

**REQUEST FOR PROPOSAL FOR
IMPLEMENTATION OF
“SMART STREET LIGHTING”**

**For Spine Roads and EESL
Roads in Guwahati**

On

**Design, Build, Operate & Renovation
Basis**



Guwahati Smart City Limited,
Guwahati, Assam

Tender Notice No. SPV/GSCL/DEV/63/2017/141

Dated: 18/03/2020

Volume V: SAFETY GUIDELINES

SAFETY CONDITIONS FOR UNDERTAKING SITE WORK

1. SCOPE

This document gives broad guidelines to be followed by the CONTRACTOR for ensuring safe working conditions in and around the site.

2. SAFETY ORGANISATION

- 2.1 Each CONTRACTOR at site shall establish a Safety organization set up at site consisting of qualified safety officers, safety supervisors and stewards as per requirement. Safety officer who shall be responsible for administering safety functions like planning and implementing site inspections, audits, examination / testing, safety surveys, providing supervision, monitoring safe working conditions at all times for their workers. The Safety Officer shall have a degree or diploma in engineering, and diploma in Industrial Safety from recognised central/state government approved institute and also field experience of minimum 03 years in case of degree in engineering or minimum 05 years in case of diploma in engineering, in the relevant discipline. The safety officer shall also have the authority to stop / suspend the unsafe practices and works taken up in unsafe conditions.
- 2.2 CONTRACTOR shall define the roles and responsibilities of all the personnel at different levels in the safety organization in the CONTRACTOR's Site Safety Plan.
- 2.3 CONTRACTOR shall take active interest and participate in the development and operation of safety programs at site. His responsibility does not cease with establishment of Safety Group and approval of its various activities. He shall demonstrate his involvement by regular participation in safety meetings, review of safety records and taking corrective action where required, introduction of safety promoting bulletins, posters, suggestions and awards and by setting example by strictly observing safety rules. CONTRACTOR shall remove all waste material and debris from and around the work area and properly clean up the area at the end of each day before leaving the work site.
- 2.4 CONTRACTOR shall take all necessary precautions not only for safe working of his own workmen but also deploy all precautions to ensure safety of structures, equipment and workmen of other agencies in and around his work site.
- 2.5 CONTRACTOR shall ensure that his workmen do not trespass into prohibited/restricted work areas.
- 2.6 EMPLOYER/CONSULTANT shall have the right to inspect at any time, all items of machinery, plant and equipments (owned, borrowed / sub-contracted, leased, rented) brought to site by the CONTRACTOR or his agents or workmen and to prohibit the use on the site of any item, which in the opinion of the EMPLOYER/CONSULTANT is or may be detrimental to the safety of the site. The exercise of such right or the omission to exercise it in any particular case shall not absolve the CONTRACTOR or his agents or workmen of their responsibility of adhering to the safe working practices.

- 2.7 CONTRACTOR shall execute the work in a manner causing the least possible interference with the business of the EMPLOYER/CONSULTANT, or with the work of any other CONTRACTOR who may be engaged on the premises and shall at all times co-operate with the other CONTRACTORS working at site.
- 2.8 CONTRACTOR shall obtain daily work permit from the EMPLOYER/CONSULTANT before start of any work at site. The work permits are issued to prevent the CONTRACTOR from working in unauthorised areas and shall be valid for specific area for a stipulated period.
- 2.9 CONTRACTOR shall ensure at all times that his workers do not lie down or sleep under or around any machine, equipment, vessel or vehicle in his work area at any time.

2.10 RESPONSIBILITIES OF THE CONTRACTOR'S SAFETY OFFICER

The duties of a safety officer shall be to advise and assist the CONTRACTOR's management in the fulfilment of its obligations, statutory or otherwise concerning prevention of personnel injuries and maintaining a safe working environment. These duties shall include the following namely:

- a) To advise the building workers in planning and organising measures necessary for effective control of personal injuries.
- b) To advise on safety aspects in a construction work and to carry out detailed safety studies of selected activities.
- c) To check and evaluate the effectiveness of action taken or proposed to be taken to prevent personal injuries.
- d) To advise purchasing and ensuring quality of personal protective equipment confirming to national standards.
- e) To carry out safety inspections of construction work in order to observe the physical conditions of work and the work practices and procedures followed by construction workers and to render advise on measures to be adopted for removing unsafe physical conditions and preventing unsafe actions by construction workers.
- f) To investigate the near misses, incidents and major accidents and submit the detail report to EMPLOYER/CONSULTANT.
- g) To promote the working of safety committees and to act as an advisor to such committees.
- h) To design and conduct, either independently or in collaboration with other agencies, suitable training and educational programmes for prevention of accidents to building workers.
- i) To frame operational control measures, safe rules and safe working practices in consultation with senior officials of the establishment.

j) Supervise and guide safety precautions to be taken in construction work of the establishment.

k) Ensure compliance to legal and contractual requirements affecting safety, health, and welfare of his workmen.

l) Keeping up-to-date with recommended codes of practice and safety literature.

Circulating information applicable to each level of employees.

m) Fostering within the company an understanding that injury prevention and damage control are an integral part of business and operational efficiency.

n) Attending job progress meetings where safety is a point on the agenda. Report on job safety performance.

3. ENTRY AND EXIT PROCEDURES:

3.1 CONTRACTOR must follow Entry / Exit to the project premises for all the project employee and materials will be from the designated entrance / exit point only.

3.2 CONTRACTOR must follow entry / exit systems through Photo ID card / bio-metric.

3.3 CONTRACTOR must follow Entry to the project premises with mandatory PPE's (safety helmet, shoe & reflective jackets).

3.4 The record of Entry / Exit of the personnel will be maintained by the security / time keeper at the gate by CONTRACTOR.

3.5 Vehicles of the CONTRACTORs must be parked only at the designated parking lots in the project premises.

3.6 General Safety awareness posters to be displayed at the entrance and exit gate points by CONTRACTOR.

3.7 CONTRACTOR must provide separate access for pedestrian/vehicles movement at the entry / exit Points.

3.8 ID cards should be displayed by all contract workmen at the entry / exit points.

3.9 CONTRACTOR must provide one full time ambulance and it must be parked near the Entry gate or at the First aid center manned by an experienced driver.

3.10 CONTRACTOR's Plant and Equipments will be screened at the gate before being deployed at site by Employer/Consultant.

3.11 Permission for Entry/Exit of CONTRACTOR's Plant and Equipment's into project premises must be through Employer/Consultant. The CONTRACTOR shall arrange to separate pedestrian and vehicular (including material handling equipment) traffic wherever possible

and maintain the routes clear of obstruction. To ensure safety of users' clear painted demarcation is encouraged as a discipline to be enforced.

4. STACKING AND STORAGE PRACTICE

- 4.1 All construction materials should be stored in designated areas. The CONTRACTOR shall submit a detailed scheme of construction and other hazardous materials' storage, stacking, dispensing and disposal also considering the physical and chemical properties along with the statutory requirements.
- 4.2 The CONTRACTOR shall ensure stacked material is bonded on a stable and level footing capable of carrying the mass of the stack. Adequate clearances shall be provided between the sides of the stack and top to facilitate unimpeded access to service equipment like overhead wiring, cranes, forklifts and firefighting equipment, and hoses. Circular items shall be sufficiently choked with wedges not with odd bits of materials. Free-standing stacks of gunny bags and sacks such as cement bags shall be stacked to prescribed safe-stack heights with layers formed for stable bonding, preventing slippage causing accidents. Stacking against walls shall not be permissible.
- 4.3 The CONTRACTOR shall maintain the premises and surrounding areas in clean and clear manner with safe access and egress.

5. STORAGE OF HAZARDOUS MATERIALS

- 5.1 CONTRACTOR shall store the Hazardous materials on solid bases. Solid bases shall include compacted earth, pallets, concrete or asphalt platforms or paving. Hazardous materials shall be stored, stacked and secured to prevent toppling, Spillage or other unintended dislodgement. Aisles and clearances shall be detailed as per requirement. Hazardous materials shall be stacked in such a manner that an observer standing in the aisle can read their labels and legend.
- 5.2 CONTRACTOR must provide each hazardous material contained be identified by a legible or legend as per governing statute, code or regulation. The label shall identify the item, quantity and appropriate warnings.
- 5.3 Hazardous materials which if brought in contact with each other could react or pose equal or greater hazard than either material stored alone shall be stored at a distance not lesser than twenty feet apart by CONTRACTOR.
- 5.4 CONTRACTOR shall display/post the Warnings and maintain it in a legible condition at all access points clearly defining the specific hazardous nature of the stored materials such as 'Explosive', 'Compressed Gas' , 'Flammable', 'Oxidising', 'Corrosive' or other hazardous nature.
- 5.5 Where hazardous materials are unloaded in the CONTRACTOR's storage maintained at site in a semi-permanent installation, such installations shall be approved by relevant statutory bodies. Copies of licences for storage shall be lodged with the EMPLOYER. The containers and storage shall display quantities stored with name of the hazardous

material and the UN hazard classification label in prescribed colour code prominently painted in a conspicuous manner.

- 5.6 The CONTRACTOR shall inspect the hazardous storages and installations on a daily basis and shall undertake any requisite preventive action necessary to avoid safety risks.

6. STORAGE OF FLAMMABLE AND EXPLOSIVE MATERIALS

- 6.1 CONTRACTOR shall secure flammable and or explosive materials against accidental ignition.

- 6.2 CONTRACTOR storage facilities for flammable liquids such as petrol, diesel, kerosene and lubricants as well as the quantities stored shall meet the legal and statutory requirements. These shall be stored in approved fire-resistant rooms with a sump of sufficient volume to contain any spillage.

- 6.3 CONTRACTOR shall provide the electrical fittings with flame proof and follow a strict maintenance schedule. Containers shall be appropriately bonded in receptacles into which low flash point fuel is decanted. afety risks.

7. COMPRESSED GAS CYLINDERS

CONTRACTOR should store the compressed gas cylinders and secure it in the upright position at safe distances shielded from welding and cutting operations/hot work. Compressed gas cylinders in storage shall be shut off and torches, hose and manifolds removed and capped. Cylinders shall be periodically checked for leakages, if any. Compressed gas storages shall be provided with safety relief valves, Safety valves and rupture disc to protect them from overpressures.

8. VEHICLES/MACHINERY MOVEMENT IN PROJECT PREMISES

- 8.1 CONTRACTOR vehicles shall have valid registration , insurance, PUC, and road permit in conformance with regulations and always keep copies of valid travelling documents in the vehicle (Driving license, registration, insurance, and identity card and contact details).

- 8.2 CONTRACTOR vehicles (Four Wheelers) shall be equipped with seat belts both in front and rear seats, first aid box, portable fire extinguisher, standard stopper (wheel choke), emergency reflective triangles, etc. The drivers should be trained to use fire extinguishers.

- 8.3 CONTRACTOR vehicles operating on site shall be fitted with reverse horn, rear view mirror and driver shall always be accomplished by trained co-driver / helper.

- 8.4 CONTRACTOR vehicles shall be well maintained and kept in perfect working order and fully equipped with the proper safety gear. Conduct regular checks of the vehicle's condition and report defects immediately. Any defect has to be removed as soon as practicable, before the vehicle is put in use. Toeing of vehicle with the help of Hydra or back push from other vehicle is strictly prohibited on site.

- 8.5 CONTRACTOR shall have driver/operator medical fitness report as per regulation; at least once a year and copy of medical report shall be available with driver/operator.
- 8.6 CONTRACTOR drivers shall have an experience of minimum 5 years and age should be between 25 and 58 years (holding Heavy vehicle license).
- 8.7 All employees including CONTRACTOR shall wear crash helmet and shoes while driving motorbike. Safety helmets provided for project / site work shall not be worn as crashed helmets, as they are not adequate to withstand the impact caused during accident of vehicle (two-wheeler). Two wheel drivers shall use adequate crash helmets of approved ISI mark.
- 8.8 Any new CONTRACTOR driver before starting driving shall attend authorized training program for safe driving as per regulation.
- 8.9 CONTRACTOR drivers shall have his journey schedule showing expected date and time to complete the journey.
- 8.10 CONTRACTOR drivers shall ensure to take minimum 15 minutes rest for every 4 hrs of continuous journey. Also shall not drive more than 12 hrs in a day.
- 8.11 CONTRACTOR drivers shall operate only those vehicles for which they are trained, authorized and licensed.
- 8.12 Without proper authorization by EMPLOYER/CONSULTANT CONTRACTOR respective drivers/operators shall not operate any vehicle other than they are authorized to operate, even if they are capable of such operation.
- 8.13 CONTRACTOR shall ensure that the person in the driver's seat as well as others in the vehicle shall keep seat belts fastened, while the vehicle is in motion.
- 8.14 CONTRACTOR shall specify and safe speed limits to be observed and maintained at all times.
- 8.15 CONTRACTOR must specify vehicle operating instructions.
- 8.16 CONTRACTOR must ensure safe driving during bad weather conditions (rain showers, winds, snow, etc.) with utmost care.
- 8.17 CONTRACTOR must ensure that, mobile phones are not to be used whilst driving or operating a vehicle.
- 8.18 CONTRACTOR must display that Driving under the influence of alcohol or any sedative drug (including prescribed medication) is strictly prohibited.
- 8.19 CONTRACTOR shall ensure that eating, drinking (even non-alcoholic beverages), etc. during driving inside the project premises be avoided. Such activities increase the risk of accident due to distraction and lack of concentration.

8.20 When loading and unloading, the CONTRACTOR shall observe relevant guidelines and requirements to avoid danger to any person or damage to any property.

8.21 Drivers/Operators shall not attend to mobile calls/listen to music while driving the vehicles/machinery.

9. EXCAVATION

9.1 As built drawings of underground services must be referred by the CONTRACTOR before starting the excavation activity.

9.2 CONTRACTOR should make detail excavation methodology and submit the Methodology for approval to EMPLOYER/CONSULTANT.

9.3 CONTRACTOR must ensure the stability of structure adjoining the workplace or other areas to be excavated by providing safety measures like Sheet piling, shoring or other similar means to support structure.

9.4 CONTRACTOR should provide a safe access by providing ladders, staircase or ramps.

9.5 CONTRACTOR should ensure at a construction site that any machinery used in excavation is positioned and operated in such a way that such machinery does not endanger the operator of such machinery.

9.6 In the event of an excavation or removing a manhole cover, the CONTRACTOR should ensure that any opening, sump or pit caused is securely fenced and covered before leaving the workplace for the day.

9.7 Hard barricading should be provided around excavation area by CONTRACTOR.

9.8 Excavated earth must be placed 2m away from the excavated area and Suitable warning boards and signs should be put up by CONTRACTOR near excavation work area.

10. SCAFFOLDS

10.1 Before erecting scaffold at site, CONTRACTOR has to get approved the scaffold design/drawings from EMPLOYER / CONSULTANT.

10.2 Scaffold materials must be as per IS standard.

10.3 Competent person must be involved in scaffold erection.

10.4 CONTRACTOR must use Mandatory scaffold components Base plate, ladders, Steel platform (tied with the scaffold), mid rail, Hand rail, Toe board (150 MM), bracings while erecting the scaffold.

10.5 EMPLOYER/CONSULTANT will inspect the CONTRACTOR scaffolding whether erected scaffold is as per the approved design.

- 10.6 SCAFF tag must be followed (Red Tag- Unsafe/Not to use, Green Tag – Safe to use).
- 10.7 CONTRACTOR must ensure usage of mobile scaffold is strictly prohibited.
- 10.8 CONTRACTOR must provide the scaffold with proper fall protection system intact and display the suitable warning boards.
- 10.9 CONTRACTOR must ensure area to be barricaded during erection and dismantling of scaffolds.

11. WORKING AT HEIGHTS

- 11.1 CONTRACTOR workmen engaged must undergo medical fitness examination before deploying them for work at heights.
- 11.2 CONTRACTOR workers should wear safety full body harness with double lanyard with hook properly fastened.
- 11.3 CONTRACTOR workmen engaged on work at heights should be experienced in such work.
- 11.4 Steel scaffold staging should be erected as per IS code and the design for Scaffold staging must be submitted to EMPLOYER/CONSULTANT for approval.
- 11.5 Wherever multiple work activities CONTRACTOR must use safety nets beneath the place of work for safety.
- 11.6 CONTRACTOR when working over equipments or tanks, Full body safety harness with double lanyard, safety lifeline and safety nets should always be used whether or not staging and scaffolding is provided.
- 11.7 Safe access to all points of works should be provided in the form of Suitable Ladders /stairways/ boom lifts by CONTRACTOR.
- 11.8 Area around the work place should be barricaded suitably or fenced off to avoid Injuries to personnel passing by. Suitable warning boards and sign should be put up by CONTRACTOR.
- 11.9 Life line and fall protection arrangements should be provided for working at heights by CONTRACTOR
- 11.10 CONTRACTOR must ensure loose materials should be cleared on daily basis from scaffolds.
- 11.11 Man-basket not permitted for height works.

12. HOT WORK (WELDING / GAS CUTTING WORK)

- 12.1 Only qualified welders should be employed at the work site. The CONTRACTOR should organise the qualifying test at site for his welders and the EMPLOYER / CONSULTANT should approve the welders. All welders should have to undergo qualifying test and only on passing the test, they should be allowed to work at site.
- 12.2 CONTRACTOR must organise for all welding work at site, Rectifier / Thyristor sets instead of AC transformer sets. AC transformer sets are banned for welding jobs (both open and closed top type).
- 12.3 CONTRACTOR should get his welding sets certified by the EMPLOYER/CONSULTANT before start of the work. These certificates should have to be renewed every month. A copy of the certificates should be displayed on respective welding sets.
- 12.4 Only cables in good condition and insulated holders should be used. The length of supply cable to welding site should not exceed 8 metres and the welding set body should be properly earthed.
- 12.5 CONTRACTOR welder should not use a building structure, pipeline or railway track etc. as a return path of the current. Adequately rated circuit breaker should be provided in the power circuit for human protection on all power supply points.
- 12.6 Before starting any Hot work like Gas cutting, welding and grinding etc., the CONTRACTOR should obtain hot work permit from the EMPLOYER/CONSULTANT. The permit should be renewed on day-to-day basis.
- 12.7 CONTRACTOR should ensure purging of piping and equipment to make it totally safe before carrying out any hot work.
- 12.8 No combustible material should be stored on or near any source of heat like hot pipes, welding or gas. Before leaving the place of work or the CONTRACTOR's sheds, the CONTRACTOR's workmen should ensure that no material or item that could start a fire is left at site. Special attention should be paid to collection and disposal of oil soaked cotton waste or rags. On no account are these to be dropped into corners, pushed below equipment or left hanging on pipes.
- 12.9 CONTRACTOR must use gas cylinders in a safe manner. These should not be dropped from heights or dragged on the floor. Trolley with rubber rimmed wheels should be used for transporting gas cylinders within the site. All cylinders should be kept in upright position. Oxygen cylinders should not be kept near inflammable materials like oil etc.
- 12.10 Standard colour codes for the cylinder must be followed (Oxygen-Black, Acetylene-Maroon) by CONTRACTOR.
- 12.11 CONTRACTOR must provide the gas cutting sets with flash back arrestor at both ends (Cylinder and Torch) and gas cutting rubber tube ends fixed with the clamps.

12.12 CONTRACTOR must provide the fire blankets for fire protection and not tarpaulins in the vicinity of welding and gas cutting jobs.

12.13 CONTRACTOR must provide charged fire extinguisher of DCP / CO2 type with each welding/gas cutting set.

12.14 LPG shall not be used for cutting / heat treatment purpose (strictly prohibited).

13. ERECTION, LIFTING APPLIANCE AND GEAR

13.1 CONTRACTOR shall submit detail erection methodology and shall get the same approved by EMPLOYER / CONSULTANT.

13.2 CONTRACTOR shall mobilize the lifting appliance and gear in good working condition.

13.3 CONTRACTOR shall submit a valid Test Certificate to the EMPLOYER / CONSULTANT, from approved certifying authorities for all of his lifting gear and hoists, slings, chains, wire ropes, hooks, chain-pulley blocks, winches, hoists and cranes etc. before commencing work.

13.4 These third party test shall be carried out at site by the CONTRACTOR

13.5 These certificates shall be available at site in the CONTRACTOR office for Inspection as and when required.

13.6 Full time mechanic shall be deployed to maintain all the lifting appliance and gear at site.

14. CLEANLINESS

CONTRACTOR must ensure cleanliness as an integral part of plant / project site outlook; the main obstacle to cleanliness in concrete batching plants, hot mix plants, grout mix plants, crushing plants, mine works, is the emission of fugitive dust. This must be fought by special care taken of the following:

- a) Material unloading & handling systems
- b) Equipments and workshops
- c) Unloading / Storage / handling of the materials
- d) Road systems.

It must be emphasized that the proper design and sizing of dust removal /extraction equipments is of utmost importance to ensure cleanliness; adequate & special care while designing & selection of machinery to be taken in the following dust prone areas:

- a) Cement Bag packing area.
- b) Cement Truck loading area.

- c) Adequate sizing of all dust preventing, dust collecting and dust suppression / recovery devices.
- d) Proper design, positioning, use and maintenance of dust control equipment.
- e) Proper design, positioning and maintenance of storage bins like silos, bunkers, screw conveyors etc.

15. MATERIAL HANDLING SYSTEMS

CONTRACTOR shall have Material handling systems such as loading and unloading areas, conveyor belts and transfer points used to handle materials as raw meal, additives, solid fuels, clinker, and cement, these be equipped with dust removal devices. While designing the conveyor systems CONTRACTOR must take special care to minimize transfer points & provide dust suppression to control fugitive emission.

16. EQUIPMENT AND WORKSHOP

CONTRACTOR shall ensure that all dusty work areas such as cement bagging, truck/wagon loading, mixing or weigh hopper landing must be properly ventilated and filtered adequate care of dust suppression to be taken while designing.

Also important to allow for cleaning away dust produced by various types of equipment if they breakdown or are taken apart. This capacity of cleaning must be included in equipment design and selection criteria. It must also be accounted for when designing work-areas.

17. STORAGE OF FINE MATERIALS

CONTRACTOR should ensure that fine materials stored in silos, must be equipped with adequate dust filtering equipment. Storage of fine materials in the open air or open buildings is only accepted at exceptional locations. These storage zones must be protected from the dominant winds either by strategic positioning or through artificial protection (walls, barns). Areas where fine materials are stored in the open must be equipped or designed in such a way that potential runoff from rain/storm water does not contaminate the environment; this means that runoff waters must be collected and settled before release to off-site receiving bodies.

18. SCRAP AND REFUSE BINS-REMOVAL SYSTEM

The CONTRACTOR shall ensure that he has sufficient waste bins that are identified for different wastes and maintained in clearly demarcated areas. Wastes with oily or other ignitable materials such as oily cotton wastes and hand gloves shall be stored separately with covers to prevent fires and shall be made of metal. Different wastes shall be segregated and stored separately and disposed off. These shall be emptied at routine intervals to prevent that they do not overflow with wastes.

18.1 Solid Waste Management

The CONTRACTOR shall ensure that he has sufficient waste collection bins categorised as hazardous and non-hazardous waste with specific names. Non- hazardous waste

shall be disposed in environment friendly manner. CONTRACTOR shall maintain adequate records of hazardous waste disposed.

The waste collection bins should be covered properly.

18.2 Vehicle Wash bay

The CONTRACTOR shall establish a wash bay near each entrance to the project site. All trucks/vehicles moving outside the site shall have the tyres washed prior to the site leaving the project site. This is to ensure that the roads outside the site are not dirtied / defaced by construction muck. The wash bays shall have submersible pump (1+1 backup) and a hose jet along with recyclable water for washing tyres. Dedicated workers would be manning the wash back at each time. Dump trucks to have lift covers on top to prevent muck/dirt/smell from flowing across roads.

18.3 Sedimentation tank

The CONTRACTOR shall establish that the trade effluent generated as a result of maintenance of concrete batch mixing plant / grout mix plant or washing any residuals of tests conducted on concrete, be properly routed to a designed and approved sedimentation tank. The CONTRACTOR shall also periodically monitor and ensure the compliance to acceptable limits of the vital parameters of the treated water like pH, oil and chemical contents, BOD, COD, TDS, Turbidity etc or as prescribed under the conditions of consent to operate the plant before discharging.

19. PROTECTION OF WATER

Both surface water and underground water resources must be protected from all possible pollution be it chronic or accidental.

20. NOISE REDUCTION

CONTRACTOR must ensure noise does not represent a nuisance to neighbours, all measures must be taken to reduce emission of noise from equipment (crushers and/or grinders must be enclosed, as well as compressors, diesel generators; care must be taken in selection of low-noise blowers). Noise reducing devices / acoustical enclosures must be installed systematically on the noisiest equipment. CONTRACTOR must follow the statutory legislation for noise levels. Timely preventive and break-down maintenance of the equipment and machinery shall be carried out by CONTRACTOR in order to reduce the noise generation.

21. WASTE MINIMIZATION

CONTRACTOR must avoid or minimize production of waste with an objective to aim towards zero-waste. Production facility must be provided with all the necessary equipment to manage its wastes; storage, sorting, cleaning, pre-processing, and recycling. Temporary waste storage facilities should be designed in such a way as to control emissions to the atmosphere (volatile organics, fugitive dust) and to protect surface and underground water.

22. ASBESTOS

- 22.1 Use of asbestos under any form is strictly forbidden in all construction activities and facilities.
- 22.2 Only CONTRACTOR trained in removal of asbestos should be eligible for asbestos removal. All removal work should be managed and approved by the EMPLOYER / CONSULTANT.

CONTRACTORS SAFETY AND HEALTH PROGRAMME

1. SAFETY ORGANISATION

1.1 SAFETY AND HEALTH POLICY

The CONTRACTOR's organization shall have a written SAFETY AND HEALTH POLICY issued by the Chief Executive of the organization, appropriate to the scale and nature of the risks involved in the CONTRACT works. A copy of the policy shall be made available to the PURCHASER at the time of the award of the CONTRACT in evidence of the CONTRACTOR's commitment to management of employee's safety & health and compliance to statutory and regulatory requirements. The policy along with its component operation procedures shall be evidenced as working document publicised among the CONTRACTOR's and his SUB-CONTRACTORS' employees through appropriate languages. All the CONTRACTOR's employees shall be familiar with the policy and their role and obligations in its implementation. The policy shall meet the relevant statutory and regulatory requirements and other requirements of the PURCHASER/CONSULTANT. The policy shall periodically be reviewed for updating with respect to new and emerging legal and other requirements.

1.2 SITE SPECIFIC SAFETY PLAN

The CONTRACTOR shall make detailed Site specific Safety Plan which should include the nature of work, time frame, work force involved, hazards and control measures and shall get the same approved by the Employer/consultant. Method statements shall be attached with Site Safety plan and the approved Safety Plan shall be displayed prominently in the Contractor's site office.

1.3 SAFETY OFFICER:

1.3.1 SAFETY OFFICERS QUALIFICATION:

A person shall not be eligible for appointment as Safety officer unless he

(i) Possesses a recognized Degree in any branch of Engineering or Technology and had practical experience of working in industrial projects in a supervisory capacity for a period of not less than 3 years or possesses a recognised Diploma in any branch of engineering or technology and has had practical experience of working in industrial projects in a supervisory capacity for a period of not less than 5 year.

(ii) Possesses a recognised degree or Advanced diploma in industrial safety. (Approved by the EMPLOYER/CONSULTANT on the basis of his adequate Safety qualification [Advanced Diploma in Industrial Safety approved by State Board of Technical Education] and his/ her experience in safety field).

(iii) Has adequate knowledge of the language spoken by majority of construction workers from the construction site in which he is deployed.

1.3.2) The CONTRACTOR shall also nominate in writing competent Safety Appointees from various disciplines to assist the Safety Officer in implementation of safety measures in their routine contract works. The Safety Officer

shall have sufficient authority to direct the CONTRACTOR's or his SUB-CONTRACTOR's personnel to meet Safety and Health requirements and to stop performance of work until such requirements are met.

1.4 EMPLOYEE CONSULTATIONS, SAFETY COMMITTEE & COMMUNICATION

1.4.1 The CONTRACTOR shall ensure full involvement of all his employees recognising their right to consultation on Safety, Health and Environment matters. The Safety officer shall be responsible for ensuring employees' involvement through routine Safety inspections, Hazard and Risk assessment in new and any changes in the work and their control. The CONTRACTOR shall maintain appropriate operating procedures to guide these requirements. The contractor shall plan, maintain and implement for entire Project duration, Training / matrix for regular SHE induction, job specific and specialized training programmes for all working levels.

1.4.2 The CONTRACTOR shall also appoint a Safety Committee comprising of the Safety Appointees from the various areas under the chairmanship of the Safety officer. Safety Officer shall report to Authority one level above the Contractor's Project In-charge. The committee should also include representatives of Sub-contractors. The committee shall meet minimum once in month to discuss the status and adequacy of the safety management, and any safety concerns of the employees. The committee shall also formulate and validate the safety procedures incorporating controls to prevent or mitigate hazards and risks before submission for approval by the EMPLOYER/CONSULTANT. Safety Officer shall maintain the records of the meetings and minutes of the Safety Committee meeting shall be submitted to the Employer/CONSULTANT.

1.4.3 The CONTRACTOR shall communicate to the employees regularly on job hazards applicable to their tasks in hand and hazards present on Project site. The Safety Appointees shall hold 'Toolbox Talks' or pep talks for this purpose on a routine basis before undertaking any safety critical and/or non-routine activities. Weekly meetings of the CONTRACTOR and his SUB- CONTRACTORS attended by the Safety Officer and the Safety Appointee shall include safety as a key item in the agenda to discuss hazards and risk assessments, job safety analysis and control procedures and to review accidents and incidents (Near-miss) for remedial measures to prevent reoccurrence. The minutes of the meeting shall be submitted to the EMPLOYER/CONSULTANT. The Safety Officer shall maintain the records
CONTRACTORS attended by the Safety Officer and the Safety Appointee shall include safety as a key item in the agenda to discuss hazards and risk assessments, job safety analysis and control procedures and to review accidents and incidents (Near-miss) for remedial measures to prevent reoccurrence. The minutes of the meeting shall be submitted to the EMPLOYER/CONSULTANT. The Safety Officer shall maintain the records.

1.5 Insurance, Statutory Requirements:

1.5.1 CONTRACTOR should obtain Contract Labour License from Inspector of labour/Inspector of factories as per Contract labour act 1970.

1.5.2 All the Contractor's workmen should be covered by Site Specific Workmen compensation insurance or Group Workmen compensation insurance with site name endorsed for the project duration (Workmen Compensation Act 1923) or should cover under ESI(If the project location is in ESI Zone).

1.5.3 All the Contractor's workmen should be covered under EPF (Employee Provident Fund Act 1952).

1.5.4 All CONTRACTORS should comply with local statutory requirement:

(i) Building and other Construction workers Act, 1996.

(ii) Environmental protection Act, 1986. (iii) Factories Act, 1948.

(iv) Indian Electricity Act, 2003. (v) Indian Boilers Act, 1923.

(vi) Petroleum Act, 2002.

1.5.5 CONTRACTOR shall obtain CAR Policy / ESIC policy for the entire project value / duration.

1.5.6 Other Statutory requirements:

(i) Electrical Equipment's, Scaffold materials, Gas cylinders, mechanical equipment and machineries which are deployed at site are as per IS code.

(ii) Storage of combustible materials inside the project premises must be as per the allowable limits mentioned in the Petroleum act/Gas cylinder storage act.

(iii) PPE's must be as per IS standard.

(iv) CONTRACTOR is accountable for any statutory violations observed by the enforcement/inspecting govt authorities.

(v) In case of accidents, inside the project premises, the accountability lies with the CONTRACTOR.

1.6 CONTRACTOR'S MONTHLY SAFETY REPORTS

1.6.1 CONTRACTOR shall submit a monthly written report to the EMPLOYER/CONSULTANT, which shall be due on the fifth workday of every month. The Safety and health of all full time, part-time, permanent, temporary, contract employees and any outsourced employee undertaking any part of the CONTRACT works shall be included in the safety report. The report shall include the total number of working hours for the month, the number of recordable accidents and the number of lost-time injury /accidents. A cumulative trend plot of

the monthly severity and frequency rate of the reportable incidents/ accidents shall be included in the Monthly safety report.

1.6.2 CONTRACTOR shall arrange to display the safety statistics and the cumulative plot of severity and frequency of accidents mentioned above painted on a board prominently displayed, as a means of encouragement and assurance to all interested parties and for publicising the safety achievements.

1.7 CONTRACTOR'S ACCIDENT/INCIDENT REPORTS/PENALTY SYSTEM

1.7.1 CONTRACTOR shall report orally, to the EMPLOYER/CONSULTANT regardless of their extent, duration and severity, immediately on occurrence of all incidents/accidents resulting in:

- (a) Personal injury / Dangerous Occurrences
- (b) Property damage
- (c) Near misses

1.7.2 CONTRACTOR shall submit the accident / incident report in writing to the EMPLOYER/CONSULTANT within 24 hours of its happening in the form as prescribed by the governing statute or in the absence of which, in the form prescribed by the EMPLOYER/CONSULTANT. The CONTRACTOR shall detail in the 'Accident / Incident Report', the particulars of the dangerous occurrence leading to the accident, lost time of absence due to accident, root cause analysis and the corrective and preventive actions to prevent such recurrence. In addition, the CONTRACTOR shall include his estimate of the impact of accident on project schedule. Incident including near miss cases shall also be reported in the same manner identifying root cause(s) to eliminate such potential occurrence or risks. The CONTRACTOR shall ensure that corrective & preventive action is taken so that recurrence of the accident / incidents at one location on site shall not take place at other locations/sites.

1.7.3 Penalty clauses applicable to contractor/ sub contractor against non-compliance of SHE norms, requirements, terms, clauses and instructions given by employer / consultant / applicable statutory laws & requirements.

1.8 FIRST-AID PERSONNEL AND FACILITIES

1.8.1 CONTRACTOR shall ensure first-aiders (person who is well trained and can administer first aid) are available on site. The Contractor shall ensure that adequate numbers of first-aid boxes and or first- aid stations as per statutory requirements. The persons holding current certificates of competency of recognised institutions in prescribed numbers as per any governing statute. First-aiders' names shall be prominently displayed.

1.8.2 The First-aid boxes shall display contents of medical and medicinal articles with quantity maintained, which shall be in accordance with governing statute. Nominated first-aider shall replenish stock of first aid boxes promptly.

1.9 OCCUPATIONAL HEALTH CENTRE

1.9.1 CONTRACTOR should establish and maintain an Occupational Health Centre. (In case, Where the CONTRACTOR out-sources such facility, it shall meet the statutory requirements and shall be approved by the EMPLOYER/ CONSULTANT and the statutory body).

1.9.2 Occupational Health Centre shall be served by a full time medical officer holding a medical degree in allopathic medicine with a minimum of five years experience in Occupational Health/Medicine. A male nurse, one dresser/compounder and one sweeper-cum-ward boy who will all be available during working hours.

1.9.3 Occupational Health Centre shall be capable of undertaking emergency care services or emergency treatment facilities which shall include emergency life saving aids and appliances to handle head and spinal injuries, severe fractures, snake bites, burns of all nature, electric shocks, cases of asphyxiation and such other severe injuries as could be reasonably anticipated at the facilities and shall meet provisions of any governing statute.

1.9.4 AMBULANCE ROOM AND AMBULANCE VANS: The CONTRACTOR shall arrange for an ambulance room and an ambulance van directly or outsource the facilities meeting the governing statutory needs for prompt transportation of serious cases of accident and or sickness to the hospital. Such facilities shall be maintained in good repair and equipped with facilities such as dry powder type extinguishers, flashlights, portable oxygen unit, self-contained breathing apparatus etc. as prescribed by the governing statute. Ambulance van shall be available round the clock.

1.10 INDUCTION AND JOB-SAFETY TRAINING

1.10.1 The CONTRACTOR shall maintain a procedure for identification of the training needs and training his employees to create a Safety and Health conscious workforce that will comply with the law and safety requirements of the organisation. He shall also maintain a procedure for safety induction and initial training as well as follow-up training on the job safety for new entrants. All employees shall receive effective training and periodic refresher training on the operation control procedures specific to their tasks designed to control the job-safety risks. A booklet of such operation control procedures and safety rules with need based pictorial illustrations shall be made available to all employees who are to learn and be familiar with such procedures. All training shall be monitored for effectiveness as per established procedures. The CONTRACTOR shall maintain records of all such training.

The induction program shall include the following:

- i) Site Safety and Health policy ii) Site entry and access.
- iii) Standard conditions of work in the site.
- iv) Site layout and arrangements such as rest rooms, storage and facilities. v) Emergency response procedures and escape routes.
- vi) Incident and near miss reporting. vii) Medical and welfare facilities.
- viii) Details of Work permit.

1.10.2 The safety officer shall conduct regular fortnightly or monthly mock-safety drills for different imaginary accident scenarios, in premeditated work areas to provide on-job training such as:

- i) Use of safety appliances such as water monitors, fire hydrants, fire hydrant pumps, fire-hoses, extinguishers, breathing apparatus and safety harness for working at height,
- ii) Response to health and safety emergencies, iii) Fighting fires using various equipment and iv) First-aid

1.10.3 Participants shall receive training during mock-drills through role-play of their normal expected tasks during emergencies and fire fighting. The degree of demonstrated ability in the chosen tasks during such safety drills shall be recorded as participants' competence level for planning his further training.

1.10.4 The Safety officer shall be trained on a standardised comprehensive advanced training programme covering safety management, legal aspects, techniques of Hazard identification and Risk assessment and specific Job- safety in various disciplines such as Civil, Electrical, Instrumentation and Mechanical plant and equipment of the CONTRACTOR. The training records shall be maintained subject to audit by the EMPLOYER/CONSULTANT. Training effectiveness shall be assessed and recorded and used as input for further training plans of the employee.

1.11 SAFETY PROMOTION

Safety Posters, Banners and Slogans displayed for safety promotion shall be rotated at frequent intervals at the site locations. The CONTRACTOR is encouraged to have safety promotion as an item in the Safety Committee agenda. The CONTRACTOR is encouraged to include safety promotion programmes such as: safety competitions in slogan and poetry writing on safety, screening of safety films, celebration of National safety and Environmental day, safety suggestion schemes and safety library etc.

1.12 PURCHASE AND PROCUREMENT CONTROL

1.12.1 CONTRACTOR shall maintain a procedure for control of his purchases to ensure that all safety requirements are appropriately vetted by the safety personnel

during all stages of procurement including planning of specifications, inspection for acceptance and commissioning in order that threats to safety are not overlooked and appropriate attention is paid to the training of personnel in the operation of the Contractor's new or changed machinery and their Operation & control procedures, to prevent/control risks.

1.12.2 CONTRACTOR shall exercise due diligence in appointing his SUB-CONTRACTORS and outsourcing contract services, that no new safety or Health threats are created. The CONTRACTOR shall ensure personnel of SUB-CONTRACTORS and outsourced contract services are competent in Safety, Health and Environmental management to meet the POLICY requirements. They shall be made aware of the safety rules, emergency procedures and any information that will have a bearing on the safety, health and related contractual obligations.

1.13 HAZARD IDENTIFICATION AND RISK ASSESSMENT (HIRA)

1.13.1 CONTRACTOR shall ensure that his key personnel and safety personnel are trained to be competent in Hazard identification, Risk assessment and risk control processes. The CONTRACTOR shall on a routine basis identify, evaluate and control all safety & health risks especially in the hazardous work activities and also to validate the previous risk assessments. Elements such as hazard identification, evaluation of risks with existing control measures in place and estimate of tolerability of the residual risks shall be an ongoing process. Any additional/new control measures shall be designed based on this process on need basis.

1.13.2 CONTRACTOR shall maintain a Hazard Identification, Risk Analysis and Control Manual (HIRAC) pertaining to all his activities duly updated as detailed above. The HIRAC for activities shall be made available to the EMPLOYER/CONSULTANT during regular inspections and audits.

1.14 WORK PERMITS

The CONTRACTOR shall maintain a work permit procedure. Essential features of the work permit system are as follows:

Clear identification of who may authorize particular jobs and who is responsible for specifying the necessary safety precautions.

1.14.1 Communication of instructions on the issue and use of permits.

1.14.2 Monitoring and auditing to ensure that the system works as intended.

1.14.3 The types of jobs requiring the control of a work permit are:

(i) Hot work of any type (e.g. Hot metal riveting, gas cutting, brazing, grinding, gouging, gas and electric welding) and Work which may cause uncontrolled hydrocarbon release, including any disconnection or opening of a closed pipeline, vessel or equipment containing flammable material.

- (ii) Work at height above 1.2m / 4ft or those works at unprotected elevations that demands fall protection to prevent from falling or involving danger of dropped objects.
- (iii) Work involving electrical isolation or work on live electrical systems and equipment.
- (iv) Work involving the use of dangerous substance (Radioactive materials). (v) Demolitions and Excavations.
- (vi) Pressure testing. (vii) Maintenance operations. (viii) Entry into confined spaces.

The work permit issued under the procedure shall be valid for a specified period and shall be issued only after all safety precautions are fulfilled and duly verified by the concerned department engineer and safety officer (EMPLOYER/CONSULTANT). If deemed necessary the same work permit sheet may be revalidated to extent beyond the specified period provided the site conditions and the persons on job remain the same.

1.15 JOB SAFETY INSPECTION:

- 1.15.1 Employer/Consultant will conduct planned inspections of the contractors work area and activities. The inspections will verify the contractor's safety records. The Contractor safety inspection will cover the safe behaviour of contractor employees, safe work condition of equipment in use and the safety and housekeeping of area where work is carried out.
- 1.15.2 Contractor also shall maintain a procedure for safety inspection at routine intervals to provide assurance that the instituted safety procedures are in place to prevent deviations from established standards that could lead to a safety hazard and consequential risk. The Contractor shall establish appropriate standardised checklist for systematic job safety verification to ensure
 - i) Set standard are followed without deviation.
 - ii) Employees are competent to perform as prescribed operational control procedure.
 - iii) Monitoring of safety of the various work areas/tasks.
 - iv) Adequacy of existing operation reports and proposed remedial measures shall be submitted to the employers/Consultant.

1.16 SAFETY AUDITS

- 1.16.1 The Employer/Consultant shall retain their rights to audit the contractor's safety management system either directly by their employees or his nominated representatives for its effectiveness.
- 1.16.2 The contractor shall undertake periodic safety audits to confirm through investigative methods the effectiveness of the measures set out in policy. In order to be effective such safety audit shall be comprehensively covering all aspects detailed in the specification to ensure effective loss-control/accident prevention programme. Safety

audits shall take into account the safety inspection records, remedial measures and effectiveness of the safety programme shall be based on the contractor's effective hazard identification and risk assessment processes for design of operational control procedures and on the safety statistics. Audit reports and preventive actions and safety improvement programmes shall be submitted to the Employer/Consultant.

2. EQUIPMENT, SUBSTANCES AND PERSONAL SAFEGUARDING

2.1 MECHANICAL SAFETY

- 2.1.1 The CONTRACTOR shall ensure that all his equipments and machinery are safe to use while in motion or working. Operators shall have received training or instruction on operation of the machinery and the regulatory requirements. The CONTRACTOR shall have adequate procedure to ensure the stability and securing of his working machinery during operation. He shall restrict repair and maintenance of the machinery to trained personnel and maintain records of repairs and maintenance. The equipment shall have appropriately designed means of isolating from sources of energy and shall have emergency stop control, which is easily accessible. All controls shall be clearly and uniformly marked. All operation controls, interlocks, sensing devices and guards on tools and equipment shall be functional and their status shall be regularly checked and recorded. The CONTRACTOR shall provide evidence of compliance to these requirements in any contractual write-ups submitted to the EMPLOYER/ CONSULTANT for approval in respect of critical construction/contract works.
- 2.1.2 The CONTRACTOR shall provide only good quality Hand tools and ensure control of condition, storage, routine inspection and use of such hand-tools. Unsafe tools such as with cracked or broken handles, mushroomed chisels and punches, worn screwdrivers, hardened hammer heads; power tools with unsafe resistance to earth or without safety guards shall be strictly prohibited.
- 2.1.3 All safety ladders, scaffolding and such access equipment shall meet requirements of IS 3696 and IS 4014:1967 and such standards as the EMPLOYER/CONSULTANT may stipulate. The safety work permits shall be issued only after ensuring that all safety requirements of access equipment are complied with. Access equipment shall be inspected on a routine basis to prevent injuries caused by falls. It shall be the responsibility of the Contractor to provide safe work access to all work places.
- 2.1.4 The CONTRACTOR shall ensure safety of all those concerned with lifting and those who may be affected by material hoisting, lifting and handling using various mechanical aids. All lifting equipment such as cranes, hoists, lifting tools and tackles, shackles, hooks chains and links shall be designed as per appropriate international codes of construction. Operators shall have been trained in operation and maintenance of such equipment besides training on standard hand signals to be employed during the hoisting and lifting operations. Safe Working Loads (SWL) shall be marked on equipment prominently. SWL shall be evidenced to

have been established by test procedures in accordance with acceptable codes of practices. Medical Examination of Operator & Signaller is mandatory.

- 2.1.5 Riding on construction equipment, forklifts and cranes shall be prohibited unless such vehicles are provided with passenger seats.
- 2.1.6 Pressurized gas and air systems shall be maintained safe in good working order and shall meet the requirements of the Factories Act 1948, The Static and Mobile Pressure Vessels Rules 1984 and the Gas Cylinder Rules 1934 as applicable. The safety relief valves, safety appurtenances and isolation systems shall be compliant with safety code of practices. Any statutory register of pressure vessel records and the code of practices shall be subject to periodic auditing by the EMPLOYER/CONSULTANT. The CONTRACTOR shall ensure the pressurized gas and air systems are periodically tested by competent authority and records are maintained properly.
- 2.1.7 The areas of highly dangerous activities like hoisting, lifting and rock blasting, and radiation, shall be appropriately barricaded to protect personnel and machinery and guided by work permit discipline. Emergency plans shall cater to emergencies arising out of such activities.
- 2.1.8 Signs, barricades, barrier tapes and warning or entry restriction devices or accessories shall be provided to minimise work related risks of accidents and injuries. Signage shall meet all regulatory requirements such as under The Building and Other Construction Workers Act, 1996; Factory Act, 1948; Manufacture, Storage and Import of Hazardous Chemicals Rules under Environmental Protection Act 1986; Indian Explosives Act 1984 and Gas Cylinder Rules, 1981 and Indian Electricity Act, 1910 and Rules there of and any other safety requirements of the EMPLOYER/CONSULTANT.
- 2.1.9 CONTRACTOR shall follow the Environment Act 1986 and Rules framed there under. Devise and adopt appropriate noise control measure to maintain noise level at site reasonably below the acceptable statutory noise levels. Work area monitoring & Ambient Air monitoring for various parameters [i.e. Noise, Dust Water, SPM, SO₂, NO₂ etc.] to be checked through approved laboratory.

2.2 ELECTRICAL SAFETY

- 2.2.1 CONTRACTOR shall provide only such equipment for work that is electrically Safe to work. The CONTRACTOR shall have a procedure to identify and record all his electrical equipment in a register, with provisions to record his periodic inspections of such equipment. Inspection shall cover cables, extension leads, all electrical equipment drawing power from socket outlet. He shall identify and maintain in good working order all electrical installations such as distribution panels and major switchgear ensuring safe accessibility. A clear area shall be maintained around panels and switchgears. The installed equipment shall be periodically inspected by qualified personnel to ensure their continued safe

operating condition. Inspection shall include earth polarity checks, continuity checks and earth resistance checks. The CONTRACTOR shall ensure use of flameproof and explosion proof switchgears and lighting fittings where required as per governing codes.

2.2.2 Approved earth leakage relays or alternative safety devices to relevant are and International codes shall be used on all portable electrical hand tools. Where possible low-voltage electric power supply shall be used for hand tools, earth leakage units shall protect electrical installations in workshops, kitchens, cafeterias, first-aid rooms, laboratories and offices. Record of regular checks shall be maintained. The CONTRACTOR shall comply with 'Code of Practice for Earthing as per IS: 3043.

2.2.3 Safety rubber matting of appropriate voltage rating conforming to IS 5424 entitled 'Rubber Mats for Electrical Purposes' shall be provided in front of all switchgears and power distribution panels for the safety of personnel operating such equipment.

2.2.4 CONTRACTOR shall arrange displaying signage under Indian Electricity Act 1910, such as:

(i) Danger notices as per IS 2551 in conspicuous places on all Low, Medium and High voltages as per Rule 35,

(ii) Instruction of restoration of persons suffering from electric shock in English and local languages as per Rule 44 in switchgear rooms, substations and places where electricity is used and

(iii) Notice prohibiting unauthorized entry in areas where electrical apparatus are used.

2.2.5 All power cables providing construction power to various construction machinery and the connectors shall be in safe and sound condition. Cables shall be routed through cable trays supported on appropriately designed structures, duly clamped, secured and identified. Road crossing cables shall be laid in conduits buried at least 600 mm below the surface to prevent damage due to vehicular traffic. All cables shall be off the floor to avoid damage or tripping hazard. Cables shall be terminated at the switchgear and sockets in a workman like manner to prevent loose contacts and flashover. Only safety receptacles shall be used for providing power connection to hand-tools. All switches and distribution boards shall be clearly marked. All electrical distribution and panel wiring diagrams shall be available with the electrical maintenance personnel. The CONTRACTOR shall maintain a safe electrical isolation/Lockout – Tagout (LOTO) procedure.

2.2.6 The CONTRACTOR shall ensure lighting circuits are not used for hand-tools.

No electrical equipment shall be overloaded. Tools and test equipment used on electrical systems shall be insulated.

2.3 SUBSTANCES ABUSE PROGRAMME

2.3.1 The CONTRACTOR is encouraged to have a 'Substance Abuse Programme'. Drinking during working hours shall be strictly prohibited. The CONTRACTOR shall promote through poster and other publicity, awareness on abuse of substances such as alcohol and such depressant drugs that slows the activity of brain and spinal cord on abusive usage endangering the safety and health of users and others affected by their work.

2.3.2 No tobacco in any form shall be allowed in EMPLOYER project premises.

2.4 HAZARDOUS SUBSTANCES CONTROL

2.4.1 CONTRACTOR shall prevent all injuries, illnesses and damage to property or the environment caused by any article or substance, which proves to be hazardous. The code of practices of construction and operation and maintenance and control procedures shall meet required statutory and regulatory requirements. Personnel shall be trained on use, handling, storage, disposal and emergency spillage procedures.

2.4.2 CONTRACTOR shall detail and deploy operational controls to reduce hazardous wastes and their disposal as required by the statute 'Hazardous Waste (Management and Handling) Rules 2000'. Oil wastes, used oils, soil and cotton soaked in oil consequent to handling operations, grease and many class of paints and asbestos sheets and gaskets are typical hazardous wastes.

2.4.3 CONTRACTOR shall identify, contain and control all sources of radiation. Appropriate regulatory approvals shall be obtained before commencement of work involving radiation sources. Radiation protection advisors suitably qualified and experienced shall be appointed whose names shall be submitted to EMPLOYER/CONSULTANT. Surveillance of personnel engaged in such work shall be maintained in accordance with regulatory requirements.

2.4.4 CONTRACTOR shall prominently display Material Safety Data Sheets (MSDS) of all chemical, and hazardous substance used, handled, stored on site, and should ensure that these MSDS are available for reference to all employees at all times and displayed at site (preferably in local language) understandable by the workmen / labour.

3. PERSONAL SAFEGUARDING

3.1 PERSONAL PROTECTION EQUIPMENT (PPE)-General

The CONTRACTOR shall provide his employees required PPE meeting the requirements of the stated IS specifications and guidelines or equivalent International Standards as may be prescribed by the EMPLOYER / CONSULTANT from time to time. The CONTRACTOR shall have instituted good working procedures and practices in providing PPEs, maintenance, issue and training on their usages. All PPE shall be periodically checked to ensure worn, damaged equipment are replaced expeditiously.

3.1.1 Control Issue, Use and Maintenance of the PPE Employees shall be responsible for the PPE issued to them. The CONTRACTOR shall meet requirements of IS 8519 entitled 'Guide for Selection of Industrial Safety Equipment for Body Protection' or any equivalent international specification that the PURCHASER/CONSULTANT may prescribe.

3.1.2 Head Protection

CONTRACTOR shall comply with requirements of IS 2925. Hard hats with chin strip shall be used and worn. Hard hats intended for use by visitors shall have replaceable paper lining.

3.1.3 Eye and Face Protection

Eye protection shall be worn during all operations by operators and people in the vicinity, where there is a danger of flying particles of metal such as generated during use of hand tools such as chisels, grinding, welding and cutting - lathe work on brass and cast iron, acid and alkali splash, high pressure jet cleaning or insulation removal from heights using high pressure jets. The CONTRACTOR shall meet the requirements of IS 8520 entitled 'Guide for Selection of Industrial Safety Equipment for Eye, Face and Ear Protection'.

3.1.4 Footwear

Safety shoes, boots and gumboots fitted with steel toe-caps of approved quality conforming to prescribed Indian or international standards. Wearing of unsafe safety shoes such as jogging shoes, tennis shoes, slippers and sandal etc. are prohibited. The CONTRACTOR shall meet the requirements of IS 10667 entitled 'Guide for Selection of Industrial Safety Equipment for Protection of Foot and Leg'.

3.1.5 Protective Clothing

CONTRACTOR shall prevent hazards of loose clothes worn by workmen getting caught in moving machine parts. Loose and thin garments such as dhoti and pyjamas are prohibited. While the CONTRACTOR shall ensure that all workmen wear long sleeved shirts, jackets or the like with the sleeves rolled down and secured at the cuff, long pants/ trousers extending upto the top of the safety shoes so as to prevent injuries caused by contact with heat, cold abrasive and sharp surfaces shall be strictly enforced. Such protective clothing shall be mandatory in hazardous areas especially during start-up operations involving hot, inflammable, and other chemical hazards, furnaces and boilers and such fired equipment and asphaltting plants. Personnel exposed to acids and alkalis hot fluids and steam during such operations shall be provided with appropriate heat or corrosion resistant clothing. The CONTRACTOR shall meet the requirements of IS 8990 entitled 'Maintenance and Care of Industrial Safety Clothing'.

3.1.6 Hand Protection

CONTRACTOR shall provide appropriate hand gloves as per IS 8807 entitled 'Guide for Selection of Industrial Safety Equipment for Protection of Arms and Hands' to prevent injuries to hands during work. The CONTRACTOR shall maintain appropriate inventory of

gloves for different applications like acid and alkali handling, general-purpose work gloves and asbestos or heat resistant hand gloves etc.

3.1.7 Safety Harness

CONTRACTOR shall provide Full body Safety harness with double lanyard to workmen engaged for work in heights such as open-sided floors, open-sided scaffoldings, floor and roof openings, overhead construction works of various nature etc. where there is a falling hazard of two meters or above. Storage, issue, wearing and maintenance of full body safety harness with double lanyard shall be under strict supervision and records shall be maintained. Practices for safety harnesses and fall arrests shall conform to IS 4912, IS 11972 and IS 8519 or equivalent international codes.

3.1.8 Falling Object Protection

Where work is in progress in elevated areas, barricades, barrier tapes, signs and such entry restriction devices shall be used to keep area below clear of personnel to prevent injury due to falling objects. If work is required in the area below elevated work area, it shall be scheduled at a time different from elevated works. The workmen below shall be protected from falling objects by the debris net or a catch platform with an adequate toe board to prevent material from falling off. Use of safety net for elevated works shall be considered in the work-permits where appropriate. Where a lift is made above a working area, the area below the path of the lift shall be cleared of personnel during the lift and barricaded and guarded to prevent entry of persons generally in conformity with IS 4912, IS 11972 and IS 13416 for protective barriers in and around building and preventive measures against safety hazards in work places and safety requirements for floor and wall opening, railings and toe- boards.

3.1.9 Respiratory Equipment

CONTRACTOR shall maintain where appropriate, procedures for training and use of Self-Contained Breathing Apparatus (SCBA). The SCBA shall be provided together with lifelines and rescue teams to safeguard personnel working in areas where gases such as carbon monoxide, methane chlorine and such life endangering atmospheres are present. The CONTRACTOR shall meet requirements of IS 9623 for 'Selection, Use and Maintenance of Respiratory Protective Devices'. The CONTRACTOR shall have trained adequate number of personnel including the identified fire fighting teams, hose teams and SAs in the use of the SCBA. The CONTRACTOR shall use the periodic safety drills to demonstrate, train and establish competence of personnel in the use of SCBA.

3.1.10 Hearing Conservation

CONTRACTOR shall ensure reasonable precautions are taken to avoid injury to the hearing of the employees. All noise levels shall be controlled within 85 dBA. The CONTRACTOR shall identify noise areas and display caution boards in such noise areas where noise levels exceed prescribed safe level, the CONTRACTOR shall arrange for appropriate engineering control measures to minimise the noise level in such high noise level areas. Where this is not feasible, appropriate earmuffs or ear protectors (ear plugs) shall be provided to workmen ensuring these are worn by those exposed to noise levels beyond safe levels. Periodic hearing acuity tests shall be conducted on such persons

exposed to high noise levels to ensure that they do not suffer any hearing impairment as per requirements of IS 8520:1977, The contractor shall also maintain records of such medical tests. The CONTRACTOR shall devise training programme for awareness on effects of high noise hazards and control measures for all the employees.

3.2 MANUAL MATERIAL HANDLING AND ERGONOMICS

3.2.1 CONTRACTOR shall have procedures to identify risks involved in manual/ material handling operation and tasks. The CONTRACTOR shall ensure appropriate training to prevent any possible injury. Full use of mechanical aids shall be made to avoid risks arising out of such manual handling. Employees shall be adequately trained on such manual tasks and related safety precautions to reduce the risk of injury to personnel engaged in such work.

3.2.2 CONTRACTOR shall undertake ergonomic study of manual operations to prevent musculoskeletal injury during manual handling, besides visual fatigue and mental stress giving considerations to matters such as seating, lighting and ventilation, etc.

4. FIRE PROTECTION AND PREVENTION

4.1 CONTRACTOR shall arrange to train his personnel meeting the prescribed qualifying competence needs, in requisite numbers in the operation of such fire protection equipment and systems.

4.2 Risk assessments shall be carried out to identify potentially vulnerable areas to provide sufficient quantities of correct type of extinguishers and ancillary equipment to deal with various types of fire hazards.

4.3 Where required under the CONTRACT the CONTRACTOR shall provide appropriate type of extinguishers close to areas of fire hazard but not too close they are cut off from use during a fire. Water based extinguishers shall not be positioned close to or used on electrical equipment.

4.4 Extinguishers shall be marked / labeled and recorded with location particulars in a register. These shall be inspected at monthly intervals to ensure they are in operable sound condition. There shall be a systematic plan for servicing, repairing and recharging fire extinguishers and for recording such dates on the register and equipment.

4.5 The location of fire fighting equipment shall quickly and easily be identifiable especially in emergencies in a conspicuous manner painted as high as possible to identify the location of the extinguisher to prevent it from being obscured by machinery and goods stacked in front and to return the equipment to its location after emergency use in other locations. In order to ensure this, 'Keep Clear' area shall be demarcated and maintained. Location plans of extinguishers and fire-fighting equipment shall be prominently displayed when desired by the EMPLOYER/CONSULTANT.

- 4.6 Safety Officer / Security shall be trained on fire fighting techniques who shall co-ordinate and control Fire protection and prevention programmes.
- 4.7 Where required under the CONTRACT, the CONTRACTOR shall maintain alarm systems powered by mains and by battery for back-up. Where required under the CONTRACT, emergency lighting shall be provided to aid evacuation in poor lighting conditions following the alarm. The alarm system shall be made known to all employees. When the EMPLOYER extends these facilities for use by the CONTRACTOR, he shall provide appropriate training to his personnel in the use of such emergency facilities and duties.
- 4.8 A clear written procedure for action in the event of fire should be produced. Fire teams and hose teams shall be identified and their responsibilities during emergencies shall be detailed in writing. Personnel shall be trained on their fire duties and use of fire-fighting equipment. Regular drills shall be conducted to test procedures and to validate them. Fire instructions and emergency procedures shall be displayed throughout the premises. Emergency response procedures are detailed under para 5.0 below.
- 4.9 A means of escape shall be provided in all work areas and storages and maintained and kept free from obstruction. All exits shall be clearly marked and kept unlocked whilst the premises are in use. Escape routes shall be protected from fire.
- 4.10 When a hot work permit is issued, the CONTRACTOR shall ensure:
- (i) Identification of combustibles such as paper, cardboard and wood and moving away from area where hot work is undertaken using open flame or electric arc.
 - (ii) Determination that flammable vapours and liquids are not present.
 - (iii) Protection of floor and wall openings to keep out sparks.
 - (iv) Determination that sprinkler and hydrant and other installed fire systems are functional.
 - (v) Establishing a fire-watch with fully loaded extinguishers or charged Water-hoses throughout the operation and 30 minutes after completion of operation
 - (vi) Adequate ventilation for welders, by means of natural air movement Local exhaust ventilators or air-line respirators as required.
 - (vii) Workmen performing the task are adequately briefed on job safety analysis, hazards and risks and the safeguards against risks.

4.11 SECURITY

- 4.11.1 Where required under the contract, security personnel shall do all that is reasonably practicable to ensure the safety of employees and property of the company in the face of accidents by fighting fires and containing losses due to pilferage, theft, vandalism and industrial espionage both by employees and external elements. Security personnel shall be appropriately competent and receive adequate safety training. Security

personnel shall routinely report on a standardized basis on aspects such as violation of fire-protection rules, use of alcohol and narcotic drugs, condition of security fencing, floodlighting and storages etc.

- 4.11.2 Where the project is located where a number of other companies are in operation, the CONTRACTOR shall plan for mutual assistance /off site programmes in cases of emergencies, as are practiced in the area in conjunction with the EMPLOYER.
- 4.11.3 Where common boundaries exist between companies, the CONTRACTOR in conjunction with the EMPLOYER shall co-ordinate security control over factors common: such as floodlights, fencing, pipelines containing gas, fuel and electricity.
- 4.11.4 Security personnel shall be represented in the Safety Committee through the Safety Appointees nominated from the area.

5. EMERGENCY PLANNING / EMERGENCY RESPONSE

- 5.1 CONTRACTOR shall plan to deal with on site emergencies. An emergency planning/emergency response specific to the job site shall be written and communicated to all employees. The emergency planning/emergency response shall identify for the potential for and responses to incidents and emergency situations and for preventing and mitigating the likely illness and injury that may be associated with them.
- 5.2 CONTRACTOR shall review his emergency preparedness and response plans and procedures in particular after occurrence of incidents or emergency operations.
- 5.3 CONTRACTOR shall designate his emergency team with their duties during emergencies defined, including those of the hose teams, medical personnel, first-aiders and security. The CONTRACTOR shall maintain a procedure as to how his emergency organization shall liaise with the EMPLOYER/CONSULTANT representatives in the emergency planning/emergency response.
- 5.4 CONTRACTOR shall also periodically test such emergency procedures by conducting mock-drills and use the experience for updating the emergency planning/emergency response and for training the employees on the perceived competence needs.
- 5.5 The Emergency Planning/Emergency Response of the CONTRACTOR shall be under the control of the Safety Representative who shall be able to co- ordinate with the EMPLOYER/CONSULTANT for liaising with government agencies, neighboring industries and community.
- 5.6 The Emergency Planning/Emergency Response shall be designed to allow people to work under disaster conditions when normal services such as telephone water, light power, transport and sanitation are not available and first aid and fire fighting facilities are not able to cope with sudden demand on services.
- 5.7 The Telephone numbers of Ambulance, Police, Fire , Hospitals/ medical centers, Managers and the Employers key executives shall be prominently displayed in the identified Emergency Response Centre.

6. PREMISES AND HOUSE-KEEPING

6.1 ORDERLY WORK-PLACE

CONTRACTOR shall maintain a well-managed safe working place in sound clean condition. The CONTRACTOR shall ensure that there is a place for everything and everything in its place so that optimum use is made of valuable floor space with commensurate cleanliness and reduced handling time. He shall ensure that his entire infrastructure including temporary and semi- temporary buildings are kept clean and good repair.

6.2 GOOD LIGHTING-NATURAL AND ARTIFICIAL

CONTRACTOR shall provide lighting natural or artificial to enable work Processes are carried out safely. Artificial lighting shall be adequate especially in the nights and emergencies. The lumen levels shall meet the statutory requirements.

6.3 VENTILATION-NATURAL AND ARTIFICIAL

CONTRACTOR shall ensure that workplaces are ventilated with at least prescribed amount of clean or cleaned fresh air of a suitable temperature, especially where toxic or irritating substances are present such as welding, vehicle exhaust fumes, irritating dusts, organic solvents or any other inimical atmosphere creating health hazards or safety.

6.4 WELFARE AND HYGIENE FACILITIES

CONTRACTOR shall provide Welfare facilities to ensure a high standard of cleanliness for all activities and rest. The CONTRACTOR shall provide facilities for his employees such as ablutions, toilets change rooms, kitchens and cafeterias adequate and in a clean and hygienic state.

6.4.1 DRINKING WATER

The Contractor shall make in every place where building or other construction work is in progress, effective arrangements to provide and maintain at suitable points conveniently situated for all persons employed therein, a sufficient supply of wholesome drinking water.

6.4.1.1 All such points shall be legibly marked "Drinking Water" in a language understood by a majority of the persons employed in such place and no such point shall be situated within six meters of any washing place, urinal or latrine.

6.4.1.2 Container used to distribute drinking water shall be hygienic and clearly marked as to the nature of its contents and not used for any other purpose.

6.4.2 LATRINE AND URINAL ACCOMODATION.

Latrines or urinals, as the case may be, required to be provided shall be of the types as specified below.

6.4.2.1 Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a door and fastenings;

- 6.4.2.2 Where both male and female building workers are employed there shall be displayed outside each block of latrine or urinals a notice containing therein “ :
- (i) For Men Only” or “For Women Only”, as the case may be, written in the language understood by majority of such workers;
 - (ii) Such notice shall also bear the figure of a man or a woman, as the case may be.
 - (iii) Every latrine or urinal shall be conveniently situated and accessible to site workers at all the times;
 - (iv) Every latrine or urinal shall be adequately lighted and shall be maintained in a clean and sanitary condition at all the times;
 - (v) Every latrine or urinal other than those connected with a flush sewage System shall comply with the requirements of public health authorities. (vi) Water shall be provided by means of a tap or otherwise so as to be conveniently accessible in or near latrine or urinal;
 - (vii)Wall, ceilings and partitions of every latrine or urinal shall be white washed or color washed once in every period of four months.
 - (viii)Hand soap or similar cleaning agent shall be provided in each latrine.

6.4.3 CANTEENS:

6.4.3.1 CANTEENS AT LABOUR CAMPS:

- (i) In every place wherein not less than two hundred and fifty building workers are ordinarily employed, contractor of such building workers shall provide an adequate canteen.
- (ii) The canteen shall consist of a dining hall with furniture sufficient to accommodate building workers using such canteen, a kitchen, and store room, pantry and washing places separately for building workers and for utensils.
- (iii) The canteen shall be sufficiently lighted at all the times when any person has access to it.
- (iv) The floor of canteen shall be made of smooth and impervious material and inside the walls of such canteen shall be lime-washed or colour-washed at least once every six months.
- (v) The precincts of canteen shall be maintained in a clean and sanitary condition;
- (vi) Waste water from canteen shall be carried away in suitable covered drains and shall not be allowed to accumulate in the surrounding of such canteen.
- (vii)Suitable arrangements shall be made for collection and disposal of garbage from canteens.

(viii) Building of canteen shall be situated at the distance not less than 15.2 metres from any latrine or urinal or any source of dust, smoke obnoxious fumes.

(ix) Site where workers can not avail canteen facility due some reason and are need to take food close to work place, at such locations contractor shall provide a separate place for food serving facility with sound hygienic principles and shall meet the applicable laws.

6.4.3.2 CANTEEN AT PROJECT PREMISES

(i) Workers must not cook in the project premises.

(i) Workers shall carry the food from labour camps and shall have at designated lunch shed made by the contractor.

(ii) Contractor should make shed for workers having lunch in designated location approved EMPLOYER/CONSULTANT.

(iii) Workers having food in open / work location are strictly prohibited.

6.4.4 SAFETY , HEALTH AND WELFARE AT LABOUR CAMPS

(i) The Contractor shall provide free of charge as near to it as may be possible, temporary living accommodation to all building workers employed by him for such period, as the building or other construction work is in progress.

(ii) The temporary accommodation provided by the contractor shall have separate cooking place, Bathing, washing & lavatory facilities.

(iii) As soon as may be, after the building or other construction work is over, the CONTRACTOR shall, at his own cost, cause removal or demolition of the temporary structures erected by him for purpose of providing living accommodation, cooking place or other facilities to the building workers and restore the ground in good level and clean condition.

(iv) Colony/shelters constructed shall be situated at suitable heights where danger of water (waste or rainy) accumulation does not exists; as water accumulation ultimately leads to breeding ground for mosquitoes.

(v) Shelters constructed at labour camp shall protect labourer/workers from rain, cold and heat. And shall be so constructed, equipped and maintained, so far as reasonably practicable, as to prevent the entrance or harbour of rodent, insect, and other vermin. A continuing and effective extermination program shall be instituted where their presence is detected.

(vi) Electric supply shall be provided at labour camps for illumination purpose.

(vii) Safe and Adequate potable water shall be provided at camps. The quantity of water shall be decided after taking number of persons residing in camp into consideration.

(viii) Proper access shall be provided to the shelters.

(ix) Labourers residing at camp shall be encouraged to maintain their camp clean by providing waste bins and waste disposal system.

(x) Facility shall be created to drain out waste water. Drainage of camps/colony shall be connected to drainage system or soak tanks to avoid water accumulation. (xi) Adequate toilets and washing facilities shall be provided for the labourers inside the camp.

(xii) Safety & Health related posters shall be placed in the camp to increase safety and health awareness amongst the labourers.

(xiii) First-aid facility shall be provided in the camp. Also few workers should be trained to render first-aid and fire fighting in case of emergencies.

6.5 POLLUTION TO GROUND, AIR AND WATER

(i) The CONTRACTOR shall strive to exceed established minimum performance norms in waste and pollution control. All drains shall be identified as clean water and foul water to aid non-harmful disposal. The CONTRACTOR shall ensure safe collection and disposal of solid, liquid and other waste, and ensure periodical cleaning of disposal bins, septic tanks and shall maintain the records.

(ii) The CONTRACTOR shall have a System in place to segregate waste during construction and subsequent reuse or recycling.

(iii) The CONTRACTOR shall take necessary measures to prevent construction activity pollution by controlling soil erosion and sedimentation as per the National Building Code (NBC) 2005 guidelines. The Top soil shall be stacked and reused for land scaping, wherever applicable/ reused suitably.

(iv) The CONTRACTOR shall take necessary measures to control dust generation at site and roads by sprinkling water at regular interval.

(v) The CONTRACTOR shall conduct periodic ambient air quality monitoring through approved lab to check the pollution levels at the site particularly in areas where batching plant shall be maintained by the CONTRACTOR and produced to EMPLOYER/ CONSULTANT