covered			3	Standby personnel provided from Process / Main / Contractor / Fire / Safety dept.		
4	Considered hazard from other operations and concerned persons Alerted.			4	Checked for oil and Gas trapped behind the lining in Equipment		
5	Equipment blinded disconnected / closed / isolated / wedge opened			5*	Shield provided against spark		
6	Equipment properly drained and depressurized			6*	Portable equipment / Nozzles properly grounded		
7	Equipment properly steamed / purged			7*	Standby persons provided for entry to confined space		
8	Equipment water flushed						
9	Iron sulfide removed / kept wet			C	For Vehicle Entry		
10	Equipment electrically isolated and tagged vide Permit No.			1*	Spark Arrestor on the mobile equipment / vehicle provided.		

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Sl. No.	Item	Done	Not Reqd.	S. No.	Item	Done	Not Reqd.
11	Gas test: HCs = %LEL Toxic gas = ppm, O2						
12*	Running water hose / Fire extinguisher pro- vided. Fire water system available.			D	For Excavation works		
13*	Area cordoned off and Precautionary tags / Boards provided.	1			Clearance obtained for excavation / road cutting / Dyke cut- ting from concerned dept.		

REMARKS:

1. The activity has the following expected residual hazards (Tick the relevant items): Lack of Oxygen / H2S, Toxic Gases / Combustible gases / Pyrophoric Iron / Corrosive Chemicals / Steam – Condensate / Others
2. Following PPEs to be used in addition to standards PPEs (Helmet, Safety Shoes, Hand gloves, Boiler suit): Face Shield / Apron / Goggles / Dust Respirator / Fresh Air Mask / Lifeline / Safety Belt / Airline / Earmuff etc.
3. Additional precautions if any:_____

Issuer Name & Designation	Issuer Signature	Receiver Name and Designation	Receiver Signature

CLEARANCE RENEWAL:

Date	Time		Additional precautions if any, Otherwise mention "NIL"	Issuer's Name, Designation & Signature	Receiver's Name, Designation and Signature	Receiver's Name, Designation and Signature
	From	To				

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CLOSING OF THE WORK PERMIT:

Receiver: Certified that the subject work has been completed / stopped, and area cleared			Issuer: Verified that he jobs has been completed and area cleared and is safe from any hazard.		
Date & Time	**Name & Designation**	**Signature**	**Date & Time**	**Name & Designation**	**Signature**

GENERAL INSTRUCTIONS

1. The work permit shall be filled up carefully and accurately in clear handwriting ensuring that complete information is provided in all sections / subsections and none of column is left blank. Sketches should be provided wherever possible to avoid miscommunication.
2. Appropriate safe guards and required personnel protective equipment shall be determined by a careful analysis of the potential hazards and the operations to be performed prior to starting the work.
3. In case of fire alarm / siren, all work must immediately be stopped.
4. Only certified vehicle / engines and permitted type of electrical equipment and tools are allowed in operating areas.
5. Welding machines should be located in non-hazardous and ventilated areas.
6. No hot work should be permitted unless the explosive meter reading is Zero.
7. When a person is entering confined space, the receiver must keep minimum two standby-designated persons at the manhole or entry point.
8. Before box up of any vessel manhole cover, ensure that no men / materials are inside the vessel.
9. For renewal of work clearance, the issuer shall ensure that the conditions are satisfactory for the work to continue. If the conditions have changed, it may be necessary to issue anew permit or amend the existing permit.
10. This clearance shall remain valid for 12 hours on the date of issue renewal.
11. This permit must be available at work site at all times.
12. On completion of the work, the permit must be closed and kept as record.

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FORM NO: SF/005

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ELECTRICAL ISOLATION / ENERGISATION PERMIT

Section-A: Isolation Permit.

S.No._____ Request for Isolation:

Date:_____ Time:_____

Department / Section / Area issuing the permit _____

Equipment number to be isolated: _____

Name of the equipment / circuit to be isolated: _____

The above-mentioned equipment / circuit shall be de-energized and isolated from all live conductors to carry out the maintenance work by Section for operational requirement.

_____ _____ _____

Issuer Name Designation Signature

Certificate of Isolation: _____ Date:_____ Time:_____

Circuit no._____ Of _____

Certified that equipment / plant has been electrically isolated by switches / isolators / links / fuses (tick as applicable) and the danger tag is put on the supply panel.

Actions in respect of electrical isolation have been recorded in the electrical shift logbook.

_____ _____ _____

Name of Authorized Person Designation Signature

Section-B: Energisation Permit. S.No._____

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Request for Energisation: Date:_____Time:_____

Department / Section / Area issuing the Permit _____

Equipment number to be energized: _____

Name of the equipment / circuit to be energized: _____

Work on the above mention equipment / circuit has been completed and all the applicable permits closed. This equipment / circuit may be energized.

_____ _____ _____

Issuer Name Designation Signature

Certificate of Energization: Date:_____ Time:____

Certified that Equipment / circuit No._____of _____plant has been electrically energized and the danger tag removed from the supply panel. This is also recorded in the electrical shift logbook.

_____ _____ _____

Name of Authorized Person Designation Signature

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FORM NO: SF/006

COMPETENCY CERTIFICATE

"Certified that Shri _____ P. Way supervisor of M/s. _____has been examined regarding P. Way working on _____ work. His knowledge has been found satisfactory and he is capable of supervising the work safely.

Employer/Authorized Representative /K-RIDE

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Annexure – I

SILICA EXPOSURE REDUCTION STRATEGIES
PART 1 – GENERAL APPLICATION

1.1 DESCRIPTION

A. This addendum specifies minimum environmental health and safety equipment, practices and procedures to minimize exposures to airborne silica dust during quarry operations, stone crushing, transport, and site construction. The scope of this section is limited to dust controls and employee protection in these environments.

B. This addendum shall take precedence over overlapping requirements in the technical Specification unless otherwise stated.

C. This document is an integral part of the contract and the contractor has the responsibility to fully implement it. Any request to deviate from any specified requirement shall be made in writing to the project sponsor.

D. This addendum supplements all local, regional and national laws and regulations concerning the location, environmental emissions, and occupational safety in these operations. If regulatory requirements are more stringent, or require more frequent verification than outlined in this standard, then the regulatory provisions shall take precedence and become the de facto requirement in that jurisdiction.

E. Contractor(s) shall provide a copy of the licensing documentation (NOC/ Consent to Establish) for each facility from where they purchase crushed stone including each quarry, stone crusher mill, and hot mix plant indicating they meet all applicable requirements.

1.2 GENERAL SITE REQUIREMENTS QUARRIES

i) Operator must establish a reliable source of water with adequate capacity and pressure to run all dust suppression systems at the quarry site;

ii) Operator must establish a reliable source of power for all mechanical equipment at the stone quarry site;

iii) Residential areas and temporary employee housing must be located a minimum of 100 meters from any quarrying operations;

iv) Stone drilling, cutting and conveying operations shall be equipped with either continuous wet suppression system or dry dust collectors designed and operated per minimum requirements below.

v) Dust controls in quarries must include water fed compressed air drilling equipment, enclosed screens; enclosed transfer points, covered conveyors, and chutes.

vi) Wet the surface of rock materials with a hose before blasting operations.

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1.3 GENERAL SITE REQUIREMENTS STONE CRUSHER MILLS AND HOT MIX PLANTS

A. Contractor shall submit a detailed plan for any temporary stone crusher or hot mix plant sites intended to be utilized for this project. The plan shall show adjacent areas within 100 meters and depict all structures and roadways. All temporary sites must meet all requirements, specified in this addendum and must obtain a Consent to Establish/ (NOC) from the applicable authorities.

B. Temporary or permanent stone crusher sites or hot mix plants must meet all of the following requirements

1. Site must be at least 250 meters from National and State Highways and 500 meters from schools, educational institutions and religious places.
2. Establish green belt zone as required by applicable local requirements;
3. Residential areas and temporary employee housing must be located a minimum of 200 meters from any stone crushing equipment or operations;
4. Operator must establish a reliable source of water with adequate capacity and pressure to run all dust suppression systems installed at the stone crusher site;
5. Operator must establish a reliable source of electricity for powering all mechanical equipment and pollution controls installed at the stone crusher site;
6. Crushing, screening, and conveying operations shall be equipped with either continuous wet suppression system or dry dust collectors designed and operated per minimum requirements below.
8. Crushing, screening, and conveying operations must be enclosed with sheet metal or other rigid material. Do not use cloth or plastic enclosures.
9. Roadways inside the crusher mill shall be metaled, paved or otherwise treated with chemical suppressants for dust suppression.
10. Waste dust materials from stone crushing operations shall be stored in close containers or closed structures.
11. Lorries exiting the site must be cleaned with shovel and broom to minimize dust being tracked off site.
12. Minimize drop heights to storage piles;
13. Windbreak walls that are at least six times longer than its height shall be in place.
14. Regularly remove and safely dispose of waste materials (rock dust) from the plant site in covered lorries;
15. Fugitive emissions including emissions from stockpiles, conveyors and other areas shall be minimized as far as practicable.
16. Emissions from these sources shall be substantially free from visible dust emission.

1.4 GENERAL SITE REQUIREMENTS CONSTRUCTION SITES

The following requirements shall be implemented during the following operations:

a) Stockpiling;
b) Earth moving/ earth works, grading, and leveling;
c) Transfer from stock pile to work site;
d) Final placement; and
e) Laying the track.

i) Operator must establish a reliable source of water with adequate capacity and for all dust suppression required at the construction site;

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ii) Regularly remove and safely disposing of waste materials (rock dust) from the site in covered lorries;
iii) Waste dust materials from stone crushing operations if used for fill shall be covered within 4 hours;
iv) Minimize spillage of raw materials. Promptly clean up all spillage and accumulations of dust.
v) Fugitive emissions including emissions from stockpiles and other areas shall be minimized as far as practicable. Emissions from these sources shall be substantially free from visible dust emission.

1.5 GENERAL ENVIRONMENTAL PROTECTION

The Contractor shall take steps to protect the environment and surrounding populations from silica dust hazards. Ensure that the water required for dust suppression operations is sourced from a supply that will not impact the quality or availability of water in the surrounding environment. Follow all State requirements for siting criteria and obtain consent from applicable state pollution control board. Ensure that emissions, surface discharges and site closure practices shall comply with all applicable laws including but not limited to:

i. The water (prevention and control of pollution) act 1974; no. 6 of 1974.
ii. The air (prevention and control of pollution) act, 1981; no. 14 of 1981.

PART 2 - TECHNICAL REQUIREMENTS TO MINIMIZE AIRBORNE DUST EMISSIONS

2.1 GENERAL

The handling of raw materials, products, wastes or by-products should be carried out as to minimize the release of airborne dust. Use Table 1 below for guidance in employing dust suppression methods.

Table 1: Feasible Control Measures for Open Dust Sources Fugitive Emission Control Measure

Source	Enclosures	Wet suppression	Chemical stabilization	Green Belt	Surface Cleaning	Wind Break Walls
Unpaved roadways and staging areas		x	x			
Storage piles	x	x	x			x
Stone crushing operations	x	x		x	x	x
Paved roadways and staging areas					x	
Exposed areas	x	x	x	x	x	x
Batch drop operations	x	x				x

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Continuous drop operations	x	x				x

2.2 Wet Methods: Water spray Dust Suppression Systems for Stone Crushing Mills

Details of system components for all stone crusher facilities:

A. Minimum number and locations of pressure spray nozzles:

i) 1 nozzle on the top of the crusher
ii) 2 nozzles at the delivery point of crushing material
iii) 1 nozzle on the bottom of the vibrator screen or rotary screen
iv) 2 nozzles within the storage hopper
v) 1 nozzle at the delivery point of raw materials
vi) 1 nozzle at the bottom of the dust hopper

B. A water pump with adequate motor horsepower and discharge pressure as required for optimal performance of spray nozzles.

C. Minimum number and locations of pressure spray nozzles:

i) 1 nozzle on the top of the crusher
ii) 2 nozzles at the delivery point of crushing material
iii) 1 nozzle on the bottom of the vibrator screen or rotary screen
iv) 2 nozzles within the storage hopper
v) 1 nozzle at the delivery point of raw materials
vi) 1 nozzle at the bottom of the dust hope

D. A water pump with adequate motor horsepower and discharge pressure as required for optimal performance of spray nozzles.

E. Covered water storage tank, with a manhole type maintenance provision. The cover should prevent atmospheric dust from entering the tank. The tank can be located at the ground level. Water from a bore well or other source could be pumped to fill the tank periodically.

F. Centrifugal Monoblock type self-priming pump capable of delivering 3 to 5 kg/cm2 pressure and 72 liters per minute.

G. 100 stainless steel mesh online water filter with two parallel cells. Parallel cells should be set up in order for to allow connections to be reversed such that one cell undergoes backwash cleaning while the other cell is in operation. Only filtered water should be supplied to the spray nozzles.

H. Chemical surfactants or wetting agents may be added to water used in the spraying systems.

I. All spraying systems used for dust suppression shall be maintained in good condition. The flow rate and operating pressure of the spraying liquid/solution shall be sufficient to suppress dust emissions from the corresponding sources. The spraying system shall be able to cover the areas of emission points concerned.

J. All water spray equipment shall be operational during all stone crushing operations at the site.

K. No domestic showers, sprinklers, or other general water spray devices may be substituted for pressure misting nozzles. Nozzles may be hollow cone, solid cone or fan type.

2.3 Dry Methods: Dust Extraction Systems for Stone Crusher Mills/ Hot Mix Plants Details of system components:

A. Minimum requirements for dry dust capture and collection systems:

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i. Hood or enclosure to capture emissions;
ii. Dust collector that separates particulates (e.g. centrifugal dust collectors); And
iii. Duct to transport particulates in air stream from dust collector to air pollution Control device (e.g. baghouse).

B. Capture hoods shall be installed over all crusher units and screens. Enclosures shall surround all sources for dust to the extent possible.

C. Dust collector shall be connected in-line via an enclosed dust to a cyclone and bag house for dust removal.

D. Air handling system shall be a suitable size to prevent the escape of untreated airborne dust. Maintain minimum airflow as per design. A minimum draft velocity of 1 meter/ second shall be maintained through all open hoods.

E. Inspect bag filters routinely and at least once per month for damage and clean, repair or replace as needed

2.4 Dust Containment Enclosures for Stone Crusher Mills and Hot Mix Plants: Particulate emissions shall be controlled by installing dust containment enclosures at the following locations:

A. Primary crusher discharge area

Enclosure shall cover discharge areas to all conveyor belts or secondary crusher

B. Vibratory Screen

All vibratory screens shall be totally enclosed. Screen houses shall be rigid and reasonably dust tight with self-closing doors or close-fitted entrances and exits for access. Where conveyors pass through the screen house, flexible covers should be installed at entries and exits of the conveyors to the housing

C. Conveyor belts (optional)The enclosures should be complete from all the four sides and roof. There should not be any open windows/openings etc. Any opening should be kept closed during operation. The gaps should be sealed using gaskets or wool type packing etc. Crusher enclosures shall be rigid and be fitted with self-closing doors and close- fitting entrances and exits. Where conveyors pass through the crusher enclosures, flexible covers should be installed at entries and exits of the conveyors to the enclosure.

D. Intel Hopper - The inlet hopper shall be enclosed on three sides

E. Rotary Dryer: The plant rotary dryer in a hot mix plant.

Malfunctioning or breakdown of equipment leading to abnormal emissions shall be dealt with promptly. In any case, the abnormal emission due to equipment failure shall be stopped as soon as practicable. The dust collection system shall be routinely inspected and maintained in

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good condition and shall be used as required. The owner shall conduct an inspection of the dust control system at least once per month.

2.5 Minimize Fugitive Dust from Roadways and Stock Piles.

Minimize fugitive dust emissions from all sites where crushed rock is stored. Particulate emissions from unpaved roads and stock piles shall be controlled with the application of suitable compounds to minimize the control of dust. Petroleum-based products, waste oils or other waste products shall never be used for this purpose. Acceptable compounds for this purpose include:

ii) Acrylic polymers;
iii) Solid recycled asphalt;
iv) Chloride compounds (calcium chloride and magnesium chloride);
v) Lignin compounds (lignin sulfate and lignin sulfonate powders);
vi) Natural oil resins (soybean oil); and
vii) Organic resin emulsions.

Contractor shall provide a product information sheet prepared by the manufacturer or distributor indicating the chemical composition, application instructions, and other environmental, safety and health considerations 30 days in advance of its intended application to Engineer's Representative. The product information shall be reviewed and approved in writing before the contractor proceeds to apply it on the project site.

2.6 Minimize Fugitive Dust from Heavy Equipment and Road Transport Vehicles Minimize fugitive dust emissions from all vehicles when loading, unloading and operating vehicles on project sites, staging area or stone crusher mills. Settled dust and particulate emissions from lorries used to transport stone or waste products generated in stone crushing operations and other heavy construction vehicles, shall be minimized in accordance with the following practices:

a. Lorries shall be filled with the material using wet methods. Load waste fine materials and powders onto tankers or closed trucks through a lengthy sleeve attached to the spout to minimize drop height and dust release.
b. Lorries once filled with stone or other waste materials shall be covered before leaving the site. A single layer impermeable tarp shall be placed over the entire load and secured with rope or other tension bar.
c. Designate a decontamination area that is required to be used by all vehicles before exiting the site. This area shall be covered with an impervious tarp. Use wet methods to wipe all accessible exterior surfaces of vehicles and tires.
d. Impose strict speed limits for all vehicles operating on service roads, loading areas, or staging areas.

2.7 Minimize Fugitive Dust During Rock Quarry Operations

Particulate emissions shall be controlled during drilling, blasting, loading, and hauling with wet methods using surfactants applied in either water or foam spray.

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Dust controls for stone drilling shall use water fed into the compressed air to suppress the dust.

2.8 Work Practices for Reducing Employee Exposures

This section pertains to all activities with potential for dust exposure to workers employed in quarries, stone crusher units, hot mix plants, and construction sites.

Use wet methods where feasible to reduce dust emissions from working surface or equipment.

Use a gentle spray or mist to moisten settled dust particles. When washing large quantities of dust from a surface, increase the water force only after pre-wetting all the dust with a gentle spray.

Use only the minimum amount of water needed to get the job done without creating runoff. Rewet surfaces as necessary to control dust.

PART 3 - TECHNICAL REQUIREMENTS FOR WORKER MEDICAL SURVEILLANCE

3.1 GENERAL

This section pertains to workers employed in quarries, stone crusher units, and hot mix plants.

3.2 MEDICAL MONITORING

Medical monitoring shall be conducted for each worker before the start of work and at least at annually thereafter. Examination shall as a minimum meet requirement as set forth below

Examination

1. The employer shall ensure that all medical examinations and procedures are performed by a licensed physician, and are provided at no cost to the employee and at a reasonable time and place.

2. Persons employed under the licensed physicians may administer the pulmonary function testing, chest x-ray or other testing procedures required by this section if adequately trained by an appropriate academic or professional institution.

3. A physical examination directed to the pulmonary system, including a chest x-ray to be administered and pulmonary function tests of forced vital capacity (FVC) and forced expiratory volume at one second (FEV (1)). Interpretation and classification of chest roentgenograms shall be conducted in accordance with ILO classification system. Interpretation of the chest x-ray shall be conducted under the ILO Classification of Radiographs of Pneumoconiosis by a reader trained

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under this protocol. Evaluate chest x- ray for possible tuberculosis because people exposed to silica have increased susceptibility.

Report from Medical Examination: A report must be submitted from all medical examinations conducted within the last 12 months to document compliance with this medical surveillance requirement for each worker employed in quarries and stone crusher units. Submit, at a minimum, for each worker the following:

4. Name and Employee Identification Number

Physician's Written Opinion from examining physician including at a minimum the following:

2.4.2 Whether worker has any detected medical conditions that would place the worker at an increased risk of material health impairment from exposure to silica.

2.4.3 A statement that the worker may wear a negative pressure respirator or any recommended limitations on the worker or on the use of personal protective equipment such as respirators.

2.4.4 Statement that the worker has been informed by the physician of the results of the medical examination and of any medical conditions that may result from dust exposure.

3.3 Record Keeping

1. The employer shall establish and maintain accurate records of medical surveillance to include the physician's written opinion on each employee's health status.
2. Records shall be maintained for at least the duration of the contract period.
3. A copy of each employee's records must be provided to the affected employee who has undergone the medical surveillance stipulated above within 30 days of the date of the examination.

PART 4 - REQUIREMENTS FOR EMPLOYEE TRAINING

4.1 GENERAL

A. This section pertains to all workers employed in quarries, stone crusher units, hot mix plants, and any construction workers using powered tools or equipment to cut, grind, core, or drill concrete or masonry materials. The training provided under this section shall be provided to workers at no cost to these employees and in a language understood by workers at each training program. The

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course shall be taught by an environmental health and safety specialist with adequate education, experience and training.

B. Incorporate general information about silica dust hazards in all orientation and site training sessions covering health or safety aspects.

4.2 TRAINING TOPICS

The employer shall provide training on the following topics to all employees prior to their assignment to jobs where the employer will be conducting these operations during this project

A. The potential health hazards of exposure to airborne silica dust including silicosis, tuberculosis, lung cancer, chronic obstructive lung disease (COPD) and decreased lung function.

B. Methods used by the employer to control employee exposures to airborne silica dust including wet or dry methods for stone crushing, drilling, cutting, local exhaust ventilation systems, and isolation of the process from employees by means of distance, enclosure, or other means, as applicable.

C. Proper use and maintenance of dust reduction systems, including the safe handling and disposal of waste materials.

D. The importance of good personal hygiene and housekeeping practices when working in proximity to silica dust including:

i) Not smoking tobacco products; appropriate methods of cleaning up before eating, and appropriate methods of cleaning clothes.
ii) Avoiding, to the extent practical, activities that would contribute significantly to exposure to airborne dusts.

PART 5 – WORKER PROTECTION

5.1 GENERAL

Contractors shall supply respirators and other specified safety equipment to all workers employed in quarries, stone crusher units, hot mix plants, and any construction workers using powered tools or equipment to cut, grind, core, or drill concrete or masonry materials as described below,

A. Do not eat, drink, smoke, chew gum or smoke tobacco in the work area. To eat, drink, chew, or smoke, workers shall follow the procedures described below and leave the work area.

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B. Provide workers with a clean source of water for a facility to wash hands and face with soap and water. This should be done before eating, smoking or drinking and at the end of the day before going home. Hand washing facilities shall be set up adjacent to the work area.

C. Engineering and work practice controls must be used whenever the possibility exists that employees may be exposed to silica including during stone crushing and construction operations.

D. The use of compressed air, dry sweeping, or any cleaning method that would cause elevated silica dust air concentrations are prohibited.

5.2 RESPIRATORY PROTECTION

Minimum Respiratory Protection: Require that the minimum level of respiratory protection used be Respirator Class FFP3 under European standard EN 143 or N99 under the U.S. National Institute for Occupational Safety and Health (NIOSH) classification. Respirators shall be single use disposal respirators for dusts or reusable half-face air-purifying respirators with high efficiency particulate air filters.

Require that a respirator be worn by anyone in a Work Area at all times during any operation. Do not allow the use of surgical masks or other types of disposable respirators not specified above for any purpose.

Fit testing shall be conducted on any reusable air-purifying respirator assigned to the worker. Only assign respirators to workers medically approved to wear negative pressure respirators as per the physicians written opinion following an annual medical examination as per the requirements in Part 3 of this addendum.

5.3 PROTECTIVE EQUIPMENT

Do not allow workers to leave the work place wearing any clothing or equipment worn during the work shift. Provide the following

A. Eye Protection: Provide eye protection as needed for the type of work being performed.
B. Shoes: Provide shoes to all workers and require that they be worn at all times in the Work Area.
C. Hearing protection: Provide all workers at all quarries, stone crushing sites, and hot mix plants and all other workers exposed to loud noise with ear plugs or other suitable hearing protection.

PART 6 - EMISSION AND AMBIENT AIR LIMITS

6.1 GENERAL

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Contractors shall conduct all required emissions monitoring as required to prove compliance with all applicable State Pollution Control Board Regulations and the limits specified within this section. This section applies to all permanent and temporary stone crushing mills and hot mix plants.

6.2 SUSPENDED PARTICULATE MATTER (SPM)

The Suspended Particulate Matter (SPM) at a distance of 40 meters from a stone crusher unit in a cluster should be less than 600 micro-grams per cubic meter (up/Nm3).

The concentration of total particulate matter in any contained emissions to air, for example the bag filter exhaust air outlet, shall not exceed 150 micro-grams per cubic meter (150 ug/Nm3). The introduction of dilution air to achieve the emission concentration limits shall not be permitted.

Monitoring of the 24-hour average concentration of the total suspended particulate and/or respirable suspended particulate in ambient air shall be conducted at the site boundary and/or any other locations to be agreed by the Authority. SPM sampling shall conform to the United State Environmental Protection Agency's Reference Method for the Determination of Suspended Particulate Matter in the Atmosphere (High-volume Method) and shall be conducted at a frequency of not less than once every 6 months.

PART 7 – CHAIN OF CUSTODY FOR CRUSHED STONE

7.1 GENERAL

Contractor shall maintain records of suppliers for each load of crushed stone brought to the construction site with the procedures as outlined below. Such records shall be collected at a central location at least monthly during the duration of the project and be available for inspection by Engineer's Representative.

7.2 SUPPLIER VALIDATION

Contractor shall maintain records of all suppliers and all internally sourced supplies of crushed stone brought to the construction site to include:

i) Name of supplier;
ii) Location of stone crusher operation;
viii) Location and name of the quarry;
ix) Proof of registration and consent from the applicable Mining Department;
x) Proof of registration and consent for operation from applicable Pollution Control Board;
xi) The supplied material size and quantity (by weight or volume);
xii) Date and specific location material was brought to site.

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PART 8 - RESTORATION OF TEMPORARY STONE CRUSHER SITES

8.1 **GENERAL**

This section applies to the removal of any temporary stone crusher sites established and used during the duration of the project. During operation all temporary operations shall meet the requirements specified in Parts 1 and 2 above.

8.2 Equipment removal

8.3 Temporary equipment shall be cleaned before being taken down and prepared for off- site transport. Clear off all temporary structures and garbage.

8.4 Site restoration

8.5 Remove all debris and visible accumulations of dust from ground surfaces. Cover all bare soil surfaces with vegetation or pavement to reduce exposure to residual silica dust.

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PART 9 – ANNEXURE - II

9.1 National Safety Day (4th March) – History & Background

The Labour Ministers' Conference in its 22nd Session held in 1962 recommended:

"A conference on 'Safety in Factories' should be convened and the question of setting up a National Safety Council for conducting a campaign on accident prevention should be considered".

The President's first conference on Industrial Safety organized in Delhi from 11th to 13th December, 1965 by the Ministry of Labour and Employment, Government of India in cooperation with the State Governments, Employers' Organizations, Trade Unions and Institutions concerned had affirmed "There is a consensus of opinion in favour of setting up National and State Safety Councils".

The 24th Session of the Standing Labour Committee accepted the proposal concerning the constitution of the National Safety Council (NSC) in February, 1966. Accordingly, National Safety Council (NSC) was set up by the Ministry of Labour, Government of India on 4th March, 1966 to generate, develop and sustain a voluntary movement on Safety, Health and Environment (S, H & E) at the National level.

It was registered as a society under Societies Registration Act, 1860 and subsequently as a Public Trust under Bombay Public Trust Act 1950. It is an apex non-profit making, tripartite body, registered under the Societies Registration Act 1860 and the Bombay Public Trust Act 1950.

The foundation day of the National Safety Council of India is observed as National Safety Day since 1972. Focus of the Day to have accident & incident free industrial activities and spread Safety & Occupational Health awareness among all citizens & workers across the country.

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