

Environmental Monitoring Report

Project Number: 43253-027
Semestral Report (February–July 2019)
July 2019

INDIA: Karnataka Integrated Urban Water
Management Investment Program (Tranche 2)

Appendices (PART E)

Prepared by Karnataka Urban Infrastructure Development and Finance Corporation, Government of Karnataka for the Asian Development Bank.

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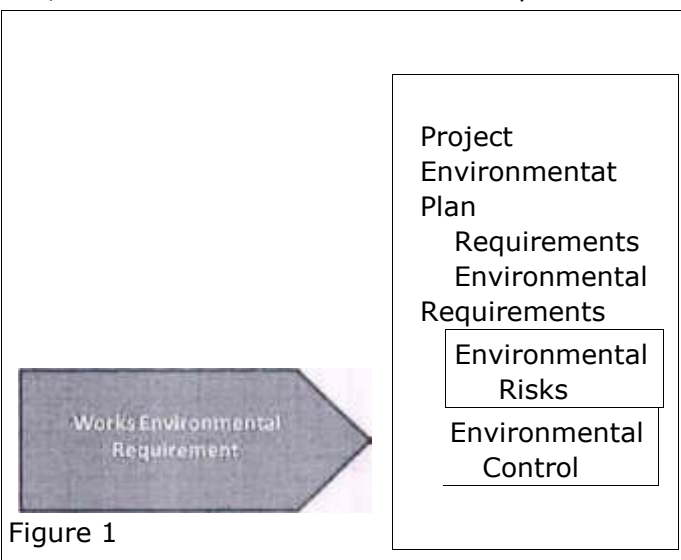
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resultant facility. In the latter case, it is based on the services stipulated in the Contract with the Client and will also be based on compensation for performing them.

Figure 1 illustrates how environmental requirements will be identified to produce environmental plans. Project Director with respect to the concerned Work/Project scope of work for environmental management plan will identify environmental requirements with respect to the following;

- Contamination of surface, ground, groundwater, surface water and rivers
- Emission to air, including smell, gases, smoke and dust
- Unsanitary or unsafe storage or discharge to drain, sewer and surface waters
- Unsanitary or unsafe storage or discharge of solid wastes

Figure 1

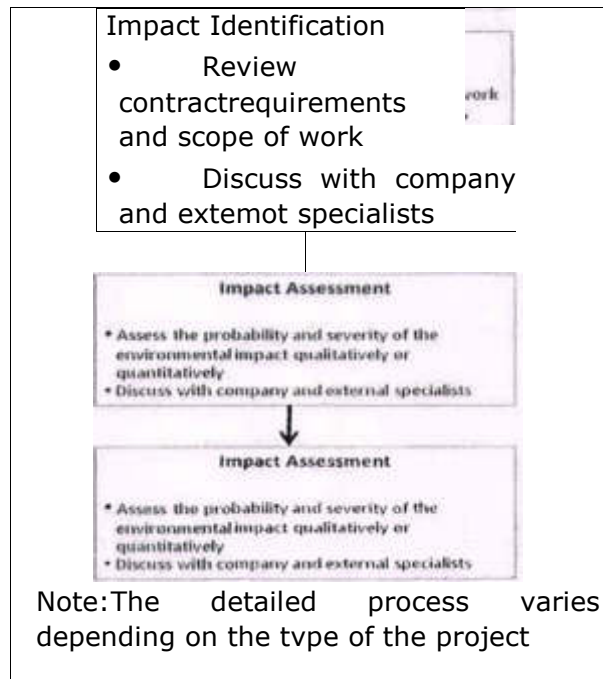


- Noise
- Visual intrusion and
- Excessive energy and water consumption

The Project Director will consult and seek guidance from the operation management or secure the services of company and external Environmental Specialists where needed to provide expert advice on the above identified scope of work. Where Tahal is acting in the role as supervisor of construction works performed by others, it is the Project Director's responsibility to confirm that appointed contractor(s) carries out identification environmental requirements for the Works.

17.3 Works/Project Environmental Impact Identification

This is the first of the three steps in the overall risks assessment process of the Works as shown in figure 2. The project manager arranges for the identification of potential impact of the Works activities, products and/or services on the environment. The Project Manager will use a team approach to identify any obvious, known and expected or foreseeable environmental impact, over which the Works team can have control by reviewing the scope of work by taking into account past experience, the specific task to be performed in the work breakdown structure and water industry relevant checklists. Where necessary data will be collected and surveys conducted to enable the identification of the environmental impact on the Works. While doing this the whole planned life of the project will also be considered with respect to noise, emission to air, conserving energy and water. The output of the environmental impact identification will be help to determine the potential environmental impacts from the Works.



17.4 Works/ Project Environmental Impact Assessment

The Project Director and the team analysis and assess each environmental impact. The assessment could be qualitative or quantitative. This assessment is undertaken to identify appropriate environmental controls and to develop planned approach or procedure to minimise risks associated with each impact. Figure 3 provides an example of qualitative environmental risks taken up by Tahal in its works. The decision as to whether action is required for each impact is based on the probable degree of impact and probability of occurrence based on simple low, medium & high rating.

PROJECT ENVIRONMENTAL RISK ASSESSMENT					
Is the likely to Involve any of the following	Yes/No NIA	Importance			Comments details of environmental impact on
		Low	Medium	High	
Are there any new/old watercourses streams ditches, etc?		M	1		The Site is located in an area with a 75 year risk of flooding. Measures should be put in place to ensure that in the event of a flood, no damage to the Site can be reached.
Is there a risk of pollution from development or other activities?	Y	M		Y	Water pollution through development. Will be managed in accordance with the sewerage agreement.
Will waste be produced?				Y	Timber and concrete will be segregated on site and, as far as possible, recycled. The re-use of excess spoil has been designed into the landscaping of the Site.
Will hazardous waste be produced?					A garage on Site is to be used for the storage of asbestos roof.
Is there asbestos present?					

nt on site?	an				
'he geneate dust'		M	M		palticu!ð' dry petfr)ds darrpiqq don be utiltsed reduce dust Into the surround ng area
Does the work involve e.g piling, demolition? Insole particulaly noisy acti l/tles					hvgered ptl:ng be uttlised site Cue to the spatial sepaabon be'ween the Site and he nearest houses It ts anhcpted that the, rutsance v,níi bê mimr md for !ernprat) peržod only
the inc'ease the background nost to the surrounding ane'					New bfmžers WII: he on Site bui these WII be housed IF an ðCOUSTIC cnclasure
SIGNIFICANCE					
f legislation, contractual duties and/or company policy, long breach of legislation, medium term effect, possible (if difficult) to legislation, no sensitive receptors, little or no scope for impact.			High Medium Low	Extremely likely or certain to occur Quite likely/occasional chance of c Improbable or unlikely to occur.	Severity Bleach HH HM HI MH occumg kctm WI LM LL
Ncenv					
Where It has been that action ired, mitt stiorg measurag will be included in the Environmentlt Plan.					

17.5 Work/Project Environmental Control

The Zonal Head and his project team with the Environmental Control Manager plan the environmental controls, develop emergency response and finalises the Environmental Management Plan (EMP) for the Works. Environmental control usually consists of mitigation measures based on the following categories;

AVOID: Prevent adverse environmental effects at source (e.g., choice of road location or specification of construction equipment).

REDUCE: Include features in the design and planning that reduce unavoidable impacts. (E.g. minimizing noise and vibration through the choice of construction technique, minimizing land-take).

REMEDiate: Take remedial action such as temporarily relocating affected sensitive/ important flora and fauna, for re-instatement later.

Activity/Hazards	Mitigation Measures
Pipe charging and Washout	AVOID: During pipeline charging and washout precautions will be taken that wash water does not to reach the roads where and where possible will be put to the surface water drains. Old pipes produced from changing to new pipes will be disposed of by trucks.
Site drainage/surface water runoff	AVOID: Precaution will be taken to avoid runoff from the construction works to the drains. This will be done using drain covers/blockers for foul water drains to prevent silt for surface water drains. Stockpiles, plant and materials will be stored in a manner that run off to the drains is minimised

Waste disposal	REDUCE: Due to the constraints of the site, waste will not be stored on the site for longer than 15 work days in any one period. Waste will be removed from site approximately every 3 days, or when the volume produced is enough to fill a waste removal wagon. Traffic to and from the site will be minimized, resulting in a reduction in-energy usage and vehicle pollution by only removing waste when there is a full load.
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An example of the likely mitigation measures that may be employed in the Works is shown in Figure 4 below•

Noise and vibration	REDUCE: Construction hours where feasible will be restricted to 08.00-18.00 Monday to Friday and 08.00-13.00 Saturday. There will be some increase of noise during pile laying, but this is short duration at a time and should therefore not cause a significant impact.
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17.6 WorkIProject Environmental Reporting

The Environmental Management Plan will be implemented and environmental impact from the project activity will be monitored and reported by the Project Director working with the Environmental Control Manager for the works. As required the reporting will be done on a monthly basis as part of the monthly reporting procedure of the Works. The report will include summary of the daily monitoring results on all the environmental aspects of the project.

18. HEALTH & SAFETY PLAN:

18.1 GENERAL RULES

Regulation Acts in General:

- Workmen below 18 years & above 58 years will not be engaged for job.
- Physically challenged personal will not be engaged, jobs which are not suitable to the individuals.
- Female work forces will not be engaged more than the prescribed time as per the recommendation by the act.
- The authorized representative will give training, before starting the job.
- No building worker lifts by hand or carries overhead or over his back or shoulders any material, article, tool or appliances exceeding in weight the maximum limits set out in the following table,

Person	Maximum Weight Load
Adult-Male	50 Kg
Adult-Female	30 Kg

18.2 HSE Orientation for the Workmen

Every new workman undergoes an HSE orientation program before sending to the site. In the program, safety engineer explains how to overcome probable hazards at site and important PPEs. Also, explains the safety norms that are to be followed at site.

18.3 TBT Talks (tool box talk)

In order to enhance the safety awareness amongst workmen, site engineer conducts TBT talks regularly. Whenever the new job starts Safety engineer inducts workmen on the hazards involved in the activity and proper work methods covering all the areas periodically.

18.4 Safety Training

Safety engineer conducts safety-trade wise training programs regularly. Site engineers, Supervisors & workmen attend the program to enhance their technical knowledge with respect to safety and learn how to integrate safety into the work-practices. Depending on the requirement, demonstration on required type will be done in consultation with the site engineers.

18.5 Safety Promotional Activities

Safety promotional activities like motivational programs, Awarding schemes, safety month celebration etc., shall be arranged to enhance safety awareness amongst execution staff and workmen. Such activities shall be initiated by safety personnel and organized by project team.

18.6 Personal Protective Equipment

All the types of personal protective equipment (PPEs) required at the site is made available at stores and all the PPEs shall conform to the relevant IS codes. Safety manual shall be referred for more details about the PPEs. Site engineers shall issue the required PPEs according to the job. The site engineer inform to SSC for making the necessary arrangement of special PPEs. Suitable foot protection will be ensured invariably to all male & female workers before engaging in the job. Please refer Exhibit 1 for the list of PPEs

18.7 Safety Code of Practice for Sub contractors

- All workmen shall be screened before engaging them on the job. Physical fitness of the person to certain jobs like working at height or other dangerous locations to be ensured before engaging the person on work. The final decision rests with the site management to reject any person on the ground of physical fitness.
- Smoking is strictly prohibited at workplace.
- Labours shall ensure adequate supervision at workplace. They shall ensure that all persons working under them shall not create any hazards to self or to co-workers.
- Nobody is allowed to work without wearing safety helmet. Chinstrap of safety helmet shall be always on.
- No one is allowed to work at or more than two meters height without wearing safety belt and anchoring the lanyard of safety belt to firm support preferably at shoulder level.
- No one is allowed to enter into workplace and work at site without adequate foot protection.
- Usage of eye protection equipment shall be ensured when workmen are engaged for grinding, shipping, welding and gas-cutting. For other jobs as and when site safety coordinator insists eye protection has to be provided.
- All PPEs like shoes, jacket, helmet, safety belt etc. shall be arranged before starting the job as per recommendation of site safety coordinator.
- All excavated pits shall be barricaded and barricade to be maintained till the backfilling is done. Safe approach to be ensured into every excavation.
- Adequate illumination at workplace shall be ensured before starting the job at night.
- All the dangerous moving parts of the portable / fixed machinery being used shall be adequately guarded.
- Ladders being used at site shall be adequately secured at bottom and top. Ladders shall not be used as work-platforms.

Material shall not be thrown from heights. If required the area shall be barricaded and one person shall be posted outside the barricade for preventing the trespassers from entering the area.

Other than the electricians with red helmet no one is allowed to carry out electrical connections, repairs on electrical equipment or other jobs related thereto.

- Power supply shall be taken through Earth Leakage Circuit Breakers (ELCB) of 30mA Sensitivity.
- Inserting of bare wires for tapping the power from electrical sockets is completely prohibited.
- All major, minor accidents and near misses to be reported to Project Manager / Site Safety coordinator to enable the management to take necessary steps to avoid the recurrence.
- All scaffoldings / work-platforms shall be strong enough to take the expected load. The width of the working platform and fall protection arrangements shall be maintained as per recommendation of Site Safety coordinator.
- Debris, scrap and other materials to be cleared from time to time from the workplace and at the time of closing of work every day.

- Adequate fire fighting equipment shall be made available at workplace and persons are to be trained in fire fighting techniques with the coordination of Site Safety Coordinator.
 - All the unsafe conditions, unsafe acts identified by contractors, reported by site supervisors and / or safety personnel to be corrected on priority basis.
 - No children shall be allowed to enter the workplace.
 - Female workmen are not allowed to work on height & high risk areas.
- 18.8. Jobs at remote & isolated site
- No person shall be assigned to work individually & team of required member will be provided according to the job nature in the particular job / area.
 - Whenever the job is in progress at least one person qualifying / trained will be at site, enabling the any emergency situation.
 - Concern Spread — in charge will be available at site / over phone, during jobs.
- Working hours will be during daylight & whenever the job is to be carried out beyond the time necessary illumination will be arranged on prior.

19. WELFARE PLAN

19.1 Labour Camp

Labour camp will be made at a nearby the work area with all necessary facilities to stay.

19.2 Drinking Water

Drinking water shall be made available in number of places to cater the labour strength and the water tank shall be cleaned regularly.

19.3 First Aid Facilities

The following activities shall be ensured.

- Provision of first aid and emergency treatment.
- Conducting training regarding First-Aid.
- Promote Health education, including family welfare among workers.

19.4. First-Aid Boxes

- Sufficient numbers of First-Aid boxes are provided and maintained for providing First-Aid to the workers.
- Every First-Aid box is distinctly marked "First-Aid".
- Nothing except appliances or requisites for First-Aid is kept in a First-Aid box and such box is so kept as to protect it against contamination by dust or other foreign matter and against penetration of moisture and such box is kept in the charge of a person trained in First-Aid and is always readily available during working hours.

19.5. Emergency Vehicle Arrangement

Vehicle for emergency purpose will be made available during working hours in a convenient place for attending any emergency situations at site. Ambulance arrangement will be made available with the tie up of local health centre / hospital / agency having the facility with necessary arrangement.

20. CRITICAL JOB ACTIVITIES

20.1 Overhead hazard (power lines)

- Wherever jobs near the overhead power lines are crossing, jobs will be carried out in presence of senior / authorized person.
- Wherever frequent movement of vehicles/ any other mode which are possible to entangle with electrocution, in the designated place "Goal Post" will be placed, at safe position for avoiding the movement of truck / vehicle with the extended height of material.
- Wherever the cranes are to be placed & job is to be carried out, such machines will be earthed locally.

20.2 Overhead Power Line crossing area

Care is to be taken while working near overhead power line and Safe distance is to be followed as per the details given below, to avoid electrocution. If not possible shutting down of power is to be done after getting permission from concerned departments and permit should be obtained from the respective department, the same should be returned after the completion of the specified work for recharging the line.

20.3 Minimum Clearance for Live Conductor

A. Classification of voltage (IE Rule 2(1)(a):

Low Voltage : Not exceeding 250V; Medium voltage : Not exceeding 650V

High voltage : More than 650V & unto 33KV ; Extra high voltage: More than 33KV

B. Clearance from building (IE Rule no 79)

Working under power line: safety distance to maintain

440 volts-----10ft from top tip of equipment to the line

13ft from top tip of equipment to the

18ft from top tip of equipment to

20.4 Underground hazard - Power cables I Water Sewage

- Wherever such items are visible, care will be taken by rerouting with the concern authority.
- If the area is under private party, clearance will be taken from the party for ensuring safe execution and rerouting of power cables, water and sewage lines.
- While carrying out job at common places it will be ensured with the available local authority.
- Wherever there is no possibility of getting details, cable detector will be used for identifying the underground cable.

20.5 Electrical & Instrument

- Only qualified electricians are allowed to give electrical connections.
- Electrician will wear red colour helmet for identification.
- Either an electrical engineer or 'B' license holder is responsible for the electrical maintenance and shall be at site till all the electrical equipment are shifted from site.
- Every DB will display a warning board to caution unauthorized person entering the area.
- Switch boards, DBS, SDBs, and all electrical installations have to be covered by a shed and must be easily approachable.
- Portable hand tools (metallic body) must have 3 core cable connection
- Colour coding for cable will be
Red — Phase, Black — Neutral, Green — Earth and for single phase Red, Yellow, Blue for 3 phase & Green for ear thing Wherever vehicle/ equipment movement is frequent cable should be laid underground/ overhead
- Metal clad plug must be used for all sorts of connection.
- Operation of portable power tools under open sky during rain must be avoided. Earthling of DBS, SDBs and all electrical panels must be checked properly before energized.
- Proper insulation n must be ensured.
- Cable lying on the ground must be avoided.

- EI-CBs must be checked whether it is in working condition and with sensitivity of 30 mA from distribution board.
- Work on live circuit is not allowed; shutdown will be taken before any electrical job commences.
- Earthling resistance should be less than 1 ohm.
- • First joint in a cable, emerging from a hand tool, must be 3M away from it, with good insulation.
- Welding cable and power cable must not overlap.
- Welding cable must be connected with proper lugs/ferules.
- Electrically operated tools should not be used in explosive environment.
- Personal protective equipment like rubber suitable hand gloves, shoes, safety helmet, safety belt etc. should be used for electrical work.
- All electrical installation should be well protected from rainwater.
- Authorized person will do periodical inspection of ELCB & electrical installation.
- All the Electrical works shall comply with all relevant statutory regulations.

20.6 Blasting (IS 4081 - 1986):

- Wherever excavation is not possible using excavators, it should be done by Controlled blasting (or) Chiseling operations.
- Authorized & recommended materials are only shall be used up to the allowable quantity.
- Controlled Blasting must be carried after obtaining Work permit.
- Explosion is to be done by the exploder/fire as per the suitable site conditions.
- Blasting will be carried out in the recommended timings only.
- Precautions will have to carry out before blasting, during blasting & after blasting.

Authorized shot firer only will be engaged for carrying out the blasting operation.

- The entire guide lines arrived by the Directorate of Explosives will be followed.
- All the above activities will be performed under the supervision of valid license holder.

20.7 Transportation of Construction materials- Cement Bag, Bricks, Mortar, Reinforcement, Pipes and valves

- Men and women should not carry more than 50 and 30 Kg weight respectively.
- Proper care shall be taken during manual transportation of Cement Bags, Bricks, Mortar, and Reinforcement on slippery area and during rainy season.
- Lifting Arrangement by two workers should be used to carry cement bags at site.
- While shifting the materials from stockyard to location using tractor/trailer, no materials shall be extended than the body of the truck.
- Red flags to be used for protruding materials for cautioning the other vehicles. If it is to be shifted at night, necessary red light is to be placed at side & rear of the vehicle, preferably at the end/tip of the materials, for cautioning the other vehicle

20.8 Excavation

- Sides of the excavation must be sloped to a safe angle or shoring should be ensured if depth is more than 5 feet.

Angle of repose for different soil		
Ashes; coal		45
Clay; dry	1 .3 : 1	38
Clay; damp		27
Earth; dry	1.3:1	38
Earth; damp		27

- No excavation below foundation level of any adjoining building/structuré. Before doing excavation near any building site in-charge/client/safety engineer should be contacted.
- Keep minimum 5 feet clearance from the excavated pit.
- Boulders also should be dumped in this fashion that it should not roll down.
- Proper care shall be taken while working with underground cable/pipeline etc.
- Under cut is not allowed in excavation.
- Shoring should be given as per the requirement.
- Proper barricading at least 1mtr away from edge should be done for the excavated pit/trench.
- Proper access ladder should be given on pit] trench.
- Excavation should be started after clearance permit from client/safety department.
- If excavation is on road, road should be blocked & caution boards shall be displayed on both sides.
- Worker should use required personal protective equipment like helmet, goggle, shoe, etc.
- Immediate action should be taken for water seepages, landslide/cracks

21 JOB SPECIFIC ACTIVITIES

21.1 Material Handling:

- While shifting the material using cranes, no items should be controlled without tag line.
- The condition of wire rope should be checked.
- The condition of the loading belt should be inspected visually before lifting the materials

21.2 At Stock Yard:

Materials are to be stacked with the wedge supports at both sides, for avoiding rolling. Stacking pipe one over other is to be avoided. If to be staked, additional care is to be taken to avoid caught between / pressed between injuries. Cast iron/breakable materials are to be stacked carefully.

21.3 Traffic -¥ At job Location/ Near Highways/ Roads:

Pipes are to be stacked well away from edge of the road, without obstructing the public movement. Signalmen provided with signalling jacket and a red flag is to be deployed for cautioning the road traffic at both the ends.

21.4 Pipe Shifting:

While shifting the pipes using cranes, swinging of the pipe should be controlled by anchoring a Polypropylene rope as a control tag line. No personnel shall be allowed to enter in between crane & material and underneath. Tested tools & tackles are only to be used for lifting & shifting.

21.5 Pipe Laying in to Trench:

Crane capacity vs. Weight of the material, which is to be lifted, must be ensured before lifting. The crane should be moved nearer to the trench as closer as possible maintaining the safe working condition. Only trained personnel are allowed to lay pipes in to the trenches. While lowering the pipes into trenches care should be to avoid foot caught between the pipe and shore of the trench.

21.6 Welding:

- If diesel-welding generator deployed for carrying out job, it should be kept horizontally.
- Main is to be stopped, while fuel filling is carried out.
- Local ground earthing is to be connected and continuity is to be ensured.
- Welding machine earth cable is to be extended up to the job & no steel materials like Reinforcement rod are not to be connected as earth.
- All the rotary parts are to be covered with the necessary protection guards.
- Other than the authorized person, no other personnel are allowed to operate the machine.
- If electrical welding sets are to be used, supply must be taken through ELCB. 4-core cables, local ground earth are to be ensured.
- Necessary authorized welder PPEs are to be arranged before starting of the job.

21.7 NDT (Non-destructive tests):

- While using RT test separate GRA is to be prepared and the same should be followed.
- Authorized & experienced personnel are only to be allowed to carry out the process.
- Proper supervision shall be ensured till completion of job.

21.8 Pressure Testing:

- Only authorized person shall be allowed to enter in the nearby areas.
- Welding, Gas cutting, Hammering on the pipe is not to be done under pressurized condition.
Continuous pressurizing is not to be done. Gradual pressuring & time delay is to be maintained.

DRS INFRATECH PVT LTD MANGALORE

TRAFFICMANAGEMENT PLAN

PROJECT: 24X7 WSS PROJECT KUNDAPURA

ContractNo: 02KDP01

PROGRAM:KUNDAPURA TRAFFIC MANAGEMENT PLAN

EMPLOYER: KARNATAKA URBAN INFRASTRUCTURE

DEVELOPMENT AND FINANCE COPORATION (KUIDFC)

CONTRACTOR: - LAXMI CIVIL ENGINEERING SERVICES PVT. LTD.

Preparedby

**LAXMI CIVIL ENGINEERING
SERVICES .PVT.LTD**

LOCATION(Kundapura)

**Traffic Diversion:Kundapura Old bustand to shashtri circle
Basrur to M kodi and Halekote to kodi (harebhajan temple)**

1.0	PURPOSE
	To provide a clear and simply worded procedure to be understood by most employees on preventing injury to persons and damage to property arising from site traffic and site transport.
2.0	SCOPE
	The procedure is applicable to LCESPL sites and other areas
3.0	RESPONSIBILITY
	It is the responsibility of the Project Incharge and Department Head to implement this procedure and ensure That delegated staff under their supervision carries it out.
4.0	DEFINITIONS
	Project Incharge: Person responsible for the execution of the project.
5.0	LEGAL REQUIREMENT
	The Building and Other Construction Workers (Regulations of Employment and Conditions of Service) Act 1996 and Central Rule 1998 Rule 48, 88 and 95, Motor Vehicle Act 1988
6.0	REQUIREMENTS
6.1	<u>General</u>
	<ul style="list-style-type: none"> All road works create inconvenience and are a potential hazard to the safety of all road users and those employed in carrying out the work. All the effects should be mitigated or reduced to the minimum, and to ensure that the works are properly guarded, lighted and signed. A clear and early warning of any obstruction to all road users should be provided. All areas where work is going on should be clearly demarcated by barricading and entry into these areas should be restricted to only authorized personnel.
6.2	<u>Planning stage</u>
	<ul style="list-style-type: none"> The client and DSC's Engineer should be consulted as regards the execution of the works and the safety measures which would be put in place. Particular attention should be given to: <ul style="list-style-type: none"> traffic signs; cones; barriers; road hazard warning lights;

	<ul style="list-style-type: none"> ○ information boards; and ○ site lighting • Consider necessity of traffic control systems such as temporary Stop/Go boards. • Access should be planned to eliminate dangerous movements of site traffic (e.g. reversing of vehicles) and personnel (e.g. crossing dual carriageways). • Provision of adequate lighting.
6.3	<u>Onsite</u>
	<ul style="list-style-type: none"> • The working area in the live road/footway is defined. • The working space is defined – this includes the area of storage of tools and equipment and space to move around the job. • Provision of safety zone – it is kept clear of all work, material storage and people and is clear of working radius of all plant.
6.4	Operators/Drivers
	<ul style="list-style-type: none"> • Experienced operators and drivers with valid licenses have been appointed. • One copy of license has been collected by Safety Department.
6.5	Equipment
	<ul style="list-style-type: none"> • Drivers are made a daily inspection of their vehicles include steering, brakes, mirrors, lights, horn, tyres and windshield wipers. • Safety Department along with Plant department has been checking the vehicles monthly basis • All vehicles have reverse horns and it is in working properly. • All vehicles, periodical maintenance has been conducted.
6.6	Roads
	<p>For safe operation we are following the below safety measure:</p> <ul style="list-style-type: none"> • Safe width has been provided. • Speed limit is varied as per the site. • Safe walkway with proper guard has been provided. • Caution board has been placed in every location within the site. • During night alert light has been provided. • Conducting Toolbox training as regular basis. • Road will be closed with proper permission (if required). • Reflective type Diversion board has been placed in required places. • Road diversion drawing has been submitted (Ref. Attached drawing)
6.7	Loading and unloading
	<ul style="list-style-type: none"> • Only authorized persons were engaged for loading/unloading. • Materials loaded within the permitted safe weight limit for the truck, • Dimensions of loads carried on a vehicle in strict accordance with relevant provisions. • A flag is being used at the extreme end of an overhanging load. • During the hours of darkness or in poor visibility conditions, a white light showing at each end of the front extremity and a red light showing at the rear extremity of the hanging load has been provided. • During Toolbox talk instruction has been delivered to all drivers/operators that when the driver leaves the driving seat, the engine of the truck shall be switched off, the gear engaged and parking brakes applied. On slopes, wheel blocks shall be applied. • Helper has been provided with all vehicles.

6.8

Working Area

The working area in the live road/footway has been defined and barricaded. The working area has been restricted from unauthorized entry. The working space has been defined—this includes the area of storage of tools, tools, and equipment and space to move around the job.

Particular attention has been taken in working area:

- traffic signs;
- cones;
- barriers;
- road hazard warning lights;
- information boards; and
- site lighting

Adequate lighting has been provided.



Figure 1: Aerial View of the Town Center of Kundapura

Figure 2: Figure 6: Distribution Mains Alignment

PROVIDING A SIGN BOARDS TO CONTROLL ALL PHYSICAL AND EROGNOMICAL ACCIDENTS AS PER IRC SP 55 SIGNS	TRAINING TO WORKERS IN TOPIC OF TRAFFIC ACCIDENTS
FLAG MAN FOR A TRAFFIC SIGNALING AND CONTROLLING. TO AVOID EXCAVATOR MOVEMENT ACCIDENTS .	BARRICADING TO EXCAVATED AREA TO AVOID TRIP,SLIP,FALL ACCIDENTS





Traffic Management Plan

Package: 24X7 WSS project Work

SAFETY & HEALTH OPERATION CONTROL PROCEDURES LOCATION:


KODI TO OLD BUSTAND ROAD



1.0	PURPOSE
	To provide a clear and simply worded procedure to be under stood by most employees on Preventing injury to persons and damage to property arising from site traffic and site transport.
2.0	SCOPE
	Over Head Tank and Pipe laying HDPE and DI pipes in Kundapura city .
3.0	RESPONSIBILITY
	Is the responsibility of the project In Charge and Depot Head to implement this procedure And ensure that delegated staff under their supervision carries it out.
4.0	Definitions
	Project In Charge :Person responsible for the execution of the project.
5.0	LEGAL REQUIREMENT
	The Building and Other Construction Workers (Regulation of employment and Conditions Of Service) Act. 1996 and Central Rule 1998 Rule 48, 88, and 95, Motor Vehicle Act 1998.
6.0	REQUIREMENTS
6.1	General
	<input checked="" type="checkbox"/> All road works create inconvenience and area potential hazard to the safety of all Road users and those employed in carrying out the work. <input checked="" type="checkbox"/> All the effects should be mitigated or reduced to the minimum ,and to ensure that the works are properly guarded, lighted and signed. <input checked="" type="checkbox"/> A clear and early warning of any obstruction to all road users should be provided. <input checked="" type="checkbox"/> All areas where work is going on should be clearly demarcated by barricading and entry into these areas should be restricted to only authorize personnel.
6.2	Planning Stage
	<input checked="" type="checkbox"/> The client and Engineer should be consulted as regards the execution of The works and the safety measures which would be put in place. <input checked="" type="checkbox"/> Particular attention should be given to: <ul style="list-style-type: none"> ✎ Traffic signs; ✎ Safety Cones ✎ Road Barriers; ✎ Road hazard warning lights; ✎ Caution board and ✎ Site lighting <input checked="" type="checkbox"/> Consider necessary of traffic control system such as temporary traffic lights or Stop/Go boards. <input checked="" type="checkbox"/> Access should be planned to eliminate dangerous movements of site traffic and personnel. <input checked="" type="checkbox"/> Provision of adequate lighting. <input checked="" type="checkbox"/> All persons working on or near the road shall wear highly is visibility jackets or across belt.

6.3	OnSite
	<p><input checked="" type="checkbox"/> The working area at the live road/footway shall be defined.</p> <p><input checked="" type="checkbox"/> The working spaces shall be defined—this includes the area of storage of tools and equipment and space to move around the job.</p> <p><input checked="" type="checkbox"/> Provision of safety zone—it shall be kept clear of all work, material storage and people and shall be clear of working radius of all plant.</p>
6.4	Operators/Drivers
	<p> Experienced operators and drivers with valid licenses have been appointed.</p> <p> One copy of license has will be collected by safety department.</p>
6.5	Equipment
	<p> Drivers will be made a daily inspection of their vehicles include steering, brakes, mirrors, lights, horn, and windshield wipers, etc.</p> <p> Safety Department along with plant department will be checking the vehicles monthly basis.</p> <p> All vehicles will be reverse horn and it is in working properly.</p> <p> All vehicles, periodical maintenance will be conducted.</p>
6.6	Roads
	<p>For safe operation we shall be following the below safety measure:</p> <p> Safe width shall be provided.</p> <p> One-way traffic roads will be used.</p> <p> Speed limit is not greater than 15 Km/hr within the site.</p> <p> Safe walkway with proper guard will be provided.</p> <p> Caution board has will be provided.</p> <p> Workers are working with reflected jackets as well as required PPE's.</p> <p> Conducting Toolbox training as regular basis.</p> <p> Road diversion drawing has been submitted.</p>
6.7	Loading and unloading
	<p> Only authorized persons were engaged for loading/unloading.</p> <p> Materials loaded within the permitted safe weight limit for the truck.</p> <p> Dimensions of loads carried on a vehicle in strict accordance with relevant provisions.</p> <p> During Toolbox talks information has been delivered to all drivers/operators that when the driver leaves the driving seat, the engine of the truck shall be switched off, the gear engaged and parking brakes applied. On slopes, wheel blocks shall be applied.</p> <p> Helper has been provided with all vehicles.</p>

Using Sign boards and traffic batrons , reflective cone for night road side works	Providing Barricades for Excavated Area in road side and any where to protect traffic.
Closing a Road/Diverting Traffic to another way .	Caution board for a safe movement

Conducting safety Training for a workers in the topic of WORK AT HIEGHT	Conducting safety Training for a workers in the topic of WORK AT HIEGHT
Providing a Reflective cones for road side work	Providing a Reflective cones for road side work

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Traffic Management Plan					
Project :- Construction Of Works and Services for Operation and Management of 24X7 Water Supply System for Puttur Town Contract Package NO 02PTR 01					
		Amruth Yedugani	Vishal Pattanshetti	Pramod Kumar B.K	For Approval
Rev.	Date	Prepared By	Checked By	Validated By	Submission Purpose
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1.0 OBJECTIVE

The 2 primary objective of temporary traffic control is to manage the traffic as efficiently and safely as possible under all work conditions and second objective is to lay down procedures to be adopted by field engineers to ensure the safe and efficient movement of traffic and also to ensure the safety of workers at site.

Traffic control aims to give adequate warning and clear information to motorists about the nature of works on site. This will translate into correct actions required in order to pass the work site safely. Traffic control shall also include measures to safeguard pedestrians when necessary. Proper traffic control also protects those who are directly involved in carrying out the works.

2.0 GUIDING PRINCIPLES

The guiding principles for safety in road construction zones are to:

- i. Warn the road user clearly and sufficiently in advance
- ii. Provide safe and clearly marking lanes for guiding road users
- iii. Provide adequate measures that control driver behavior through construction zones.

3.0 PHASES OF TRAFFIC CONTROL

There are five phases of traffic control for major projects:




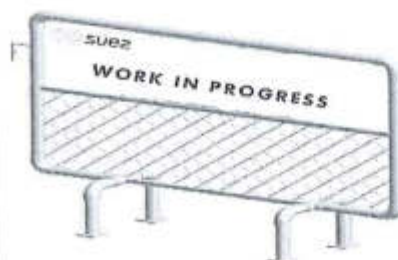
- **Planning Phase:** To identify and include traffic control requirements in the contract specification, work program & method of construction.
- **Design Phase:** To design the Traffic Control Plan in detail, with regards to types, location and layout of traffic control devices for submission to the authority for approval.



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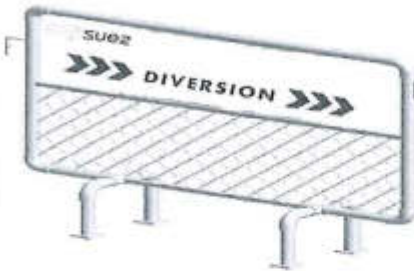


- **Implementation:** - To install the temporary traffic control devices safely in accordance with the approved traffic control Plan.
- **Operation and Maintenance Phase:** - To inspect the Traffic Control Plan and devices regularly by day and night to ensure that they are effective and absolutely safe.
- **Close out Phase:** - To remove all the traffic control devices safely and reinstate the permanent traffic scheme

4.0 TRAFFIC CONTROL DEVICES


NO	DESCRIPTION	SPECIFICATION	PICTURE
1	MEN AT WORK, GO SLOW 	Material: MS Pipe, MS sheet, Height: 1150 MM Width : 1500 MM The signalization shall respect color, be visible from distance and robust. However, design of boards & logo may vary.	
2	WORK IN PROGRESS 	Material: MS Pipe, MS sheet, Height: 1150 MM Width : 1500 MM The signalization shall respect color, be visible from distance and robust. However, design of boards & logo may vary.	


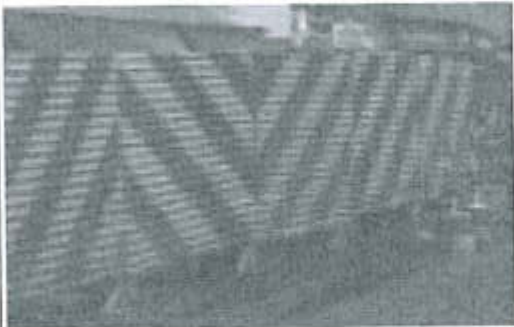




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3	DIVERSION 	Material: MS Pipe, MS sheet, Height: 1150 MM Width : 1500 MM The signalization shall respect color, be visible from distance and robust. However, design of boards & logo may vary.	
4	CAUTION SAFETY TAPE	Material: Plastic Color: Red and white stripes	
5	TRAFFIC CONES	Height: 75cm Material: Rubber Base With reflection bar	



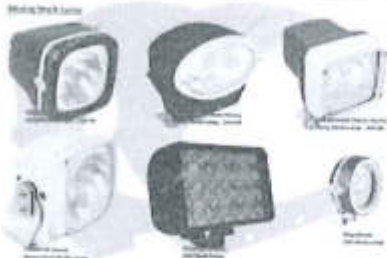


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6	BARRIERS	<p>Barricading block Interlocking wall effect, 90 degree turning radius</p> <p>For wide road > 2000mm Length- 2000mm Width- 600 mm Height- 900mm</p> <p>For narrow street < 2000mm Length- 1000mm Width- 300 mm Height- 800mm (low width barricades are acceptable for narrow spaces)</p> <p>GI sheet barricading as per requirement (min. two sheet width)</p>	 
7	ROTARY LAMP (Must for traffic block / diversion)	<p>Color: Yellow Rotating motor use motor system</p> <p>Environment friendly: no UV, IR, lead or mercury.</p>	
8	BARRICADE LAMP (Must for barricade along running traffic and additional for traffic blocking / diversion)	Color: Red/ Orange	



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9	STICK LAMP (Must for traffic controller / security man / Signaling man)	Color: Red/Orange	 
10	LIGHTING LAMP	Super Bright White LEDS	

5.0 SIGN PLACEMENT

The correct positioning and size of signs will ensure that it will be observed and recognized, thereby providing the driver with more time to react and act.

The following principles will govern the positioning of signs:

- Their location will have clear visibility
- They will be so placed that driver would have adequate time for responses
- As a general rule, signs will be placed on the left-hand side of the road. Where special emphasis is required
- The signs will be covered or removed when they are not required

6.0 TRAFFIC CONES

Traffic cones will be 800mm high and 300mm to 500mm in diameter or in square shape at base and are often made of plastic or rubber and normally have retro-reflector red and white band. Their advantages are that they:

- Cause minor impediments to traffic flow and capacity,



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- ii. Are well recognized and understood, without damaging vehicle when hit,
- iii. Will be easily stored and transported,
- iv. Will be fastened to the pavement and self-restoring when hit



7.0 BARRICADES


Barricades are intended to provide containment without significant deflection or deformation under impact and to redirect errant along the barrier. They are designed to be easily relocated and have four specific functions to:

- (i) Prevent traffic from entering work areas, such as excavations or material storage sites;
- (ii) Provide protection to workers;
- (iii) Separate two-way traffic; and
- (iv) Protect construction such as false work for culverts and other exposed objects.

8.0 FLAGMEN

The control of traffic through work area is an essential part of road construction and maintenance operations. Flagmen with hand signaling devices such as flags and traffic batons play crucial role in this direction. The flagmen at the work sites are expected to stop traffic intermittently and to maintain continuous traffic past a work



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site at reduced speeds to help protect the workmen. For both functions, the flagmen will, at all-time be clearly visible to approaching traffic for a distance sufficient to permit proper response by the drivers to the flagging instruction and to permit traffic to reduce speed before entering the work site. This distance is basically related to approach speed and site conditions; however, 60 m to 100 m is desirable.

Working in public utilities / near busy roads involves risk to general public in addition to workmen performing their duties. Therefore, proper planning of diversion of traffic, putting signage / caution boards, installing barricade and deputing signaling man / watch man to be identified well before start of work.

Implementation of traffic plan with identified control measures is responsibility of each person in-charge of activity.

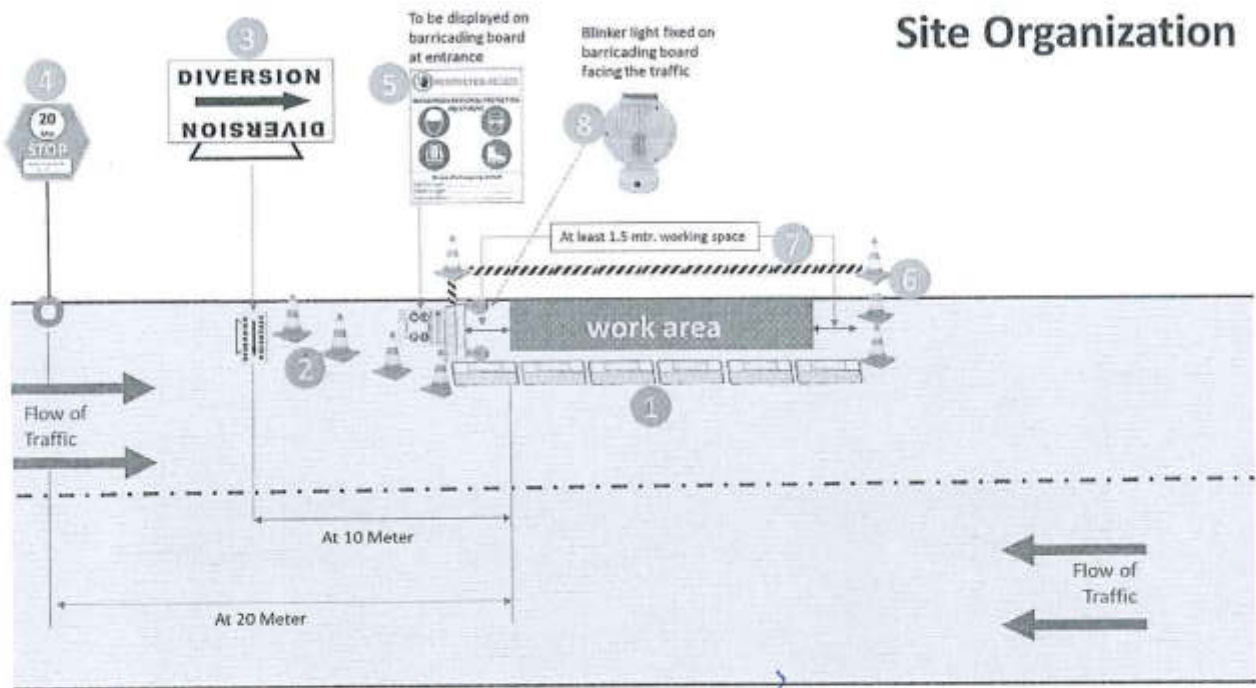
9.0 SITE ORGANIZATION

- **Following is the standard for organizing a work site**

1. Barricading boards
2. Traffic cones
3. Diversion sign board @ 10 Meter from work site
4. Stop Sign @ 20 Meter from work site
5. Mandatory PPE sign board
6. Traffic cones
7. Soft Barricading by caution tape
8. Blinker lights on barricading boards facing the traffic



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Following major risks are being identified and rules are being set-up for such works:

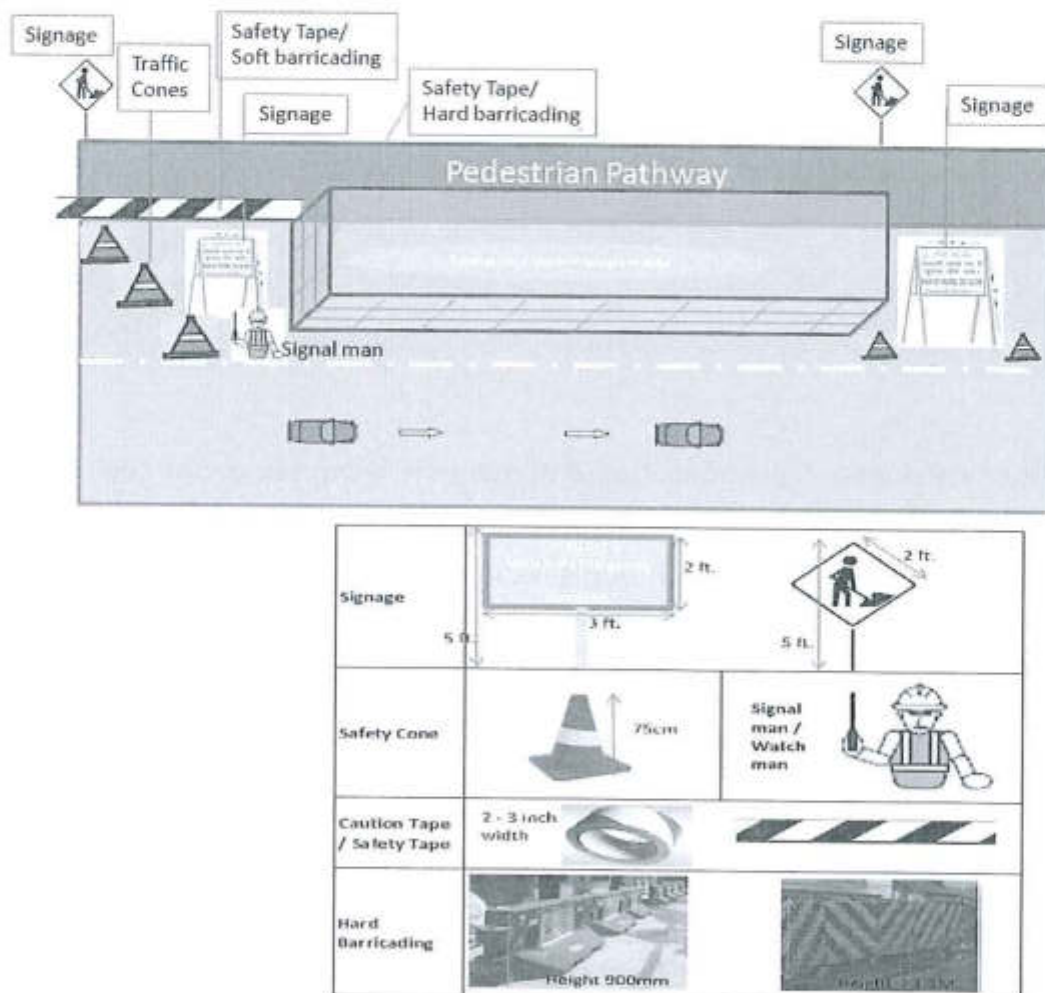
9.1 Narrowing of roads or walkways may have potential risk of injuries and inconvenience to pedestrians:


- Ensure that pedestrian pathways are maintained free from obstacles.
- Display signage to caution pedestrians.
- Barricade the excavated or work in progress areas prior to start of work.
- Keep watch on the area to maintain safe conditions all the time.

The SPPL / subcontractor has **obligation to signalize & barricade every single work** in order to prevent any incident to pedestrians or surrounding communities.

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In general, if the walking space is less than 1 mtr. in Width (depending on pedestrian flow), or there is insufficient space left for fixing the barricading board, pedestrian movement can be blocked / diverted after obtain permission from concern authority. Storage of loose materials or construction materials / machines should not be done on walkways. This may require continuous clearing of waste / unwanted materials from work areas.




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9.2 Partial blocking of a traffic lane of road may cause potential risk of collision of vehicles resulting to serious injuries and inconvenience to commuters:

Blocking of a traffic lane to be planned and controls to defined and implemented prior to start of job. This may require permission from authorities and:

- Diversion of traffic to minimize bottle neck and impact on traffic load
- Placing hard barricades & safety cones to contain risks arising out of work in progress area
- Placing signage, caution notices & signals (lighting lamps / rotary lamps) for public and vehicles keeping day and night in mind
- Deputing a dedicated man as watch man / signaling man to guide traffic

The supervisor of works shall ensure that the signalization / safety signage, barricade of works are in place prior the start and during works.

All workmen including watch man / security guard to be inducted for hazards and associated risks and Do's & Don's instructions to be followed by each one of them.

Additional soft barricading to be provided for visual impact and better controls.

Continuous vigil to be kept to rectify and improve the controls as and when required.

Do's and Don'ts for an employee working beside busy roads.

Sl.	Do's	Don't
1	Wear reflective vest, helmet and safety shoes for high visibility and protection from injuries.	Do not remove your PPE's while working on site
2	Stay out of path of moving vehicles, plant or equipment	Do not approach to traffic / roads or un-barricaded areas without permission
3	Follow traffic signals of police and watch man deputed on site	Do not take shortcuts or do not avoid dedicated paths



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4	Ensure all machines & materials are placed safely.	Do not keep machines or materials etc. on pathways or outside the barricaded areas
5	Enter trenches only when appropriate wall support is in place	Do not enter deep trenches unless you are authorized by your supervisor
6	Be vigilant to your surroundings. In case you notice any abnormal conditions,	Do not ignore instructions given to you or danger noticed by you
	<ul style="list-style-type: none"> - Inform your supervisor - Alert your co-workers 	<ul style="list-style-type: none"> - Do not put yourself or your co-workers in danger

9.3 Complete Closure of a road may cause potential risk of traffic congestion, and inconvenience to commuters and trespassing of vehicles resulting to serious injuries:

There may be situations where work plan requires complete closure of a road. In such cases good traffic planning and organization of work is desired even if it is planned in lean traffic timings.

- Diversion of traffic to minimize bottle neck and traffic congestion
- Complete closure of road / pathways using hard barricading & safety cones to contain risks arising out of work in progress area
- Placing direction signage, red light, caution notices & signals (lighting lamps / rotary lamps) for public and vehicles keeping day and night in mind
- Deputing a dedicated watch man / signaling man to guide traffic

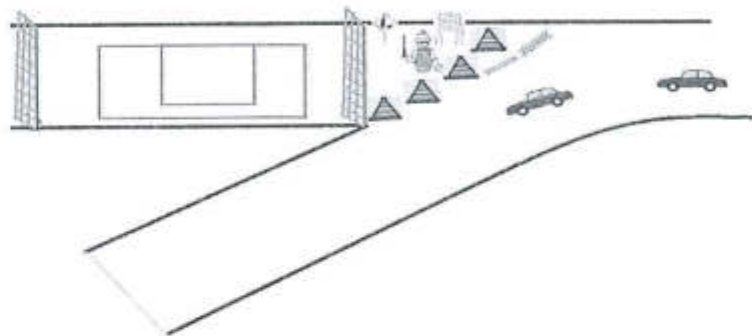
Manager of works along with subcontractor & Safety officer to inspect prior to start of works and review the situation periodically.

Supervisor of works to inspect the area every day before starting and at end of day's work or during recess to ensure no unsafe condition is left behind. There may be chance that barricading boards are temporarily removed or any materials / machines are left unattended in public places posing risk of trespassing or injury to general public.



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Flagman to be dedicatedly deputed to guide traffic and keep control on unauthorized entries.



Road Diversion for complete closure



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10.0 LIFE SAVING RULE

Life saving rules related to driving safety must be followed at site

1. Do not handle your phone or any other communication device when driving.



2. Do not work and do not drive under the influence of alcohol or drugs.




3. Signal, reduce speed and check mirrors before turning or reversing.




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11.0 INSPECTION OF VEHICLES

All Site vehicles shall be inspected once in a month as per following checklist.

		Safety Department											Date:	
													Rev:	
													Doc:	
		Vehicle Inspection Checklist												
S. No.	Vehicle Reg. Number	License of Driver	Emission certificate	Insurance Documents	Fitness Certificate	Head Light	Tail Light	Indicators	Horn	Reverse Horn	Fire Extinguisher	First aid Box	Break	Remarks
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														




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12.0 TRAFFIC SAFETY RULES

Rules and Regulations related to driving license, registration of motor vehicles, control of traffic, construction & maintenance of motor vehicles etc. are governed by the Motor Vehicles Act, 1988 (MVA) and the Central Motor Vehicles rules 1989 (CMVR). All these rules must be obeyed wherever applicable




	Suez Projects private Limited	Doc: SUEZ-EMP-01 July 2019 / Rev.: 00
	Environment Management Plan	

<h2 style="margin: 0;">Suez Project Private Limited</h2>					
<h2 style="margin: 0;">Environment Management Plan</h2>					
<p>Project: Construction of Distribution System for 24x7 Water Supply including Services for Operation and Management for Udupi City, Contract Package No 02UDP01</p>					
		Pradeep Shetty	Vishal Pattanshetti	Ramesh Patel	For Approval
Rev.	Date	Prepared By	Checked By	Validated By	Submission Purpose
00					


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	Environment Management Plan	

1. Environmental Management Plan


S. No	Potential Environmental Impacts	Mitigation Measures	Time Frame / Contract Stages	Responsible Agencies
1.1	Submission of EMP to client	All impacts for Environmental aspects related to construction as mentioned below will be submitted to the client before start of work.	Before starting construction	SUEZ
1.2	Tree Cutting	i) Try to save the trees by changing the alignments after getting notification and approval from the client. ii) Provide adequate protection to safeguard trees. iii) If required, trees shall be removed from the construction sites before commencement of construction with prior permission from the concerned Department/client.	Pre-construction & construction phase	SUEZ & Client
1.3	Use of modern machineries	Using of modern machineries such as Excavator, JCBs, dumpers, cranes etc. shall be used to minimize the construction period, it will reduce the construction period impacts to the nearby residents.	During construction	SUEZ
1.4	Utility Relocation	i) Identify the common utilities-underground or overhead to be affected such as: telephone cables, electric cables, electric poles, overhead electrical lines, water pipelines, public water taps, etc ii) Affected utilities shall be relocated with prior approval of the Client / concerned agencies before construction starts.	Pre-construction & construction phase	SUEZ & concerned agency & client
1.5	Planning of temporary Traffic arrangements	i) Temporary diversion will be provided after consulting the engineer. Traffic control plans for construction phase will be marked on layout prior to commencement of works as agreed by client. ii) The traffic control plans shall contain details of temporary diversion, details of traffic arrangement for under construction areas etc.	Pre-construction & construction phase	SUEZ
1.6	Informatory Signs and Hoardings	The informatory/safety signs concerning road work, caution etc. shall be provided in English and local language and maintained wherever applicable.	During construction	SUEZ
1.7	Storage of materials	Identification of site for temporary use of land for construction sites /storage of construction materials, will be done with client consent. Good practices will be adopted for disposal of construction waste & it will be done in such manner that it is not posing hazard to Environment.	Pre-construction & construction phase	SUEZ & Client

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S. No	Potential Environmental Impacts	Mitigation Measures	Time Frame / Contract Stages	Responsible Agencies
	Labour camps	Welfare facility to ensure sound health & hygiene measures during construction and maintenance of labour camp. Construction and maintenance of labour camp to be done without damaging any flora/fauna or giving any considerable negative impact to the environment. The sewage system & garbage removal for the camp must be planned.	construction	
1.9	Pollution from Construction Wastes	All precautionary measures shall be taken to prevent the wastewater generated during construction (e.g. during the testing of pipeline) from entering into streams, water bodies or the irrigation system. All waste arising from the project is to be disposed off in the manner that is acceptable by the client. It must be ensured that all liquid wastes disposed off from the sites is not polluting the soil.	During Construction and post-construction	SUEZ
1.10	Disposal of construction debris and excavated materials.	Sites for debris disposal shall be identified and should be finalized in consultation with client prior to start of the earthworks; taking into account the following a) The dumping does not impact natural drainage courses b) No endangered / rare flora is impacted by such dumping c) Should be located in non-residential areas located in the downwind side d) Avoid disposal on productive land. Minimize the construction debris by balancing the cut and fill requirements.	Pre-construction and Construction	SUEZ
1.11	Waste Disposal	i) Sufficient number of garbage bins shall be provided in the camps and ensure that these are regularly emptied and disposed off in a hygienic manner as per the Comprehensive Solid Waste Management Plan. ii) Unless otherwise arranged by local sanitary authority, arrangements for disposal of night soils (human excreta) suitably approved by the local medical health / municipal authorities or as directed by Engineer will be ensured. iii) A detailed waste disposal plan shall be submitted to client before starting O&M phase to ensure management of waste generated during operation & maintenance of the plant	During Construction & Operation and maintenance phases	SUEZ
1.12	Protection of	The top soil to be protected and compacted after	During	SUEZ

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S. No	Potential Environmental Impacts	Mitigation Measures	Time Frame / Contract Stages	Responsible Agencies
	top soil	Completion of work, where the pipelines run, including open lands and agricultural lands, if any.	construction	
1.13	Dust Pollution near settlements	i) All earthworks will be protected in manner acceptable to the client to minimize generation of dust. ii) Construction material shall be covered or stored in such a manner so as to avoid being affected by wind direction. iii) Unpaved haul road up to site office / plant site to be watered periodically to reduce dust pollution.	During construction	SUEZ
1.14	Noise from vehicles, plants and equipment	i) Servicing of all construction vehicles and machinery will be done regularly and during routine servicing operations, the effectiveness of exhaust silencers will be checked and if found defective will be replaced. ii) Maintenance of vehicles, equipment and machinery shall be regular and up to the satisfaction to keep noise levels at the minimum. iii) All potential high noise yielding machines shall meet MOEF guidelines and their preventive maintenance shall be done as per the approved plan.	During construction & Operation and maintenance phase	SUEZ
1.15	Clearing of construction camps and restoration	i) Site restoration plans shall be agreed by client after the construction work is over, the plan is to be implemented prior to demobilization. ii) On completion of the works, all temporary structures will be cleared away, all rubbish cleared, excreta or other disposal pits or trenches filled in and effectively sealed off and the site left clean and tidy, at expenses as may be agreed by contract.	After completion of the project	SUEZ
1.16	Pollution from Fuel and Lubricants	i) It shall be ensured that all construction vehicle parking location, fuel/lubricants storage sites, vehicle, machinery and equipment maintenance / refueling sites will be located far from rivers and irrigation canal/ponds. ii) All location and lay-out plans of such sites shall be submitted to client as per contract. iii) It shall be ensured that all vehicle/machinery and equipment operation, maintenance and refueling will be carried out in such a fashion that spillage of fuels and lubricants does not contaminate the ground. iv) Arrangement for collection, storing and disposal of oily wastes to the pre-identified disposal sites shall be done as approved by the client. All spills and collected petroleum	Construction and operation & maintenance phase	SUEZ

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S. No	Potential Environmental Impacts	Mitigation Measures	Time Frame / Contract Stages	Responsible Agencies
		products will be disposed off in accordance with MOEF and state PCB guidelines. v) All arrangements shall comply with the guidelines of PCB/ MOEF or any other relevant laws.		
1.17	Preserve natural resources	i) Ground water extraction shall be done only after approval from concern agency / client and measuring / monitoring shall be done in case of use. ii) Use of electricity / fuel etc. to be measured and good practices / procedures to be adopted for ensuring optimum usage / preserve such natural resources.	Construction & Operation and maintenance phase	SUEZ

2. Environmental Enhancement and Special Issues


S. No.	Environmental enhancement and special issues		Implementing Agency	Location
2.1	Flora and Chance found Fauna	All reasonable precaution shall be taken to prevent workmen or any other persons from removing and damaging any flora (plant/vegetation) and fauna (animal) including fishing in any water body and hunting of any animal. If any wild animal is found near the construction site at any point of time, the contractor will immediately upon discovery thereof acquaint the client and carry out the client's instructions for dealing with the same. This must be reported to the nearby forest office by / through the client (range office or divisional office) and appropriate steps/ measures shall be taken, if required in consultation with the forest officials.	Project / Plant area	SUEZ & Client
2.2	Chance Found Archaeological Property	All fossils, coins, articles of value of antiquity, structures and other remains or things of geological or archaeological interest discovered on the site shall be the property of the Government and shall be dealt with as per provisions of the relevant legislation. Reasonable precautions shall be taken to prevent workmen or any other persons from removing and damaging any such article or thing. He will, immediately upon	Project / Plant area	SUEZ & Client

S. No.	Environmental enhancement and special issues		Implementing Agency	Location
		discovery thereof and before removal acquaint the client representative of such discovery and carry out the instructions as given for dealing with the same, waiting which all work shall be stopped. The direction from the Archaeological Survey of India (ASI) shall be taken by / through client before instructing to recommence the work in the site.		
2.3	Monitoring of environment parameters	Seasonal monitoring of air, water, and noise and soil quality through an approved monitoring agency shall be done as required by contract. The parameter to be monitored, frequency and duration of monitoring plan to be done as per the contract / SPCB norms.	Project / Plant area	SUEZ
2.4	Sensitive Areas	All efforts will be made to protect sensitive areas like Schools, hospitals etc. from dust and noise impacts due to vehicle movement during construction and their effectiveness to be checked during operation phase.	Project / Plant area	SUEZ
2.5	Initial Assessment	Baseline to be recorded as per the contract requirement.	Project Area	Client / SUEZ

3. Environmental Monitoring Plan

To monitor the extent of environmental impact for proposed project, the periodic monitoring of the ambient environmental quality will be done. The monitoring requirement for the different environmental components is presented in table below:

Traffic management:	
Traffic management plan and implementation	
Spoil Management:	
Spoil mgmt. plan and its implementation	
Air Quality Monitoring	
O&M Phase	Operation & Maintenance period (as agreed)
Parameter	SPM, SO ₂ , NO _x , CO and PH
Sampling Method	Use method specified by CPCB for analysis
Standards	Air (Prevention and Control of Pollution) Rules, CPCB, 1994
Frequency	Once before start of O&M phase & or as agreed by client
Duration	As per rule / procedure

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	Environment Management Plan	

Location	DG Sets.
Implementation	Contractor through approved monitoring agencies
Supervision	Implementing agency
Water quality Monitoring	
O&M phase	Operation & Maintenance period (as agreed)
Parameter	As agreed by client / as per applicable standards
Sampling Method	Grab sample collected from source and analysis as per Standard Methods for Examination of water and Waste water
Standards	Indian standards for Inland Surface Water (IS; 2296, 1982) / for Drinking water (IS; 10500, 1991) or as per contract specifications.
Frequency	Twice a year (pre-monsoon and post monsoon seasons) / As agreed by client.
Duration	Grab sampling
Location	Treated water reservoir / raw water sump.
Implementation	Contractor through approved monitoring agencies
Supervision	Implementing agency
Noise	Operation & Maintenance period (as agreed)
Frequency	Once in a year.
Duration	Reading to be taken at 15 seconds interval for 15 minutes every hour and then averaged
Location	Blower, Centrifuge & pump houses
Measures	In case of noise levels causing disturbance to the receptors, management measures as suggested in the EMP shall be carried out.
Implementation	Contractor through approved monitoring agencies
Supervision	Implementing agency

Apart from the above-mentioned monitoring requirements, any major accidents / spillage during bulk transport of hazardous materials. Depending on the type of spillages / accidents the parameters to be monitored will be decided as per applicable rules.


FORMATS FOR REPORTING:

Formats for reporting / monitoring the progress / parameters achieved will be followed as agreed by client / contract.


Environmental Compliance Report:

A progress report as per the reporting format approved by the client will be submitted as prescribed, to know status of the implementation of the EMP for its compliance.

---XXXX---


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	Health, Safety and Environment	

Suez Project Private Limited					
Health and Safety Plan					
Project: Construction of Distribution System for 24x7 Water Supply including Services for Operation and Management for Udupi City, Contract Package No 02UDP01					
		Pradeep Shetty	Vishal Pattanshetti	Ramesh Patil	For Approval
Rev.	Date	Prepared By	Checked By	Validated By	Submission Purpose
00					

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I. HEALTH, SAFETY AND ENVIRONMENT POLICY



HEALTH, SAFETY, ENVIRONMENT & INDUSTRIAL RISK POLICY

Excellence in safety, health and environment contributes directly to the performance of SUEZ and creates value for our clients. This is an ongoing and critical objective.

Everyone has an obligation to work safely and the duty to contribute on this by behaving responsibly.

All accidents can be avoided by implementing appropriate methods, equipment, training, controls and behaviors.

IN ORDER TO ACHIEVE THIS LEVEL OF SAFETY, HEALTH AND ENVIRONMENT, WE ASK THAT:

- All employees behave in an exemplary manner and comply with all applicable regulations, rules and commitments, including in disruptive situations. Our internal rules prevail when they offer greater protection than local regulation.
- We follow all applicable requirements including Life Saving Rules developed by company.
- Activities are organized so that they reduce risks to an acceptable level.
- Employees contribute to routine and incident feedback, and formalization of working instructions.
- Sustaining and improving health and wellbeing of our employees and temporary workmen.
- To develop fair culture approach where good behavior is recognized, error is seen as a source of progress and violation of the rules is not tolerated and sanctions are imposed as disciplinary action.
- Our clients get facilities that can be run in complete safety for people and for the environment.
- Partners and contractors contribute to continuous improvement actions and that they are selected on the basis of their commitment to do so.

MISSION AND DUTIES

Within their area of responsibility, each manager has the duty to ensure the health and safety of all personnel and the protection of property and the environment. Each manager is responsible for the communication and application of the rules and commitments and ensuring that messages and practices are consistent.

Each employee is aware of his / her personal role in protecting the environment and in preventing accidents. Employees are expected to deploy responsible behavior to their benefit and their co-worker.

The Sustainable Development and Risk Prevention Department establishes and ensures the deployment and continuous improvement of all Safety, Health and Environment related processes in our Omega Management system. It oversees its implementation and its effectiveness.


WHILE REINFORCING OUR COMMITMENT TO ABOVE WE SHALL FURTHER EMPHASIZE

- Compliance with SUEZ Health, Safety, Environment and Industrial Risk management rules and procedures to minimize Health & Safety risks, environmental impacts, machinery breakdown and damage to property.
- Prevention of pollution, continual improvement, ongoing detection/rectification of deficiencies and implementing changes wherever necessary.
- Conservation of key resources like chemicals, water and energy.
- Environmentally safe handling of chemicals and safe disposal of inevitable wastes.
- Elimination, minimization and/or control of occupational hazards and associated risks having potential for ill health and diseases.
- Sustaining and improving health and well-being of our employees and temporary workmen.



Mr. Shyam J Bhan
CEO - SUEZ Business Area India

Date & Rev.: 2nd Jan. 2017

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II. INTRODUCTION

Suez ranks among the world’s leaders in water and waste management services. Its objective: to meet the challenge of conserving natural resources. A human adventure spanning more than 120 years that continues to unfold day after day.


We believe we can reconcile economic performance, environmental performance and corporate responsibility. We are committed to helping our customers achieve their objectives and find the ideal solution tailored to their specific concerns.

SPPL, as SUEZ PROJECTS PRIVATE LIMITED follows highest standards of Health, Safety and Environment in lined with guidelines of SUEZ.

This standard defines mandatory requirements for ensuring safe working environment for employees and all stake holders working with us. Overall goal of implementing HSE standard, procedure and practices is to minimize loss, damage and/or workplace injury incidents and “Zero Loss Time Accidents” in our activities and services.

In this context all employees / workmen are required to strictly follow procedures / rules stated in this HSE standard.

To ensure effective implementation of HSE rules in our activities, HSE department in coordination with concern manager or alone will carry out routine and non-routine, planned and surprise inspection of workplaces.

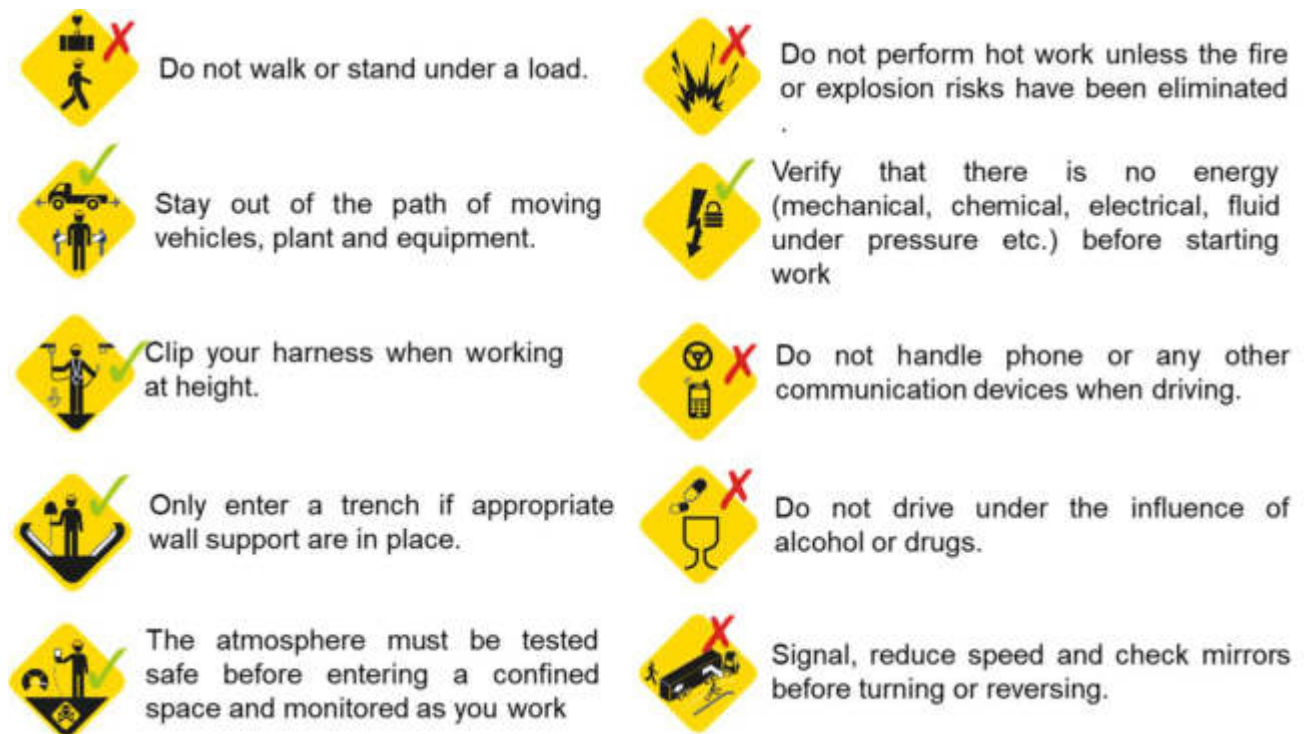
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III. Health, Safety and Environment Standard:

LIFE SAVING RULES:

“In all our businesses, in all countries where the Group is present, fighting against serious accidents has always been our priority. To achieve this, we are committed to implement 11 “Life saving rules” in all our worksites. Each one of our employee and subcontractors including temporary workmen will play role to save his life and also that of others”.

Here are these rules to be committed by each employee and follow as basic rules in all our sites.



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1. PERSONAL PROTECTIVE EQUIPMENT (PPE):

Prior to commencement of any work, concern manger/ engineer/ subcontractor shall ensure that all the workers are having necessary protective equipment to perform his work safely. All PPE's must meet IS/EN/CE / equivalent standards and sound physical condition.

Helmets, safety boots, reflective vest shall be considered as mandatory PPE and shall be worn by all employees / workmen / visitors etc. on worksites. Sandals or sneakers must never be worn on the job.

In addition to mandatory PPE's, specific job-related PPE's must be worn by all employees e.g.

- Workmen working in dusty operations shall use suitable dust mask, goggles and hand gloves.
- While working in noisy operation, suitable ear plug, ear muff shall be used.
- Workmen engaged in welding, cutting and grinding suitable face shield, goggles and screens shall be used.
- Electrical hand gloves (rubber), shoe & goggles to be used while working with electrical panels (hazards)
- Workmen working at height more than 1.0 meter should wear full body safety belt / Harness and it should be tied / anchored properly to a firm support or lifeline with a guy rope.

Responsibility of employee:

It is the responsibility of every employee/workmen to:


- To wear mandatory PPE while on the site
- To wear specific job-related PPE as per the requirement
- To maintain his PPE's in clean & sound condition

Any will full violation of rules will be viewed seriously, and strict action will be taken in such case.

To define and maintain minimum stock of PPE is responsibility of facility manager / subcontractor under whom respective staff is working.

Mandatory PPE's:

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No	DESCRIPTION	SPECIFICATION	PICTURE
1	HELMET	IS- 2925 The Helmet needs to have adjustable suspension and complete chin strap	
2	SAFETY BOOTS	EN-345 or IS-15298 Safety boots with toe guard Suggestion to wear the socks for better protection and comfort	
3	HIGH VISIBILITY VEST	EN- 471 "Silver" Stabillo (Scot light).	
4	GOGGLES (Clear / tinted for indoor / outdoor works)	EN 166 FT CE Maker:- Karam ES 006	

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2. FIRST-AID:

First aid kit to be provided in all offices and worksites accessible to teams. This kit must contain sufficient items for 11 to 50 persons or as per the employee strength. Responsibility of providing this facility lies with each subcontractor and SPPL facility manager.

This first aid kit shall be kept in charge of either subcontractor's authorized person who will be on the site during all working hours to ensure that the first aid kit is available without delay.

The SPPL / subcontractor shall ensure that adequate numbers of first aid kits and trained personnel are available strategically at the site during working hours.

The SPPL / subcontractor will ensure availability of the emergency vehicle at the site during working hours and shall have his own arrangements / tie-ups with nearby hospitals for shifting and treatment of sick and injured.

3. SIGNALIZATION/ SAFETY SIGNAGE, BARRICADE FOR WORKS:

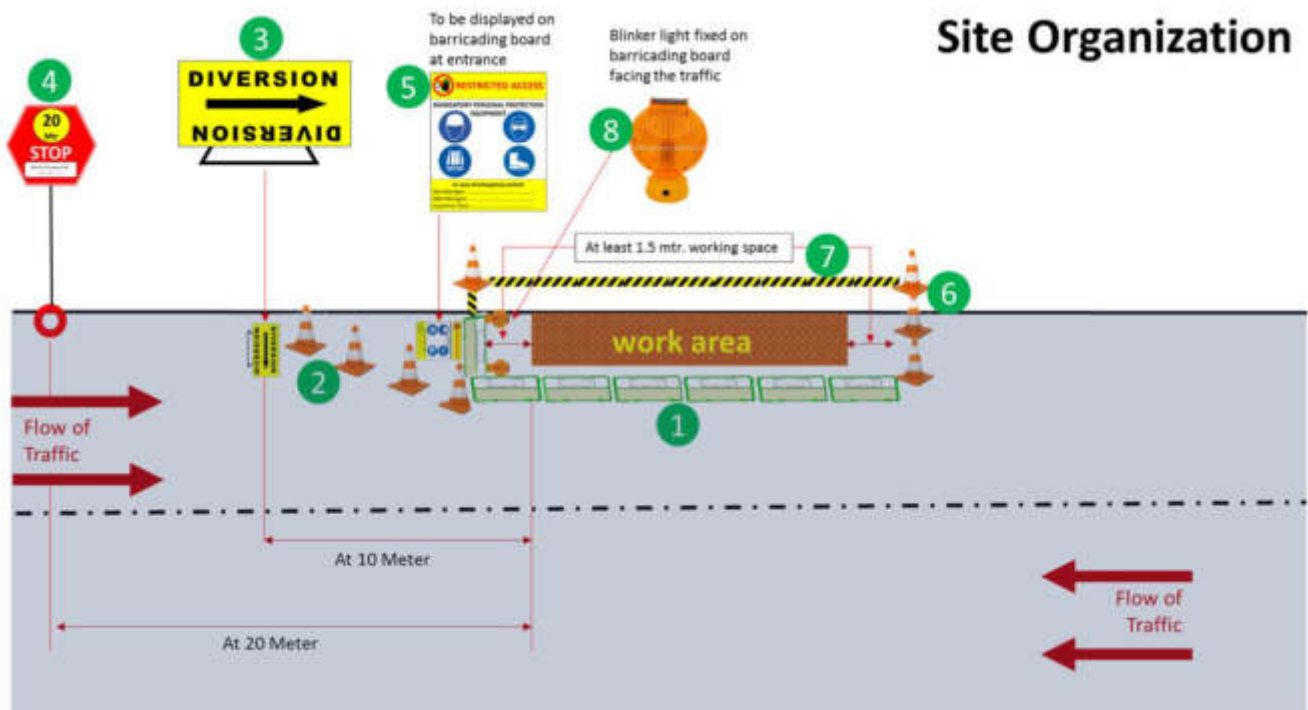
Working in public utilities / near busy roads involves risk to general public in addition to workmen performing their duties. Therefore, proper planning of diversion of traffic, putting signage / caution boards, installing barricade and deputing signaling man / watch man to be identified well before start of work.

Implementation of traffic plan with identified control measures is responsibility of each person in-charge of activity.

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- Following is the standard for organizing a work site

1. Barricading boards
2. Traffic cones
3. Diversion sign board @ 10 Meter from work site
4. Stop Sign @ 20 Meter from work site
5. Mandatory PPE sign board
6. Traffic cones
7. Soft Barricading by caution tape
8. Blinker lights on barricading boards facing the traffic



Following major risks are being identified and rules are being set-up for such works:

1. Narrowing of roads or walkways may have potential risk of injuries and inconvenience to pedestrians:

- Ensure that pedestrian pathways are maintained free from obstacles.
- Display signage to caution pedestrians
- Barricade the excavated or work in progress areas prior to start of work.
- Keep watch on the area to maintain safe conditions all the time.


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The SPPL / subcontractor has obligation to signalize & barricade every single work in order to prevent any incident to pedestrians or surrounding communities.

In general, if the walking space is less than 1 mtr. in Width (depending on pedestrian flow), or there is insufficient space left for fixing the barricading board, pedestrian movement can be blocked / diverted after obtain permission from concern authority.

Storage of loose materials or construction materials / machines should not be done on walkways. This may require continuous clearing of waste / unwanted materials from work areas.



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2. Partial blocking of a traffic lane of road may cause potential risk of collision of vehicles resulting to serious injuries and inconvenience to commuters:

Blocking of a traffic lane to be planned and controls to defined and implemented prior to start of job.

This may require permission from authorities and:

- Diversion of traffic to minimize bottle neck and impact on traffic load
- Placing hard barricades & safety cones to contain risks arising out of work in progress area
- Placing signage, caution notices & signals (lighting lamps / rotary lamps) for public and vehicles keeping day and night in mind
- Deputing a dedicated man as watch man / signaling man to guide traffic

The supervisor of works shall ensure that the signalization / safety signage, barricade of works are in place prior the start and during works.


All workmen including watch man / security guard to be inducted for hazards and associated risks and Do's & Don'ts instructions to be followed by each one of them.


Additional soft barricading to be provided for visual impact and better controls. Continuous vigil to be kept to rectify and improve the controls as and when required.

Do's and Don'ts for an employee working beside busy roads.

Sl.	Do's	Don't
1	Wear reflective vest, helmet and safety shoes for high visibility and protection from injuries.	Do not remove your PPE's while working on site
2	Stay out of path of moving vehicles, plant or equipment	Do not approach to traffic / roads or un-barricaded areas without permission
3	Follow traffic signals of police and watch man deputed on site	Do not take shortcuts or do not avoid dedicated paths
4	Ensure all machines & materials are placed safely.	Do not keep machines or materials etc. on pathways or outside the barricaded areas
5	Enter trenches only when appropriate	Do not enter deep trenches unless you are

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	wall support is in place	authorized by your supervisor	
6	Be vigilant to your surroundings. In case you notice any abnormal conditions,	Do not ignore instructions given to you or danger noticed by you	
	<ul style="list-style-type: none"> - Inform your supervisor - Alert your co-workers 	<ul style="list-style-type: none"> - Do not put yourself or your co-workers in danger 	

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3. Complete Closure of a road may cause potential risk of traffic congestion, and inconvenience to commuters and trespassing of vehicles resulting to serious injuries:

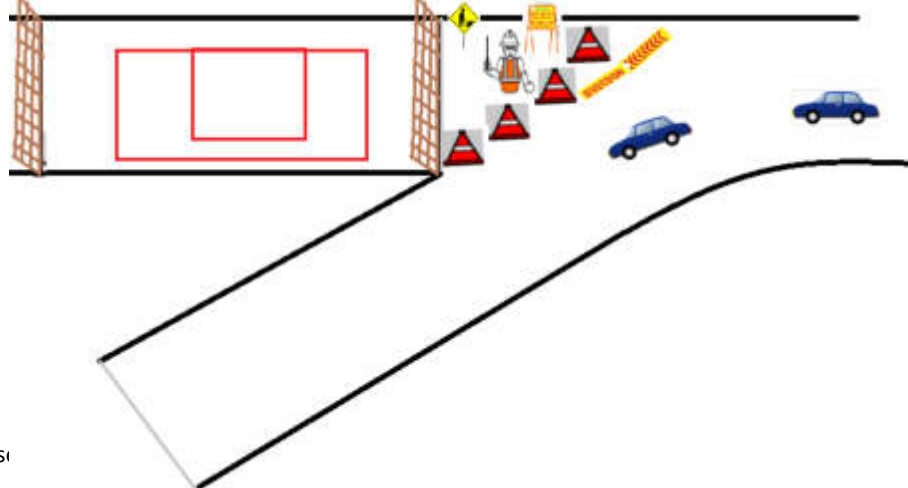
There may be situations where work plan requires complete closure of a road. In such cases good traffic planning and organization of work is desired even if it is planned in lean traffic timings.


- Diversion of traffic to minimize bottle neck and traffic congestion
- Complete closure of road / pathways using hard barricading & safety cones to contain risks arising out of work in progress area
- Placing direction signage, red light, caution notices & signals (lighting lamps / rotary lamps) for public and vehicles keeping day and night in mind
- Deputing a dedicated watch man / signaling man to guide traffic

Manager of works along with subcontractor & Safety officer to inspect prior to start of works and review the situation periodically.


Supervisor of works to inspect the area every day before starting and at end of day's work or during recess to ensure no unsafe condition is left behind. There may be chance that barricading boards are temporarily removed or any materials / machines are left unattended in public places posing risk of trespassing or injury to general public.

Watchman to be dedicatedly deputed to guide traffic and keep control on unauthorized entries.



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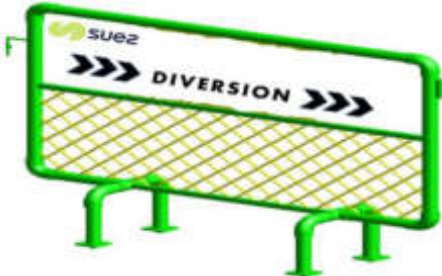
Road Diversion for complete closure

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Description of Signalization/ safety signage, barricade:





Specification must be in accordance to EN / IS standards especially for standard color & high visibility.


Ensure robust make and reputed manufactures for the same.






NO	DESCRIPTION	SPECIFICATION	PICTURE
1	MEN AT WORK, GO SLOW 	Material: MS Pipe, MS sheet, Height: 1150 MM Width : 1500 MM The signalization shall respect color, be visible from distance and robust. However, design of boards & logo may vary.	
2	WORK IN PROGRESS 	Material: MS Pipe, MS sheet, Height: 1150 MM Width : 1500 MM The signalization shall respect color, be visible from distance and robust. However, design of boards & logo may vary.	
3	DIVERSION 	Material: MS Pipe, MS sheet, Height: 1150 MM Width : 1500 MM The signalization shall respect color, be visible from distance and robust. However, design of boards & logo may vary.	


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4	CAUTION SAFETY TAPE	Material: Plastic Color: Red and white stripes	
5	TRAFFIC CONES	Height: 75cm Material: Rubber Base With reflection bar	
6	BARRIERS	<p>Barricading block Interlocking wall effect, 90 degree turning radius</p> <p>For wide road > 2000mm Length- 2000mm Width- 600 mm Height- 900mm For narrow street < 2000mm Length- 1000mm Width- 300 mm Height- 800mm (low width barricades are acceptable for narrow spaces)</p> <p>GI sheet barricading as per requirement (min. two sheet width)</p>	 

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7	ROTARY LAMP (Must for traffic block / diversion)	Color: Yellow Rotating motor use motor system Environment friendly: no UV, IR, lead or mercury.	
8	BARRICADE LAMP (Must for barricade along running traffic and additional for traffic blocking / diversion)	Color: Red/ Orange	
9	STICK LAMP (Must for traffic controller / security man / Signaling man)	Color: Red/Orange	 
10	LIGHTING LAMP	Super Bright White LEDs	

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4. IDENTIFYING HAZARDS, ASSOCIATED RISKS & DEFINING CONTROLS

4.1 HSE Management Plan




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4.2 IDENTIFICATION OF DANGERS AND CONTROLS OF RISK

Considering all activities with respect to road works hazards and risks are identified and necessary control measures are suggested as below.


IDENTIFICATION OF DANGERS AND CONTROLS OF RISK			
ACTIVITY	POTENTIAL HAZARDS	ASSOCIATED RISKS	CONTROL MEASURES
Travelling by company car	Traffic hazards (Vehicle speed, condition and compliance)	Injury to driver or traveling employee due to hit / collision of vehicle	Fasten your seat belt while driving / traveling by vehicle
			Check condition of vehicle daily - by driver & periodic Joint inspection of vehicles by H&S and Admin. Managers
			Install speed governor to limit speed to 60 KMPH & Follow speed limits
			Park the vehicle in designated areas
			Follow traffic signage's and safety instructions given by H&S
Travelling by company motor cycle /	Traffic hazard (vehicle speed, condition and	Injury to rider or travelling employees due to hit / collision of	Crash Helmet is mandatory for rider & pillion rider in case of motor cycle and Bicycle helmet & reflective vest is mandatory in case of Bicycle.
			Check condition of motor cycle before riding, periodic joint inspection by H&S and Admin


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Bicycle	compliance)	vehicles	Do not over speed	
			Follow traffic signs	
Walking / visual surveying on	Vehicular Traffic	Traffic - Hit or over-run by vehicle	Use pedestrian pathways, plan your activity in case it is mid of the road.	


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the streets / roads			Use of PPE's - Safety helmet, Shoes, Reflective vest/jacket is mandatory
			Depute a signaling man with baton (light) to keep watch / control on traffic when working in group
Working on the road	Movement of vehicles pedestrians	Damage injury to general public	Display a sign board " CAUTION - WORK IN PROGRESS" with client logo
			Barricade the area using hard barricading boards.
			Depute a signaling man with baton (light) to control traffic, maintain barricades & control on movement of workmen working on job site
			Keep a vehicle standby and maintain first aid box, drinking water in the vehicle
			Check for underground utilities before start of excavation and ensure to locate electric cables / other underground utilities and Accordingly define safe work procedures.

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Excavation work on road	Underground utilities, fall of person / vehicle in to the depth, collapse of soil / edges	Injury to person / damage to vehicles	Barricade & signpost the area using hard barricading (1 meter away from edges) & depute a signaling man to guide the traffic, alert the workmen and maintain barricades	
			Keep sufficient slope for protection against soil collapse	
			Supervisor to inspect work location before start of works each day & periodically and ensure that area is not left unsecured, provide lighting during night	

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			Activity to start with work permit issued by concern engineer / manager.
Welding & grinding operation	Electric hazards, radiation - eye, rotating part - grinder, flying chips	Electric shock, Injury to eye, hand and other body parts	Use suitable welding machine and electric power source to avoid open connections / cables etc.
			Welder and his helper must use welding glass (Filter No. 12 or suitable), Leather hand gloves, apron and shoes
			Grinding technician must use suitable machine (rpm of wheel must be compatible to machine and wheel guard in place) leather hand gloves, shoes, eye protectors & ear plugs
			Welding inside the rooms, flammable areas, confined spaces to follow specific Procedure for addressing specific risk controls.
Storage of materials beside the road	Blocking pedestrian pathways, roads causing restriction to circulation	Injuries / damages to pedestrians, restriction to vehicle movement	In case the activity requires any storage of material / machines on site: Limit the storage duration and qty., Barricade the material / machines & have visible signage to caution passerby,

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			keep pathways clear
Emergency situation on site	Various hazards	human injuries	Prepare emergency response plan for various scenarios (such as Electrocution, damage to gas pipeline, vehicle collision, vehicle hitting worker etc) and display / place it inside the site vehicles
			Identify & tie-up with hospital nearby work location / areas
			Train Engineers, supervisors & other staff on site & practice it (Communication of serious incident and response of driver, supervisor and co-workers)
			List certified first aiders with each crew / team


Above IDCR (IDENTIFICATION OF DANGERS AND CONTROLS OF RISK) exercise gives few basic controls which need to be implemented in almost all project activities. As a result, 10 basic rules/checkpoints for implementation and enforcement are listed below in the form of checklist from risk prevention & control point of view.


Actual Risk assessment as per the Suez procedure to be performed at site covering all activities.

4.3 Evaluation of Performance of Subcontractors

Evaluation of performance of subcontractors - All		Week / Date:
		Note: Refer AP for details
Contract:		
Sl. No.	Check points	Subcontractors / Partner / Services

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<p>0 = No compliance: the requirement is almost imperceptible on site.</p> <p>1 = Little compliance: the requirement is most of the time not respected on site</p> <p>2 = Partial compliance: the requirement is most of the time respected on site but non-compliances were seen.</p> <p>3 = Full compliance: the requirement is strictly respected on site. No cases of non-compliances were seen</p>									
1	PPE: The personnel wear their PPE (basic and work specific). The PPE are in good condition.								
2	Tools/Equipment: The tools and equipment used are in good condition (collective protection available, no hazardous wear and tear)								
3	Housekeeping: debris, scraps and other wastes are removed from the work place. Tools and equipment are properly stored.								
	Supervision: A supervisor from the subcontractor is on site. He is active and reacts to abnormal situations.								
5	TBT: Tool-Box-Talks are organized at least once a week								
6	Work permits: They are available on site where the job is taking place.								
7	Barricading: work in progress areas are barricaded, signage is available & a signal man is deputed.								
8	Lifting: Loads are not lifted over persons and the workers do not position themselves under a suspended load. Necessary documents are available with lifting machine & operator.								
9	Driving: site vehicle driving rules are respected (Speed, seat belt, stoppage/parking, authorized use, etc.)								
10	Excavations: excavated areas are barricaded, Signage is available and the access is limited to authorized personnel.								

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11	Planning: Check for underground utilities before start of excavation and ensure to locate electric cables / other underground utilities and accordingly define safe work procedures.												

5. RISKS IN EXCAVATION AND SAFETY PRECAUTIONS:

Excavation work is unavoidable for repairs and laying of new pipes.

Excavation work may pose various following hazards and related risks:

- Collapse of trench / excavation walls
- Unstable mobile equipment very close to excavated edges / uneven surface
- Contact with electrical power lines
- Breaking of pipes / underground utilities in service
- Injuries caused by the fall of an object
- Falling, from heights or otherwise
- Confined spaces - contaminated soil causing microbial infection

Different type of soils will have different bearing capacity and safe angle of repose will vary as per the bearing capacity i.e. stability of soil. While working on busy road / areas there is no possibility of maintaining safe angle of repose (slope) and therefore as a thumb rule, soil support is a must for excavation deeper than 1.5M.


Following precautions and controls to be taken for excavation works and excavated areas.

Before Start:

Plan the activity in advance and inform to all concerns (authorities / employees) to take necessary steps for minimum disturbance and impact to general public and traffic.

- Barricade all sides of the trenches
- Red danger lights for easy visibility from dusk to dawn at an interval of 15-20 m and at all the road crossings.

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- Traffic signals and display boards giving direction for diversion of traffic at the appropriate places.
- Locate ground utilities & isolate them for avoiding interference with our activities Use cable and pipe locating tools, detector, and transmitter receiver instruments.
- Depute signaling man / security man for round the clock watch and ward for maintaining all safety regulations at the site of work and protecting the site from unauthorized intrusions.

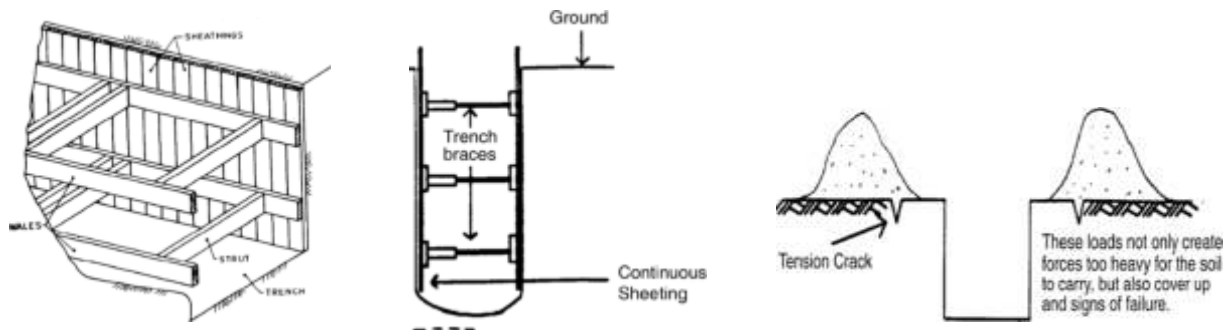
During Works:

- In case of deep excavation, store excavated soil / spoil at least 1.5M away from edges.
- Support the soil from possible collapse by providing suitable benching, sloping or shoring.
- Shoring plates to be supported using trench braces at equidistance throughout the trench depth & length.
- Stop unauthorized entry to trench and maintain safe conditions surrounding trenches.

After the work:

- Ensure that area is leveled and restored to normal after completion of work.
- Inspect the area during recess / work intervals and periodically during the day.

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Soil support to be provided as per the IS-3764 or OHSAS excavation standard

Avoid over loading of edges due to spoil / equipment

Other precautions while working in excavated areas:

- Where a road or footpath is to be kept opened up in the course of work, special care shall be taken to see that proper protection is provided to prevent any accidents from occurring. Work shall be done in such a manner that it will not unduly inconvenience pedestrians or occupants of building or obstruct road traffic
- Care shall be taken to see that apparatus, tools or other excavating implements are not left in a dangerous or insecure position as to fall or be knocked into the trench thereby injuring any workmen who may be working inside the trench.
- The flags and lams shall be placed in conspicuous position so as to indicate the pedestrians and drivers of vehicles the full extent, i.e. both width and length of the obstruction.
- Where any excavation is not clearly visible for a distance of 25 meters to traffic approaching from any direction or any part of the carriage way of the road, a warning notice shall be placed on the curb of all such roads to make excavated area well visible. Such warning shall be placed at a distance of 25 meters from the excavated area or at least 10 meters from the junction of an entering of intersecting road with in the road in which the excavation exists.
- All warning, in these cases shall be clearly visible and legible. All warning lamps shall exhibit a red light, but white lights may be used in addition to facilitate working at night. Wherever required a passage for pedestrians with foot bridge shall be provided. At excavation tools and all materials likely to offer obstruction shall be properly folded round and protected.
- In case there is any damage to underground gas pipes:
- Evacuate the area, keep everyone clear of leaking area.
- Enforce no smoking and no naked lights.
- Inform immediately SPPL authorized person & service provider company and follow instruction given to you

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- Remember do not put yourself in to danger situation and also to others

Disposal of Debris:

Due to excavation on existing roads the debris will be generated and that waste to be disposed-off with due permission from client in environment friendly way. The debris should not be accumulated on roads causing inconvenience to public and shall be disposed on regular intervals.

These debris shall be dumped in approved debris disposal sites. Debris shall be collected in trucks and covered with dust nets and transported to the approved disposal site.

Avoid disposal of debris in or near water bodies / rivers / residential areas / forest areas.

6. FIRE PREVENTION & CONTROL

Basically, fire is a chemical reaction. Whenever fire occurs there is combustion or burning, in other words, oxidation of substance accompanied by heat, light and smoke. Three things are necessary for fire to occur Fuel, Heat and Oxygen. The danger of fire is greater during the period of construction than it is after the completion. To eliminate the causes of fire, it is important to locate how and where fire starts. The maximum frequency of fire cause is Electrical. There are various other causes like Smoking, Hot work etc.

Suitable quantity of fire extinguishers shall be maintained for each class as per the fire potential.


CLASS A FIRES - Wood, Textiles and paper.

CLASS B FIRES - Oil, petroleum, solvents, grease paint & the like. CLASS

C FIRES - Gaseous substance under pressure.

CLASS D FIRES - Reactive chemicals, active metals and the like.

All extinguishers provided at site shall be inspected periodically and maintained in good condition all the time.


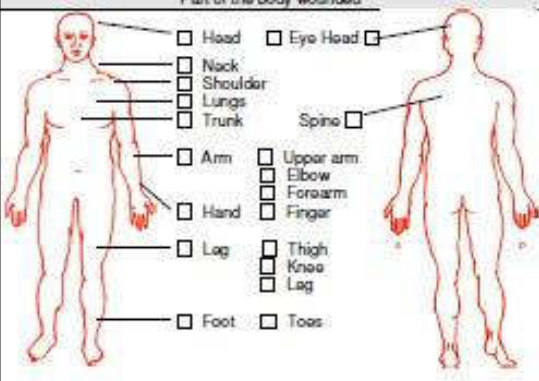
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7. PROCEDURE IN CASE OF ACCIDENT:

In the event of an incident/accident occurring on site, the SPPL / subcontractor shall provide first aid assistance and ensure transportation to a near hospital if necessary. Same shall be informed immediately to Project Manager SPPL & HSE officer by Phone & then the event shall record and report in writing in the prescribed form by the concern manager/ engineer/ subcontractor's representative to SPPL Project Manager and HSE officer within 24 hours.

Reporting of all kind of incidents is necessary to find root causes and avoid recurrence of similar incidents. This is not to develop blame game but to improve upon workplace conditions and minimize unsafe situations having potential to cause accidents.

The subcontractor has the obligation to report any accident by completing the Accident / Incident Notification Form enclosed below.

BU:	BA:	SITE:	DATE:	TIME:
1 - NATURE OF THE INCIDENT:				
HUMAN <input type="checkbox"/> WORK ACCIDENT <input type="checkbox"/> COMMUTING ACCIDENT <input type="checkbox"/> NEAR MISS		ENVIRONMENT <input type="checkbox"/> POLLUTION: WATER <input type="checkbox"/> AIR <input type="checkbox"/> SOIL <input type="checkbox"/> <input type="checkbox"/> WASTE <input type="checkbox"/> NUISANCE: NOISE <input type="checkbox"/> OLFACTORY <input type="checkbox"/>		INDUSTRIAL SAFETY <input type="checkbox"/> TOXIC DISCHARGE: AIR <input type="checkbox"/> WATER <input type="checkbox"/> SOIL <input type="checkbox"/> <input type="checkbox"/> EXPLOSION: OF GAS <input type="checkbox"/> OF DUST <input type="checkbox"/> <input type="checkbox"/> FIRE <input type="checkbox"/> OTHER:
ACTUAL SEVERITY OF INCIDENT: <input type="checkbox"/> 0 <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5			POTENTIAL SEVERITY OF INCIDENT: <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5	
RELATED TO A LIFE-SAVING RULE? 				
INJURED PERSON: LAST NAME / FIRST NAME: POSITION: COMPANY: <input type="checkbox"/> Employee <input type="checkbox"/> Temp <input type="checkbox"/> Sub-contractor: <input type="checkbox"/> Third party:		WITNESS: <input type="checkbox"/> YES <input type="checkbox"/> NO LAST NAME / FIRST NAME: POSITION: COMPANY: <input type="checkbox"/> Employee <input type="checkbox"/> Temp <input type="checkbox"/> Sub-contractor: <input type="checkbox"/> Third party:		AUTHOR: LAST NAME / FIRST NAME: POSITION: DATE OF REPORT: HIERARCHY NOTIFIED DATE: AT:
2 - DESCRIPTION OF THE INCIDENT				
What happened (Who?, When?, What?, Where?, How?, estimated quantity?, affected people, duration?):				
1- Before the incident (description of the situation prior to the incident : work done, process conditions, etc):				
2- At the time of the incident (accidental event):				
3- After the incident (what was done: removal of a persistent danger, rescue of the victim, first corrective actions, etc):				
3 - ACTUAL CONSEQUENCES OF THE INCIDENT:				
Part of the body wounded 		Type of injury <input type="checkbox"/> Death <input type="checkbox"/> Lumbago <input type="checkbox"/> Traumatism <input type="checkbox"/> Crushing <input type="checkbox"/> Contusion <input type="checkbox"/> Muscle tear <input type="checkbox"/> Sprain/dislocation <input type="checkbox"/> Fracture <input type="checkbox"/> Abrasion <input type="checkbox"/> Cut <input type="checkbox"/> Bite <input type="checkbox"/> Sting <input type="checkbox"/> Burn <input type="checkbox"/> Visual problems <input type="checkbox"/> Auditory problems <input type="checkbox"/> Intoxication <input type="checkbox"/> Asphyxiation <input type="checkbox"/> Other:	Equipment / Process / Environmental damages Type: Cost (if knows): Other:	
4 - FIRST ACTIONS TAKEN:				
CARE: First aid given: Yes <input type="checkbox"/> No <input type="checkbox"/> Victim transported to: Local nurse <input type="checkbox"/> Doctor <input type="checkbox"/> Hospital/Clinic <input type="checkbox"/> Time off work: Yes <input type="checkbox"/> Until: No <input type="checkbox"/> Adapted assignment proposed: Yes <input type="checkbox"/> No <input type="checkbox"/> Accepted by employee: Yes <input type="checkbox"/> No <input type="checkbox"/>		CONFINEMENT: Confinement of a zone: Yes <input type="checkbox"/> No <input type="checkbox"/> Name of the zone: External means contacted: Yes <input type="checkbox"/> No <input type="checkbox"/> Type of actions considered:		ALERT: Triggering of an alert: Yes <input type="checkbox"/> No <input type="checkbox"/> Client contacted: Yes <input type="checkbox"/> No <input type="checkbox"/> Administration contacted: Yes <input type="checkbox"/> No <input type="checkbox"/>
5 - ILLUSTRATIONS				
Photos, diagrams illustrating the incident location, the material involved, the human, environmental or industrial damages				

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8. SAFE MEANS OF ACCESS & SCAFFOLD / WORKING PLATFORMS:

Adequate safety measures of access and exit shall be provided at all elevations using suitable means as per standards.

Suitable scaffoldings, ladders and platforms shall be provided for working at height more than 1.5 meter from the ground. Timber bamboo scaffoldings shall not be used.

Every scaffold and every component thereof is of adequate construction, made of sound material and free from defects and is safe for the purposes for which it is intended for use. All metal scaffold used in construction work conform to the relevant national standards.

All scaffoldings shall be examined by the competent person before use and stairways platforms etc. shall be suitably guarded.


The platform shall not project beyond the end support and ladders used as approach shall not be more than 8 meters in length. The upper end of the ladder shall be 1 meter above platform.

Scaffolding shall be properly designed and erected, with its intended use in mind. All hazards involved with the erection or dismantling shall be identified at the planning stage and the appropriate safety precautions taken. Proximity to live electrical equipment or interface problems may need to be considered. SPPL / subcontractor shall take all precautions to prevent any accidental collapse of scaffolding or fall of persons from scaffolding. SPPL / subcontractor shall ensure that scaffolding erection, dismantling and repairs should be done under the expert supervision. The scaffolding shall meet the required strength and other requirements for the purpose for which the scaffold is erected.


9. CONFINED SPACE WORK AND PRECAUTIONS:

Major Hazards and associated risks: -

- Asphyxiation due to lack of oxygen in air.
- Intoxication due to presence and inhalation of toxic gases.
- Fire /explosion due to presence of flammable gases and contact with ignition source
- Slip / fall and injuries due to physical hazards
- Electrocution and injuries due to electricity and machines

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No person shall be required or allowed to enter any chamber, tank, vat, pit, pipe, flue or other confined space in any worksite in which any gas, fume, vapour or dust or other physical hazard is likely to be present to such an extent as to involve risk to persons being overcome thereby, unless it is provided with a man entry of adequate size i.e safe / effective means of access / egress.

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No person shall be required or allowed to enter any confined space referred above, until all practicable measures have been taken to remove any gas, fume, vapour or dust and physical hazards which may be present so as to bring its level within the permissible limits and to prevent any ingress of such gas, fume, vapour or dust and unless: -

A) a certificate in writing has been given by a competent person, based on a test of confined space atmosphere is carried out by himself that the space is reasonably free from dangerous gas, fume, vapor or dust; or

B) such person is wearing suitable breathing apparatus and a belt securely attached to a rope the free end of which is held by a person outside the confined space or as appropriate

A dedicated signaling man should be placed near entrance with means to raise the alarm in case of any emergency & follow the intervention procedure specifically prepared for the activity after risk assessment.

All personnel working in confined space shall be adequately trained & medically fit for executing the job.

The SPPL / subcontractor shall ensure adequate ventilation / explosion proof lighting (24V hand lamp) in the work place.

Always perform risk assessment and use work permit, LOTO of all energies.


10. LIFTING MACHINES / TOOLS & TACKLES:

Major hazards and associated risks: -


Improper lifting (arrangements / methods) or failure of lifting devices resulting in fall of materials and consequential injuries to person and/or damage to materials

The SPPL / subcontractor shall ensure all the lifting appliances, tools & tackles including cranes etc. are in good condition, examined & certified by competent person before use and afterwards once in a year according to Section 29 of The Factories Act 1948.

- Copy of third party certificates to be submitted to SPPL before use / furnished on demand.

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- SWL of all lifting appliances to be marked on it. Do not use lifting tools to lift loads access to it's SWL.
- Method of use of a sling, chain pulley block etc. can reduce it's SWL considerably when used at higher than recommended angle or in different position / use.
- Never stand below load being lifted. Barricade the area as far as practically possible.

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11. WORKING AT HEIGHTS:

Major hazards and associated risks: -

Fall of person or materials from height and consequential injuries to person and/or damage to materials

Working at above 1 meter of height to be considered as height work and all safety precautions to be taken to avoid fall of workers from height.

Person working at height shall have: -

- Working platform with access and handrails
- Full body harness with anchoring point

All working platforms, walk ways etc. shall be maintained free from accumulations of debris or any other material causing obstructions and tripping / falling.


Every opening at elevation from ground level through which a person, material, equipment etc. may fall at a construction work shall be covered and or guarded suitably by the SPPL / Subcontractor to prevent such falls.

12. WELDING AND GAS CUTTING:


Major hazards and associated risks: -

- Electric shock, Burn injuries, Fire / explosion
- Arc eye due to UV exposure
- Exposure to toxic fumes
- Operation shall be done by authorized persons only after issue of work permit.
- Remove flammable materials from surrounding area before start of welding / cutting / hot work.
- Gas cylinder in use shall be kept upright on a custom-built stand or trolley fitted with a bracket to accommodate the hoses & 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. Use of makeshift arrangements in place of clamp e.g. wires etc. to be strictly avoided.

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- All gas cylinders shall be fixed with pressure regulator & dial gauge.
- Non-return valve & flashback arrestor shall be fixed at both the end of cylinder & torch.
- Domestic LPG cylinder shall not be used for gas welding & 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. Fire extinguisher should confirm to local standards.
- Use firewatchers if there is a possibility of ignition unobserved by the operator.
- Oxygen cylinder and flammable gas cylinders shall be stored separately.

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13. FENCING OF ROTATING / DANGER PARTS OF A MACHINE:

Major hazards and associated risks: -

- Abrasion, puncture, cut injuries due to contact of body part with machine part in motion
- Electric shock
- Entanglement of loose cloth / caught in between

Rotating / reciprocating / transverse movement for cutting, punching, bending or other operations may have above potential risks. All machines should be placed safely and Dangerous parts of machines to be suitably guarded all the time. SPPL / Subcontractor shall ensure at a worksite that:

- All chains & friction gearing, dangerous & moving parts of machinery are securely fenced / guarded.
- The fencing of dangerous parts of machinery shall not be removed while such machinery is in motion or in use.
- Machine parts are cleaned when such machine is stopped.
- When a machine is stopped for servicing or repairs, adequate measures (Lock out/ tag out) should be adopted to ensure that such machine does not re-start inadvertently.
- After servicing machine guard shall be reinstalled immediately.

14. HAND TOOLS:

14.1. General


Trained manpower shall be engaged and periodically inducted to avoid accidents relating to hand tools. Accidents arising out of hand tools can be attributed to any one of the following reasons:

- Using the wrong tools.
- Using tools, which are in poor condition.
- Using the tool in a wrong way.
- Keeping tools in unsafe places.

If the above four conditions are taken care of, we can eliminate all the hand tool accidents. Also, concerned engineer / supervisor must train all operators time to time.

SPPL / Subcontractors / users must carry out inspection of all machines and tools being used on site

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on monthly basis. Records of such inspections must be visible to identify that tool / machine is in sound condition and can be used. Defective tools shall be removed from the site.

14.2. Using the Wrong Tools

The weight, size and type of tool should be selected to suit the job being carried out. Using pliers or wrenches as hammers, using screw drivers as pinch or chisels, using double end spanners in place of ring spanners, using pipe wrenches as spanners are a few examples of using wrong tools.

14.3. Using Tools in Poor Condition

Tools provided with wooden handle should always be used with the handles intact. The handles should be tightened with wedges whenever necessary. Split or broken handles should be replaced immediately. Pipes or rods shall not be used as handles.

Sharp tools improve accuracy and are safer than dull tools. Accumulated dirt or grease should be wiped off immediately to avoid slippage. Shovel and pick handles should be free from splinters, splits and cracks. Insulated and non-conducting tools should be tested frequently for their electrical resistance. Mushroomed chisel is a serious source of hazard.

14.4. Using Tools in Wrong Ways

Wrenches should always be placed on nuts with the jaw opening facing the direction in which the wrench is to be rotated. Wrenches should not be pushed but be pulled.

Chisels should be held with steady but relaxed grip. Chisels being struck by other should be held by tongs or other holding devices. Always chip away from yourself and protect others by screening. Use goggles while chipping.


While using screwdriver, the object should not be held in hand or thigh.

Blades of hacksaw should always point forward and the entire length of the blade should be using in the forward cutting stroke. The stroke should be steady and firm to avoid jumping of blade.

14.5. Keeping Tools in Work Places

Hand tools should not be allowed to lie on workbenches, scaffolding, etc. where from they can be tipped down. They should be stored properly after the work is over. Sharp tools like screwdriver, etc.


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Should not be kept in pockets. Hand tools shall not be held in hand while climbing up or down through a ladder. Tools should never be thrown up or down.

14.6. Jacks

Select jacks heavy enough to raise and hold the load safely. Jacks should rest on firm level foundation, adequate to support the load. Jack of same capacity and type should be used while using number of jacks. Simultaneously be sure that the jack does not tip and

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is in line with the vertical movement of load. Wooden block should be given over the jack also to avoid metal to metal contact. Load must rest on firm packing before releasing the jack or before allowing persons to work below the raised load.

Inspect frequently and use only the proper grade and clean oil. It is advisable to shore up any load that must remain in a raised position for any length of time.

14.7. Portable Electric Tools

Maintenance of electric tools should be systematic.

Safety guards provided in the tools should not be tampered with.

Gloves, safety shoes, goggles, etc. should be worn by the operator wherever necessary.

Only experienced and authorized personnel should be permitted to operate power tools.

For all electric power tools, a running earth must be maintained, and the supply cable should be handled very carefully.

Electric supply should be disconnected before attempting any repairs or servicing. Even a change of wheel in the grinding machine requires the supply to be disconnected.

14.8. Drilling Machine

A prick punch or pilot hole should always be provided to guide the drill bit.

Suitable drill bit should be selected for the material being drilled.

If bit is long enough to pass through the object, care should be taken to avoid damage or injury on the far side.


If the object is small, it should be secured to prevent spinning.

Care should be taken to prevent sleeves and other clothing from being wound around drill.

14.9. Portable Grinders

HOOD GUARD provided in the machine should be maintained in place always.

Wheels of proper rpm rating should be used. Date of expiry of wheels should always be checked before mounting. If in doubt, a tap test may be conducted to check for minor cracks and the machine be allowed to run under no load in a safe place for some time.

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The grinding wheel shall be stored and handled properly. It shall never be allowed to be dropped and stored in damp places.

Mounting blotter should be used when provided in the machine the spindle nut should not be over tightened.

Only experienced and skilled grinders shall be engaged.

The grinding machine shall not be allowed to be kept on the ground when the wheel is in rotation.

14.10. Pneumatic Tools

Air hoses of pneumatic tools should be protected against whipping. They should also be protected against damage by vehicles.

The airline should be depressurized before opening any joint.


Compressed air should not be directed against self or others. It should not be used for removing dirt from the clothes, etc.

Air hoses taken over head or vertically should be sufficiently supported.

15. ELECTRICAL FACILITIES:

Major hazards and associated risks: -


- Electric shock, Burn injuries
- Fire / explosion
- Working on site and offices requires electricity for operating equipment and area lightings etc. Providing electricity often requires temporary arrangement which is more hazardous.
- Temporary electrical facilities to be provided with following minimum standards:
- All temporary distribution boxes must be robust and provided with rain protection & main switch to supply/cutoff power of DB.
- Each DB must have earthing of metallic parts, 30mA ELCB, rubber mat and lockable to avoid unauthorized working.
- Only authorized persons should be allowed to work with electricity.
- Display danger sign and provide physical barrier to prevent entry of unauthorized persons in electrical facility.

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- Put numbering on each DB and inspect them periodically for safe and sound condition.
- Maintain minimum inventory of temporary boards with industrial cable and plug tops, power tools / machines required for their job.

Before start of works, the SPPL / subcontractor shall ascertain that all sources of electricity e.g. cables / wires / machines (underground / above ground) etc. are identified and isolated suitably to prevent mishap due to possible interference with planed activity in proposed working area.

The SPPL / subcontractor should ensure that all electrical installations at the construction work comply with the requirements of local electricity acts/rules & site rules.

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The SPPL / subcontractor shall take all adequate measures to prevent any worker from coming into physical contact with any electrical equipment or apparatus, machines or live electrical circuits which may cause electrical hazards during the construction work. The subcontractor shall provide the sufficient ELCBs / RCCBs for all the portable equipment, electrical switchboards, distribution panel etc. to prevent electrical shocks.

The SPPL / subcontractor should ensure use of single/double insulated hand tools or low voltage i.e. 110 volts hand tools.

The SPPL / subcontractor should also ensure that all temporary electrical installations at the construction works are provided with Earth Leakage Circuit Breakers.

16. OVERHEAD ELECTRICAL POWERLINES:

Wooden goal post shall be erected under all overhead lines by keeping safe clearance distance subjected to the lines for avoiding any contacts by moving machinery. Safe clearance distance shall be confirmed by local electricity rules / authority.


17. HEAVY EQUIPMENT (Cranes, Excavators, Hydra, Bulldozers, etc.):

The SPPL / subcontractor shall provide heavy construction equipment in good condition, suitable for safe operation. All safety features shall be operating as fitted by the manufacturers e.g. reversing alarms, seat belts, limit switches etc.

- A valid vehicle fitness certificate/ operator license as per local legislation shall be produced by the subcontractor.

18. SCAFFOLDING:


For any work that cannot be done from ground level or from part of any permanent structure or from other available means of support, soundly constructed scaffoldings of adequate strength shall be used as a safe means of access. A scaffold or its components should be designed to support 4 times the maximum intended load. During erection and dismantling, neither the scaffolding components nor tools shall never be allowed to be thrown up or down. Slippery conditions on scaffolds must be eliminated as soon as they occur.

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18.1. Wooden Scaffoldings

As far as possible, wooden scaffolding shall be avoided. However, when it is unavoidable following precautions shall be taken.

- Vertical poles of scaffoldings should not be more than two meters apart.
- Diagonal bracings should be provided at the level of each joint. The joints in scaffoldings being the weakest points should be inspected regularly and maintained

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in proper condition. Diagonal bracings should be sufficient to prevent buckling of the scaffoldings due to wind pressure or side thrust.

- No welding or gas cutting work shall be carried out in above or near wooden scaffoldings. In addition, suitable firefighting provision (preferably water hose) shall be made available.
- A shuttering supervisor exclusively shall be placed to check, monitor and ensure that no failure occurs while pouring concrete.

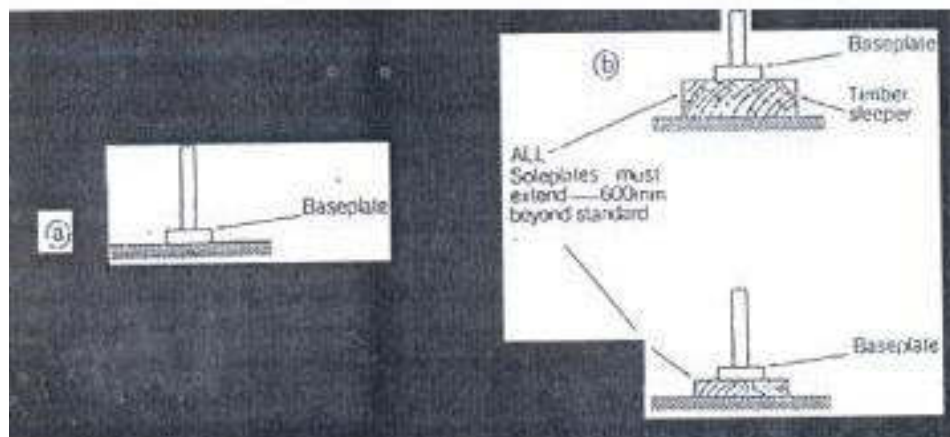
18.2. Hanging Scaffolding/Swing Scaffolding/Continuous Scaffolding


- Chain, ropes or other lifting materials used for the suspension of scaffolding must be of adequate strength and of suitable tested quality. In any case, the rope shall not be less than 20 mm dia. The chain or rope used for suspension scaffold should be properly fastened to safe anchorage points and not to hand railing, etc.
- In continuous scaffolding, more than 2 persons should not stand. The scaffold must be inspected and tested every day before use.
- The working platform shall be sufficiently wide and provided with handrails of about 1 Meter height with one top rail, mid rail and toe board
- If the platform is long and provided with two lifting arrangements, lowering/ lifting of the scaffolding should be done simultaneously at both the ends. A safety rope shall be provided in addition to the main supporting rope.
- A tag tie should always be used to control the movement of the scaffolding.

18.3. Steel Scaffolding

- Before starting the scaffolding erection, the surface on which it has to be erected must be made firm and level.
- Once the surface is ready, sole plates have to be kept. It can be a timber sleeper or steel plate. Sole plates should be long enough to hold at-least two vertical pipes and should extend 600 mm beyond the vertical pipes. Sole plates may be avoided in case if the scaffold is erected on a firm ground. (Ref Fig. 16.3 (i)).

Fig. 16.3 (i)



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- However, base plates are a must, irrespective of where the scaffolding is erected. It should be 200 x 200 x 10 mm steel plate. Sole plates and base plates support the entire load of the scaffolding. They distribute the load and prevent the scaffold from sinking.
- Vertical members should not be kept more than 3 M apart.
- Right angle coupler and swivel coupler used in the erection of scaffolding are tested for 1.2 tonnes without slipping (Fig. 16.3(ii)).



Fig. 16.3 (ii)

- Single bolt coupler can take only a load of 508 kgs without slipping. The putlog coupler can take only 129 kgs without slipping (Fig. 16.3(iii)).
- Joint pin connects the pipes internally. This can be used only to connect vertical pipes (Fig. 16.3(iv)).
- Sleeve couplers are fixed on the outside of two tubes to connect them. This can be used to connect vertical, horizontal and slanting pipes.

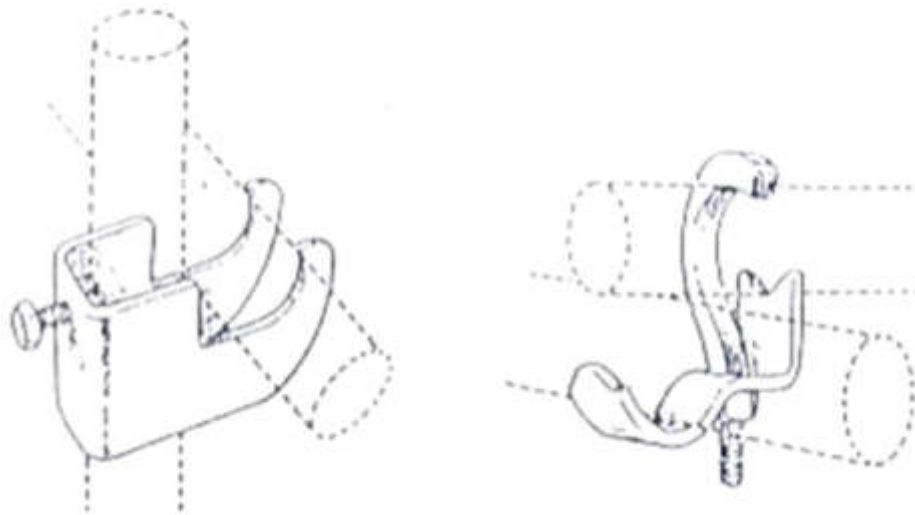



Fig. 16.3 (iii)

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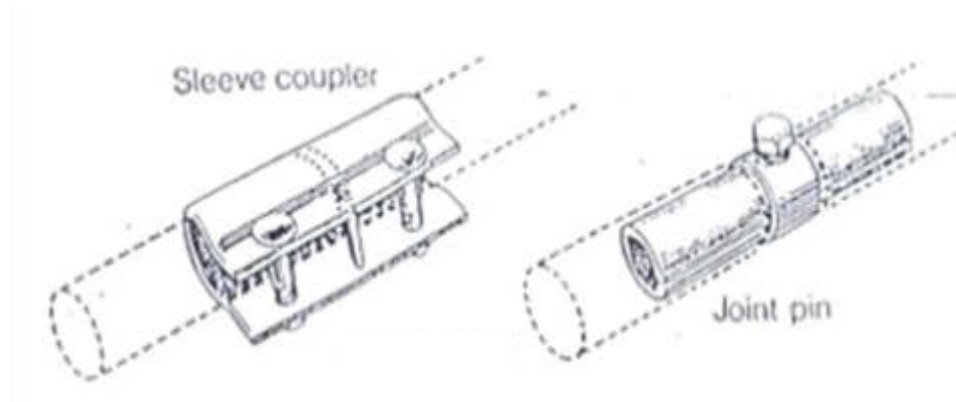



Fig. 16.3 (iv)

- DO NOT USE PIPES WHICH are (a) split along their length, (b) bent or kinked, (c) thin at the ends, (d) heavily pitted and (e) having badly cut or ragged ends.
- Do not use corroded or deformed couplers and make sure that the threads are in good condition.
- Allowable maximum span between support for:
 - a) 40 mm thick plank is 1.5 M and
 - b) 50 mm thick plank is 2.6 M.
 - c) Wooden jallies is 1.0 M.
 - d) Steel jallies is 1.5 M.
- The Overhang of a scaffold plank should be at least 50 mm but not more than 4 times the thickness of board.
- Knots or knot holes in the scaffolding board should not exceed 50 mm in diameter across the edge. The board must not be split even partway. The grain should be reasonably straight.
- Dropping or throwing materials from the top and from bottom to top should not be entertained. A rope shall be used for that purpose.

18.4 Common Faults in Scaffolding

- Supporting of boards inadequate and therefore liable to tilt.
- Absence of toe-boards and guard rails where necessary.
- Faulty alterations made without approval.
- Erected on uneven ground.
- Supported by scaffold lashings instead of wire ropes.
- Couplers misused; use of putlog coupler where load bearing coupler to be used.
- Absence of ties where necessary.
- Foundations insecure.
- False supports, for example, drums, ladders, piles of brick etc.
- Outdated and damaged couplers.
- Lack of bracings.

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- Defective boards, large knots, splits etc.
- Inadequate access.
- Not wide enough - three planks is normally the minimum.
- Gangways obstructed.

19. LADDERS:

The following practices should be observed when placing ladders:

Place a ladder so that the horizontal distance from the base to the vertical plane of the support is approximately one fourth the ladder length between supports. For example, place a 4 M ladder so that the bottom is 1 M away from the object against which the top is leaning.

Do not use ladder in a horizontal position as runways or as scaffolds. Single and extension ladder is designed for use in a nearly vertical position and not be used in horizontal position.

Never place a ladder in front of a door that opens towards the ladder unless the door is locked, blocked or guarded.

Place the ladder feet on a substantial, firm and level base, and not on any other objects, like barrels, wooden boxes etc.

When using a ladder for access to high places, securely lash or otherwise fasten the ladder to prevent its slipping.


Secure both bottom and top to prevent displacement when using a ladder for access to a scaffold.

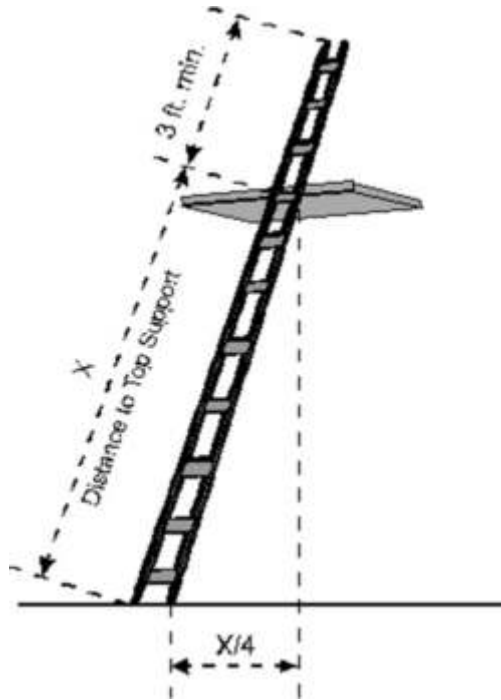
Extend the ladder side rails at least 1 meter above the top landing.

Do not use a metal ladder close to live electric wiring or any operational piping like acid, gas, etc. which could be damaged.

While ascending or descending, the user shall face the ladder, use both hands and place his feet near the ends of the rungs rather than the middle. Be sure the shoes are not greasy, muddy or slippery before ascending or descending.

Extension ladder should be sufficiently propped.

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All ladders of vertical height more than 10 meters shall be provided with an intermediate landing with guard rail, mid rail and toe board.

No portable single ladder should be over 6 meters in length.

Ladders should not be hung from brackets, as it tends to pull out the rungs. Landing

- Tie-up the ladder with this.

Aisle - Do not place ladders blocking this.

Doors - Do not keep ladders against this.

Descend - Do not ascend or descend with some materials in the hands. Elec.


Equip. - Do not use metal ladders to work in this.

Rungs - Do not have makeshift methods, in case this breaks.

20. DEMOLITION:

Before any demolition work is commenced and also during progress of work the following safety precautions are to be taken:

A definite demolition procedure shall be worked out after studying the entire structure and followed strictly throughout the demolition work.

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All the roads and open areas adjacent to the work site shall be protected and caution Boards / Danger sign in local language, Hindi English shall be displayed at prominent places. Unauthorized entry to the building under demolition shall be effectively controlled.

No electric cables or apparatus, which is liable to be a source of danger, shall remain electrically charged. Water and gas connections, if any, have to be removed, but a separate water source must be available nearby for quenching operations.

Glass panels of doors and windows are to be removed first.

When only a portion of a structure is to be demolished adequate props should be provided to prevent damage to the remaining portion due to shock and vibrations. Shoring of other buildings may be necessary when the demolition operation exposes or breaches and adjoining wall.

Debris shall not allow to be thrown from heights. Remove all debris promptly, using chutes or through internal holes. Try to minimize production of dust, by watering.

Permit no employee to work below others.

Safety appliances like safety belt, goggles, foot protection, gloves, etc. should be used, wherever necessary.

Use only proper and tested tackles while lowering heavy materials.

The cages, hoists, tackles should not be overloaded.

Before demolishing buildings with over hangs, chajjas, etc. they should be properly supported and demolished first before demolishing superstructure of the buildings.

The work should be carried out under strict supervision of a responsible supervisor. Only one man who is well experienced should give signal.

All practical steps shall be taken to prevent danger to persons employed from risk of fire or explosion. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render it unsafe.


While breaking roof slabs, workmen should not be allowed to sit on the same floor. A separate platform with independent supports shall be used for the demolition purpose.

Walls should not be left in an unstable condition where they may be toppled by wind or other force. Walls may need temporary support unless designed to be free standing.

21. PROTECTION FROM EXCESSIVE NOISE:

The SPPL / subcontractor shall take adequate measures to protect the workers against the harmful effect of excessive noise. The noise should not exceed the limit prescribed under the local regulation.

- Provide engineering controls and PPE's to reduce noise as far as practically possible.

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22. PLANT & EQUIPMENT


22.1. General

In this section of "Plant & Equipment" the accident preventive measures to be followed for all Diesel/Petrol engines and Light/Heavy Vehicles, in general, have been covered in two separate sub-sections. These procedures and practices are applicable for all plants and equipment, which have engines or are treated as vehicles.

The specific safety measures for any particular plant or equipment has been further elaborated and detailed in the relevant equipment items subsequently.

22.2. Hydraulic Excavators / Power Shovels


- Trained and authorized persons should operate.
- Warning boards should be displayed where excavation is going on. Put barricades around the excavated area. "KEEP AWAY" from the "SWING AREA"
- Before starting movement of the machine check the inside, outside and down side of the machine.
- Never grab joysticks or other control levers while getting on/off the machine.
- During operation, do not read, drink or eat. Do not divert your attention away from the attachment / control board
- Never swing the load over persons.
- Never allow anyone to ride in the machine.
- Never try to operate the machine except from the seat of the operator as the machine may go out of control.
- Do not load a dumper / truck unless the driver is in a safe location.
- Working in the vicinity of electrical lines, contact the electrical department before beginning excavation.
- Treat all power lines as energized even when it is known that the power is shut off and the line is grounded.
- Always maintain more than the minimum specified clearance between the machine and the power lines, employ a qualified or experienced signalman, if required.
- Slow down the operation cycles when operating in the vicinity of power lines.
- Remember death can occur in case of an accident caused due to electric shock from the energized power line.
- Never exceed the lifting capacity of the machine.
- Keep the machine away from the edge of an excavation. Avoid cutting under the machine.
- Operating on a slope is risky.
- Heavy items to be lifted by a hydraulic excavator should be hung from the designated lifting point. Never exceed the specified lifting values as shown in the chart. Failure of the bucket/ sling can occur even if the wire ropes used for the boom suspension as well as for the shovel / bucket shall be of the specified diameter.

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- Always use the proper equipment for the job to be undertaken.
- While moving on a road, travel with the headlights on even in the day light. While taking a turn allow for boom overhand and other structural clearance if any. Watch for boom clearance while travelling.
- Be careful while parking the machine. Do not park the machine where there is a possibility of the ground caving-in or at low-lying areas where the rainwater might accumulate.
- The attachment is held in position by the trapped hydraulic oil in a cylinder or a motor when the machine is not working (Hydrostatic locking). If there is any leakage of hydraulic oil, the attachment might come down suddenly endangering anyone or anything who/which may be below the attachment. Make sure that attachment is firmly resting on the ground.
- Power shovels / Excavators shall be so operated as not to endanger their stability.
- Power shovels that are equipped with unit for deep digging shall either be so designed that the bucket teeth should not come nearer the under-carriage more than 40 cm or be provided with reliable stop that prevents the bucket to come nearer than the specified distance.
- The boom shall not be pulled tight against the emergency stops while supporting a load.
- The bucket or grab of the shovel shall be pulled out of the bank as soon as it is full. When not in use, the bucket shall be kept resting on stable ground and shall not be left hanging.
- The bucket or grab of a power shovel shall be fixed to restrict movement while it is being repaired.
- While operating near edge of excavations or embankment substantial space shall be provided to prevent it from approaching a dangerous position and the sides of the excavation shall be adequately shored. Heavy equipment such as excavating machinery and road traffic shall be kept back from the excavated sides at a safe distance.
- The height of benches in overburden shall not be more than the height of the boom of the machine used for digging excavation of removal.

22.3. Tippers / Dumpers

- No unauthorized persons should operate the vehicle.
- Tipping system should be used only after positioning the vehicle for unloading (Tilt cylinder lever should not be tempered with).
- Rear view mirrors should be provided on both the sides of the cabin for reversing, loading or unloading of the vehicle.
- All tippers/ dumpers should be equipped with reverse horn.

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22.4. Water Tankers (Truck MountedType)

- No unauthorized person should operate the vehicle.
- Rear view mirrors should be provided on the cabin on both the sides for reversing the vehicle.
- The vehicle should be placed on a firm ground for filling or emptying the tank.

22.5. Tractors

- No unauthorized persons should operate the vehicle.
- Tilting and lifting should be done only when required.
- Vehicles should be used for towing, levelling or ploughing purposes only.
- Workers should not be allowed to travel on a tractor.

22.6. Vibratory Compactors

- A trained operator should be allowed to run the machine.
- If the compactor is electrically operated, the wiring/ cables should be properly laid so that movement of the machine is not restricted.
- Electrically operated compactor must be earthed properly.

22.7. Vibratory Rollers / Road Rollers


- A trained/ Authorized person should operate the machine.
- Caution boards should be displayed at the site of work.
- In the vicinity of the weak structures, vibration should be minimized and to bed own with precautions.
- Vibration should not be continued while the roller is not in motion.

22.8. Tar Boiler

- Only trained person should be allowed to operate the equipment.
- Burner and the connections should be checked against blockade/ leakage.
- Equipment should be anchored properly before loading and firing.
- Fuel tank should always be kept at a distance from boiler.
- Never use petrol with diesel for burner firing.
- Exhaust pipes should be checked / inspected against blockade.
- Keep your hands and face away from the inspection hole while burner is in operation / started firing.

22.9. Pavement Breakers / Concrete Drills

- Safety goggles should be worn by the operator while working.

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- All the pneumatic hose connections should be checked to detect any leakage, before starting the machine/tools.
- Whips to be provided with all compressed air hoses.
- Damaged hoses should be replaced immediately.

22.10. Pneumatic Compressor


- Compressor should be checked against any crack in the air receiver and pipe connection.
- Safety valves should be checked periodically for their effective functioning at the specified / set pressure.
- Pressure gauges should be checked regularly.
- Compressor should not be installed / placed near excavation pits / blasting area.
- Air hose ends should not be kept free to avoid whipping.
- No one should use compressed air to clean his dress or body. It should not be directed on others; no horseplay is allowed with compressed air.
- Supply of compressed air to pneumatic tools should be controlled by valves and connected with oil lubricator.
- Goggles should be used while the air compressor tools are in operation.

22.11. Concrete Batching and Mixing Plant

- Skip, weigh batcher and drum should be clearly visible to the operator in the cabin.
- Trained persons only should operate the plant.
- Weighing attachment should not be tampered with / nothing should fall on it.
- Mixing drum should be cleaned after completion of each and every delivery.
- Workmen should be kept away from the area of operation of scrapper unit.
- Plant should have proper earthing.
- Periodic inspections of wire ropes should be done.
- Overloading of the scrapper/ skip unit and drum should be avoided.
- Any unwarranted mechanical noise should be carefully probed into for corrective action.
- All operators and laborer for cement filling should use dust masks and helmets.

22.12. Transit Mixer

- Only trained/ valid license holding person should be allowed to operate the equipment.
- Rear view mirrors should be provided for reversing the vehicle.
- Mixing drum should be cleaned regularly.
- Inspection covers of the drum should be bolted properly.
- Water and air connections should be checked before operation.

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22.13. Mixers

- All gears, chains and rollers of concrete mixer should be adequately guarded to prevent damage / danger.
- Concrete mixer hopper shall be protected by side railing to prevent workers from passing under them. Operators shall make sure before lowering the skip that the operational space is absolutely clear.
- Wire rope used for hopper hoisting has to be checked thoroughly and periodically.
- Hopper hoist and anchoring brake should be checked for proper functioning.
- Be sure that motor fan guard is secured.
- Be sure that wiring is properly connected and insulated.

22.14. Concrete Pump

- Only the trained persons should operate the equipment.
- The pipes, bends and the snap couplings should be checked against leakages/cracks.
- O-Ring with the proper size only should be used between the joints / connections.
- The equipment should be greased periodically.
- Slurry should be passed before pumping the concrete.
- Elephant hose should be held in position with the help of rope while discharging concrete.
- Electrical connections and earthing of the equipment should be properly done.
- Proper anchoring should be done between piping and equipment.


22.15. Concrete Vibrators

- Vibrating unit shall be completely enclosed and the belt transmitting power to the unit to be adequately guarded.
- Electrically operated compaction vibrators shall be totally enclosed and be protected against overloads by suitable overload relays and shall be effectively earthed.
- Be sure that the sufficient length of cable is provided to the vibrator.
- Ensure electric starters are fixed firmly on the stand.
- While needle is inserted in the vibrator, be sure that needle load is firmly locked.
- Be sure to lubricate inner core of needle.

22.16. Overhead Hazards

Overhead protection shall be provided at any location where there is a hazard of falling objects. This shall particularly be observed around any scaffolding and in excavation.


Goalposts (wooden) shall be erected under all overhead power lines with minimum safe clearance to prevent the arms or jibs of crane/plant from approaching such lines.

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22.17. Cranes

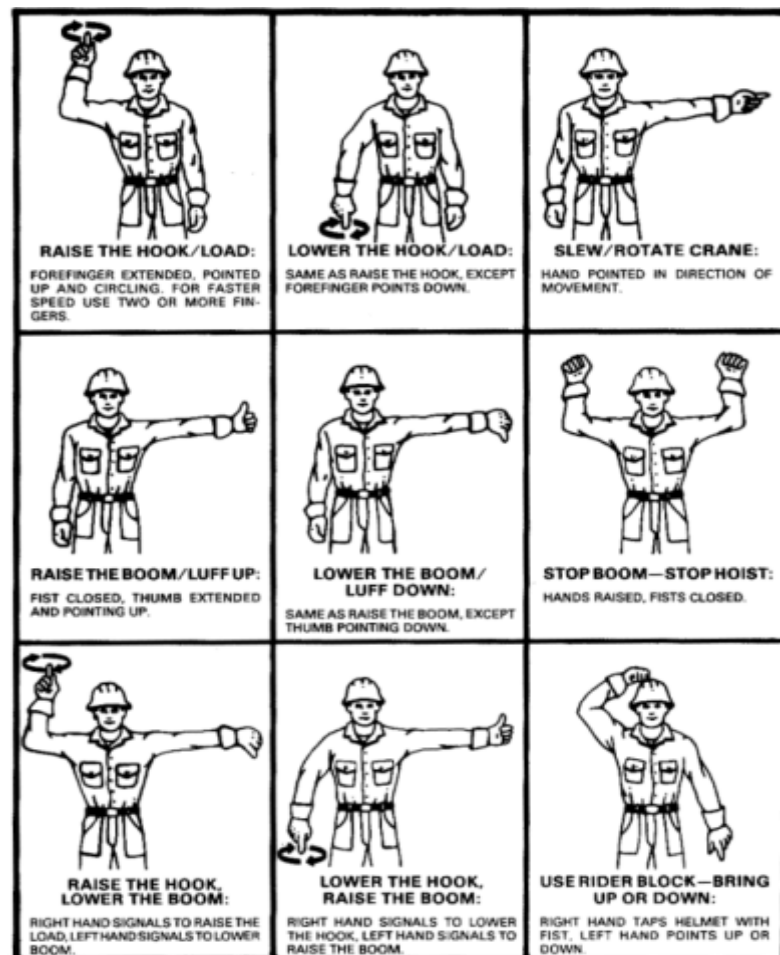
All cranes must be tested and certified by competent authority and SWL of the crane shall be written on the crane. The capacity of the crane should be ascertained by user before use.


- Crane should never be overloaded.
- Crane should be operated by authorized person.
- Mobile cranes should be parked on hard soil or strong base. They should not be placed near the edge of the pit or excavation.
- Crane should be tested at least once in a year by competent person or according to local legislation requirement.
- Safe working load of any mobile crane depends on:
 - Operator's skill
 - Condition of the ground
 - Boom length
 - Radius of rotation and inclination of boom to the vertical while lifting the load
 - Out rigger blocked / free
- The safe working load is generally tabulated in the load chart of the crane. Sometimes cranes are de-rated due to the defects in welding, bend in angle, bracings and condition of clutch brake.
- Remember that the capacity of a crane is the total load hung from the hook including weight of hook, block, ropes, slings etc.
- Standard signaling code properly understood by the operator and trained signaller should be used. The crane operator shall respond to signals only from the appointed signaller but shall obey 'stop' signal at any time no matter who gives it.
- Tag lines should be used while hoisting heavy and bulky materials.
- The brake, boom, hook, wire rope pulley and rope anchoring should be checked periodically by a maintenance person to ensure safe operation of a crane.
- The load being lifted should not touch the boom.
- The boom or any part of the crane should not come near any live electric line/ service line.
- Swinging of load should be done smoothly.
- Proper quality of packing should be used, and the outrigger should rest tightly on the packing placed on support.
- Nobody should stand below the boom or load.
- The operator should be positioned at high level to see the hook and load throughout the hoisting, swinging and unloading operation.
- During storm, the hook block should be anchored firmly and swing lock to be released.
- When an extended boom is used on the crane, the operator must use extreme care in lowering the load to the ground. An extended boom should never be lowered to

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one side of the chassis as the stability of the crane is usually reduced at that position.

- During shifting the crane has to be crawled on a heavy timber mat in case soil does not have adequate bearing capacity.
- Any make shift methods to maximize utilization of crane such as blocking with timber or adding counter-weight, should not be permitted.
- In idle condition the crane operator should remove load from the hook and raise the hook block to a maximum height.
- The crane operator should keep the cabin deck free from any oil, mud and grease.
- Operator should always keep the windshield clear in order to have clear vision.
- Ensure at least two full winding of ropes always on the rope drum. After a boom extension, the hooks shall be lowered to the required lowest point to ensure that at least two dead coils remain on the drum and to the highest point to check that the drum capacity will not be exceeded.



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22.18. Mobile Cranes


- Following precautions have to be taken while using tyre mounted mobile cranes in addition to the given above.
- When traveling up a gradient, the load shall be derrick out and when travelling down a gradient, the load shall be derrick into the minimum radius, and this position shall be corrected on reaching level ground. Otherwise, constant watch on the radius should be maintained while travelling on uneven surfaces.
- The mobile crane shall be fitted with suitable horn, headlights, and side lamps, rear and stoplights and flashing direction indicator.
- A cantilever type jib of crane when travelling without load should be lowered to a horizontal position.
- The pneumatic tires shall be maintained at the correct pressure at all times.

22.19. Chain Block/ Pull Lift

- Chain blocks of proper lifting capacity supported by Test Certificate should be used for lifting known loads.
- Chain block must be checked and tested periodically. It should be lubricated before every use.
- No cannibalizing should be done on chain block.
- Chain block should be tested against slip by suspending safe load.
- It should operate freely and the chain should not come out of pulleys.
- The anchorage should be strong and rigid.
- They should be check for cracks, excessive wearing, elongation, etc. Hook opened out should not be used.
- No chain block / puller which has been tampered, should be used unless it is thoroughly checked and tested by competent person.
- Chain block / pulley must be checked if stored for longer time, by subjecting to shock load to observe slipping of load, jamming of links etc.

22.20. Winches

- Safe working load with gearing arrangements should be marked on the winch and tested regularly by competent person.
- Winch should not be overloaded.
- It should be placed on a firm base and properly anchored.
- The brake, ratchet arrangement, gear and pinion including the meshing, wire rope and its clamping arrangements and direction of receiving rope drum / tie rods should be checked before using the winch.
- Ratchet arrangement should be kept in position while hoisting a load.
- Tie rod should be adjusted not to allow drum movement causing clutch arrangement to slip.

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22.21. Bar Bending and Cutting Machines

- Only trained persons should be allowed to operate the equipment.
- Equipment should be grounded / earthed properly.
- Equipment should be placed on sound foundations for fixing properly.
- Bars used for cutting or bending should be of designated size as per manufacturer's catalogue of the machine.

22.22. D.G. Sets

- No unauthorized person should operate.
- Equipment should be mounted on foundation or on levelled ground with anti- vibrator pads.
- Equipment should be grounded / earthed properly as required.
- Ventilation should be proper. The exhaust piping should have less bends and no restrictions. Make and emission of DG sets shall be maintained as per the local standards.
- Safety devices should be checked / inspected before use / operation.

23. HOUSE KEEPING:


The SPPL / subcontractor shall maintain his work areas, site office and storage are clean and tidy.

- All cables shall be routed safely.
- Material storage at store or at erection site shall be done systematically at identified places only. In no condition the gangways, stairs or other work front can be disturbed by improper storage.
- After completion of work or end of day the subcontractor shall remove the surplus materials, scrap or debris generated during construction.

a) Stacking of materials:

The SPPL / subcontractor shall ensure, at a construction site that:

- All construction materials are stored or stacked in a safe and orderly manner to avoid obstruction of any vehicle movement, pedestrian etc.
- Material piles are stored or stacked in such a manner as to ensure stability
- Material or equipment is not stored upon any floor or platform in such quantity as to exceed its safe carrying capacity.

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- Material or equipment is not stored or placed so close to any edge of a floor or platform as to endanger the safety of persons below or working in the vicinity.

b) Stacking of cement bags, pipes and other material:

The SPPL / subcontractor shall ensure, at a construction site that:

- A stack pile is not more than ten bags in height unless such stack pile is stacked in a suitable enclosure or otherwise adequately supported.
- While removing bags from the stack pile, the stability of such stack pile is ensured.
- Bags containing cement or lime are stored in dry places.
- The material like bricks, tiles or blocks are stored on a firm ground.
- Reinforcing steel is stored according to its shape, size and length, stack of reinforcing steel is kept as low as possible.
- No pipe is stored on rack or in stack where such pipe is likely to fall by rolling.
- The material or article are not stacked to such a height and in such a manner as would render the pile of such stack unstable and cause hazards to the workers or others.


24. DRINKING WATER:

The SPPL / subcontractor shall make in every place where construction work is in progress, effective arrangements to provide and maintain at suitable points conveniently situated for all person employed therein, a sufficient supply of wholesome drinking water.

25. RIGHT TO STOP WORK:

The SPPL Managers / Safety Officers /Engineers shall have the right at his sole discretion to stop the work, if in his opinion the work is being carried out in such a way that it may cause accidents and endanger the safety of the persons and / or property, and / or equipment. In such cases, the subcontractor shall be informed in writing about the nature of hazards and possible injury/ accident and he shall comply to remove shortcomings promptly. After taking all corrective measures subcontractor shall inform to the concerned authority for verification then only he can resume the stopped activity.

The subcontractor shall not be entitled for any damage/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.

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26. FAIR CULTURE

Fair Culture in H&S could be defined as a balanced approach in workplace which has three main pillars:

1. Encourage positive behavior:

Positive behaviors and ideas must be appreciated, motivated and recognized.

Therefore, employees leading with exemplary behavior, contributing feedback on safety and sharing good practices / innovative ideas must be recognized and rewarded.

2. Improve sharing:


Fair Culture policy allows errors and mistakes to be fearlessly reported and should be used as an opportunity for improvement. Safety culture where more sharing takes place is better culture because it's an open culture. In this case you not only identify the causes which are responsible for injuries / losses but also share them to alert others and prevent similar incidents to happen.

3. Do not tolerate the unacceptable behavior:

The third pillar of fair culture policy is "strict action against willful violations". To reprimand willful violations is part of service rule book of employees as per which willful violation are punishable to the level of responsibility of violator. This can even lead to termination of employment contract. Any breach of rule, violation of established procedure or norms is unacceptable to the organization.

27. STATUTORY PROVISION:

The SPPL / subcontractor shall comply with applicable Acts / Rules e.g. THE BUILDING AND OTHER CONSTRUCTION WORKERS (regulation of employment and conditions of service) ACT & RULES. & WORKMEN'S COMPENSATION ACT 1923.


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28. PROCEDURE FOR COMMUNICATION OF SERIOUS INCIDENTS:

Following events to be considered as serious incidents:

- Accident resulting in fatalities or a life-threatening situation
- Serious injury
- Significant damage to property or the environment
- Significant security or safety issues
- Significant risk of liability to SPPL
- Major negative media impact
- Damage to the image of SPPL


Sl. No.	Communication	Responsibility
Communication at site level:		
1	Immediate communication to Site Manager / Safety officer and concerned subcontractor	Concerned Supervisor
2	Communication to clients	Site Manager
3	Communication with Hospitals/ Ambulance Room	Supervisor / Site Manager
4	Communication to local emergency services e.g. fire brigade etc.	Safety Officer / Supervisor
5	Communication to Project Director	Site / Project Manager
Communication to HO level:		
1	Communication to HSE manager	Project Manager / Director
2	Communication to CEO	HSE Manager / Project Director
3	Communication to local authorities and response agency	Project Director through client
4	Designated person for media contacts	Project director through client
5	Communication with families of the affected person if required	Project director through Client

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29. EMERGENCY CONTACT NUMBERS

To be displayed in all site offices and work sites

SL	NAME OFFICE / AUTHORITY	CONTACT NO
IN CASE YOU SEE ANY DANGEROUS SITUATION OR ACCIDENT IN WORKSITE PLEASE INFORM TO:		
A	HSE MANAGER	74060 09720
B	SITE MANAGER	91487 01365
C	PROJECT MANAGER	91487 01365
D	PROJECT DIRECTOR	96321 51617
E	CONTRACTOR	TBD
F	CONTRACTOR	TBD
NUMBER OF AUTHORITIES FOR HELP IN CASE OF SERIOUS ACCIDENT		
1. NEAR BY POLICE STATIONS (Different Locations)		
A	Control Room	100
B	Police Station – City Police	0820 - 2520444
C		
2. NEAR BY HOSPITAL (Different Locations)		
A	Adarsha Hospital, Udupi	0820 – 2535289
B	Government Hospital, Hospital	0820 – 2536666
C	Ambulance	108
3. NEAR BY BLOODBANK		
A	Blood Bank, Udupi	0820 – 2520555
B	Blood Bank, KMC Manipal	0820 – 2922331
4. NEAR BY AMBULANCE SERVICE		
A	Control Room	102
B	Ambulance	108
5. FIRE BRIGADE		
A	Control Room	101
B	Fire Station	0820 – 2520333

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30. HSE TRAININGS:

All employees to be inducted by concern manager / HSE manager before visiting site.

All employees including subcontractor employees to be inducted for site specific hazards and associated risks and safety rules to be observed during site work. Minimum hour training will be mandatory for Communicating HSE rules related to site. However, other specific topics e.g. Road Safety, Driving Safety, Safety in excavation work, first aid etc. can be giving in separate sessions to separate target groups as per the training needs identified.

HSE manager should keep record of all such trainings.

TRAINING ATTENDANCE SHEET

TRAINING PROGRAMME:

DATE:

TIME:


CONDUCTED BY:

Topic Covered:

- ☐ Basic Trainings: Induction to HSE mgmt., Project Familiarization, Construction Orientation, Environmental Awareness, Water, Air, Land Pollution, First Aid, Driving Safety/Road Transport, Hazard Spotting, PPE, Safe Working Practices, Manual Handling, Risk Assessment, Emergency Preparedness, Basic Fire Fighting, Permit to Work, Safe Handling of Chemicals
- ☐ Skilled Workers: *Basic Training* + Signs & Signals, Falls & Falling Objects, Electrical Hazards, Hand Tool Safety, Machinery Maintenance & Equipment Check, Spill Containment and Response.


I ACKNOWLEDGE THAT I HAVE UNDERSTOOD THE ABOVE-MENTIONED TOPICS


S/N	NAME	COMPANY / DEPTT.	DESIGNATION	SIGNATURE
1.				
2.				
3.				
4.				
5.				

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31. MINIMUM STANDARDS FOR LABOR CAMPS:


Following minimum standards for labor camp to be maintained at site.

	Control H&S Risks and Environmental impact	CLLC-01
	MONTHLY CHECKLIST FOR LABOUR CAMPS	Rev. 1-Apr.2018
Contract:		
Subcontractor:		
Meaning of compliance levels: 0 = Unacceptable, 1 = Major corrections needed, 2 = Minor corrections needed, 3 = No corrective action needed		
	COMPLIANCE %	0.0
Sl	Check Points to ensure minimum safety, security & welfare standards at labour camp	Compliance Level (0,1,2,3)
1	General:	Observations
i	Isolation from active work site	
ii	Entry control, security & circulation	
iii	Cleanliness of common areas	
iv	Display of Life Saving Rules, Do's & Don'ts and emergency contact details	
2	Living areas	
i	Robust construction, space allotted (16ft x 12ft for 6 workmen, 192/6=32)	
ii	Individual mattress, bunk bed etc. facilities	
iii	Air circulation / fans / coolers	
iv	Cleanliness of living rooms	
3	Housekeeping	
i	Deployment of dedicated team for housekeeping	
ii	Availability of bins / skips in living and common areas	
iii	Disposal of waste on daily basis / Waste Mgmt.	
iv	Storage conditions - food stuffs and other items	
4	Lightings	
i	Dedicated feeder / panel / DB with ELCB for labour camp	
ii	Area lighting and lighting in living rooms	


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iii	Condition of electrical cables & appliances		
iv	Periodic inspection by electrical engineer. & H&S officer		
5	Water & Sanitation		
i	Maintaining drinking water facility in safe and clean condition (storage provision and availability of drinking water 20L/workmen)		
ii	Maintaining potable water facility for bathing (covered), washing of cloths etc. (Storage provision and availability of 50L/workmen)		
iii	Maintaining toilets in clean conditions (1 toilet for every 15 workmen / women separately)		
iv	Safe disposal of waste water & general cleanliness of area		
6	Cooking & Canteen Facility		
i	Maintain kitchen area in safe & clean condition		
ii	Cooking of food inside living rooms is prohibited		
iii	Maintain a reasonable eating space and canteen facility		
iv	Maintain arrangements for prevention and controls of fire		
7	Health		
i	Is there 6 monthly medical checkup camps		
ii	Does the doctor examines on communicable diseases?		
iii	Does the facility have arrangements for first and tie-up with hospitals for nearby hospital for emergency medical cases.		
iv	Does there arrangements for insects, snakes etc. repellents		
8	Other points		
i	Common recreation facility at camp - Volleyball court / Carrom / Yoga		
ii	Weekly meetings between labour camp in charge and members (1 out of 25)		
iii	Maintaining following mandatory registers for record of: - workmen living in camp as per allotted living room number - Weekly / monthly control of camp - complain / suggestion register - health check-up records to avoid contagious etc. diseases		

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	<ul style="list-style-type: none"> - record of kids with a dedicated care taker - fire extinguishers inspection record 		
iv	Monthly joint inspection by labour camp in charge, H&S Manager, facility manager of subcontractor and SUEZ project manager / his representative		
	Signatures:		
	Labour Camp Sup.		Facility Mgr (Sub)
	H&S Manager		Project Mgr.

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32. SITE VEHICLES:

Instructions for Drivers:

Drivers must have valid driving license, training and adequate experience. Following are vital aspects of good driving!

a. AWARENESS

- Know your vehicle
- Know the road conditions
- Mentally prepare yourself & avoid frustration
- Ensure statutory vehicle documents are available with you.

b. ANTICIPATION


- Plan for unexpected/others' unsafe acts
- Adjust speed for road condition/construction
- Observe surroundings e.g. schools, parks, walkways, etc.
- Always wear your seat belt before starting your car for your own safety. Also ask persons accompanying you to wear seat belt.
- Signal your intention to change lanes/turn
- Always obey & respect traffic signals.
- Jumping red light signal endangers your safety as well as safety of other road users
- Always adhere to the prescribed speed limits while driving.
- Slow down while approaching roundabouts, road crossing, speed breakers etc. and negotiate them safely.
- Don't indulge in zig-zag driving, wrong overtaking, improper lane changing etc.
- Don't mix drinking & driving.
- Drunken driving can prove fatal.
- Do not drive if you are under medication.

c. DRIVING AT NIGHT IS MORE DIFFICULT THAN DAY:

- Your Headlight illuminate only a portion of road.
- Have your headlights properly aimed. Misaimed headlights blind other drivers and reduce your ability to see the road.
- SLOW DOWN WHEN DRIVING AT NIGHT !!!!
- Keep safe distance.

d. BACKING / REVERSING RULES:


As far as possible avoid reversing; if vehicle must reverse then Signal the reverse light. Avoid reversing over long distance.


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- If possible, get someone as reversing assistant; ask the person to stand at safe & visible place.
- Always look over your shoulders & check mirrors all time
- Keep one foot on brake Pedal
- Reverse Slowly
- Be careful of small children who may wander behind your vehicle.
- Follow and respect Traffic Signs.

Vehicle Inspection Checklist:

Vehicle must be inspected monthly with reference to the following checklist and compliance must be ensured.

		SUEZ PROJECTS PVT. LTD.															NO.: SPPL/CBE/VL-01 Rev.: 0 Date: APR. – 2018.				
VEHICLE INSPECTION CHECKLIST																			REMARKS		
S.N	VEHICLE REG. NUMBER	DATE	MIRRORS	HEAD LIGHTS	INDICATORS		REVERSE LIGHT	BRAKE LIGHT	HORN	SEAT BELT		FIRST AID BOX	FIRE EXTINGUISHER	VEHICLE DOCUMENTS				TYRE CONDITION		BRAKES	DRIVER'S NAME / SIGNATURE
					FRONT	REAR				FRONT	REAR			DRIVER LICENSE VALID UP TO	INSURANCE VALID UP TO	REGISTRATION CERTIFICATE	FITNESS CERTIFICATE				

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33. INSTRUCTIONS FOR VISITORS:


- All cars to be parked in the designated parking area
- Firearms, weapon and consumption of alcohol is forbidden inside the work site.
- Be accompanied with company representative during site visit and follow his instructions during your visit.
- Please follow all safety instructions, signs and signals posted at site.
- Please be aware of hazards on site e.g. Traffic on the road, temporary accesses, deep tanks, excavated areas, Temporary electrical wires, tools, sharp objects, overhead hazards etc.
- Please be cautious, check the traffic on both the sides and then cross the road only when it is safe to do so.
- Keep away from work in progress and barricaded areas.
- Visitors are not allowed to climb any temporarily erected structure, enter electrical, chemical, chlorine, ATEX facility or any deep tanks / excavated areas without specific authorization of SPPL site manager.
- Specific risks related to this site will be communicated to you preferably on hazard map.
- Walk; don't run except in case of emergency.
- Don't touch any tools, equipment or objects without permission
- First aid kit is available at various locations in site & office.
- Please use bins for disposal of waste.
- Do not assume, if in doubt please ask.
- Please ask for Risk Information Report (RIR) forms, available in this site office. SPPL gives you (all stakeholders) right & opportunity.

To remove yourself from danger and notify potential risk or unsafe conditions you might encounter during your site visit.

To contribute your suggestions for improvement.

Instructions to be followed in case of emergency

- Emergency situation may arise due to any potential risk present on site.
- In case of emergency, assemble at nearest assembly point (in front of office / main gate)
- Seek help from company representative with you and wait for instructions of site manager.
- You can also call company site emergency coordinators on following numbers.

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HSE Manager / Project Manager


PLEASE COOPERATE WITH US; WE WANT YOU TO REACH HOME SAFELY

I assure you that I have understood all the above instructions given to me by SPPL representative
and I will follow them during my site visit.


VISITOR'S NAME:

DATE & TIME:

SIGNATURE:


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<h2 style="margin: 0;">Suez Project Private Limited</h2>					
<h3 style="margin: 0;">Traffic Management Plan</h3>					
<p>Project: Construction of Distribution System for 24x7 Water Supply including Services for Operation and Management for Udupi City, Contract Package No 02UDP01</p>					
		Pradeep Shetty	Vishal Pattanshetti	Ramesh Patil	For Approval
Rev.	Date	Prepared By	Checked By	Validated By	Submission Purpose
00					

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1.0 OBJECTIVE

The 2 primary objective of temporary traffic control is to manage the traffic as efficiently and safely as possible under all work conditions and second objective is to lay down procedures to be adopted by field engineers to ensure the safe and efficient movement of traffic and also to ensure the safety of workers at site.

Traffic control aims to give adequate warning and clear information to motorists about the nature of works on site. This will translate into correct actions required in order to pass the work site safely. Traffic control shall also include measures to safeguard pedestrians when necessary. Proper traffic control also protects those who are directly involved in carrying out the works.

2.0 GUIDING PRINCIPLES


The guiding principles for safety in road construction zones are to:

- i. Warn the road user clearly and sufficiently in advance
- ii. Provide safe and clearly marking lanes for guiding road users
- iii. Provide adequate measures that control driver behavior through construction zones.






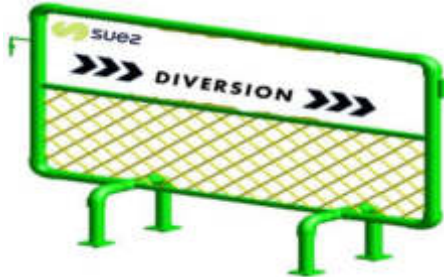
3.0 PHASES OF TRAFFIC CONTROL

There are five phases of traffic control for major projects:






- Planning Phase: To identify and include traffic control requirements in the contract specification, work program & method of construction.
- Design Phase: To design the Traffic Control Plan in detail, with regards to types, location and layout of traffic control devices for submission to the authority for approval.
- Implementation: - To install the temporary traffic control devices safely in accordance with the approved traffic control Plan.
- Operation and Maintenance Phase: - To inspect the Traffic Control Plan and devices regularly by day and night to ensure that they are effective and absolutely safe.
- Close out Phase: - To remove all the traffic control devices safely and reinstate the permanent traffic scheme

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4.0 TRAFFIC CONTROL DEVICES

NO	DESCRIPTION	SPECIFICATION	PICTURE
1	MEN AT WORK, GO SLOW 	Material: MS Pipe, MS sheet, Height: 1150 MM Width : 1500 MM The signalization shall respect color, be visible from distance and robust. However, design of boards & logo may vary.	
2	WORK IN PROGRESS 	Material: MS Pipe, MS sheet, Height: 1150 MM Width : 1500 MM The signalization shall respect color, be visible from distance and robust. However, design of boards & logo may vary.	
3	DIVERSION 	Material: MS Pipe, MS sheet, Height: 1150 MM Width : 1500 MM The signalization shall respect color, be visible from distance and robust. However, design of boards & logo may vary.	

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4	CAUTION SAFETY TAPE	Material: Plastic Color: Red and white stripes	
5	TRAFFIC CONES	Height: 75cm Material: Rubber Base With reflection bar	
6	BARRIERS	<p>Barricading block Interlocking wall effect, 90 degree turning radius</p> <p>For wide road > 2000mm Length- 2000mm Width- 600 mm Height- 900mm</p> <p>For narrow street < 2000mm Length- 1000mm Width- 300 mm Height- 800mm (low width barricades are acceptable for narrow spaces)</p> <p>GI sheet barricading as</p>	 

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		per requirement (min. two sheet width)	
7	ROTARY LAMP (Must for traffic block / diversion)	Color: Yellow Rotating motor use motor system Environment friendly: no UV, IR, lead or mercury.	
8	BARRICADE LAMP (Must for barricade along running traffic and additional for traffic blocking / diversion)	Color: Red/ Orange	
9	STICK LAMP (Must for traffic controller / security man / Signaling man)	Color: Red/Orange	 

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10	LIGHTING LAMP	Super Bright White LEDS	

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5.0 SIGN PLACEMENT

The correct positioning and size of signs will ensure that it will be observed and recognized, thereby providing the driver with more time to react and act.

The following principles will govern the positioning of signs:

- a) Their location will have clear visibility
- b) They will be so placed that driver would have adequate time for responses
- c) As a general rule, signs will be placed on the left-hand side of the road. Where special emphasis is required
- d) The signs will be covered or removed when they are not required

6.0 TRAFFIC CONES

Traffic cones will be 800mm high and 300mm to 500mm in diameter or in square shape at base and are often made of plastic or rubber and normally have retro- reflectories red and white band. Their advantages are that they:

- i. Cause minor impediments to traffic flow and capacity,



- i. Are well recognized and understood, without damaging vehicle when hit,
- ii. Will be easily stored and transported,
- iii. Will be fastened to the pavement and self-restoring when hit

7.0 BARRICADES

Barricades are intended to provide containment without significant deflection or deformation under impact and to redirect errant along the barrier. They are designed to be easily relocated and have four specific functions to:

- (i) Prevent traffic from entering work areas, such as excavations or material storage sites;
- (ii) Provide protection to workers;
- (iii) Separate two-way traffic; and
- (iv) Protect construction such as false work for culverts and other exposed objects.

8.0 FLAGMEN

The control of traffic through work area is an essential part of road construction and maintenance operations. Flagmen with hand signaling devices such as flags and traffic batons play crucial role in this direction. The flagmen at the work sites are expected to stop traffic intermittently and to maintain continuous traffic past a work.

site at reduced speeds to help protect the workmen. For both functions, the flagmen will, at all-time be clearly visible to approaching traffic for a distance sufficient to permit proper response by the drivers to the flagging instruction and to permit traffic to reduce speed before entering the work site. This distance is basically related to approach speed and site conditions; however, 60 m to 100 m is desirable.

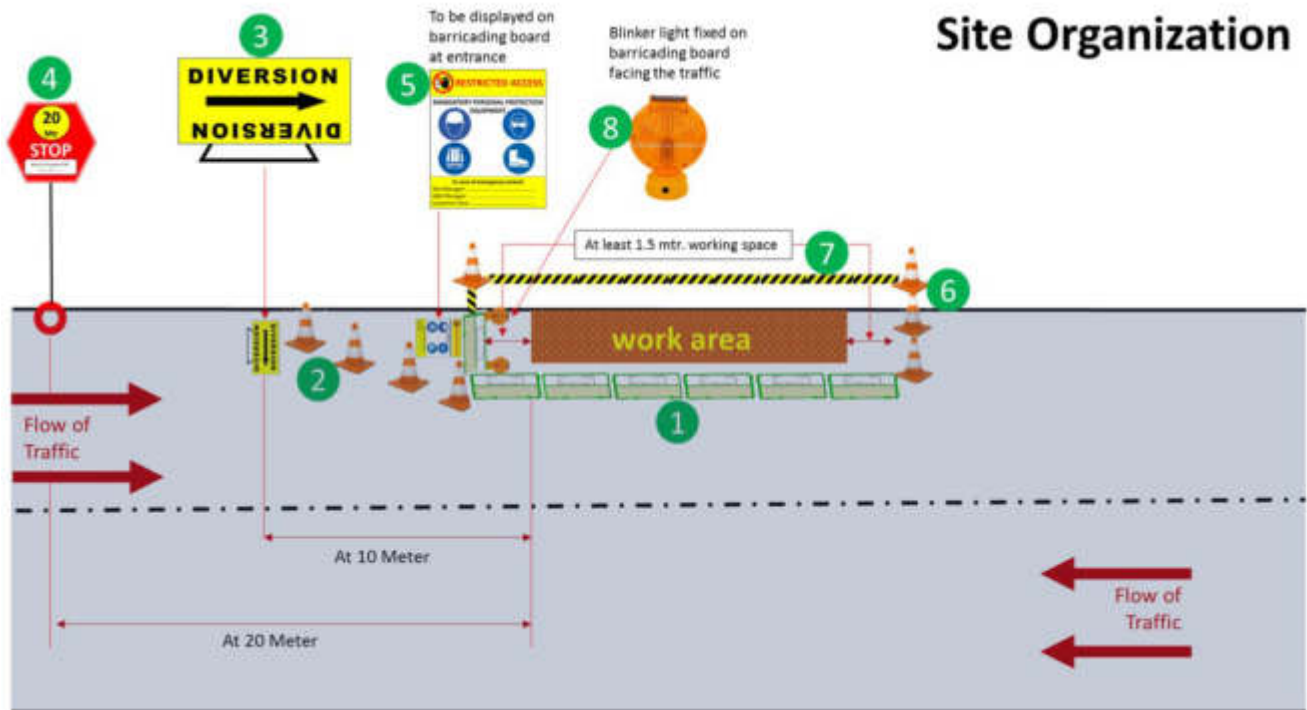
Working in public utilities / near busy roads involves risk to general public in addition to workmen performing their duties. Therefore, proper planning of diversion of traffic, putting signage / caution boards, installing barricade and deputing signaling man / watch man to be identified well before start of work.

Implementation of traffic plan with identified control measures is responsibility of each person in-charge of activity.

9.0 SITE ORGANIZATION

- Following is the standard for organizing a work site
 1. Barricading boards
 2. Traffic cones
 3. Diversion sign board @ 10 Meter from work site
 4. Stop Sign @ 20 Meter from work site
 5. Mandatory PPE sign board
 6. Traffic cones

7. Soft Barricading by caution tape
8. Blinker lights on barricading boards facing the traffic




Following major risks are being identified and rules are being set-up for such works:

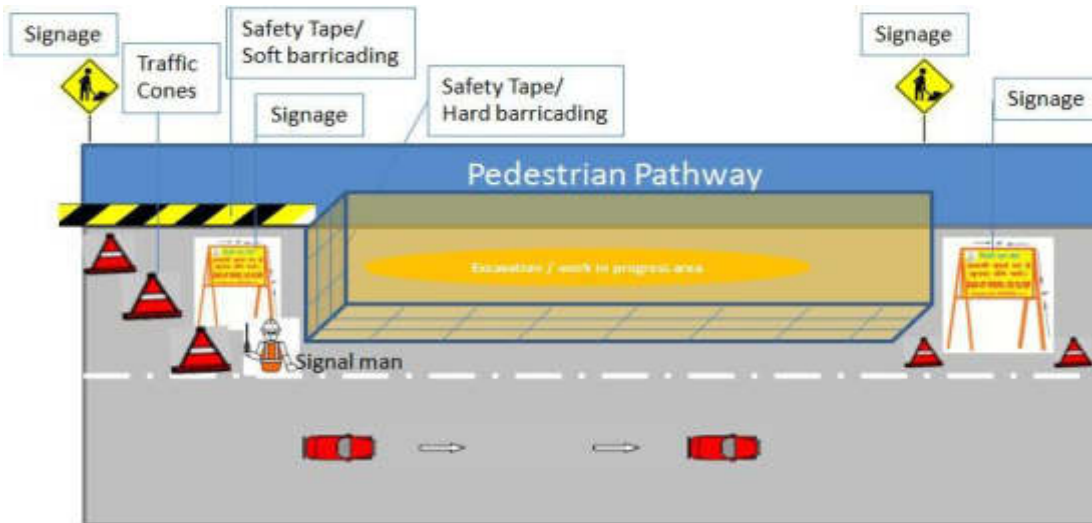
9.1 Narrowing of roads or walkways may have potential risk of injuries and inconvenience to pedestrians:









- Ensure that pedestrian pathways are maintained free from obstacles.
- Display signage to caution pedestrians.
- Barricade the excavated or work in progress areas prior to start of work.
- Keep watch on the area to maintain safe conditions all the time.

The SPPL / subcontractor has obligation to signalize & barricade every single work in order to prevent any incident to pedestrians or surrounding communities.

In general, if the walking space is less than 1 mtr. in Width (depending on pedestrian flow), or there is insufficient space left for fixing the barricading board, pedestrian movement can be blocked / diverted after obtain permission from concern authority. Storage of loose materials or construction materials / machines should not be done on walkways. This may require continuous clearing of waste / unwanted materials from work areas.

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Signage	 5 ft. (height), 2 ft. (width), 3 ft. (pole diameter)	 5 ft. (height), 2 ft. (width)
Safety Cone	 75cm (height)	 Signal man / Watch man
Caution Tape / Safety Tape	 2 - 3 inch width	
Hard Barricading	 Height 900mm	 Height > 1.1M

9.2 Partial blocking of a traffic lane of road may cause potential risk of collision of vehicles resulting to serious injuries and inconvenience to commuters:

Blocking of a traffic lane to be planned and controls to defined and implemented prior to start of job. This may require permission from authorities and:

- Diversion of traffic to minimize bottle neck and impact on traffic load
- Placing hard barricades & safety cones to contain risks arising out of work in progress area
- Placing signage, caution notices & signals (lighting lamps / rotary lamps) for public and vehicles keeping day and night in mind
- Deputing a dedicated man as watch man / signaling man to guide traffic

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The supervisor of works shall ensure that the signalization / safety signage, barricade of works are in place prior the start and during works.

All workmen including watch man / security guard to be inducted for hazards and associated risks and Do's & Don's instructions to be followed by each one of them.


Additional soft barricading to be provided for visual impact and better controls. Continuous vigil to be kept to rectify and improve the controls as and when required.

Do's and Don'ts for an employee working beside busy roads.

Sl.	Do's	Don't
1	Wear reflective vest, helmet and safety shoes for high visibility and protection from injuries.	Do not remove your PPE's while working on site
2	Stay out of path of moving vehicles, plant or equipment	Do not approach to traffic / roads or un-barricaded areas without permission
3	Follow traffic signals of police and watch man deputed on site	Do not take shortcuts or do not avoid dedicated paths
4	Ensure all machines & materials are placed safely.	Do not keep machines or materials etc. on pathways or outside the barricaded areas
5	Enter trenches only when appropriate wall support is in place	Do not enter deep trenches unless you are authorized by your supervisor
6	Be vigilant to your surroundings. In case you notice any abnormal conditions,	Do not ignore instructions given to you or danger noticed by you
	<ul style="list-style-type: none"> - Inform your supervisor - Alert your co-workers 	<ul style="list-style-type: none"> - Do not put yourself or your co-workers in danger

9.0 Complete Closure of a road may cause potential risk of traffic congestion, and inconvenience to commuters and trespassing of vehicles resulting to serious injuries:

There may be situations where work plan requires complete closure of a road. In such cases good traffic planning and organization of work is desired even if it is planned in lean traffic timings.

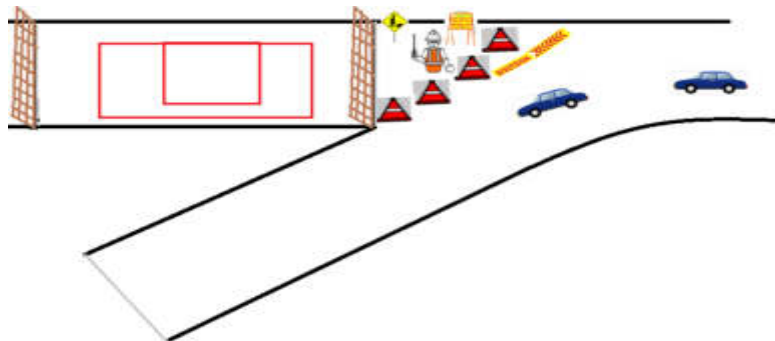
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- Diversion of traffic to minimize bottle neck and traffic congestion
- Complete closure of road / pathways using hard barricading & safety cones to contain risks arising out of work in progress area
- Placing direction signage, red light, caution notices & signals (lighting lamps / rotary lamps) for public and vehicles keeping day and night in mind
- Deputing a dedicated watch man / signaling man to guide traffic


Manager of works along with subcontractor & Safety officer to inspect prior to start of works and review the situation periodically.

Supervisor of works to inspect the area every day before starting and at end of day's work or during recess to ensure no unsafe condition is left behind. There may be chance that barricading boards are temporarily removed or any materials / machines are left unattended in public places posing risk of trespassing or injury to general public.

Flagman to be dedicatedly deputing to guide traffic and keep control on unauthorized entries.



Road Diversion for complete closure

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10.0 LIFE SAVING RULE

Life saving rules related to driving safety must be followed at site


1. Do not handle your phone or any other communication device when driving.



2. Do not work and do not drive under the influence of alcohol or drugs.





3. Signal, reduce speed and check mirrors before turning or reversing.

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11.0 INSPECTION OF VEHICLES

All Site vehicles shall be inspected once in a month as per following checklist.

		Safety Department												Date:
														Rev:
		Vehicle Inspection Checklist												Doc:
S. No.	Vehicle Reg. Number	License of Driver	Emission certificate	Insurance Documents	Fitness Certificate	Head Light	Tail Light	Indicators	Horn	Reverse Horn	Fire Extinguisher	First aid Box	Break	Remarks
1														
2														
3														
4														
5														
6														
7														
8														
9														
10														

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12.0TRAFFIC SAFETY RULES

Rules and Regulations related to driving license, registration of motor vehicles, control of traffic, construction & maintenance of motor vehicles etc. are governed by the Motor Vehicles Act, 1988 (MVA) and the Central Motor Vehicles rules 1989 (CMVR). All these rules must be obeyed wherever applicable