



DELHI METRO RAIL CORPORATION LIMITED

**Conditions of Contract on Safety and Health in Electrical work
of O&M Wing**

DELHI METRO RAIL CORPORATION LTD.

**Metro Bhawan, Fire Brigade Lane,
Barakhamba Road, New Delhi –110 001**

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PART – I: SAFETY AND HEALTH MANAGEMENT

1.0 General

1.1 Scope

This document defines the principal requirements of the Employer on Safety and Health associated with the contractor / sub-contractor and any other agency to be practiced in works at all time.

1.2 Definition / languages

In this document

- a) The use of ‘shall’ indicates a mandatory requirement.
- b) The use of ‘should’ indicates a guideline that is strongly recommended.
- c) The use of ‘may’ indicates a guideline that is to be considered.
- d) Employer means Delhi Metro Rail Corporation Ltd., (DMRC).
- e) Chief Safety Officer means an officer nominated by DMRC who is overall responsible for monitoring all Safety and Health functions prescribed in this document.
- f) BOCWA means Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996
- g) BOCWR means Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Central Rules, 1998
- h) DBOCWR means Delhi Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Rules, 2002
- i) DG means Director General of Ministry of Labour, Govt. of India.
- j) CIIBC means Chief Inspector of Inspection of Building and Other construction works of Govt. of Delhi.

1.3 Application of this document

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

1.4 Purpose of this document

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 work.

2.0 ‘SHE’ Targets and Goals

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

- a) Zero total recordable injuries.
- b) Zero reportable environmental incidents
- c) 100% incident recording and reporting
- d) 100% adherence of usage of appropriate PPEs at work.
- e) Executing work with least disturbance to the environment, adjoining road users and traffic.

3.0 Compliance

3.1 DMRC’s Safety and Health Policy and Management Systems

The works shall be undertaken in accordance with DMRC’s Safety and Health Policy and Management Systems as amended from time to time provided in Safety and Health Manual.

3.2 Indian statutory requirements

Contractor shall develop thorough understanding about Building and Other construction Workers (Regulation of Employment and Conditions of Service) Act 1996, Central Rules 1998, Delhi Govt. Rules 2002, Building and Other construction workers Welfare Cess Act, 1996 and Central Rules, 1998 and Delhi Building Workers' Welfare Board Rules, not only to satisfy the Inspectors' perspective but the use of legislation as the strong tool for effective SHE management at work place work places. Contractor is strongly advised to practice the principle of voluntary compliance.

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

- a) Indian Electricity Act 2003 and Rules 1956 .
- b) National Building Code, 2005
- c) Factories Act, 1948 and Delhi Factories Rules.
- d) Gas Cylinder Rules, 2003
- e) The Public Liability Insurance Act 1991 and Rules 1991
- f) Employees Compensation Act, 1923 along with allied Rules
- g) Minimum Wages Act, 1948 and Rules 1950
- h) Contract Labour Act, 1970 and Rules 1971
- i) Child Labour (Prohibitions & Regulations) Act, 1986 and Rules 1950
- j) Environment Protection Act, 1986 and Rules 1986
- k) Air (Prevention and control of Pollution) Act, 1981
- l) Water (Prevention and Control of Pollution) Act, 1974
- m) The Noise Pollution (Regulation & Control) Rules, 2000
- n) Notification on Control of Noise from Diesel Generator (DG) sets, 2002
- o) Recycled Plastic Usage Rules, 1998
- p) Notification, Central Ground Water Board, Act January 1997
- q) Manufacture, Storage & Import of Hazardous Chemicals Rules, 1989
- r) The Hazardous Waste (Management & Handling) Rules, 1989
- s) Hazardous Waste Management Rules 1989 (as amended in 1999)
- t) Batteries (Management and Handling) Rules

4.0 ID Card and First day at work, SHE orientation training

Identity card to each staff shall be issued by the Contractor. The contractor should submit application for this in the prescribed format clearly providing basic details affixing photographs and finger prints of the concerned staff. In the absence of valid identity card, the staff shall not be permitted to enter into the station premises/work sites.

The Contractor shall ensure that all personnel working at the site receive an induction Safety and Health training explaining the nature of the work, the hazards that may be encountered during the work place work and the particular hazards attached to their own function within the operation.

5.0 Safety and Health Training

- 5.1 The contractor shall organise quality SHE training to engage Managers, supervisors and other personnel in behavioural change and improve safety performance.

The Contractor shall analyse the training requirements for all the employees and initiate a training program to demonstrate that all persons employed, including subcontractors, are suitably qualified, competent and fit. This will include:

- i) Detailed Job descriptions for all personnel, to include their specific 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
- 5.2 The contractor shall arrange behavioural-based training programmes for all the executives to identify recognise and eliminate unsafe act and unsafe conditions.
The refresher-training programme to all employees shall be conducted once in six months.
- 5.3 Toolbox talk as given in the Employer's Project SHE manual shall be conducted to all high-risk workmen everyday.
- 5.4 On-the spot practical skill development training on height safety including scaffold safety, Fire safety, welding safety, electrical safety etc shall also be conducted to all foremen/workmen who are associated to the concerned jobs.
- 5.6 Contractor shall provide training on Safety, Health & Environment to all its workers/staff/employees/subcontractors of at least 36 hrs at the time of induction.
- 5.7 All the above listed training programmes as well as mentioned in appendix – 7 shall be organised by the contractor only after taking approval from the Employer for the training faculty / organisation, content and durations.
- 6.0 Safety and Health Inspection
- The contractor shall evolve and administer a system of conducting Safety and Health inspections and other risk management analysis on a periodical basis.
- The purpose of SHE inspection is to identify any variation in site activities and operations, machineries, plant and equipment and processes against the Safety and Health Plan and its supplementary procedures and programs.
- 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.
- All inspection records and reports will be properly kept and filed for record purpose. Inspection reports of Planned General Inspection and Routine Inspection will be used for discussion during Safety Meetings.

7.0 Safety & health Communication

The contractor shall take every effort to communicate the Safety and Occupational health management measures through posters campaigns / billboards / banners / glow signs being displayed around the work places as part of the effort to raise safety awareness amongst the work force. Posters should be in Hindi, English and other suitable language deemed appropriate.

8.0 Accident reporting and investigation

8.1 Reporting to Employer

All accidents and dangerous occurrences shall immediately be informed verbally to the Employer. Reports of all accidents (fatal / injury) and dangerous occurrences shall also be sent within 24 hours as per format provided.

No accident / dangerous occurrences is exempted from reporting to the Employer. Any wilful delay in verbal and written reporting to the Employer shall be penalised as per relevant clause.

8.2 Reporting to Govt. organisations

In addition to the above verbal and written reporting to the Employer, a notice of any accident to a worker at the building or work place that causes loss of life; or disables a worker from working for a period of 48 hours or more immediately following the accident;

shall forthwith be sent by telegram, telephone, fax, email or similar other means including special messenger within 24 hours in case of fatal accidents and 72 hours in case of other accidents, to:

- a. the Regional Labour Commissioner (central), wherein the contractor has registered the firm/work
- b. the board with which the worker involved was registered as a beneficiary;
- c. Director General and
- d. the next of kin or other relative of the worker involved in the accident;

8.3 Further, notice of accident shall be sent in respect of an accident which causes loss of life; or disables the injured worker from work for more than 10 days to:

- a. the officer-in-charge of the nearest police station;
- b. the District Magistrate or, if the District Magistrate by order so desires, to
- c. the Sub-Divisional Magistrate

8.4 Where any accident causing disablement that subsequently results in death, notice in writing of such death, shall be sent to the authorities mentioned above within 24 hrs and not later than 72 hours of such death.

8.5 Reporting of dangerous occurrences:

All classes of dangerous occurrences shall be reported to the Inspector having jurisdiction, whether or not any disablement or death caused to the worker. The same shall also be immediately reported to the employer.

8.6 Accident investigation

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

8.7 Employers' independent incident investigation

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.

9.0 Emergency preparedness plan

- i) The Contractor shall prepare an Emergency Response Plan for all work sites. The Emergency Response Plan shall detail the Contractor's procedures, including detailed communications arrangements, for dealing with all emergencies that could affect the Site. This include where applicable, injury, sickness, evacuation, fire, chemical spillage, severe weather and rescue etc.
- ii) 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.
- iii) Contractors shall require to tie-up with the hospitals and fire stations located in the neighbourhood for attending to the casualties promptly and emergency vehicle kept on standby duty during the working hours for the purpose.
- iv) Contractor shall conduct an onsite emergency mock drill for all his workers and his subcontractor's workers.

10.0 Contractor Safety & Health Policy & Plan

As per Section 39 of BOCW Act, Contractor shall formulate a Safety & Health Policy and shall be displayed it at conspicuous places at work sites in Hindi and a local language understood by the majority of workers

Contractor shall submit a detailed and comprehensive contract specific Safety & Health Plan. The Safety & Health plan shall include detailed policies, procedures and regulations which, when implemented, will ensure compliances of the contract provisions.

11.0 Contractor Safety & Health organisation

- i) Contractor shall appoint the required Safety personnel and establish safety organisation based upon the site condition. At least one safety personnel shall be deployed per site per shift.
- ii) The conduct and functioning of the contractor Safety personnel shall be monitored by the Employer. 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.

- iii) No Safety personnel shall be required or permitted to do any work which is unconnected to, inconsistent with or detrimental to the performance of the Safety duties.

PART – II: SAFETY

12.0 Housekeeping

- i) Contractor shall understand and accept that improper is the primary hazard in any work place and ensure that a high degree of is always maintained. Indeed “Cleanliness is indeed next to Godliness”
- ii) General shall be carried out by the contractor and ensured at all times at Work place, Labour Camp, Stores, Offices and toilets/urinals.
- iii) All stairways, passageways and gangways shall be maintained without any blockages or obstructions. All emergency exits passageways, exits fire doors, break-glass alarm points, fire fighting equipment, first aid stations, and other emergency stations shall be kept clean, unobstructed and in good working order.
- iv) Water logging on work places shall not be allowed.
- v) Proper and safe stacking of material needs to be ensured.
- vi) All wooden scrap, empty wooden cable drums and other combustible packing materials, shall be removed from work place to identified location(s).
- vii) Some DO's and DON'T's for Working Staff

DO'S AND DON'TS FOR STAFF

DO'S

- a In case of fire / anything unusual on electric traction equipment or wires, inform the station controller/Manager.
- b Extinguish fire by special extinguishers (carbon tetrachloride or carbon dioxide type, if available).
- c Ensure no water jet to be directed at the fire under any circumstances.
- d Before taking up the work on a line running parallel to 25 KV AC lines, the line shall be earthed on both sides. Ensure that the distance between the two earths used for protection does not exceed 1km.
- e Keep clear of the track and avoid contact with the rails when electric train within 250m.
- f Special care should be taken to carry long pipes, poles or ladders so that it should not come in contact with or within 2 meters of live OHE.
- g Cleaning work other than that of surface (i.e. of beam, pillars etc.) should be done during block period only.
- h Whenever washing or cleaning using water jets is done, take appropriate power block.
- i Cases of electric shock arising out of contact with 25 KV A.C traction equipment shall be reported immediately to TPC.

DON'Ts

- a. Do not approach within 2 meters of any traction wires or live equipment.
- b. Do not work on or near traction wires or any live equipment unless they are made dead, earthed and shut down notices/ permit to work obtained.
- c. Do not enter any switching station or remote control centre unless specially permitted.
- d. Do not touch a person in contact with live traction wires. Remove body only after power supply is switched off & earthed.
- e. Do not touch any traction wire hanging from the mast or fallen on the ground and do not allow anyone else to touch it.
- f. Cleaning work with conducting materials like Aluminium/ Steel rods should be avoided at all times when power block is not availed.
- g. Do not lift or raise your tools towards traction wires.
- h. Do not damage the plinth continuity, connection to BEC, OPC and handrail continuity.

- i. Do not use steel tape or metallic tape or tape with woven metal reinforcement in electrified area.
- j. Do not forget to give artificial respiration to the victim as per the prescribed procedure laid down at shock treatment charts.
- k. Metallic telescopic rods are prohibited for use in the DMRC station.
- l. Do not throw garbage in haste. Dispose it properly at designated place.
- m. Do not dispose dirty water in to

13.0 Working at Height

The contractor shall ensure that work at height is

- a. properly planned for any emergencies and rescue
- b. appropriately supervised; and
- c. carried out in a manner, which is reasonably practicable safe.

13.1 Falling objects

- i) 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.
- ii) 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.
- iii) 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.
- iv) Every contractor shall ensure that, every workplace where chances of fall of material or other may exist shall be properly barricaded or provided with suitable safety net as well as fall catch arrestors etc.

13.2 Danger areas

Every contractor shall ensure that

- i) where a workplace contains an area in which, owing to the nature of the work, there is a risk of any person at work,
 - a) falling a distance; or
 - b) being struck by a falling object,which is liable to cause personal injury, the workplace is so far as is reasonably practicable equipped with devices preventing unauthorised persons from entering such area; and such area is clearly indicated.

13.3 Inspection of work equipment

The contractor shall ensure that, all work equipment used at work place and exposed to conditions causing deterioration shall be inspected regularly and recorded.

13.4 Requirements for all Working Platforms

Every contractor shall ensure that whenever necessary proper, safe and adequate to the working requirement, working platforms is provided

13.5 Every contractor shall ensure that fall protection measures are provided for safety means of access as well as safe working.

13.6 Requirements for Ladders

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.

- i) Only metal ladders shall be allowed. Bamboo ladders are prohibited.
- ii) 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.
- iii) A ladder shall be so positioned as to ensure its stability during use

- iv) A portable ladder shall be prevented from slipping during use by -
 - a. securing the stiles at or near their upper or lower ends;
 - b. an effective anti-slip or other effective stability device; or
 - c. any other arrangement of equivalent effectiveness.
- v) 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.
- vi) No interlocking or extension ladder shall be used unless its sections are prevented from moving relative to each other while in use.
- vii) A mobile ladder shall be prevented from moving before it is stepped on.
- viii) Where a ladder or run of ladders raises a vertical distance of 9 metres or more above its base, there shall, where reasonably practicable, be provided at suitable intervals sufficient safe landing areas or rest platforms.
- ix) Every ladder shall be used in such a way that
 - (a) a secure handhold and secure support are always available to the user; and
 - (b) the user can maintain a safe handhold when carrying a load unless, in the case of a step ladder, the maintenance of a handhold is not practicable when a load is carried, and a risk assessment has demonstrated that the use of a stepladder is justified because of
 - (i) the low risk; and
 - (ii) the short duration of use.

13.7 Fragile surfaces

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.

Where it is not reasonably practicable to carry out work safely and under appropriate ergonomic conditions without passing across or near, or working on, from or near, a fragile surface, every contractor shall,

- (a) ensure, so far as is reasonably practicable, that suitable and sufficient platforms, coverings, guard rails or similar means of support or protection are provided and used so that any foreseeable loading is supported by such supports or borne by such protection;
- (b) where a risk of a person at work falling remains despite the measures taken under the preceding provisions of this regulation, take suitable and sufficient measures to minimise the distances and consequences of his fall.

Where any person at work may pass across or near, or work on, from or near, a fragile surface, every contractor shall ensure that

- (a) prominent warning notices are so far as is reasonably practicable affixed at the approach to the place where the fragile surface is situated; or
- (b) where that is not reasonably practicable, such persons are made aware of it by other means.

14.0 Slipping, Tripping, Cutting and Falling Hazards

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

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

15.0 Lifting Appliances and Gear

- i) The contractor shall ensure that a valid certificate of fitness is available for all lifting appliances, if used.
- ii) The laminated photocopies of fitness certificate issued by competent person, 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.
- iii) All lifting appliances and loose gears shall be clearly marked for its safe working load and identification by stamping or other suitable means.

15.1 Test and periodical examination of lifting appliances and gears

- i) 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.
- ii) 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

15.2 Automatic safe load indicators

As stipulated in Rule 57 of DBOCW Rules, every lifting appliances and gears like cranes, hydras etc, if so constructed that the safe working load may be varied by raising or lowering of the jib or otherwise shall be attached with an automatic indicator of safe working loads approved by Bureau of Indian standards/ International certifying bodies which gives a warning to the operator and arrests further movements of the lifting parts.

15.3 Mandatory rigging requirements

- i) Rigging shall be done under experienced and qualified rigger only.
- ii) The primary requirement in rigging shall be to assess the weight of load before attempting any lift.
- iii) 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.
- iv) 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.
- v) Hand spliced slings up to 32mm diameter shall not be used at site for any lifting purpose.
- vi) No load shall be slewed over public areas without stopping the pedestrians and road traffic first.
- vii) Requirements of outriggers
 - a) All outriggers shall be fully extended and at all tyres are clear of the ground
 - b) Heavy duty blocking having large bearing area shall be necessary to prevent sinking of floats
- viii) All loads shall have tag-lines attached in order to ensure that the load can be controlled at all times.
- ix) No close working to any live overhead power line is permitted without the operation of a strict Permit to Work.
- x) Minimum lighting is to be ensured at all lifting operations.

16.0 Work place machinery

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

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

17.0 Machine and General Area Guarding

The contractor shall ensure at the work place all dangerous and moving parts of machines are securely fenced. The fencing of dangerous part of machinery is not removed while such machinery is in motion or in use.

18.0 Manual lifting and carrying of excessive weight

The contractor shall ensure at his work place no staff, lifts by hand or carries overhead or over his back or shoulders any material, article, tool or appliances exceeding in weight as said below, unless aided by another staff or device.

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

19.0 Work place Electricity

- i) Every contractor shall ensure safe usage practices of power supply as well as safe electrical equipments fitted with protection devices.
- ii) Cables shall be selected after full consideration of the condition to which they shall be exposed and the duties for which they are required.
- iii) The contractor shall ensure plugs, socket-outlets, and couplers available in the work place as per IS/applicable standard.
- iv) Every joint and connection in a system shall be mechanically and electrically suitable for use to prevent danger. Proper cable connectors as per standards shall only be used to connect cables.
- v) No loose connections or tapped joints shall be allowed anywhere in the work place, office area, stores and other areas.
- vi) 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.
- vii) 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.
- viii) 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.

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

20.0 Work on or near live conductors

- i) For working near OHE & other Electrical installation, the rules/measures provided in the Safety Circular – 2 of O&M wing shall be followed.

- ii) 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) Suitable precautions (including where necessary the provision of suitable protective equipment) are taken to prevent injury.

20.1 Inspection and Maintenance

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

21.0 Hand Tools and Power Tools

- i) The contractor is wholly responsible for the safe condition of plant and equipment used by his employees and that of his sub-contractors.
- ii) Use of short / damaged hand tools shall be avoided and the contractor shall ensure all his hand tools used at his work place are safe to work with or stored and shall also train his employees (including his sub-contractors) for proper use thereby.
- iii) All hand tools and power tools shall be duly inspected before use for safe operation.
- iv) The contractor shall ensure that power tools (electric) are properly grounded or / and double insulated.

22.0 Fire prevention, protection and fighting system

- i) The contractor shall ensure that storage area is provided with fire extinguishing equipment sufficient to extinguish any small fire at work place.
- ii) Recharging of fire extinguishers and their proper maintenance should be ensured and as a minimum should meet Indian National Standards
- iii) Combustible scrap and other work place debris should be disposed off on a regular basis.

23.0 Corrosive substances

Corrosive substances including alkalis and acids shall be stored and used by a person dealing with such substances at a building / work place in a manner that it does not endanger the 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 worker, the contractor shall take immediate remedial measures.

24.0 Work Permit system

24.1 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 permit is needed when work place work can only be carried out if normal safeguards are dropped or when new hazards are introduced by the work. Examples of high-risk activities include but are not limited to:

- a. Entry into confined spaces
- b. Lifting/Lowering activity
- c. Excavation
- d. Work in close proximity to overhead power lines and telecommunication cables.
- e. Work with electrical equipment and operations closer to live power line
- f. Working on track & operation rooms

24.2 A Work Permit authorisation form shall be completed with the maximum duration period not exceeding one shift.

- 24.3 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.
- 25.0 Work to adjacent track
Whenever work is to be conducted in close proximity to the live track then the following measures shall need to be addressed:
- The rules/measures provided in the Safety Circular – 2 of O&M manual shall be followed.
 - No persons are allowed to work onto the track unless specific authority has been given by DMRC. Adequate protection in accordance with the O&M requirements shall be followed.
 - All persons shall wear high visibility clothing at all times.
 - Any induction training requirements of the Track shall be strictly observed
- 26.0 Lighting
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.
- 27.0 Welding, Gouging and Cutting
- 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.
 - Hose clamp or clip shall be used to connect hoses firmly in both sides of cylinders and torches.
 - All gas cylinders shall be fixed with pressure regulator and dial gauges
 - Non-return valve and Flashback arrester shall be fixed at both end of cylinder and torch.
 - Domestic LPG cylinders shall not be used for Gas welding and Cutting purpose.
 - 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.
 - Use firewatchers if there is a possibility of ignition unobserved by the operator (e.g. on the other side of bulkheads).
 - Oxygen cylinders and flammable gas cylinders shall be stored separately, at least 6.6 meters (20 feet) apart or separated by a fire proof, 1.6 meters (5 feet) high partition. Flammable substances shall not be stored within 50 feet of cylinder storage areas.
 - Transformer used for electrical arc welding shall be fixed with Ammeter and Voltmeter and also fixed with separate main power switch.
 - 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.
 - Use a low voltage open circuit relay device if welding with alternating current in constricted or damp places.
 - 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.
 - Avoid being in contact with water or wet floors when welding. Use duckboards or rubber protection.
 - All electrical installations shall meet the IS: 5571: 1997 and NFPA 70 for gas cylinder storage area and other hazardous areas.
 - The current for Electric arc welding shall not exceed 300 A on a hand welding operation.

28.0 Demolition

- i) The Contractor shall ensure that all demolition works be carried out in a controlled manner under the management of experienced and competent supervision.
- ii) 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..
- iii) No demolishing work be performed if the adjacent structure seems to be unsafe unless and until remedial measures like sheet piling, shoring, bracing or similar means be ensured for safety and stability for adjacent structure from collapsing.
- iv) Debris / bricks and other materials or articles shall be removed by means of chutes, buckets or hoists through openings through floors or any other safe means.
- v) 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.

29.0 Excavation

- i) Where any site 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.
- 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 site 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.

30.0 Personal Protective Equipments (PPEs)

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

- A. Height Work
 - i. Safety Helmet
 - ii. Full body Safety harness
- B. Electrical Operation Room
 - i. Shoes with insulated sole/Rubber Gum boots
 - ii. Electrically insulated Gloves
- C. Chemical Handling
 - i. Eye protection i.e Safety goggles
 - ii. Chemical Gloves for hand protection

PART – III: OCCUPATIONAL HEALTH AND WELFARE

31.0 Physical fitness of workmen

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.

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

32.0 Medical Facilities

32.1 Medical Examination

As per BOCW relevant rules, the contractor shall arrange a medical examination of all his employees including his sub-contractor employees employed 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.

32.2 Ambulance van

The contractor shall ensure that 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.

32.3 First-aid boxes

The contractor shall ensure at a work place one First-aid box provided and maintained for providing First-aid to the workers. Every First-aid box is distinctly marked “First-aid” and is equipped with the articles specified in BOCWR.

33.0 Welfare measures for workers

33.1 Toilets and Urinals

Generally facilities are available at Metro Station, Depots & other work places and maintained by agencies engaged by DMRC. Contractors workers may utilised these facilities on payment basis

33.2 Drinking water

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

34.0 Noise

The Contractor shall 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.

Noise level reduction measures shall include the following:

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

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

35.0 Illumination

Contractor shall take every effort to illuminate the work site as per the Employer's requirement. The contractor shall conduct a monthly illumination monitoring by lux meter for all the locations and the report shall be sent to the Employer

PART - IV: PENALTY AND AWARDS**36.0 Charges to be recovered from contractor for unsafe act or condition**

36.1 DMRC has built an image of safety conscious organisation meticulously over a long period of operation. 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 DMRC. Most of the accidents are avoidable and caused preliminary due to contractors' negligence. Hence DMRC shall recover the cost of damages from the contractors for every reportable incident (fatality / injury).

36.2 In addition sometimes our activities are exposed to public scrutiny as the work is executed on public places. Any unsafe act / unsafe condition observed by public further damage our reputation. Without limiting to the unsafe acts and or conditions, 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.

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

S. No.	Topic	Unsafe Act/Unsafe Condition	Amount of Penalty
1.	SHE Policy & Plan	(i) SHE Plan a) Not as per Employer's content and coverage b) Delay in submission c) Not updated as per employer's instruction.	Rs.50,000/- per single violation, compounded to a maximum of Rs. 1,00,000/- at any single instance
2.	SHE Organisation	i) Not complying to the minimum manpower requirements as mentioned in Appendix – 6 ii) Not filling up the vacancies created due to SHE personnel leaving the contractor within 14 days iii) Disobedience/improper conduct of any SHE personnel	i) Rs. 50,000/- per month for first month and ii) Rs. 25,000/- per month for first month and Rs. 50,000/- for subsequent months iii)Rs.10,000 for first violation and Rs. 25,000 for subsequent violation
3.	SHE Training	i) Not complying to the requirement as mentioned in conditions of contract on SHE and project SHE manual with regard to: a. Induction training not given b. Supervisor/engineer/manager training not conducted as per clause 5.1 c. Tool-box talk not conducted as per clause 5.3 d. Skill development training not conducted as clause 5.6	For i (a) to (e) Rs. 25,000/- for first violation on and Rs. 50,000/- for subsequent violations

4.	Injury and incidence	i) Fatal accidents ii) Injury accidents iii) Abnormal delay in reporting accidents or wilful suppression of information about any accidents/dangerous occurrence as per clause 8.4 iv) Delay in informing about any accidents/dangerous incidents v) Non-compliance of the clause 8.4	i. Rs. 2,00,000/- for first fatality and Rs. 5,00,000/- for every subsequent fatality ii. 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) iii. Rs. 50,000/- For items iv) and v) Rs. 50,000/- for first violation and Rs. 1,00,000/- for subsequent violations
5	Housekeeping	i) Surrounding areas of drinking water tanks/taps not hygienically cleaned/maintained ii) Office, stores, toilet/urinals not properly cleaned and maintained iii) Openings unprotected iv) Excavated earth not removed within a reasonable time v) Wooden scraps, empty wooden cable drums lying scattered vi) Water stagnation leading to mosquito breeding	Rs. 5,000/- per single violation Compounded to a maximum of Rs. 25,000/- at any single instance
6	Working at Height/ Ladders and Scaffolds	i) Not using or anchoring Safety Belt ii) Not using Safety Net iii) Absence of life line or anchorage point to anchor safety belt iv) Non-compliance of clause 13.4 v) Using Bamboo ladders vi) Improper usage (less than 1 m extension above landing point, not maintaining 1:4ratio) vii) Aluminium ladders without base rubber bush viii) Usage of broken/weak ladders ix) Usage of re-bar welded ladders x) Improper guardrail, toe board, barriers and other means of collective protection xi) Improper working platform xii) Working at unprotected fragile surface xiii) Working at unprotected edges	Rs. 5,000/- per single violation compounded to a maximum of Rs. 30,000/- at any single instance
7	Lifting appliance and gear	i) Non availability of fitness certificate as per clause 15.0 (i) ii) Documents not displayed on the machine or not available with the operator as per clause 15.0 (ii) iii) Maximum Safe Working Load not written on the machine as per clause 15.0 (iii)	Rs. 25,000/- per single violation compounded to a maximum of Rs. 50,000/- at any single instance

		iv) Non-compliance of 15.1 (i) v) Non-compliance of 15.1 (ii) vi) Automatic safe load indicator not provided or not in working condition as per clause 15.1 (iii) vii) Non compliance of any of the items mentioned regarding rigging requirements as per clause 15.3. viii) Failure to submit method statement in case of all critical lifting ix) Person riding on crane x) Absence of portable fire extinguisher in driver cabin xi) Fail to guard hoist platform xii) No fencing of hoist rope movement area xiii) Hoist platform not in the horizontal position	
8	Site Electrical safety	i) Non-compliance of clause 19.0 (iv), (v) ii) Exposed electric lines (fermentative damage) and circuits in the workplace iii) Inserting of bare wires into the socket iv) Improper grounding for the electrical appliances v) Electrical cables running on the ground	Rs. 5,000/- per single violation compounded to a maximum of Rs. 25,000/- at any single instance
9	Hand tools and Power tools	i) Non-compliance of clause 21.0	Rs. 5,000/- per single violation
10	Gas Cutting	i) Wrong colour coding of cylinder ii) Cylinders not stored in upright position iii) Flash back arrester, non- return valve and regulator not present or not in working condition iv) Fail to put cylinders in a cylinder trolley v) Damaged hose vi) Using domestic LPG cylinders vii) Fail to store cylinder 6.6. m away from fire prone materials viii) Fail to use hose clamps ix) Fire extinguisher not placed in the vicinity during operation	Rs. 5,000/- per single violation compounded to a maximum of Rs. 25,000/- at any single instance
12	Welding	i) Voltmeter and Ammeter not working ii) Improper grounding and return path iii) Damaged welding cable iv) Bare openings in the cable v) Non-availability of separate switch in the transformer vi) Non-availability of main switch control to switch off power to the welding unit vii) Usage of reinforcement rod as return conductor	Rs. 5,000/- per single violation compounded to a maximum of Rs. 25,000/- at any single instance

		viii) Damaged holder ix) Fire extinguisher not placed in the vicinity during operation	
13	PPE	i) Not having ii) Not wearing (or) using and kept it elsewhere iii) Using damaged one iv) Using wrong type v) Using wrong colour helmet or helmet without logo vi) Using for other operation (.e. Using safety helmet for storing materials or carrying water from one place to other) vii) Not conforming to BIS standard	From item i) to vi) Rs. 200 per single violation For item vii) Rs. 5,000/- for first violation and Rs. 10,000 for subsequent violations
14	Occupational Health	i) Fail to conduct Medical examination to workers ii) Workers not having ID card iii) Inadequate number of toilets iv) Toilets not cleaned properly v) Absence of water facilities for toilets and washing places vi) Absence of drinking water vii) Absence of first-aid person in work site viii) Absence or inadequacy of first-aid box ix) Misuse of first-aid box x) First-aid box not satisfy the minimum Indian standard xi) Smoking inside the construction site xii) Drink and drive or work xiii) Canteen not provided xiv) Food stuff not served on no loss no profit basis xv) Creche not provided, if required xvi) Fumigation/insecticides not sprayed to prevent Mosquito breeding	Rs. 5,000/- per single violation compounded to a maximum of Rs. 25,000/- at any single instance
15	Labour Welfare Measures	i) Non adherence of Labour welfare provisions of BOCWA ii) Fail to register establishment and display the registration certificate at workplace iii) Absence of workers register and records iv) Absence of muster roll and wages register v) Fail to display an abstract of BOCWA and BOCWR	Rs. 5,000/- per single violation compounded to a maximum of Rs. 25,000/- at any single instance

36.4. Without limiting to the unsafe acts and or conditions mentioned above in clause 36.3 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 36.3.

37.0 Stoppage of work

- 37.1 The Employer shall have the right to stop the work at his sole discretion, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and / or property, and / or equipments at specific work place. In such cases, the contractor shall be informed in writing about the nature of hazards and possible injury / accidents.
- 37.2. The contractor shall not proceed with the work until he has complied with each direction to the satisfaction of Employer
- 37.3 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.

38.0 Awards

The following categories will be considered for awards as per the scheme in practice of Employer

- a. Zero fatality contracts
- b. 100% adherence to voluntary reporting of all accidents throughout the currency of contract
- c. Safest Contractor of the year.

40.0 Contracts costing below Rs. 50.00 lakh and of following nature with moderate safety hazard are exempted of clause no. 5.6, 5.7, 6, 7, 9 & 10.

- (i) Parking development
- (ii) Painting work at low level i.e. upto 3 M height
- (iii) Toilet renovation and improvement
- (iv) Renovation in interior of Station Building with height works upto 3 metre
- (v) Horticulture
- (vi) Cleaning of Track bed etc.
- (vii) Regarding applicability of this exemption clause, decision of Engineer shall be final and binding on Contractor

Topics for First day at work SHE orientation training of Workmen

1. Hazard Identification Procedure

Hazards on work place:

- Electricity
- Machinery
- Handling materials
- Work place
- Work at Height
- Fire

2. Personal Protective Equipment

- What is available?
- How to obtain it?
- Correct use and care.

3. Health

- Work place welfare facilities
- Potential health hazards
- First Aid/CPR

4. Duties of the contractor

- Brief outline of the responsibilities of the Contractor by law
- Details of Contractor's accident prevention policy
- Building and other construction worker Welfare Law

5. Employee's Duties

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

ID CARD FORMAT

(85 mm x 55 mm)

Front Side of ID Card

DELHI MRTS	
Company Logo	Name & Address of Main/Sub/Labour
Name: Designation: Blood Group: Valid Up to:	Photo Authorised Signatory

Back Side of ID Card

Employee Address:
1. This card is the property of “xx” (Main/Sub/labour Contractor) and must be returned on demand and on transfer/cancellation of employment 2. A change will be leived for replacement of the card due to loss or theft 3. If found please return to Main Contractor Address

SAFETY AND HEALTH POSTERS

Every contractor shall prepare a SHE Communication Plan as a part of work place specific SHE Plan and shall include the following minimum requirement of Posters / Signages / Video as applicable. In case readymade posters are available in any of the category from safety related organisations they may procure the same and display it. In case the same is not available then the contractors' shall make necessary arrangements to get the posters designed and printed on their own. The List of Posters:

1. Mandatory PPE Usage
2. Working at Height
3. Work place Electricity
4. Crane Safety & Lifting operation
5. Excavation
6. Confined Space
7. Hand tools & Power tools
8. Material Handling
9. First Aid

DELHI METRO RAIL CORPORATION	SAMPLE SAFETY FORM REFERENCE :	SAF – 001
ACCIDENT/DANGEROUS OCCURRENCE REPORT FORM		Accident No.
Name of Contractor:		Contract No.
Instructions : 1. A copy of this form shall be completed for every Accident and Dangerous Occurrence. 2. It must be signed by a senior work place management representative. 3. A copy shall be sent to the Employer's Representative within 24 hours of the Accident.		
Part A : Details of Injured Person Name : _____ Date of Birth : _____ Male ☐ Female ☐ Address : _____ _____ Job Title : _____ Name of Employer : _____		
Part B : Details of The Accident Date : _____ Time : _____ Location : _____ ➤ Describe the task the injured person was doing at the time of the accident: ➤ Describe in details how the accident happened (Attach, sketch, plan photographs etc.): ➤ Was any plant or machinery involved yes/no : if yes give details: ➤ Name of any Witnesses:		
Part C : Details of the Inquiry What was the Injury ? (eg. Fracture, Lacerations) What part of the body was injured? Was the injury : Fatal ☐ Major Injury ☐ Minor Injury ☐ Was the injured person sent to ; First Aid ☐ Doctor ☐ Hospital ☐ Home ☐		
Part D : Certification I have checked the above information and can confirm that it is a true record of the accident Signed _____ Contracotr Workplace Incharge _____ Date _____ _____		

FORMAT of SITE SAFETY & HEALTH PLAN

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 Organisation Chart Chart indicating reporting of SHE personnel
4	Roles & Responsibility Individual responsibility of the i. Construction Manager ii. Construction Supervisors iii. SHE Incharge iv. Site Engineers v. First Line Supervisors vi. Sub-contractors
5	SHE Training
6	Subcontractor Evaluation, Selection and Control
7	Accident Investigation And Reporting Procedures
8	Occupational Health Measures
9	Labour Welfare Measures
10	Risk assessment and mitigation procedures
11	Safe Work Procedures i. Work at Height ii. Structural Steel Erection iii. Floor, Wall Openings and Stairways iv. Welding, Cutting and Bracing v. Lifting appliances vi. Work Permit Systems vii. Electrical Equipments viii. Mechanical Equipments ix. Excavation x. Fire Prevention xi. Hazardous Chemicals and Solvents xii. Ionising Radiation xiii. Lighting xiv. Abrasive Blasting
12	Work Permit System
13	List of standard job specific PPEs to be used in the site
14	Maintenance of Regime for construction Equipment and Machinery
15	Traffic management
16	Housekeeping
17	Environmental Management
18	Emergency Management
19	Visitors and Security arrangement

MINIMUM MANPOWER REQUIREMENTS OF SHE ORGANIZATION BASED ON CONTRACT VALUE

Awarded Contract value	Safety Manager	Safety Steward
Upto 1 crore	-	01 *
More than 1 crore	01	01 *

Note 1: **Qualification for Safety Manager:** Adequate, qualified and trained Safety manager with required support staff to be deployed at each worksite at each shift. He shall be science graduate or have 3 year diploma course in Engineering. He shall also have one year diploma in industrial safety.

Note 2: **Qualification for Safety Steward:** Adequate, qualified and trained Safety steward shall be deployed at each worksite at each shift. He shall be possessing senior secondary school certification as well as minimum 6 months certificate course in industrial safety.

OR

Senior secondary passed candidate having minimum 48 hrs of Safety and Health training can be deployed as safety supervisor/steward

*** Contractor shall deploy one Safety Steward per site during work.**

TENTATIVE TOPICS FOR SAFETY AND HELATH TRAINING
(Minimum – 36 hrs training)

General Safety:

1. Safety management Principles	-----	1 hr
2. Project Safety Manual & Plan	-----	1 hr
3. Accident Prevention Technique	-----	1 hr
4. Risk Assessment/HIRA	-----	1 hr
5. DMRC Condition of Contract on Safety, Health	----	1 hr
6. Safety Inspections/Audits	-----	1 hr
7. Labour Welfare Measures	-----	1 hr
8. Accident Reporting, Investigation & Analysis	----	1 hr
9. Housekeeping	-----	1 hr
10. Plant & machinery	-----	1 hr

Safety at Site:

1. Safety during Excavation	-----	2 hrs
2. Safety during confined space entry	-----	1 hr
3. Safety in ladder use	-----	2 hrs
4. Safety during work at height	-----	2 hrs
5. Safety during welding and cutting operation	-----	2 hrs
6. Safety during lifting operation	-----	1 hr
7. Crane safety	-----	2 hrs
8. Fire Safety	-----	2 hrs
9. Safety during cutting/grinding	-----	1 hr
10. Electrical safety	-----	2 hrs
11. Storage & Handling of Material	-----	1 hr
12. Safety during steel erection	-----	1 hr
13. Hand tools & Power tools safety	-----	1 hr
14. Safety during masonry work	-----	2 hrs
15. Safety during formwork/scaffolding	-----	2 hrs
16. First Aid & PPE	-----	2 hrs

NOTE: Contractor to develop a SHE training module covering relevant topic with proposed duration for each topic to achieve the target of minimum 36 hrs for DMRC approval before undertaking the training.