

**BHARAT HEAVY ELECTRICALS LIMITED**



**HEALTH, SAFETY &  
ENVIRONMENT PLAN**

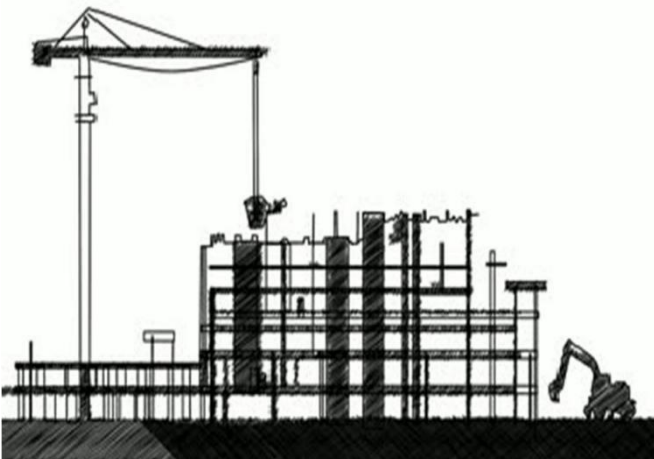
*for*

**SITE OPERATIONS**

*by*

**CONTRACTOR  
(HSEP14)**

**2x660 MW SUPER CRITICAL  
TPP, HTPS, KORBA WEST of  
CSPGCL**



**BHARAT HEAVY ELECTRICALS LIMITED  
POWER SECTOR WESTERN REGION**

**HSE PLAN FOR SITE OPERATIONS BY BHEL CONTRACTORS AT A GLANCE**

<b>BEFORE START</b>			
<b>SIGNING OF MOU</b>			
Agree to comply to HSE requirement- Statutory and BHEL's			
<b>MANPOWER PLANNING</b>			
<b>HSE ORGANISATION</b>			
No. of Workers	No. of Safety Supervisors	No. of Safety Officers	<b>HSE Roles and responsibilities</b> <ul style="list-style-type: none"> <li>Site In-charge- As per clause 7.3.2</li> <li>Safety officer- As per clause 7.3.4</li> </ul> <b>Qualification</b> <ul style="list-style-type: none"> <li>As per clause 7.2</li> </ul>
Up to 20	1	0	
20 to 50	0	1	
50 to 100	1	1	
101 to 250	2	1	
251 to 500	4	1	
501 to 1000	6	2	
1000 to 2000	6+ One additional supervisor up to every additional 250 workers	3	
2000-3000	10+ One additional supervisor up to every additional 250 workers	4	
3000-4000	14+ One additional supervisor up to every additional 250 workers	5	
Above 4000	18 + One additional supervisor up to every additional 250 workers	5 + one safety officer up to addition 1000 workers	

<b>HSE PLANNING</b>
For Man, Machine / Equipment /Tools & Tackles

PROVIDE	
HSE INFRASTRUCTURE	
<ul style="list-style-type: none"><li>• PPEs</li><li>• Drinking Water</li><li>• Washing Facilities</li><li>• Latrines and Urinals</li><li>• Provision of shelter for rest</li><li>• Medical facilities</li><li>• Safety Labels</li></ul>	<ul style="list-style-type: none"><li>• Canteen facilities</li><li>• Labor Colony</li><li>• Emergency Vehicle</li><li>• Pest Control</li><li>• Scrap yard</li><li>• Illumination</li></ul>

TRAINING	
HSE TRAINING, AWARENESS & PROMOTION	
<b>Training</b> <ul style="list-style-type: none"><li>• Induction training</li><li>• Height work and other critical areas</li><li>• Safety Walk by Top Management</li><li>• Tool Box talk &amp; Pep Talk</li></ul>	<b>Awareness &amp; Promotion</b> <ul style="list-style-type: none"><li>• Signage</li><li>• Poster</li><li>• Banner</li><li>• Promotional activity/ Competition</li><li>• Awards (To Motivate Workers/ Employee)</li></ul>

COMMUNICATION	
HSE COMMUNICATION	
<b>Incident Reporting</b> <ul style="list-style-type: none"><li>• Accident- Fatal &amp; Major</li><li>• Minor, Fire Incident</li><li>• Property damage</li><li>• Near Miss</li></ul>	<b>Event Reporting</b> <ul style="list-style-type: none"><li>• HSE Celebrations</li><li>• HSE Training</li><li>• Medical camp</li><li>• Mock drill (Fire, Medical, emergency, height etc.)</li></ul>

**EXECUTIVE SAFETY****OPERATIONAL CONTROL PROCEDURES****PERMIT TO WORK**

Height work (above 2 meters), Hot Work, Heavy Lifting, Confined Space, Radiography, excavation, Safety Facility Removal, Night / Holiday Work, Loading / Unloading, Lockout / Tag out, Alignment etc..

**SAFETY DURING WORK EXECUTION**

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li>• Height work</li> <li>• Welding</li> <li>• Rigging</li> <li>• Lifting</li> <li>• Cylinder- storage &amp; Movement</li> <li>• Demolition work</li> <li>• T&amp;Ps</li> </ul> | <ul style="list-style-type: none"> <li>• Chemical Handling</li> <li>• Electrical works</li> <li>• Fire</li> <li>• Scaffolding</li> <li>• Working on Platform</li> <li>• Excavation</li> <li>• Ladder</li> <li>• Hoisting appliance</li> </ul> |
|---|---|

**HOUSE KEEPING****WASTE MANGEMENT****TRAFFIC MANAGEMENT****ENVIRONMENTAL CONTROL****EMERGENCY PREPAREDNESS AND RESPONSE PLAN****HSE CHECKS****HSE AUDITS & INSPECTION**

- |   |  |
|---|--|
| <ul style="list-style-type: none"> <li>• Daily Checks</li> <li>• Inspection of PPEs</li> <li>• Inspection of T&amp; Ps</li> <li>• Inspection of Cranes &amp; Winches</li> </ul> | <ul style="list-style-type: none"> <li>• Inspection of Height work</li> <li>• Inspection of Welding and Gas cutting</li> <li>• Inspection of elevators etc.</li> </ul> |
|---|--|

**HSE PERFORMANCE EVALUATION PARAMETER****CONFEO RMANCE****PENALTY FOR NON CONFORMANCE****REFER FORMAT NO. HSEP:14-F14****INCREMENTAL PENALTY**

- Any additional penalty or any other penalty levied by the customer/ authorities on account of safety violations by the contractor shall be payable by the contractor.
- In case of non-fulfilment of mandatory / contractual HSE requirements, BHEL shall have the right to fulfil such requirements at the risk & cost of contractor with applicable overheads.



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### 1.0 PURPOSE

<b>1.1</b>	The purpose of this HSE Plan is to provide for the systematic identification, evaluation, prevention and control of general workplace hazards, specific job hazards, potential hazards and environmental impacts that may arise from foreseeable conditions during installation and servicing of industrial projects and power plants.
<b>1.2</b>	This document shall be followed by BHEL's Contractor's/ Sub Contractor's for EPC scope at 2x660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST of CSPGCL. In case customer specific documents are to be implemented, the same will be followed in conjunction with customer specific documents in complementary manner.
<b>1.3</b>	Although every effort has been made to make the procedure and guideline in line with statutory requirements, in case of any discrepancy wherein the relevant statutory guidelines or HSE contract requirements supersedes this document , the same shall be followed.
<b>1.4</b>	We will promote and maintain a safe, healthy & environmentally complaint workplace for all employees, agency/ contractor, visitors and any others that may be affected by construction activities in line with BHEL HSE Policy may be displayed in its office and strive for a "GOAL TO ZERO RECORDABLE INCIDENTS" at project site.
<b>1.5</b>	All safety rules & codes applied by the BHEL/ Customer as per the contract at site shall be ensured by the contractor and hence customers HSE policy and local state/ central HSE rules will be part of HSE policy.
<b>1.6</b>	Vendors have to comply requirements of HSE & Statutory requirement in line with BHEL HSE plan, 2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST of CSPGCL Safety requirement, and Chhattisgarh/BOCW/Central statutory requirement.
<b>1.7</b>	In case there is any specific HSE requirement from BHEL/ Customer Korba west of CSPGCL, not explicitly indicated in this document the same shall be required to be fulfilled as per the decision of BHEL Project Director/ Construction Manager.



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## 2.0 SCOPE

2.1	<p>Health, Safety, and Environment (HSE) Plan for site operations by contractors is a mandatory framework applicable to all contractors, agencies, and sub-contractors engaged in the 2x660 MW Super Critical Thermal Power Project (TPP) at HTPS, Korba West, under CSPGCL. This plan aligns with BHEL's General Safety Rules and is designed to ensure comprehensive safety and environmental compliance across all project phases, including dismantling, material management, erection, commissioning, testing, civil works, and labour colony operations.</p> <p>BHEL's HSE Plan emphasizes the systematic identification, evaluation, prevention, and control of workplace hazards and environmental impacts. It mandates that all subcontractors adhere to this plan in conjunction with any customer-specific requirements, ensuring compliance with statutory and contractual HSE obligations. The plan outlines clear objectives, such as ensuring the health and safety of all personnel, protecting the environment, providing trained and competent personnel, and maintaining safe work systems. It also sets ambitious targets aiming for <b>zero incidents across various categories</b>, including explosions, fatalities, lost-time injuries, fires, vehicle incidents, and environmental incidents.</p> <p>As a dynamic and living document, the HSE Plan is subject to revisions to accommodate evolving project needs and regulatory requirements.</p>
2.2	<p>This document is applicable for BHEL's Agency/ contractors/ Sub contractor at all activities of BHEL 2x660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST of CSPGCL as per the relevant contractual obligations.</p>



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### 3.0 OBJECTIVES AND TARGETS

- ❖ To achieve “Zero Incident at Site”
- ❖ 100% PPEs compliance in high and medium risk activities.
- ❖ 100% compliance to all legal/statutory requirements related to EHS.
- ❖ 100% incident reporting, recording and reviewing for corrective actions.
- ❖ 100% Health, Safety and Environmental Induction training attendance for all workers.
- ❖ Regular Safety Reviews to assess HSE program compliance and closure of any recognized gaps to improve safety management and incident prevention.
- ❖ 100% High Risk activities to be carried out only after approved Method Statement, HIRA / Aspect-Impact / JSA / OCP and Permit to Work are implemented.

3.1	Prevent injury and ill health of all workers at site ('Workers' refers to all personnel including managerial, supervisory, professional, technical, clerical and other workers including contract labour).
3.2	Prevent Pollution to environment as per ISO 14001:2015 (Environment Management System) and Occupational Health & Safety as per ISO 45001:2018.
3.3	Ensure the Health and Safety of all persons at work site is not adversely affected by the work.
3.4	Ensure protection of environment of the work site.
3.5	Comply at all times with the relevant statutory and contractual HSE requirements.
3.6	Provide trained, experienced and competent personnel. Ensure medically fit personnel only are engaged at work.
3.7	Provide and maintain plant, places and systems of work that are safe and without risk to health and the environment.
3.8	Provide all personnel with adequate information, instruction, training and supervision on the safety aspect of their work.
3.9	Effectively control, co-ordinate and monitor the activities of all personnel on the Project sites including contractors in respects of HSE.
3.10	Establish effective communication on HSE matters with all relevant parties involved in the Project works.
3.11	Ensure that all work planning takes into account all persons that may be affected by the work.
3.12	Ensure fitness testing of all T&Ps. Lifting appliances like cranes, chain pulley blocks etc. are to be certified by competent authority.
3.13	Ensure timely Provision of resources to facilitate effective implementation of HSE requirements.
3.14	Ensure continual improvements in HSE performance
3.15	Ensure conservation of resources and reduction of wastage
3.16	Capture the data of all incidents including near misses, process deviation etc. Investigate and analyze the same to find out the root cause.
3.17	Ensure timely implementation of correction, corrective action and preventive action.



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#### NOTE

- A. The contractor shall also comply with HSE Targets/ Compliance stipulated by BHEL/ Customer from time to time.
- B. BHEL install IP based CCTV system along with IP based announcement system which shall be used for monitoring safety during construction from Safety control room. It shall be possible to make announcements to alert the workers. Whenever required. These cameras shall be installed at all strategic locations in the plant area. This camera can be wired or wireless as per suitability at site. Initially these installations will be temporary & locations will keep on changing depending upon the work in progress. Drone based safety monitoring shall be done during day to day monitor of all construction activity at a close range.  
 NOTE :- Assistance for Camera positioning and its safety will be responsibility of contractor working in that area.
- C. Contractor shall take all necessary precautions to protect all the existing equipment, structures, facilities and buildings etc. from damage. In case any damage occurs due to the activities of the contractor on account of negligence, ignorance, accidental or any other reason whatsoever, the damage shall be immediately made good by the contractor at his own cost to the satisfaction of the BHEL/ Customer (2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST of CSPGCL. The contractor shall also take all necessary safety measures with specific reference to excavation in rock, at his own cost, to avoid any harm or injury to his workers and staff from the equipment and facilities of the power plant.





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#### 4.0 REFERENCES

<b>4.1</b>	Contract Documents
<b>4.2</b>	Relevant Legislations
<b>4.3</b>	BHEL Power Sector HSE Management System
<b>4.4</b>	<p>BHEL to provide contractor hard / soft copies of all applicable HSE Procedures, Work Permits (Soft Copy/ via HSE observer App), Operational Control Procedures, Job Safety Analysis, Hazard Identification &amp; Risk Assessment formats and any other instructions required to be followed by the contractors, as a minimum before commencing operations at site. These shall include, but not limited to:</p> <ul style="list-style-type: none"> <li>i. HSE Procedures</li> <li>ii. Method Statements</li> <li>iii. JSA &amp; HIRA Standard Format</li> <li>iv. Operational Control Procedures</li> <li>v. Work Permits</li> <li>vi. Inspection &amp; HSE Formats</li> </ul>
<b>4.5</b>	Relevant Indian & international standards in case of any ambiguity in/ lack of procedure/ specifications. All IS & BS standards mention in this HSE Plan must follow wherever applicable.
<b>NOTE</b>	<ol style="list-style-type: none"> <li><b>1. All contractor must use HSE observer App for raising HSE observation, Near miss, weekly Safety Walk by top management, TBT, Asset Management system (T&amp;Ps etc.), HSE Inspection, All Work Permit system etc.. In case of any technical error or any specific requirement HARD Copy of work permit system shall be implement at site, as per Work Permit Format Attached under Annexure - 10.</b></li> <li><b>2. However, in case Customer have their own Safety Work Permit system, then same shall be followed.</b></li> <li><b>3. Contractor shall ensure availability and understanding of these requirements prior to commencing work at site. In case the statutory requirements i.e. State or Central Acts and / or applicable rules like the Building and Other Construction Workers Regulation of Employment and Conditions of Service- Act,1996 or State Rules (wherever notified),the Factories Act, 1948 or Rules (wherever notified), etc. are more stringent than the requirements stipulated in this document, they shall be applicable.</b></li> </ol>



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### 5.0 BHEL HEALTH, SAFETY & ENVIRONMENT POLICY

In BHEL, Health, Safety and Environment (HSE) responsibilities are driven by our commitment to protect our employees and people we work with, community and environment. BHEL believes in zero tolerance for unsafe work/non-conformance to safety and in minimizing environmental footprint associated with all its business activities. We commit to continually improve our HSE performance by:

- Developing safety and sustainability culture through active leadership and by ensuring availability of required resources.
- Ensuring compliance with applicable legislation, regulations and BHEL systems.
- Taking up activities for conservation of resources and adopting sound waste management by following Reduce/Recycle/Reuse approach.
- Continually identifying, assessing and managing environmental impacts and Occupational Health & Safety risks of all activities, products and services adopting approach based on elimination/substitution/reduction/control.
- Incorporating appropriate Occupational Health, Safety and Environment criteria into business decisions, design of products & systems and for selection of plants, technologies and services.
- Imparting appropriate structured training to all persons at workplace and promoting awareness amongst customers, contractors and suppliers on HSE issues.
- Reviewing periodically this policy and HSE Management Systems to ensure its relevance, appropriateness and effectiveness.
- Communicating this policy within BHEL and making it available to interested parties.

Chairman & Managing Director  
**BHEL**



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5.1

#### MEMORANDUM OF UNDERSTANDING:

After award of work, contractors are required to enter into a memorandum of understanding as given below:

#### Memorandum of Understanding

BHEL, Power Sector \_\_\_\_\_ Region is committed to Health, Safety and Environment Policy (HSE Policy).

M/s (Contractor) \_\_\_\_\_ do hereby also commit to comply with the same HSE Policy while executing the Contract Number.

M/s \_\_\_\_\_ have gone through and understood all the HSE requirements of the contract including HSE manpower, tools & equipment, systems & procedures, and agree to fulfill the same as a minimum. Any additional resources and support required for ensuring fulfillment of HSE Objectives shall be provided by contractor at no extra cost.

M/s \_\_\_\_\_ agree that in case they fail to comply to the HSE requirements as stipulated in the contract, BHEL shall have the right to implement the same at the risk and cost of the contractor with applicable overheads.

M/s \_\_\_\_\_ agree that delays on account of non-implementation of HSE requirements by contractor, incidents etc. shall not be attributed to BHEL.

M/s \_\_\_\_\_ shall ensure that safe work practices as per the HSE plan. Spirit and content therein shall be imbibed in all workers and supervisors for compliance.

In addition to this, M/s) \_\_\_\_\_ shall comply to all applicable statutory and regulatory requirements which are in force in the place of project and any special requirement specified in the contract document of the principal customer.

M/s \_\_\_\_\_ shall co-operate in HSE audits/inspections conducted by BHEL /customer/ third party and ensure to close any non-conformity observed/reported within prescribed time limit.

Signed by authorized representative of M/s -----

Name:

Place & Date:



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#### 5.2 TERMS & PROCEDURE FOR THE PAYMENT LINKED TO RA BILL FOR SAFETY:

**There is an amount linked to each RA bill w.r.to safety.** Contractor must fulfill all the details mention below to process the amount linked to RA bill for Safety aspect/ safety Rule/ Compliance etc.

**Agency/ Contractor are advised to price their bids in such a manner that the component for 'Amount linked to Safety Aspects/ compliance to Safety Rules' should not be less than 1.5 % of the cumulative total of Service Portion of the Contract, i.e. Civil + Installation/ Erection + Structural Works etc.. In case 'Amount linked to Safety Aspects/ compliance to Safety Rules' is less than aforesaid minimum percentage specified of the cumulative total of Service Portion of the Contract, i.e. Civil + Installation/ Erection + Structural Works etc., the amount by which it is lower shall be retained proportionately from the other components mention below of the Contract price while releasing payments of each RA bill. No interest shall be payable on the amounts linked to Safety Aspects / Compliance to Safety Rules including aforesaid retained amount. The amounts linked to Safety Aspects / Compliance to Safety Rules including aforesaid retained amount shall be payable in part or full based on safety compliance duly certified by Project Manager (Package In charge)/ Construction manager and Safety-in-charge on quarterly basis/ 3 month period.**

5.2.1	The amount linked to Safety Aspects/ compliance to Safety shall be paid in two parts, viz,
5.2.1.A	10% of Y amount (calculated as 0.1 Y of the service portion amount of RA bill) shall be linked to Fatal/Major Accidents, and
5.2.1.B	90% of Y amount (calculated as 0.9 Y of the service portion amount of RA bill) shall be linked to various Safety Aspects specified in HSE Plan for Site operation by Contractor.
	<b>NOTE :</b> <b>Y = 1.5 % of service portion of gross amount (excluding taxes as applicable) of each RA bill raised in 3 months, envisaged for Safety Aspect.</b>
5.2.2	Contractor shall claim Amount linked to Safety Aspects/ Compliance to Safety in such a manner that amount claimed is equal to Y of service portion of gross amount (excluding taxes as applicable) of RA bill.
5.2.3	The amount as elaborated at PARA 5.2.1 (above) shall be withheld from first and second monthly RA bill of the respective quarter/three-month period and shall be released in part or full based on safety compliance duly certified by Project Manager and Safety-in-charge on quarterly basis. The amount for the entire quarter (i.e. RA bills raised during a 3-month period) shall be paid to the Contractors at the end of that three months period along with 3rd/last RA Bill for the quarter/three months period upon complying the following conditions:



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5.2.3.A Amount of RA bill linked to FATAL/ Major Accidents (0.1Y as mention at clause 5.2.1.A).

**I.No fatal injury** or accident-causing death in that three months' period.  
**AND**

**II.No Major injury** or accident causing 25% or more permanent disablement to workmen or employees in that three-month period. Permanent disablement shall have the same meaning as indicated in The Workmen's Compensation Act' 1923 or IS 3786.

In case of any fatal injury or accident as elaborated above occurs during that three-month period, the stipulated amount (0.1Y) subject to minimum of **Rs 10 Lakh per fatality** shall be forfeited and shall not be payable to the contractor under the contract. In case, the amount to be deducted/forfeited exceeds the amount linked to Fatal/ Major Accidents, the same shall be recovered from remaining Amount (0.9Y) linked to Compliance of Safety Rules and/or any other payments immediately due to the contractor under the Contract.

In case of any Major injury or accident causing **25%** or more permanent disablement to workmen/worker or employees occurs during that three-month period, **Rs 4 lakh per Major injury** shall be deducted from the amount (0.1Y) linked to Fatal/ Major Accidents and shall not be payable to the Contractor under the contract. In case, the amount to be deducted/forfeited exceeds the amount linked to Fatal/ Major Accidents, the same shall be recovered from remaining Amount (0.9Y) linked to Compliance of Safety Rules and/or any other payments immediately due to the Contractor under the Contract.

Further, in case, Contractor doesn't raise RA Bills in any three-month period/quarter and if any fatal injury and/or major accident takes place in that period, Construction Manager shall deduct the amount [**Rs 10 Lakh per fatality and Rs 4 lakh per Major injury**] pertaining to this particular quarter from his next RA bill/due payment. In case, the amount to be deducted/forfeited exceeds the amount linked to Safety, the same shall be recovered from any other payments immediately due to the contractor under the Contract.

The amount deducted/forfeited as mentioned above shall be in addition to the compensation payable to the workmen / employees under the relevant provisions of the Work-men's Compensation Act' 1923 and rules framed there under or any other applicable laws as applicable from time to time.





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#### 5.2.3.B **Amount of RA Bill linked to Compliance of Safety Rules (0.9Y i.e. 90% of amount as elaborated as mention at clause 5.2.1.B).**

Aforesaid amount (on quarterly basis) shall be payable to Contractor in five equal parts under five heads as under:

- (i) Amount payable on deployment of required Safety Personnel One fifth of the amount specified at clause 5.2.3.B (calculated as 0.18Y of Service portion amount of RA Bill), on quarterly basis, shall be paid upon certification by Construction Manager in consultation with Safety dept. that required number of Safety personnel/ Officer/ Supervisor etc. as per Clause 7.0 (HSE Organization) have been deployed. The aforesaid amount linked to deployment of requisite safety personnel shall be paid as under:

- a. 50% of the amount referred at 5.2.3.B (i), for deployment of Safety Supervisors shall be paid on pro-rata basis depending upon the actual no. of Safety Supervisors deployed vis-à-vis actual requirement:

(Amount to =  $0.09Y \times \text{Service portion of RA bill amount} \times (a/b)$  be paid)

Where 'a' is actual no. of Safety supervisors deployed.

And

'b' is required no. of Safety supervisors as per, This HSE Plan for site operation by contractor.

In case, actual no. of Safety supervisors deployed is more than requisite number (i.e.  $a/b$  is more than 1), the amount to be paid shall be restricted to 0.09Y.

- b. 50% of the amount referred at clause 5.2.3.B (i), for deployment of Safety Officers shall be paid on pro-rata basis depending upon the actual no. of Safety Officers deployed vis-à-vis actual requirement:

(Amount to be paid) =  $0.09Y \times \text{Service portion of RA bill amount} \times (a/b)$

Where 'a' is actual no. of Safety Officers deployed

And

'b' is required no. of Safety Officers as per HSE plan for site operation by contractor.

In case, actual no. of Safety Officers deployed is more than requisite number (i.e.  $a/b$  is more than 1), the amount to be paid shall be restricted to 0.09Y.

- c. In case aforesaid requisite no. of Safety personnel are not deployed by contractor, amount not to be paid as calculated above for that particular quarter/three-month period shall be forfeited and shall not be payable to the contractor under the contract.

**NOTE: - In case as per this HSE plan, contractor/ agency has to deploy only Safety supervisor (where worker < 20) & only Safety officer (where worker >20 & <50), then Both a & b portion will be released/ deducted as per compliance.**



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5.2.3.B

(ii) **Amount payable on providing requisite Personal Protective Equipment & Safety Equipment**

One fifth of the amount specified at Clause 5.2.3.B (calculated as 0.18Y of Service portion amount of RA Bill), on quarterly basis, shall be paid upon certification by Construction Manager in consultation with Safety dept. that contractor has adhered to the requirements of Clause 8.7 (Personal Protective Equipment) and Annexure - 1 (List of Safety Enables - PPEs).

In case of non-compliance by contractor, warning letter/Noncompliance shall be issued by Construction Manager /Safety Officer of BHEL. Further, if more than two such warning letters/Non Compliance Memos are issued in a quarter/three monthly period, above mentioned amount for that particular quarter/three- month period shall be forfeited and shall not be payable to the contractor under the contract.

**Note:-** The agency should ensure sufficient inventory of personal protective equipment (PPEs) prior to initial mobilization. After identifying the need of the required PPEs for various activities performed at the site, an additional inventory of approx. 20% of required PPEs should be maintaining during the execution of the work. If sub agency fails to provide the PPEs to worker the same may be issued by BHEL and cost for the PPEs will be recovered from the contractor from regular RA Bill with overhead as per contract.

(iii) **Amount payable on providing requisite Safety Induction and Training**

One fifth of the amount specified at Clause 5.2.3.B (calculated as 0.18Y of Service portion amount of RA Bill), on quarterly basis, shall be paid upon certification by Construction Manager in consultation with Safety dept. that contractor has adhered to the requirements of imparting Safety training as per Clause 9.0 (HSE Training & Awareness) to at least 90% of its employees/workmen (who have not been previously provided with requisite training) in a quarter/ three months' period. In case contractor fails in meeting the aforesaid requirement, above mentioned amount for that particular quarter/three-month period shall be forfeited and shall not be payable to the contractor under the contract.



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**5.2.3.B (iv) Amount payable on providing requisite Medical and First Aid Amenities**

One fifth of the amount specified at clause 5.2.3.B (calculated as 0.18Y of Service portion amount of RA Bill), on quarterly basis, shall be paid upon certification by Construction Manager in consultation with Safety dept. that contractor has adhered to the requirements of Clause 8.8.5 to Clause 8.8.8 and Annexure -A (i.e. Medical Centre with First Aid Amenities & Ambulance & First Aider & First Aid Box). In case contractor fails to support BHEL in complying Clause 8.8.5 (i.e. Medical Centre with First Aid Amenities & Ambulance & Annexure-A) and Providing First Aider & First aid box nearby construction activity area (i.e. Clause 8.8.6 & Clause 8.8.7 & Annexure-A for First Aider & First aid box), then even on one incidence in any quarter/three-month period, above mentioned amount for that particular quarter/three-month period shall be forfeited and shall not be payable to the contractor under the contract.

**(v) Amount payable on compliance to Work Permit System**

One fifth of the amount specified at Clause 5.2.3.B (calculated as 0.18Y of Service portion amount of RA Bill), on quarterly basis, shall be paid upon certification by Construction Manager in consultation with Safety dept. that contractor has adhered to the requirements of Clause 11.2 (i.e. Work Permit System). In case of non-compliance by contractor, warning letters/Non Compliance Memos shall be issued by Construction Manager/ Safety Officer of BHEL. In case of issuance of more than two such warning letters/Non Compliance Memos in a quarter/three monthly period, above mentioned amount for that particular quarter/three-month period shall be forfeited and shall not be payable to the contractor under the contract.

**NOTE :-**

1. In case 'Amount linked to Safety Aspects / compliance to HSE Plan for site operation by contractor' is less than 1.5 % of the cumulative total of Service Portion of the Contract, i.e. Civil/ Installation/ Erection /Structural Works etc., the amount by which it is lower shall be retained proportionately from the other components of RA Bill while releasing payments of each RA bill. No interest shall be payable on the amounts linked and withheld for Safety Aspects / Compliance to HSE Plan for Site operation by contractor including aforesaid retained amount. The amounts linked to Safety Aspects / Compliance to HSE Plan for site operation by contractor including aforesaid retained amount shall be payable in part or full based on safety compliance duly certified by Construction Manager and Safety-in-charge on quarterly basis/ after 3 month period.
2. Amount deducted by customer against amount/ payment linked to RA bill for safety mention in above para, shall be distributed amongst the agencies responsible for the same proportionate to violation made by contractor/ agency.
3. In case BHEL have deducted any penalty for Safety violation and this penalty category match with above mention terms & procedure for the Payment linked to RA bill for safety (Clause 5.2), then total higher amount penalty shall be deducted from quarterly claim raised for Safety amount withheld for safety aspect by contractor/ vendor.





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## 6.0 TERMS & DEFINITIONS

<b>6.1</b>	<p><b>SAFETY WALK: -</b></p> <p>It's conducted periodically by an official – it's a walk through a portion or whole of a site as a HSE officer who notes down HSE observations, speak to concerned workmen and supervisor on observation, get the same corrected with personal follow up- this sends out a strong message on Management's commitment to safety.</p>
<b>6.2</b>	<p><b>BUILDING OR OTHER CONSTRUCTION WORK: -</b></p> <p>Building or other construction work means the construction, alteration, repairs, maintenance or demolition, of or, in relation to, buildings, streets, roads, railways, tramways, airfields, generation, transmission and distribution of power, water works, oil and gas installations, electric lines, tunnels, bridges, viaducts, pipelines, towers, cooling towers and such other work as may be specified.</p>
<b>6.3</b>	<p><b>BUILDING WORKER: -</b></p> <p>Building worker means a person who is employed by a contractor to do any skilled, semi-skilled or manual, supervisory, technical or clerical work for hire or reward, whether the terms of employment be expressed or implied, in connection with any building or other construction work.</p>
<b>6.4</b>	<p><b>ESTABLISHMENT: -</b></p> <p>Establishment means an establishment who or which employs building workers in any building or construction work, and includes an establishment belonging to a contractor.</p>
<b>6.5</b>	<p><b>CONTRACTOR/ SUB CONTRACTOR: -</b></p> <p>Contractor means a person who undertakes to produce a given result for any establishment, other than a mere supply of goods or articles of manufacture by the employment of building workers or who supplies building workers for any work of the establishment, and includes a contractor or any other agency engaged on his behalf.</p>
<b>6.6</b>	<p><b>CUSTOMER / EMPLOYER: -</b></p> <p>Employer in relation to an establishment, means the owner thereof that is the contractor himself.</p>
<b>6.7</b>	<p><b>COMPETENT PERSON: -</b></p> <p>Competent Person means a person so approved by the Central Government who belongs to a testing establishment in India possessing adequate qualification, experience and skill for the purpose of testing, examination or annealing and certification of lifting appliances, lifting gears, wire ropes or pressure plant or equipment.</p>
<b>6.8</b>	<p><b>DANGER: -</b></p> <p>Danger means danger of accident or of injury or danger to health.</p>
<b>6.9</b>	<p><b>HAZARD: -</b></p> <p>Hazard means danger or potential danger.</p>



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<b>6.10</b>	<p><b>HAZARDOUS SUBSTANCE: -</b></p> <p>Hazardous substance means any substance, which due to its explosiveness, inflammability, radioactivity, toxic or corrosive properties and similar hazardous characteristics may Cause injury; or Affect adversely the human system; or Cause loss of life or damage to property or environment;</p>
<b>6.11</b>	<p><b>HAZARDOUS PROCESS: -</b></p> <p>Hazardous Process comprises roof work, steel erection, and work under and over water, demolition and work in confined space etc.</p>
<b>6.12</b>	<p><b>NATIONAL STANDARD/ INDIAN STANDARD: -</b></p> <p>National Standard/ Indian Standard means standards as approved by the Bureau of Indian Standards (BIS) and in the absence of such standards, the standards approved by the Central Government for a specific purpose.</p>
<b>6.13</b>	<p><b>LIFTING APPLIANCE: -</b></p> <p>Lifting Appliance means a crane, hoist, derrick, winch, jack, pulley block etc. or other equipment used for lifting materials, objects or building workers etc.</p>
<b>6.14</b>	<p><b>LIFTING GEAR: -</b></p> <p>Lifting gears means ropes, chains, hooks, slings and other accessories of a lifting appliance etc.</p>
<b>6.15</b>	<p><b>SAFE OPERATING PRACTICE: -</b></p> <p>Safe operating practice/ method statement/ operating control procedure means the practice followed in building and construction activities for the safety of workers and for safe operation of machinery and equipment used in such activities. Such practices shall conform to all or any of the following:</p> <p>Relevant Standards approved by BIS; National Building Codes Manufacturer's instruction on safe use of equipment and machinery; Code of practice on safety in construction industry published by International Labour Organization.</p>
<b>6.16</b>	<p><b>SAFE WORKING LOAD: -</b></p> <p>Safe working load in relation to an article of lifting gear or lifting appliance, means the load which is the maximum load that may be imposed on such article or appliance with safety in the normal conditions as assessed and certified by a competent person.</p>
<b>6.17</b>	<p><b>INCIDENT: -</b></p> <p>Work- related or natural event(s) in which an injury, or ill health (regardless of severity), First aid, Minor/ Major ,damage to property or fatality occurred, or could have occurred.</p>
<b>6.18</b>	<p><b>NEAR MISS: -</b></p> <p>An incident where no ill health, damage or other loss occurs, but it had a potentialto cause is referred to as "Near-Miss".</p>



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<b>6.19</b>	<p><b>MAN-HOURS WORK: -</b></p> <p>The total number of man hours worked by all employees including contractors working in the premises. It includes managerial, supervisory, professional, technical, clerical and other workers including contract labours. Man-hours worked shall be calculated from the payroll or time clock recorded including overtime. When this is not feasible, the same shall be estimated by multiplying the total man-days worked for the period covered by the number of hours worked per day. The total number of workdays for a period is the sum of the number of men at work on each day of period. If the daily hours vary from department to department separate estimate shall be made for each department and the result added together.</p>
<b>6.20</b>	<p><b>FIRST AID CASES: -</b></p> <p>First aids are not essentially all reportable cases, where the injured person is given medical treatment and discharged immediately for reporting on duty, without counting any lost time.</p>
<b>6.21</b>	<p><b>LOST TIME INJURY: -</b></p> <p>Any work injury which renders the injured person unable to perform his regular job or an alternative restricted work assignment on the next scheduled work day after the day on which the injury occurred.</p>
<b>6.22</b>	<p><b>MEDICAL CASES: -</b></p> <p>Medical cases come under non-reportable cases, where owing to illness or other reason the employee was absent from work and seeks Medical treatment.</p>
<b>6.23</b>	<p><b>TYPE OF INCIDENTS &amp; THEIR REPORTING: -</b></p> <p><b>i) Near Miss:</b></p> <p>A near miss is an unplanned event that did not result in injury, illness or damage – but had the potential to do injury, illness or damage.</p> <p><b>ii) Non-Reportable Cases:</b></p> <p>An incident, where the injured person is given medical help and discharged for work without counting any lost time.</p> <p><b>iii) Reportable Cases:</b></p> <p>In this case the injured person is disable for 48 hours or more and is not able to perform his duty.</p> <p><b>iv) Injury Cases:</b></p> <p>These are covered under the heading of non-reportable cases. In these cases the incident caused injury to the person, but he still continues his duty.</p>
<b>6.24</b>	<p><b>TOTAL REPORTABLE FREQUENCY RATE: -</b></p> <p>Frequency rate is the number of Reportable Lost Time Injury (LTI) per one Million Man hours worked. Mathematically, the formula read as:</p> <p><math display="block">(\text{Number of Reportable LTI} \times 1,000,000) / \text{Total Man Hours Worked}</math></p>



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<b>6.25</b>	<p><b>SEVERITY RATE: -</b></p> <p>Severity rate is the Number of days lost due to Lost Time Injury (LTI) per one Million Man hours worked. Mathematically, the formula reads as:</p> $(\text{Days lost due to LTI} \times 1,000,000) / \text{Total Man Hours Worked}$
<b>6.26</b>	<p><b>INCIDENCE RATE: -</b></p> <p>Incidence Rate is the Number of LTI per one thousand manpower deployed. Mathematically, the formula reads as:</p> $(\text{Number of LTI} \times 1000) / \text{Average number of manpower deployed}$
<b>6.27</b>	<p><b>PERSONAL PROTECTIVE EQUIPMENT (PPE): -</b></p> <p>PPEs are the protective devices made available for individual or collective use of the workers likely to be affected by the hazards of the workplace or process.</p>
<b>6.28</b>	<p><b>HIRA :-</b></p> <p>Hazard Identification and Risk Assessment (HIRA) is a process of identifying Hazards in work area and then assessing them properly.</p>
<b>6.29</b>	<p><b>METHOD STATEMENT: -</b></p> <p>A method statement is prepared by the Execution/ Engineering Department detailing the steps, equipment, competencies and safety precautions required for carrying out any activity.</p>
<b>6.30</b>	<p><b>JOB SAFETY ANALYSIS: -</b></p> <p>A job safety analysis (JSA) is a procedure which helps integrate accepted safety and health principles and practices into a particular task or job operation. In a JSA, each basic step of the job is to identify potential hazards and to recommend the safest way to do the job. Other terms used to describe this procedure are job hazard analysis (JHA) and job hazard breakdown.</p>
<b>6.31</b>	<p><b>HEAVY &amp; COMPLEX LIFTING: -</b></p> <p>A heavy and complex lifting activity includes:</p> <ol style="list-style-type: none"> <li>1. Lifting above 20 Tons</li> <li>2. Tandem Lifting using multiple cranes Total load exceeding 75% of capacity of crane. Depending up the condition of cranes, hydra/ Farana cranes, winch machines &amp; other lifting accessories</li> <li>3. Lift of unusual difficulty or geometry or rigging</li> <li>4. Lift over operating units</li> <li>5. Any other lift as decided by site HSE / Erection</li> </ol>
<b>6.32</b>	<p><b>NIGHT WORK: -</b></p> <p>Work conducted after sunset when only a fraction of total manpower is available</p>



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## 7.0 HSE ORGANIZATION

7.1	<b>Deployment:</b> The contractor should deploy sufficient HSE Officers and HSE Supervisors/Stewards, as per requirement given above, since initial stage and add more in proportion to the added strength in work force. <b>The schedule of requirement of safety personnel is given below.</b>		
	No. of Workers	No. of Safety Supervisors	No. of Safety Officers
	Up to 20	1	0
	20-50	0	1
	50 to 100	1	1
	101 to 250	2	1
	251 to 500	4	1
	501 to 1000	6	2
	1000 to 2000	6+ One additional supervisor up to every additional 250 workers	3
	2000-3000	10+ One additional supervisor up to every additional 250 workers	4
	3000-4000	14+ One additional supervisor up to every additional 250 workers	5
	Above 4000	18 + One additional supervisor up to every additional 250 workers	5 + one safety officer up to addition 1000 workers
	7.1.A	<b>DEPLOYMENT PLAN</b>	
1	<b>Above requirement is for every shift for each unit.</b>		
2	<b>The dynamic deployment plan of Safety manpower at various locations containing names, areas, time periods, shifts etc. shall be submitted to BHEL for approval by subcontractor</b>		
3	<b>BHEL may modify the deployment plan based on nature and volume of jobs, Risks and hazards associated etc.</b>		
4	<b>For less than 20 workers HSE Officer is not mandatory. In case the number of workers exceed 20 for 3 consecutive months, HSE Officer is to be engaged. The HSE Officer shall be deployed for a minimum period of 6 months, even if the number of workers fall below 20 in any month subsequent to deployment. If within that 6-month period, the number of workers is more than 20 for at least 3 months, the deployment duration of HSE Officer will extend further 6 months after completion of previous 6-month period.</b>		
5	<b>NOTE :- Site Material Management/ Handling (Loading/ Unloading) contracts, 1 no. HSE Officer shall be required irrespective of the total manpower deployed. Additional Safety Supervisor shall be deployed, if material yard are at different locations as per instructions from construction manager/ GM/ PD.</b>		
6	<b>HSE Officers/Supervisors of all the vendors may be required to report directly to BHEL HSE Officer at site &amp; shall comprise as a total team for handling all HSE issues. However, each safety officer/ agency shall be individually responsible for the safe execution of work in their respective areas.</b>		



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#### 7.2 MINIMUM QUALIFICATION & EXPERIENCE REQUIREMENTS OF HSE PERSONNEL

<b>1. HSE Officer</b>	<p>i) Recognized degree in any branch of Engg. Or Tech. or Architecture with practical experience of working in a building or other construction work in supervisory capacity for a period of not less than three years,</p> <p style="text-align: center;"><b>OR</b></p> <p>Recognized diploma in any branch of Engg. Or Tech with practical experience of working in a building or other construction work insupervisory capacity for a period of not less than five years.</p> <p style="text-align: center;"><b>AND</b></p> <p>ii. Recognized degree or diploma in Industrial safety.</p> <p>iii. (Preferably) have adequate knowledge of the language spoken by majority of the workers at the construction site.</p> <p>Alternatively: B.</p> <p>Graduation Degree in Science with Physics &amp; Chemistry and degree or diploma in Industrial Safety (from any Indian institutes recognized by AICTE or State Council of Tech. Education of any Indian State) with practical experience of working in a building, plant or other construction works (as Safety Officer, in line with Indian Factories Act, 1958) for a period of not less than five years.</p>
<b>2. HSE Supervisor</b>	<p>i) Possesses recognized degree in any branch of Engineering.</p> <p style="text-align: center;"><b>OR</b></p> <p>Diploma in any branch of Engineering with atleast one-year construction experience.</p> <p>ii). Should possess Requisite skills to deal with construction safety &amp; fire related day-to- day issues.</p>
<b>3. HSE Steward</b>	<p>i) Class XII pass certificate</p> <p style="text-align: center;"><b>AND</b></p> <p>ii) Trained in fire- fighting as well as in safety / occupation al health related subjects, with:</p> <p>a) Minimum two year of practical experience in construction work environment</p> <p style="text-align: center;"><b>AND</b></p> <p>b) Should have adequate knowledge of the local language spoken by majority of the workers at the construction site.</p>





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<b>7.2.1</b>	<b>Appointment of Safety Officer/ Safety Supervisor/ Safety Steward: -</b> Each contracting Agency shall provide a sufficient number of qualified, suitable and experienced persons to manage all safety related matter on Site relating to the works. Irrespective of manpower employed by the agency whether temporary, casual, and probationer, regular or permanent or on contract, Agency shall deploy a qualified Safety Officer/executive, responsible for carrying out the safety management programme before start of the work.
<b>7.2.2</b>	<b>Safety Steward –</b> I. <b>01 nos steward for every 20 nos worker for up to 100 workers.</b> II. <b>for above 100 workers; 1 nos additional steward for every 50 workers in addition to 5 nos steward (i.e. up to 100).</b>
<b>7.2.3</b>	In case there is more than one HSE Officer with any Contractor/ subcontractor, one of them, who is senior most by experience & meets qualification as per clause 7.2 of this HSE plan, may be designated as HSE In-charge who will be the nodal point of contact on HSE matters.
<b>7.2.4</b>	For Safety compliance against HSE/ Safety Observation at site, Contractor/ Subcontractor shall provide adequate number of workers as and when required, in order to attend and comply to Safety observations raised by BHEL/ Customer.
<b>7.2.5</b>	<b>Appointment of HSE Officer at Project site</b>
1	The subcontractor shall submit the certificates of qualification & experience of HSE manpower before deployment for BHEL to assess suitability as per requirement detailed in this document
2	In case of rejection, subcontractor shall arrange additional candidates and submit resume to BHEL. Penalties will be applicable during the period of non-deployment in such cases as well.
3	Subcontractor shall ensure physical availability of safety personnel at the place of specific work locations.
4	The Subcontractor shall deploy the HSE Officers as per the site's requirement. Non-deployment shall lead to stoppage of the work and final decision shall rest with Site HSE & Construction manager.
5	The Subcontractor shall prepare an organization chart identifying the areas of operations, responsibilities and reporting structure of all safety personnel for each shift and submit the same to BHEL.

<b>7.2.6</b>	<b>AVAILABILITY AND PENALTY FOR NON-DEPLOYMENT: -</b>  In case contractor fails to deploy the required Safety professionals mention under Clause no 7.1 i.e. Safety Engineer/ Officer & Safety Supervisor at Project site, BHEL will impose penalty mention under Clause 7.2.6 and This penalty shall be deducted from contractor's monthly RA bill.  <b>1. Safety Engineer/ Officer                      Rs. 2,500 / day.</b> <b>2. Safety Supervisor                              Rs. 1,500 / day</b>  <b>Note :-</b>  <b>1. Penalty shall be collected for the period of non-availability of safety personnel after allowing a grace period of 10 days for finding a replacement. The same shall be deducted on pro-rata basis till the required manpower is deployed. In case agency could not provide replacement/ deployment for more than 10 days, then penalty will be calculated from day 1 of absence/ deployment.</b>
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	<p>2. In case of abnormal delay &amp; frequent rejections of candidates proposed by the subcontractor, BHEL shall exercise the right to deploy the safety manpower &amp; deduct the amount from subcontractor's running bill with applicable overheads. In such cases also, the provision of logistics, transportation, accommodation and other logistical support to the HSE personnel shall be in the scope of subcontractor in addition to the salary. After deployment of manpower by BHEL, the penalty for non-deployment specified above shall not be applicable.</p>
7.3	<p><b>HSE – A LINE RESPONSIBILITY</b></p> <p><b>RESPONSIBILITIES FOR IMPLEMENTATION OF SAFETY RULES: -</b></p> <ul style="list-style-type: none"> <li>The term “Line” includes management, Executives, Supervisors, Foremen, and Workers who are part of the workforce. Line is to be fully involved in HSE Planning &amp; Implementation with the aid and advice of HSE organization.</li> <li>Line, having control of resources and manpower is responsible for action on the HSE non-conformities reported by the HSE personnel.</li> <li>HSE organization should play a supporting role to line management and should work closely with them on executing HSE Planes) all together.</li> </ul>
7.3.1	<b>SAFETY RULES</b>
1	The Contractors / Subcontractors shall ensure proper safety of all the workmen, materials, plant and equipment belonging to him or to the Employer or to others, working at the Site.
2	All equipment's used in construction and erection by the contractor shall meet BIS / International Standards and where such standards do not exist, the Contractor shall ensure these to be absolutely safe. All equipment's shall be strictly operated and maintained by the contractor in accordance with manufacturer's operation manual. The contractor should also follow Guidelines / Rules of the Employer in this regard.
3	The Contractors / Subcontractors shall provide suitable latest Personal Protective Equipment's of prescribed standard to all their employees and workmen according to the need. The Engineer I/c shall have the right to examine this safety equipment's to determine their suitability, reliability, acceptability and adaptability. The contractor should also ensure these before their use at worksite.
4	The Contractors / Subcontractors shall provide safe working conditions to all workmen and employees at his workplace including safe means of access, railings, stairs, and ladders, scaffolding, work platforms, toe guards etc. The scaffoldings shall be erected under the control and supervision of an experienced and competent person. For erection of scaffolds, access, work platforms etc. shall be good and the contractor shall use standard quality of material.
5	The Contractors / Subcontractors shall follow and comply with all the Safety Rules, standards, code of practices of BHEL and relevant provisions of applicable laws pertaining to the safety of workmen, employees, plant and equipment as may be prescribed from time to time without any protest or contest or reservation. In case of any nonconformity between statutory requirement and the Safety Rules of the Employer referred above, the latter shall be binding on the Contractor unless the statutory provisions are more stringent. As and when required he can refer / obtain copy of BHEL safety documents as stated above.





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<b>6</b>	The Contractors / Subcontractors shall have his own arrangements/ tie up with nearby hospitals for treatment of sick and injured. The medical examination of the workers employed in hazardous areas shall be conducted as per Rule 223 of The Building and Other Construction Worker (Regulation of Employment and Condition of Service) Central Rule 1998 Their health records shall be maintained accordingly and to be submitted to Engineer I/c when asked for. If any worker found suffering from occupational health hazard, the worker should be shifted to suitable place of working and properly treated under intimation to Engineer I/c. The medical fitness certificate to be submitted to Engineer (I/c).
<b>7</b>	First Aid boxes equipped with requisite articles as specified in the Rule 231 of The Building and Other Construction Worker (Regulation of Employment and Condition of Service) Central Rule 1998 OR Annexure – 2 (Details & Contents of First Aid Box as per Contract Labour (Regulation & Abolition Act), Central Rules, 1971) whichever is applicable to site shall be provided at construction sites for the use of workers. Training has to be provided on first aid to workmen & office bearers working at site.

<b>7.3.2</b>	<b>SITE IN-CHARGE OF CONTRACTOR</b>
1	Shall sign Memorandum of Understanding (MoU) for compliance to BHEL's HSE Plan for Site Operations as per clause 5.1
2	Shall engage (HSE Organization) qualified safety officer(s), supervisor(s) and steward (s) as per clause 7.0
3	Shall adhere to the rules and regulations mentioned in this code, practice very strictly in his area of work in consultation with his concerned engineer and the safety coordinator.
4	Shall screen all workmen for health and competence requirement before engaging for the job and periodically thereafter as required.
5	Shall not engage any employee below 18 years of age.
6	Shall ensure that all T&Ps engaged are tested for fitness and have valid certificates from competent person.
7	Shall ensure closure of all HSE non-conformities reported by BHEL or observed during internal inspection by providing appropriate resources in a timely manner.
8	Shall ensure that provisions stipulated in contract Labour Regulation Act 1970 for canteen, rest rooms/washing facilities to contracted employees at site.
9	Shall adhere to the instructions laid down in Operation Control Procedures (OCPs) available with the site management.
10	Shall ensure that person working above 2 meter should use Safety Harness tied to a life line/stable structure.
11	Shall ensure that materials are not thrown from height. Cautions to be exercised to prevent fall of material from height.
12	Shall report all incidents (Fatal/Major/Minor/Near Miss) to the Site engineer / HSE officer of BHEL.
13	Shall ensure that Horseplay is strictly forbidden.
14	Shall ensure that adequate illumination is arranged during night work.



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15	Shall ensure that all personnel working under contractor are working safely and do not create any Hazard to self and to others.
16	Shall ensure display of adequate signage/posters on HSE.
17	Shall ensure that mobile phone is not used by workers while working.
18	Shall ensure conductance of HSE audit, mock drill, medical camps, induction training and training on HSE at site.
19	Shall ensure full co-operation during HQ/External /Customer HSE audits.
20	Shall ensure submission of look-ahead plan for procurement of HSE equipment's and PPEs as per work schedule.
21	Shall ensure good housekeeping.
22	Shall ensure adequate valid fire extinguishers are provided at the work site.
23	Shall ensure availability of sufficient number of toilets /restrooms and adequate drinking water at work site and labour colony.
24	Shall ensure adequate emergency preparedness.
25	Shall be member of site HSE committee and attend all meetings of the committee
26	Power source for hand lamps shall be maximum of 24 v.
27	Temporary fencing should be done for open edges if Hand – railings and Toe-guards are not available.
28	To record all incidents including near miss and report to BHEL and to ensure analysis & corrective actions for the same
29	Shall conduct weekly Safety Walks in the work area.
30	Shall arrange for all the necessary PPE's like Safety Helmets, Safety Belts, Full Body Harness, Safety Shoes, Face Shield (if required), Hand Gloves etc. including RFA – Retractable Fall Arrestor, Safety Net as a Secondary line of Protection before start of work.
31	Shall ensure the implementation of provisions of applicable acts and rules pertaining to HSE.
32	Shall ensure availability of updated (Hazard Identification and Risk Assessment) Register for the area of activity
33	Shall ensure availability of Method Statements & Job Safety Analysis for all hazardous activities
34	Shall ensure necessary controls to minimize risk in all applicable hazardous activities including Height Work, Hot Work, Lifting & Rigging, Confined Space, Maintenance, excavation, Radiography, Loading/ Unloading, Drilling/ Blasting etc.
35	Shall ensure implementation of HSE requirements mentioned in this document and as specified in the BHEL HSE management System including training, inspection, awareness, reporting etc.
36	Shall ensure that person working above 2.0 meter should use Safety Harness tied to a life line/stable structure.
39	Shall ensure a secondary means of fall protection (Safety Net, Retractable Fall Arrestor etc.) for preventing fall from height
40	Construction of Canteen at Site, Office Infrastructure: Printer, PC, Fire Extinguishers etc.
41	Shall analysis HSE Performance regularly in work area and take steps to improve the same.
42	Shall ensure stoppage of work in case of unacceptable Safety hazards.



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<b>7.3.3</b>	<b>SITE HSE COMMITTEE</b>
<b>1</b>	<b>Site HSE/ Safety committee</b> shall be formed within each contracting agency comprising of worker representatives with equal no. of management representatives as per the provisions of BOCW Act/rules. This committee in each agency shall meet at least once in every month. The safety officer of the concerned agency shall coordinate these meetings. BHEL/ 2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST of CSPGCL Safety officer shall be special invitee for Safety Committee meetings. The safety committee functioning shall be in line with the provisions of BOCW Act/Rules.
<b>2</b>	Apart from the above, each agency shall organize safety meetings every day before start of day's work to educate & motivate the workers about the necessity of safety. Case study of accident/ incident can be shared in these meetings.
<b>3</b>	The contractor shall also regularly organize safety meetings for all job supervisors/foremen.
<b>4</b>	Weekly meeting with contractors Safety Officers to be organized by safety department of BHEL/ 2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST of CSPGCL and minutes to be recorded, circulated and compliance status to be checked on regular basis.
<b>5</b>	Site HSE committee shall consist of BHEL Project Director/ Construction Manager (Chairman), Site BHEL HSE coordinator (Secretary/Convener), BHEL HOS (Member), Site In charge of contractor (Member) and Safety officer of contractor (Member).
<b>6</b>	Shall evaluate a suitable course of action for the effective implementation of safety system & procedures. Committee will also ensure that all the relevant codes & acts / rules are followed.
<b>7</b>	Shall meet monthly and as and when required, to discuss ways and means to eliminate unsafe acts/condition.
<b>8</b>	Shall monitor the performance of the HSE programs and suggest improvements as required.
<b>9</b>	Shall discuss exception points relating to HSE Audits, sub-contractor HSE practices, incident reports, near miss reports, etc.
<b>10</b>	Shall analyze the high risk activities to be undertaken in the near future to identify hazards and decide on the control measures to be taken.
<b>11</b>	Shall inspect the site on regular intervals to locate unsafe conditions with reference to the inspection checklist.
<b>12</b>	Shall investigate all incidents and strengthening the safety programme by additional precautions, if any based on the incident investigate.
<b>7.3.4</b>	<b>HSE OFFICER/ INCHARGE OF CONTRACTOR</b>
<b>1</b>	Carry out safety inspection of Work Area, Work Method, Men, Machine & Material, P&M and other tools and tackles.
<b>2</b>	Facilitate inclusion of safety elements into Work Method Statement.
<b>3</b>	(HSE Head of Contractor) To prepare deployment plan of HSE personnel for all shifts, so as to ensure constantsupervision of all areas. The plan to be submitted to BHEL.
<b>4</b>	Highlight the requirements of safety through Tool-box / other meetings.
<b>5</b>	Help concerned HOS to prepare Job Specific instructions for critical jobs.
<b>6</b>	Conduct investigation of all incident/dangerous occurrences & recommend appropriate safety measures.
<b>7</b>	Advice & co-ordinate for implementation of HSE Systems & Procedures.



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8	To stop work in case of any critical safety violation until the violation is cleared
9	Convene HSE meeting & minute the proceeding for circulation & follow-up action.
10	Plan procurement of PPE & Safety devices and inspect their healthiness.
11	Report to BHEL on all matters pertaining to status of safety and promotional program at site level.
12	Support administration of Medical Centre.
13	Facilitate screening of workmen and safety induction.
14	Conduct fire Drill, Mock Drill, Electrocution Drill, Fall from Height Rescue Drill etc.and facilitate emergency preparedness at project site.
15	Design campaigns, competitions & other special emphasis programs to promote safety in the workplace.
16	Apprise BHEL on safety related problems.
17	Notify site personnel non-conformance to safety norms observed during site visits / site inspections.
18	Recommend to Site In charge, immediate discontinuance of work until rectification, of such situations warranting immediate action in view of imminent danger to life or property or environment.
19	To decline acceptance of such PPE / safety equipment that do not conform to specified requirements.
20	Encourage raising Near Miss Report on safety along with, improvement initiatives on safety.
21	Shall work as interface between various agencies such customer, package-in-charges, contractors on HSE matters
22	The contractor shall submit the certificates of qualification & experience of HSE manpower at least 10 days before deployment for BHEL to assess suitability as per requirement detailed in this document.
23	The deployment of HSE personnel shall be part of payment terms
24	BHEL shall have the right to reject in case of any deviation. In case of rejection, contractor shall arrange suitable candidates as a replacement and submit resume to BHEL. Penalties will be applicable during the period of non-deployment in such cases as well.
25	At any point of time (in case contractor is not deployed HSE officer), BHEL shall have the right to deploy the required HSE manpower at the risk and cost of contractor with applicable overheads at market determined rates with applicable overheads.
26	In such cases also, the provision of logistics, transportation, food and other logistical support to the HSE personnel shall be in the scope of contractor in addition to the salary.
27	Contractor shall ensure physical availability of safety personnel at the place of specific work locations. No work shall be started at any of the project sites until above safety personnel & concerned Site Engineer of contractor are physically deployed at site.
28	The Contractor shall prepare an organization chart identifying the areas of operations, responsibilities and reporting structure of all safety personnel for each shift and submit the same to BHEL.



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29	Blood Alcohol test must be performed regularly/ daily basis by contractor Employee/ designated worker to ensure safe working environment at project site. In case of any employees or workers observed that they consume alcohol, same are not allowed at project site for the day.
30	Any worker found misbehaving, using abusive language, or engaging in physical altercation with fellow workers, BHEL staff, customer representatives, or any site personnel shall be liable for immediate removal from the site. Such action will be taken at the sole discretion of BHEL.
7.3.5	<b>HSE RESPONSIBILITIES OF HSE SUPERVISOR OF CONTRACTOR</b>
1	All requirements as per 7.2 and their sub clause.
2	To assist Safety officer for all the Construction activity at site.
3	To monitor allotted area by Safety Officer for any unsafe act, unsafe condition, Safety Violation, take immediate action for unsafe construction activity & inform the concern safety officer (Contractor/ BHEL) or supervisor of contractor.
7.3.6	<b>HSE RESPONSIBILITIES OF ALL EMPLOYEES (INCLUDING ABOVE)</b>
1	To be aware of, get involved in and ensure implementation of all HSE related Systems and Procedures including but not limited to: <ul style="list-style-type: none"> <li>a. BHEL HSE Management System including HSE Procedures and OCPs</li> <li>b. Work Permit System</li> <li>c. Emergency Preparedness Response Plans</li> <li>d. Contractual HSE requirements</li> <li>e. Legal Requirements</li> <li>f. Penalty System</li> <li>g. Training requirements</li> </ul>
2	To ensure that the persons engaged in respective area follow the safety rules like using appropriate PPEs.
3	To record all incidents including near miss and report to BHEL.
4	To adopt safe working practices at all times and act as role model for Safety
5	To take immediate corrective action in case any non-conformity is observed on product / process / system with respect to Occupational Health, Safety and Environment.
6	In case any particular activity / work has extremely high consequential risk or high environmental impact, same shall be brought to the notice of BHEL Package In-charge before starting the work.
7	To interfere/ stop work as & when identified unsafe.
8	To maintain & promote improved level of house-keeping all the time at site.
9	To support/co-operate with audit team members as & when safety audits are carried out.
10	To involve in investigation, if any incident occurs in his work area.
11	To participate in safety promotional programmer.
12	To attend the safety committee meeting, if member/invitee
13	To ensure that only fit T&Ps and qualified persons are engaged for all activities.
14	Shall ensure that person working above 2 <b>meter</b> should use Safety Harness tied to a life line/stable structure.
15	Shall ensure that materials are not thrown from height. Cautions to be exercised to prevent falloff material from height.





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16	Shall ensure that all T&Ps engaged are tested for fitness and have valid certificates from competent authorities.
17	To develop Method Statement and ensure availability of Job Safety Analysis (JSA) for all construction activities/ Execution in scope.
18	To ensure that the reported HSE Non-Conformities in the work area are resolved immediately before start of work /resuming work.
<b>7.3.7</b>	<b>HSE RESPONSIBILITIES OF SUB CONTRACTOR WORKERS:</b>
<b>1</b>	It shall be the responsibility of the worker to comply with the requirements of safety as laid down for him and the group of workers to which he belongs and fully cooperate in the discharge of the responsibility for work that has been assigned to the contractor.
<b>2</b>	If he discovers any defects in the lifting appliance, lifting gear, lifting device or those concerning any transport equipment or other construction equipment or tools as well as the physical work conditions, he will report such defects promptly to his agency or BHEL or BHEL or other person in authority;
<b>3</b>	No building worker shall, unless duly authorized or in case of absolute necessity, remove or interfere with any fencing, guards, gangways, gear, ladder, hatch covering, lifesaving appliances, lighting or other things whatsoever required and provided for safety and health. If any of the aforesaid things is removed, the persons engaged in the work shall restore such thing at the end of the period during which its removal was necessary;
<b>4</b>	Every worker shall use only means of access provided in accordance with the approved norms and no person shall authorize or order another to use such means of access or method other than those approved;
<b>5</b>	Workers shall use such means of access and egress for going to and exiting from the workplace as provided.
<b>6</b>	All worker must ensure that they are not consume alcohol during Working hours or under work/ plant premises.
<b>7.3.8</b>	<b>PUNITIVE ACTIONS ON WORKERS AND EMPLOYEES FOR “CRITICAL SAFETY VIOLATIONS”</b>
	<b>“CRITICAL SAFETY VIOLATIONS”</b>
<b>1</b>	Not wearing required PPEs when provided and not following safe work procedure
<b>2</b>	Taking unnecessary risks especially in height work, hot work, radiation work, lifting activity
<b>3</b>	Coming to work under influence of sedatives like alcohol, drugs etc.
<b>4</b>	Coming to work without ID Card/ Gate Pass (if provided)
<b>5</b>	Smoking while working at site.
<b>6</b>	Bringing arms or firearms to work.
<b>7</b>	Intimidating/ threatening at work
<b>8</b>	Using cell phones during height work, hot work, lifting activity, driving
<b>9</b>	<p><b>Any legal implication:</b> - Any Legal Costs incurred by BHEL, on account of accidents taking place in the activities of the subcontractor, shall be debited to the subcontractor on actual cost basis.</p> <p>For any accident occurring at site to any worker/ employee of the subcontractor leading to legal implications to BHEL Employee/ Management shall be safeguarded by BHEL legal department. All legal expenses incurred by BHEL on this account shall be recovered from the subcontractor. The accident also includes fire, loss of property or life at site.</p>



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**10.** In case any worker/ employee carries out any of the critical safety violations as above, punitive action shall be ensured in following manner:

FIRST OFFENCE	1 (One) Punch hole on Gate Pass/ Induction Card/ ID Card/ Competency Card etc. and 1 hour HSE Training with 1 day Off from Duty/ Site.
SECOND OFFENCE	2 (Two) Punch hole on Gate Pass/ Induction Card/ ID Card/ Competency Card etc. and 2 hours HSE Training with 1 day Off from Duty/ Site.
THIRD OFFENCE	3 (Three) Punch hole on Gate Pass/ Induction Card/ ID Card/ Competency Card etc. and the worker will be dismissed or do not allow to work at site with any agency. Gate Pass to be confiscated.

**Note :-**

- For above violations, guilt of the worker/ employee has to be established through appropriate evidence and records for the same will be maintained at site.
- If worker/ employee has not been given the required PPEs and safety equipment by the agency and/or not facilitated by the agency to follow safety rules, he/ she will not be considered liable but the agency will be penalized as per penalty provision in this document. In such cases, the contractor shall not pass the penalty over to the worker/ employee through wage deduction etc.
- These critical safety violations and their consequences shall be shared with all workers and employees during induction and other training programmes / meetings etc.
- Gate Pass shall have provision of Punching as indicated above.
- Warning Letters shall contain documentary proof and signature of erring worker/ employee, contractor safety officer and BHEL Safety Officer, and shall be approved by and submitted to Contractor site in-charge by BHEL Package In-charge.
- The appellate authority in this case shall be the BHEL Site In-charge whose decision shall be final on the matter and binding on all parties.





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### 8.0 HSE PLANNING BY CONTRACTOR

<b>8.1</b>	<b>IDENTIFYING HAZARD ANALYSIS AND RISK ASSESSMENT (HIRA), METHOD STATEMENTS (MS) AND JOB SAFETY ANALYSIS (JSA)</b>
1	Contractor/ Sub Contractor shall identify all OHS Hazards and Risks applicable to all activities in scope throughout the duration of the job as per HSEP01: HSE Procedure for Register of OHS Hazards and Risks, and plan & implement the required control measures.
2	Contractor shall identify all Environmental Aspects and Impacts applicable to all activities in scope throughout the duration of the job as per HSEP02: HSE Procedure for Register of Environmental Aspects and Impacts, and plan & implement the control measures.
3	Contractor / Sub Contractor shall develop Method Statement & Job Safety Analysis documents for all hazardous activity in scope and ensure the required control measures. Job Safety Analysis is to be attached along with any work permit request.
4	The procedures referred above are for reference purposes only, shall be tailored to the requirements of the activities in the contract, and shall cover all activities throughout the duration of the task.
<b>NOTE</b>	<b>Contractor shall ensure availability and understanding of these requirements prior to commencing work at site. In case the statutory requirements i.e. State or Central Acts and / or applicable rules like the Building and Other Construction Workers' Regulation of Employment and Conditions of Service- Act, 1996 or State Rules (wherever notified), the Factories Act, 1948 or Rules (wherever notified), etc. are more stringent than the requirements stipulated in this document, they shall be applicable.</b>
<b>8.2</b>	<b>REGISTER OF REGULATIONS</b>
	Contractor shall prepare a register of applicable rules and regulations in the scope as per HSEP03: HSE Procedure for Register of Regulations and plan to ensure compliance. <b>Note:-</b> These Registers of regulations, HIRA Register, Method Statement , Job Safety Analysis shall be submitted to BHEL at least 10 days prior to start of work at site and shall be reviewed: a. At a fixed frequency of 3 months b. Addition/ deletion/ modification of a process/ activity c. After an accident/ incident d. After any change in applicable rules/ regulations/ laws
<b>8.3</b>	<b>MONTHLY HSE PLANNING &amp; REVIEW OF HSE ACTIVITIES ALONG WITH BHEL:</b>
	Monthly planning and review of HSE activities shall be carried out by contractor / Sub Contractor as per provided format jointly along with BHEL
<b>8.4</b>	<b>MOBILISATION OF MACHINERY/EQUIPMENT/TOOLS BY CONTRACTOR</b>
1	As a measure to ensure that machinery, equipment and tools being mobilized to the construction site are fit for purpose and are maintained in safe operating condition and



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	<p>complies with legislative and owner requirement, periodic inspection shall be arranged by in-house competent authority for acceptance as applicable.</p> <p>Inspection by Third Party competent person shall be arranged:</p> <p>a. Before first time use at site</p> <p>b. After carrying out any modification</p> <p>c. After repairs subsequent to involvement in any accident/ incident.</p> <p>The machinery and equipment to be covered shall include but not limited to the following:</p>		
	<ul style="list-style-type: none"><li>▪ Mobile cranes.</li><li>▪ Side Booms.</li><li>▪ Forklifts.</li><li>▪ Grinding machine.</li><li>▪ Drilling machine.</li><li>▪ Air compressors.</li><li>▪ Man lifter</li><li>▪ Scissor lift etc.</li></ul>	<ul style="list-style-type: none"><li>▪ Welding machine.</li><li>▪ Batching Plants</li><li>▪ Generator sets.</li><li>▪ Dump Trucks.</li><li>▪ Excavators.</li></ul>	<ul style="list-style-type: none"><li>▪ Dozers</li><li>▪ Grit Blasting Equipment.</li><li>▪ Hand and power tools.</li><li>▪ Lifts</li></ul>
2	<p>Contractor shall notify the engineer, of his intention to bring on to site any equipment or any container, with liquid or gaseous fuel or other substance which may create a hazard. The Engineer shall have the right to prescribe the condition under which such equipment or container may be handled and used during the performance of the works and the contractor shall strictly adhere to such instructions. The Engineer shall have the right to inspect any construction tool and to forbid its use, if in his opinion it is unsafe. No claim due to such prohibition will be entertained.</p>		
3	<p>As a further measure to ensure that machinery, equipment and tools being mobilized to the construction site are fit for purpose and are maintained in safe operating condition and comply with legislative and owner requirement, inspection as per provided format shall be arranged by in-house expert / competent authority (preferable) for acceptance. The equipment considered for this purpose shall include all those in the T&amp;P list in the tender document.</p>		
8.5	<b>MOBILISATION OF MANPOWER BY CONTRACTOR</b>		
1	<p>As a measure to ensure that manpower being mobilized to the construction site is fit and competent for safe working, screening arrangement shall be made by the sub-subcontractor to ensure competency and fitness through following measures:</p> <p>a. Medical Checkup: Examination of medical fitness shall be conducted through qualified medical professional for all workers to be deployed as per provided format. For height workers, vertigo (height phobia) test to be carried out as qualification criteria as per Annexure - I – Vertigo Test and recorded in BHEL provided format.</p> <p>b. Induction Training: Induction training of all workers to be ensured as per provided procedure and format. Training evaluation to be carried out and training to be repeated if not passed</p> <p>c. Only on successfully meeting above criteria, permanent gate passes to be issued</p>		



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2	The contractor shall arrange induction and regular health check of their employees as per schedule VII of BOCW rules by a registered medical practitioner.
3	The contractor shall take special care of the employees affected with occupational diseases under rule 230 and schedule II of BOCW Rules. The employees not meeting the fitness requirement should not be engaged for such job.
4	Ensure that the regulatory requirements of excessive weight limit (to carry/lift/ move weights beyond prescribed limits) for male and female workers are complied with.
5	Appropriate accommodation to be arranged for all workmen in hygienic condition.
6	Cost of contractual, statutory and regulatory requirements like Training, medical checks, PPEs etc. shall not be transferred to the workers and such activities shall be considered as part of the job.
8.6	<p><b>START UP, COMMISSIONING &amp; TESTING</b></p> <p>There are various activities involved prior to commissioning- the major ones not limited to – Hydraulic Test, Steam Blowing, charging of transformers, Boiler Light Up, Rolling and Synchronization and Full loading of unit etc. These activities shall be personally supervised by the site executive along with the commissioning engineer. The readiness of upstream and downstream system shall be ensured before taking up. These shall be handled strictly by the authorized persons only and the team shall be suitably briefed about the activity including hazards &amp; risks involved and control plan by the concerned executive-in-charge before start.</p> <p>Entry of persons to the area of activity shall be suitably restricted and the emergency functions like Ambulance, Medical Centre and Fire Tender at site shall be intimated about the plan well in advance. Lock-out/ Tag-out shall be in place while charging transformer and whenever necessary. Electricians with valid wiremen license only shall be permitted to work on power lines. The area and the passage shall be adequately illuminated.</p>
8.7	<b>PROVISION OF PERSONAL PROTECTIVE Equipment's (PPE's)</b>
1	The agency should ensure sufficient inventory of personal protective equipment (PPEs) prior to initial mobilization. After identifying the need of the required PPEs for various activities performed at the site, an additional inventory of approx. 20% of required PPEs should be maintaining during the execution of the work. A PPE plan shall be prepared which gives fair idea regarding issue of PPEs to various personnel. <b>If sub agency fails to provide the PPEs to worker the same may be issued by BHEL and cost for the PPEs debited to the Sub agency from regular RA Bill. Overhead charges applicable as per contract.</b>
2	Personnel Protective Equipment (PPEs), shall be provided by the subcontractor to all workers as per requirement of the job.
3	The choice of PPE's to ensure multiple (at least more than 1) means of protection against any hazard. All applicable safety precautions for a job shall be ensured notwithstanding the duration or perceived importance of the task.
4	The applicability of PPEs shall be as per the concept of Hierarchy of controls, i.e.: iv. Elimination->Substitution->EngineeringControls->AdministrativeControls-PPEs.
5	Relying solely on PPEs without ensuring necessary controls to be strictly avoided



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6	<b>Safety PPE's, Equipment and Devices etc. shall be ensured as per Annexure - 1. However it is not limited to Annexure - 1, contractor must comply for PPE's as per construction activities or instruction from BHEL.</b>	
7	<b>Mandatory PPEs:</b> Wearing of Safety Helmet, Safety Shoes and reflective jacket is mandatory for all work at site and it should be ensured that all employees and project visiting personnel shall invariably wear safety helmet, safety shoes & reflective jacket.	
8	Personnel Protective Equipment (PPEs), in adequate numbers, will be made available at site & their regular use by all concerned will be ensured	
9	The following matrix recommends usage of minimum PPEs against the respective job.	
	<b>S. No</b>	<b>Type of work</b>
	1	Concrete and asphalt mixing
	2	Welders/Grinders/ Gas cutters
	3	Stone/ concrete breakers
	4	Electrical Work
	5	Insulation Work
	6	Work at height
	7	Grit/Sand blasting
	8	Painting
	9	Radiography
		<b>PPEs</b>
		Nose mask, hand glove, apron and gum boot
		Welding/face screen, apron, hand gloves, nose mask and ear muffs if noise level exceeds 90dB. Helmet fitted with welding shield is preferred for welders
		Ear muffs, safety goggles, hand gloves
		Rubber hand glove, Electrical Resistance shoes, Arc Suit for High Tension Lines
		Respiratory mask, Hand gloves, safety goggles
		Double lanyard full body harness, Safety Harness/ Fall arrestor (specific cases), Retractable fall arrestor.
		Blast suit, blast helmet, respirator, leather gloves
		Plastic gloves, Respirators (particularly for spray painting)
		As per BARC guidelines
10	The PPEs shall conform to the relevant standards (ISI mark) as per Annexure - 6 – Indicative List of Indian Standard Codes for Safety.	
11	Where workers are employed in sewers and manholes, which are in use, the contractor shall ensure that the manhole covers are opened and ventilated at least for an hour before the workers are allowed to get into manhole, and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent incident to the public.	
12	Besides the PPEs mentioned above, the persons shall use helmet and safety shoe. The visitors shall use Helmet and any other PPEs as deemed appropriate for the area of work.	
13	Proposed Color scheme for Helmets shall be followed: a) Workmen: Yellow b) Safety staff: Green or white with green band c) Electrician: Red d) Others including visitors: White e) Height Work, Special Markings/ Stickers on Helmets beside induction on Gate Pass/ ID Card	
14	The contractor shall maintain register for issue and receipt of PPEs.	
15	All the PPEs shall be checked for quality before issue and the same shall be periodically re-checked. The users shall be advised to check the PPEs themselves for any defect before putting on. The defective ones shall be replaced.	



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16	The Helmets shall have logo or name (abbreviation of agency name permitted) affixed or printed on the front.
17	The agency should ensure sufficient inventory of personal protective equipment (PPEs) prior to initial mobilization. After identifying the need of the required PPEs of various activities performed at site, an additional inventory of approx. 15-20 % of required PPEs should be maintaining during the execution of the work/ while working at site. If agency fail to provide the PPEs to worker the same may be issued by BHEL site and cost for the same debited to Contractor from regular RA bill. overhead charges as per contract terms and condition.
18	Mandatory PPEs: Wearing of Safety Helmet, Safety Shoes and reflective jacket is mandatory for all work at site and it should be ensured that all employees and project visiting personnel shall invariably wear safety helmet, safety shoes & reflective jacket.
19	PPEs required while execution of work: Face Shield, Chemical splash goggles, Helmet mounted welder's shield, gum boot, Double lanyard full body harness, Safety goggles, Dust mask, supplied air mask/hood, Ear plug/Ear Muff, Cotton hand gloves, Leather hand gloves, Leather apron, Rubber gloves, PVC Gloves, PVC Apron, Self-contained breathing apparatus, Welding goggles, Electrical Rubber Gloves. Breathing apparatus etc...
20	The above-mentioned PPEs should be made available with contractor at site and issued to the concerned workers on the day of employment. All PPEs shall comply with ISI standards with valid test certificates.
21	At least two breathing apparatus sets (complying requirement as per IS: 10245) shall be provided at each site where excavation/tunneling works and Welding/ Cutting operations in confined areas are being carried out, to rescue the victims under exposure to harmful gases/vapors, if any.
22	The body harnesses shall be serial numbered.
23	<b>Eye Protection:</b> - the contractor shall provide suitable personal protective equipment to his workmen depending upon the nature of hazards and ensure their usage by the workers engaged in operations like welding, cutting, chipping, grinding or similar operations which may cause injuries to his eyes.
8.7.A	<b>CRITICAL REQUIREMENTS W.R.T. EQUIPMENTS, HEAVY EQUIPMENTS &amp; PPE's</b>
1	<b>Conventional Hydra/ Farana crane with carriage in front shall not be permitted. Pick &amp; carry tyre mounted Front Cabin mobile crane (FX or TRX/ Next Gen series of 'ESCORT' or equivalent make) shall only be permitted.</b>
2	<b>Any Heavy equipment (cranes, winch machines, etc.) shall be deployed only after pre-safety inspection by safety dept. Valid AMCs/ Fitness/ other statutory clearances as per local rules shall be required to be submitted before mobilizing the equipment at site.</b>
3	<b>During movement of all earth-moving equipment, deployment of flag men is mandatory to ensure safe movement of all earth moving equipment.</b>
4	<b>All other Hand tools and power tools should not be older than 5 years.</b>
5	<b>For Chimney passenger lift, winch to have double drum rope for passenger and double safety devices must be used. Winch should not more than 3 years old and winch rope must be inspected with valid certificate from competent authority within 6 months and should meet the IS standard 9507 provision of OLR and push back button arrangement or dead man switch.</b>
6	<b>Gate pass for all the lifting T&amp;Ps and construction machinery/ equipment shall be made after obtaining written acceptance (Pre-entry Safety Clearance) from BHEL Site Safety Department after physical verification and checking all requisite documents/ compliance to Safety norms</b>
7	<b>All motor vehicles should have valid registration certificate, insurance, Pollution under control (PUC) and fitness certificate as per Motor Vehicle Act 2020. The certificates should be pasted in the glass from inside.</b>





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8	PPEs shall be from reputed manufactures viz. 3M, Udyogi, Karam, Frontier, Freedom, Honeywell, Liberty, Bata, Nomex, Acme, Unicare, Life Gear or equivalent. In case Subcontractor recommends any other name the same can be approved at site level by the Construction manager & Site HSE
9	For height work, where fall could result in death or disability, a secondary means of fall protection (Safety Net, Retractable Fall Arrestor etc.) shall be mandatorily provided by the subcontractor, failing which, a penalty of INR 5,000 per case will be imposed. In addition, there should be constant supervision for such critical height work. Any non-erection activities at height eg. Housekeeping etc. shall also fall under the category of height work.
8.8	<b>ARRANGEMENT OF INFRASTRUCTURE</b>
8.8.1	<b>DRINKING WATER</b>
1	Drinking water shall be provided and maintained at suitable places at different elevations
2	Container should be labeled as "Drinking Water" in languages understood by the workers
3	Cleaning of the container shall be ensured at least once in a week or whenever required. The tank shall be thoroughly cleaned with potable water only before it is refilled (also applicable to Labour Colony)
4	Suitability of water source for drinking to be tested as per IS10500 at least once in six months or whenever required.
5	Drinking Water tank shall be so installed so as to be available within 200 Meters of each work area.
8.8.2	<b>WASHING FACILITIES</b>
1	In every workplace, adequate and suitable facilities for washing shall be provided and maintained.
2	Separate and adequate cleaning facilities shall be provided for the use of male and female workers. Such facilities shall be conveniently accessible and shall be kept in clean and hygienic condition and dully illuminated for night use.
3	Water suitable for washing and not for drinking shall be clearly indicated as "Not for Drinking" in language understood by workers.
4	Overalls shall be supplied by the contractor to the workmen and adequate facilities shall be provided to enable the painters and other workers to wash during the cessation of work.
8.8.3	<b>TOILETS :-</b> Toilets (Latrines and urinals shall be ensured at Site and Labour Colony in accordance with the Inter-State Migrant Workmen Act, 1979 as given below:
A	<b>LATRINES</b>
1	Latrines shall be provided in every work place as per BOCW Act or as per Site requirement/ BHEL Instruction.
2	Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings.
3	Where workers of both sexes are employed there shall be displayed outside each block of latrine and urinal a notice in the language understood by the majority of the workers 'For Men Only', or For Women Only', as the case may be.
4	The notice shall also bear the figure of a man or of a woman, as the case may be.
5	They shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times, by appointing designated person.





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<b>B</b>	<b>URINALS</b>
<b>1</b>	There shall be at least one urinal for male workers up to fifty and one for female up to fifty employed at a time and further as per BOCW Act.
<b>2</b>	The urinals shall be designed and located so as to ensure privacy.
<b>3</b>	The latrines and urinals shall be conveniently situated at different elevations and accessible to workers at all times at the establishment.
<b>4</b>	The latrines and urinals shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times.
<b>5</b>	Latrines and urinals other than those connected with a flush sewage system shall comply with the requirements of the public health authorities.
<b>6</b>	Water shall be provided by the means of tap or otherwise so as to be conveniently accessible in or near the latrines and urinals.
<b>NOTE</b>	<p>i) Latrines and Urinals shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times, by appointing designated person.</p> <p>ii) At Site, on ground, Modular Bio-toilets as per industry standard specifications and regular professional cleaning shall be ensured. The toilets should be sufficient in number and easily accessible to workers from every work area</p> <p>iii) At Site, in various elevations, suitable urinals with proper drainage to be ensured at each elevation in line with IS 2064 (1993). Same to be cleaned regularly</p> <p>iv) Latrines and urinals other than those connected with a flush sewage system shall comply with the requirements of the public health authorities.</p>
<b>8.8.4</b>	<b>PROVISION OF SHELTER FOR WORKERS DURING REST PERIOD</b>
<b>1</b>	Proper Rest Shed (s) with shelter shall be provided for rest during break so as to accommodate all workers as indicated in the Annexure-D (REST SHEDS)
<b>2</b>	The sheds shall be cleaned, ventilated with fans, windows etc. as required and have provision of seating and drinking water facility etc
<b>8.8.5</b>	<b>MEDICAL CENTRE WITH FIRST AID FACILITY AND AMBULANCE (As per Schedule V, X and XI of BOCW central Rules, 1998)</b>
<b>1</b>	Medical Centre/ Medical facilities, Medical officer, Ambulance with 24 hrs. First Aid Trained Driver (Spec. / mention in Annexure - A), Nursing staff & Medical consumable etc. (Spec. / mention in Annexure - A) will be centrally arranged by BHEL on cost sharing model basis (i.e. expense for this will be apportioned among all the working contractors proportionate to their Awarded contract value).
<b>2</b>	A Medical Centre shall be ensured/identified at site by BHEL with basic facilities for handling medical emergencies.
<b>3</b>	Medical waste shall be disposed as per prevailing legislation (Bio-Medical Waste —Management and Handling Rules, 1998)
<b>4</b>	<b>Following Condition shall be prevailing before start of work.</b>
<b>I</b>	Ambulance as required will be centrally arranged by BHEL on cost sharing model basis & shall be used by all contractors as & when required. Ambulance with proper equipment for prompt transportation of the injured persons to a physician or a hospital shall be available at work place. (i.e. The expense for this will be apportioned among all the working contractor's proportionate to their Awarded contract value).



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II	<p>BHEL will deploy full time construction medical officer as per BOCW (qualification as per Schedule XI of BOCW Central Rules -1998) on cost sharing model basis. One additional construction medical officer if required as per BOCW, for providing adequate medical treatment by qualified medical officers and nursing staff, as and when required.</p> <p>Note: Medical officer will be centrally arranged by BHEL on cost sharing model basis &amp; shall be used by all contractors. (i.e. The expense for this will be apportioned among all the working contractors proportionate to their Awarded contract value).</p>																				
III	Additional staff including one nurse, one dresser-cum compounder, one sweeper-cum-ward boy with each construction medical officer for full working hours shall be arranged by BHEL on cost sharing model basis and distributed to all working contractor proportionate to their Awarded contract value.																				
IV	The Telephone nos. of Medical officer, Hospital(s) or ambulance shall also be conspicuously displayed at each work place/ site and Medical Centre.																				
V	<p><b>Health Management:</b> The site manager shall implement health examinations for the working personnel on a regular basis.</p> <table><tr><th>TYPES OF HEALTH EXAMINATION</th><th>TARGET</th><th>FREQUENCY</th></tr><tr><td>General health examination</td><td>All workers</td><td>Annual</td></tr><tr><td>Occupational health examination (Audiometric,PFT, Vision etc.)</td><td>Worker engaging in noise, dust, vibration, harmful light generating work</td><td>Annual</td></tr><tr><td>Occupational health examination (Vision)</td><td>Personnel involved in operation of Cranes, heavy vehicles</td><td>Annual</td></tr><tr><td>Occupational health examination (Vertigo/Heightpass)</td><td>Workers engaged at Height Works</td><td>At the time of induction training and every year</td></tr><tr><td></td><td></td><td></td></tr></table>			TYPES OF HEALTH EXAMINATION	TARGET	FREQUENCY	General health examination	All workers	Annual	Occupational health examination (Audiometric,PFT, Vision etc.)	Worker engaging in noise, dust, vibration, harmful light generating work	Annual	Occupational health examination (Vision)	Personnel involved in operation of Cranes, heavy vehicles	Annual	Occupational health examination (Vertigo/Heightpass)	Workers engaged at Height Works	At the time of induction training and every year			
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5	In addition to Medical Centre with first aid Amenities & ambulance Hiring by BHEL, All contractor must ensure first aid Box as approved by medical officer shall be provided at accessible points nearby construction activity area in the ratio of at least one first aid box for every 50 employees/ workers.																				
6	<b>In addition to Clause 8.8.5 sub clause 1, sub clause 2, sub clause 3 &amp; sub Clause 4 being arranged by BHEL on behalf of all contractor on sharing basis and In addition to this all Contractor has to arrange one trained and certified first aider for every twenty workers in eachshift. To ensure compliance of first aider, list of first aider along with gate pass / identification no. shall be submitted every month to HSE Officer for his Clearance before RA bill processing. List of First aider must be displayed at Medical Centre.</b>																				
7	<b>Notwithstanding anything stated above, Contractor/Agency shall strictly comply with the requirements of relevant BOCW Act/ BOCW Rules/ Factory Act/Factory Rules/ any other statutory Act/Rules/Law with regards to providing suitable medical facilities to the workers.</b>																				
8	All the Contractor shall be liable to arrange and pay for the expenses towards the medical treatment in respect of all labour employed by him for the execution of the Contract.																				
8.8.6	<b>FIRST AIDER</b>																				
1	Ensure availability of Qualified First aider throughout the working hours.																				
2	Every injury shall be treated, recorded and reported.																				



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3	The First Aider should have under gone through valid certification course and have valid certificate.
4	The First Aider shall refer any victim to doctor or any other medical facilities for further treatment if necessary.
5	Refresher course on first aid shall be conducted as necessary.
6	List of Qualified first aiders and their contact numbers should be displayed at conspicuous places
7	The first aider along with first aid box should be available at a point nearest to the work location wherein majority of the workers are working.
	<p><b>FIRST AID TREATMENT:</b></p> <p><b>GENERAL:</b></p> <ul style="list-style-type: none"> <li>➤ Test area will be cordoned off and unauthorized person's entry shall be prohibited. Suitable signboard shall be displayed.</li> <li>➤ Hydro test need to be conducted for the whole system including temp connections. Test the integrity of temp piping's.</li> <li>➤ Whenever any inspection is made during the cleaning process, the location should be adequately ventilated.</li> <li>➤ The valve to the acid cleaning tank should be erected 2-3 meters away from the tank, so that during spillage/overflow from tank it will be safe to handle/operate.</li> <li>➤ Adequate illumination should be available near the activity area including arrangement for emergency lighting.</li> <li>➤ Any gland leakage in valve/pipeline leakage of permanent /temporary system prior to hot water rinsing and alkali flushing during system fill test, the same may be isolated and attended before putting acid into the system/boiler.</li> </ul> <p><b>SPLASHES OF THE EYE:</b></p> <ul style="list-style-type: none"> <li>➤ Immediately flood the eye with water. To be effective the eyelids must be opened. The eyelids should be pushed apart using the thumb and index finger of the left hand. The injured personnel will probably not be able to open the eye himself because of painful spasms.</li> <li>➤ If an eye wash bottle is used the jet should not be directed at the front of the eye. It should be directed in from the side, so that flow is over the surface of the eye.</li> <li>➤ Irrigation should be continued for 5 – 10 minutes after which the casualty should be taken to the first aid room at Medical Centre.</li> <li>➤ Irrigation should be continued in the first aid room at Medical Centre. Remember vision is saved by thorough Irrigation; no other treatment can prevent damage if this is omitted.</li> <li>➤ After thorough irrigation the eye should be covered with a pad; the patient should be referred for medical opinion.</li> </ul>
<b>8.8.7</b>	<b>FIRST AID BOX (as per BOCW)</b>
1	The contractor shall provide necessary first aid facilities as per schedule III of BOCW.
2	The first aid box shall be kept by first aider who shall always be readily available during the working hours of the work place. His name and contact no to be displayed on the box
3	The first aid boxes should be placed and maintained at various elevations/ every workplace so as to make them available within the reach and at the quickest possible time.
4	The first aid box shall be distinctly marked with a Green Cross on white background.
5	Details of contents of first aid box is given in Annexure – 2 & in this HSE Plan.
6	A slip of contents shall be pasted/display on the First Aid Box.
7	The first aid box shall be distinctly marked with a Green Cross on white background.
8	Monthly inspection of First Aid Box shall be carried out by the BHEL as per format.



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<b>9</b>	The contractor should conduct periodical first-aid classes to keep his supervisor and Engineers properly trained for attending to any emergency.
<b>8.8.8</b>	<b>HEALTH CHECK UP (As per BOCW)</b> The persons engaged at the site shall undergo health check-up as per the format no. HSEP: 14-F02 before induction. The persons engaged in the following works shall undergo health check-up at least once in a year for all workers including below mention: <ol style="list-style-type: none"> <li>Height workers</li> <li>Drivers/crane operators/riggers</li> <li>Confined space workers</li> <li>Shot/sand blaster</li> <li>Welding and NDE personnel</li> <li>Civil workers etc.</li> </ol>
<b>8.8.9</b>	<b>HEIGHT PHOBIA/ VERTIGO TEST</b>
<b>1</b>	The persons engaged in working at heights (above 2 meters) to be assessed for Vertigo and associated conditions and recorded as per provided format. Suggested Vertigo Test procedure is given in Annexure – I (Vertigo Test).
<b>2</b>	Such workers are to be allowed only on successful completion of test, otherwise shall be allocated ground based jobs.
<b>3</b>	Gate-Pass/ ID / Height Passes shall be issued to such workers, besides special marking / Stickers on Helmets for easy identification.
<b>8.8.10</b>	<b>PROVISION OF CANTEEN FACILITY</b>
<b>1</b>	Canteen facilities shall be provided for the workmen of the project inside the project site.
<b>2</b>	Proper cleaning and hygienic condition shall be maintained.
<b>3</b>	Proper care should be taken to prevent biological contamination.
<b>4</b>	Adequate drinking water should be available at canteen.
<b>5</b>	Fire extinguisher shall be provided inside canteen.
<b>6</b>	Regular health check-up and medication to the canteen workers shall be ensured as per applicable regulations.
<b>7</b>	Canteen waste to be disposed of in hygienic manner.
<b>8.8.11</b>	<b>PROVISION OF ACCOMODATION - LABOUR COLONY</b>
<b>1</b>	The Contractor shall have total responsibility for providing and maintaining facilities for safety, welfare, drinking water and sanitation, hygiene etc. for construction workers at their workplaces as well as at labour & staff colonies. The facilities for occupational safety, healthy environment, first aid, drinking water, resting place & toilets, canteen, crèche, etc. shall be provided at the workplace for construction workers by the contractor.
<b>2</b>	Labour Colony shall have inspected every week by Contractor Safety Officer or Contractor Team and report the same submitted to BHEL site safety officer as per BHEL provided format.
<b>3</b>	Proper accommodation to worker / workforce to be provided in line with minimum requirements indicated in Annexure – E (LABOUR COLONY)
<b>4</b>	The area in which the quarters and/or barracks are located as well as the latrines and bathrooms provided therein shall be kept in a clean and sanitary condition at all times
<b>5</b>	All contractors shall ensure that provision of adequate power backup arrangements are in place at the labour colony to avoid any disruption in essential services.



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6	Adequate number of toilet facilities with water for workers as per norms to be provided. There must be separate toilet for women workers. Drinking water and electricity to be provided at the labour colony.
7	Potable water shall be tested once in one year as per IS10500.
8	Availability of Bathing/ Washing bay to be ensured.
9	Availability of local market to be ensured by the contractor.
10	Room ventilation and safe electrification to be ensured
11	Labour colony shall be inspected each week by Safety Officer and report submitted to BHEL as per Format No. HSEP:14-F16.
12	MSDS of LPG shall be put up prominently. This shall be included in the induction training as well.
13	The labour colony shall be appropriately secure so that only authorized persons have access to it.
14	First aid facility shall be provided in the labour colony under the administration of trained first aiders by contractor.
15	Common kitchen facilities to be ensured and cooking inside the room to be avoided. The canteen should be maintained in hygienic condition.
16	No. of occupants in room to be as per the standards practice.
17	Adequate drainage and approach roads to be done.
18	Perimeter fencing, security and main gate entrance shall be established and maintained.
19	Monthly inspection to be done to ensure the compliance and for opportunity of improvement
20	For sprinkling on roads, it is to be kept in respective vendor's scope for sprinkling water near by labour colony as well as at site approached road (towards concern agency) for construction activity
21	A "Suggestion Register" shall be made available at the labour colony for workers. The feedback shall be reviewed on weekly basis and acted upon
22	Awareness training shall be organized for the workers regarding fire safety, safe use of LPG, Health & hygiene and electrical safety etc. on monthly basis.
8.8.12	<b>PROVISION OF EMERGENCY VEHICLE</b> Dedicated emergency vehicle shall available at site and same shall be coordinate with BHEL to handle emergency situation/ condition occur at site. However, Ambulance shall be used exclusively for taking victim/ injured person to hospital.
8.8.13	<b>PEST CONTROL</b> Regular pest control should be carried out at all offices, mainly laboratories, canteen, labour colony and stores.
8.8.14	<b>SCRAPYARD</b>
1	In consultation with customer, scrapyard shall be developed to store metal scrap, wooden scrap, waste, hazardous waste.
2	Scrap/Waste shall be segregated as Bio-degradable and non-bio-degradable and stored separately.






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8.8.15	<p><b>CONFINED SPACE ENTRY (CONTRACTOR TO HAVE OXIMETER AND TOXIC GAS METER)</b></p> <p>A hazard assessment must be completed prior to any entry into a confined space. The hazard assessment must identify the sequence of work to be performed in the confined space, the specific hazards known or anticipated, and the control measures to be implemented to eliminate or reduce each of the hazards to an acceptable level. No entry must be permitted until the hazard assessment has been reviewed and discussed by all persons engaged in the activity. Personnel who enter confined spaces must be trained per role e.g. entrant (worker), confined space supervisor &amp; attendant, and must be informed of known or potential hazards associated with the confined spaces to be entered. Number of persons entering shall be kept at minimum. All confined spaces must be inventoried at site and kept on file. Confined spaces must be posted at the entrance with similar type wording "DANGER – Do Not Enter – Confined Space – Permit required".</p> <div style="text-align: center;">  </div>
8.8.16	<b>ILLUMINATION</b>
1	The contractor shall arrange at his cost adequate lighting facilities e.g. flood lighting, hand lamps, area lighting etc. at various levels for safe and proper working operations at dark places and during night hours at the work spot as well as at the pre-assembly area.
2	Lamp (hand held) shall not be powered by mains supply but either by 24V or dry cells.
3	Lamps shall be protected by suitable guards where necessary to prevent danger, in case of breakage of lamp.
4	Emergency lighting provision for night work shall be made to minimize danger in case of main supply failure.
5	Adequate and suitable light shall be provided at all work places & their approaches including passage ways as per IS: 3646 (Part-II).
6	Each phase of construction will create its own illumination and lighting challenges; whether the work is related to confined spaces, hazardous atmospheres, stairways, pedestrian walkways or night work. Proper and adequate illumination is critical in order to perform the work in a safe and healthy manner. The following are the minimum requirements: Lamp (hand held) shall not be powered by mains supply but either by 24V or dry cells.
7	Temporary lighting used in damp and / or hazardous locations and confined areas must be of not more than 24 volts.
8	Lamps shall be protected by suitable guards where necessary to prevent danger, in case of breakage of lamp. Broken and burnt-out bulbs must be replaced immediately.
9	Emergency lighting provision for night work shall be made to minimize danger in case of main supply failure.
10	Adequate and suitable light shall be provided at all work places & their approaches including passage ways as per 29 CFR 1926.56.





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	<table><tr><th>Foot-Candles</th><th>Area of Operation</th></tr><tr><td>5</td><td>General construction area lighting.</td></tr><tr><td>3</td><td>General construction areas, concrete placement, excavation and waste areas, access ways, active storage areas, loading platforms, refueling, and field maintenance areas.</td></tr><tr><td>5</td><td>Indoors: warehouses, corridors, hallways, and exit ways.</td></tr><tr><td>5</td><td>Tunnels, shafts, and general underground work areas: (Exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Bureau of Mines approved cap lights shall be acceptable for use in the tunnel heading)</td></tr><tr><td>10</td><td>General construction plant and shops (e.g., batch plants, screening plants, mechanical and electrical equipment rooms, carpenter shops, rigging lofts and active store rooms, mess halls, and indoor toilets and workrooms.)</td></tr><tr><td>30</td><td>First aid stations, infirmaries, and offices.</td></tr></table>	Foot-Candles	Area of Operation	5	General construction area lighting.	3	General construction areas, concrete placement, excavation and waste areas, access ways, active storage areas, loading platforms, refueling, and field maintenance areas.	5	Indoors: warehouses, corridors, hallways, and exit ways.	5	Tunnels, shafts, and general underground work areas: (Exception: minimum of 10 foot-candles is required at tunnel and shaft heading during drilling, mucking, and scaling. Bureau of Mines approved cap lights shall be acceptable for use in the tunnel heading)	10	General construction plant and shops (e.g., batch plants, screening plants, mechanical and electrical equipment rooms, carpenter shops, rigging lofts and active store rooms, mess halls, and indoor toilets and workrooms.)	30	First aid stations, infirmaries, and offices.																																														
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11	Illuminations shall be inspected on weekly basis as per provided Format using a calibrated Lux Meter.																																																												
12	Prior to the extension of any work permit, illumination levels shall be verified in accordance with Clause 8.8.16, same must be recorded on work permit.																																																												
13	Suitable illumination levels for various areas shall be decided based on broad guidelines indicated below: <table><tr><th>S. No.</th><th>Location</th><th>Lux Level (lumens/sqm)</th></tr><tr><td>A</td><td>Construction Site</td><td></td></tr><tr><td>1</td><td>Outdoor areas like store yards, entrance and exit roads</td><td>20</td></tr><tr><td>2</td><td>Platforms</td><td>50</td></tr><tr><td>3</td><td>Entrances, corridors and stairs</td><td>100</td></tr><tr><td>4</td><td>General illumination of work area</td><td>150</td></tr><tr><td>5</td><td>Rough work like fabrication, assembly of major items</td><td>150</td></tr><tr><td>6</td><td>Medium work like assembly of small machined parts</td><td>300</td></tr><tr><td>7</td><td>Fine work like precision assembly, precision measurementsetc.</td><td>700</td></tr><tr><td>8</td><td>Sheet metal works</td><td>200</td></tr><tr><td>9</td><td>Electrical and instrument labs</td><td>450</td></tr><tr><td>B</td><td>Office</td><td></td></tr><tr><td>1</td><td>Outdoor area like entrance and exit roads</td><td>20</td></tr><tr><td>2</td><td>Entrance halls</td><td>150</td></tr><tr><td>3</td><td>Corridors and lift cars</td><td>70</td></tr><tr><td>4</td><td>Lift landing</td><td>150</td></tr><tr><td>5</td><td>Stairs</td><td>100</td></tr><tr><td>6</td><td>Office rooms, conference rooms, library reading tables</td><td>300</td></tr><tr><td>7</td><td>Drawing table</td><td>450</td></tr><tr><td>8</td><td>Manual telephone exchange</td><td>200</td></tr></table>	S. No.	Location	Lux Level (lumens/sqm)	A	Construction Site		1	Outdoor areas like store yards, entrance and exit roads	20	2	Platforms	50	3	Entrances, corridors and stairs	100	4	General illumination of work area	150	5	Rough work like fabrication, assembly of major items	150	6	Medium work like assembly of small machined parts	300	7	Fine work like precision assembly, precision measurementsetc.	700	8	Sheet metal works	200	9	Electrical and instrument labs	450	B	Office		1	Outdoor area like entrance and exit roads	20	2	Entrance halls	150	3	Corridors and lift cars	70	4	Lift landing	150	5	Stairs	100	6	Office rooms, conference rooms, library reading tables	300	7	Drawing table	450	8	Manual telephone exchange	200
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#### 8.8.17 Safety Labels

Safety Labels and Placement Guidelines to be provided Prior to operating the conveyor or any of the associated accessories or equipment, all safety markings, guards and warnings must be in place in accordance with governmental regulations and site specific requirements.

All safety labels should be bilingual. Some of safety labels are indicated below:

To be placed on removable guards to warn that operation of the machinery with guards removed would expose chains, belts, gears, shafts, pulleys, couplings, etc. which create hazards.



To be located on conveyors where there are exposed moving parts which must be unguarded to facilitate function, i.e. rollers, pulleys, shafts, chains, etc.



LOCATE ON INSPECTION DOOR (S)

General warning to personnel that a conveyor's moving parts, which operate unguarded by necessity of function, i.e. belts, rollers, terminal pulleys, etc., create hazards to be avoided; in particular, conveyors which stop and start by automatic control near operator work stations would use this label.

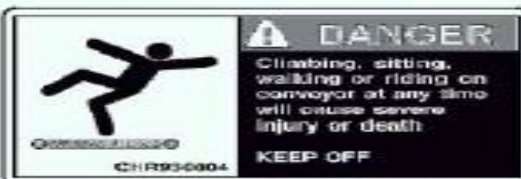


LOCATE AT ENTRANCE TO CONVEYOR

To be placed on removable guards to warn that operation of the machinery with guards removed would expose chains, belts, gears, shafts, pulleys, couplings, etc. which create hazards.

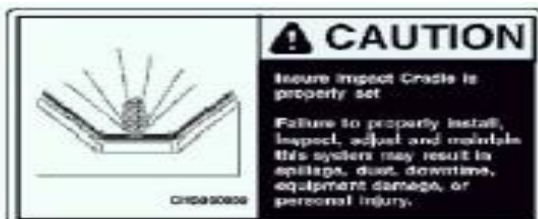


To be placed up to a maximum of 50' centers along the walkway side.



SPACE UP TO A MAXIMUM OF 50 FT CENTERS ( WALKWAY SIDES)

To be placed at entrances to enclosed areas which would expose personnel to operational or environmental hazards which should only be entered by trained and authorized personnel under specific conditions; Examples, lifting conveyors, transfer car aiseways, confined spaces, etc.





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<b>8.8.18</b>	<b>Dust Suppression During Construction Activities</b>
	<p>All contractors, whether engaged in civil or mechanical works, must implement effective dust suppression measures during all construction-related activities. This requirement is applicable to all construction to control dust emissions, safeguard workers' health, reduce environmental impact, and ensure compliance with relevant HSE (Health, Safety &amp; Environment) regulations.</p>
	<p>❖ Key Dust Suppression Measures During Construction Activities:</p> <ul style="list-style-type: none"> <li>● Regular water sprinkling on excavation areas, earthwork zones, and haul roads.</li> <li>● Limiting vehicle speed inside the construction site to reduce dust generation.</li> <li>● Routine inspection by the HSE team to verify dust control implementation and effectiveness.</li> </ul>



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### 9.0 HSE TRAINING AND AWARENESS

<b>9.1</b>	<b>HSE TRAINING PLANNING</b>																																		
1	All training programs to be carried out in a planned manner. Monthly/ Annual Training Calendar to be submitted to BHEL for approval and shall cover HSE Training requirements of all activities, workers, hazards applicable to the area(s) of work.																																		
2	Subcontractor shall nominate workers as per the schedule of specific training plan, failing which, penalty shall be imposed.																																		
3	One safety trainer is to be deployed by contractor/ agency, where total number of worker exceeds 200 nos workers.																																		
4	Training records of all workers along with attendance, signatures, faculty details etc. shall be maintained in soft/ hard copy as per provided formats.																																		
5	Each labour (workers) should undergo at least 0.5% of total man-hours worked in HSE training.																																		
<b>9.2</b>	<b>HSE INDUCTION TRAINING</b>																																		
1	All persons entering into project site shall be given HSE induction training by the HSE officer of BHEL /contractor before being assigned to work.																																		
2	The induction training shall be imparted through audio-visual medium, and shall be minimum of 1 complete day and as required.																																		
3	Evaluation to be carried out after training and training shall be repeated in case of failure.																																		
4	Safety Induction Card shall be printed by Subcontractor and provided to all trained workers. A Safety induction book shall also be printed and issued to each worker after induction training (Format for the same may be provided by BHEL).																																		
5	<p>In-house induction training subjects shall include but not limited to:</p> <table border="1"> <tr><td>A</td><td>Briefing of the Project details.</td></tr> <tr><td>B</td><td>Safety objectives and targets.</td></tr> <tr><td>C</td><td>Site HSE rules.</td></tr> <tr><td>D</td><td>Critical Safety Violations and consequences</td></tr> <tr><td>E</td><td>Site near miss, Major hazards and risks, aspects &amp; impact and mitigation measures related to the jobs to be performed by the person or group of person.</td></tr> <tr><td>F</td><td>First aid facility.</td></tr> <tr><td>G</td><td>Fire Fighting</td></tr> <tr><td>H</td><td>Emergency Contact No.</td></tr> <tr><td>I</td><td>Near Miss &amp; Incident reporting.</td></tr> <tr><td>J</td><td>Fire prevention and emergency response.</td></tr> <tr><td>K</td><td>Rules to be followed in the labour colony (if applicable)</td></tr> <tr><td>L</td><td>Use and maintenance of PPEs (i.e. Shoes/ Helmets/ Goggles/ Leg guard/ Apron etc.)</td></tr> <tr><td>M</td><td>Accident case studies.</td></tr> <tr><td>N</td><td>General traffic rules / Pedestrian rules.</td></tr> <tr><td>O</td><td>House keeping</td></tr> <tr><td>P</td><td>HSE &amp; Environmental compliance requirement.</td></tr> <tr><td>Q</td><td>No smoking/alcohol/gambling/fights/theft/damaged to property and cell phone use restrictions.</td></tr> </table>	A	Briefing of the Project details.	B	Safety objectives and targets.	C	Site HSE rules.	D	Critical Safety Violations and consequences	E	Site near miss, Major hazards and risks, aspects & impact and mitigation measures related to the jobs to be performed by the person or group of person.	F	First aid facility.	G	Fire Fighting	H	Emergency Contact No.	I	Near Miss & Incident reporting.	J	Fire prevention and emergency response.	K	Rules to be followed in the labour colony (if applicable)	L	Use and maintenance of PPEs (i.e. Shoes/ Helmets/ Goggles/ Leg guard/ Apron etc.)	M	Accident case studies.	N	General traffic rules / Pedestrian rules.	O	House keeping	P	HSE & Environmental compliance requirement.	Q	No smoking/alcohol/gambling/fights/theft/damaged to property and cell phone use restrictions.
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**GENERAL**

A	First aid facility.
B	Fire Fighting
C	Emergency Contact No.
D	Near Miss & Incident reporting.
E	Fire prevention and emergency response.
F	Accident case studies.
G	General traffic rules / Pedestrian rules.
H	House keeping
I	HSE & Environmental compliance requirement.
J	Rules to be followed in the labour colony (if applicable)
K	They must arrive fully dressed in safety wear & gear to attend the induction.
L	Any one failing to conform to this safety wear& gear requirement shall not qualify to attend.
M	Use and maintenance of PPEs (i.e. Shoes/ Helmets/ Goggles/ Leg guard/ Apron etc.)
N	They may only then be qualified to be issued with a personal I.D. card, for access to the work site subject to clearing the medical fitness test.
O	No smoking/alcohol/gambling/fights/theft/damaged to property and cell phone use restrictions.
P	Proper safety wear & gear must be issued to all the workers being registered for the induction (i.e. Shoes/Helmets/Goggles/Leg guard/Apron etc.)
Q	On completing attending contractor's in-house HSE induction, each employee shall sign an induction training form (format no. HSEP: 14-F03) to declare that he had understood the content and shall abide to follow and comply with safe work practices.
R	Each worker deployed by the agency shall be given 1-days induction training, which shall include the medical examination and instruction related to particular job, firefighting, first- aid and reporting of accidents. All employees shall be given safety training as per BOCW Act/Rules.
S	The contracting agency shall also impart job specific skill based safety training to all its employees (Minimum one day) on various related safety topics using internal/external safety professionals/consultants as per the matrix given below. However, training matrix list is not limited to topic mention below, more topic may add in future as decided by BHEL/ customer. Record of such trainings and attendance particulars shall be maintained in a register for ready reference to statutory authorities/engineer-in charge.

<b>SAFETY INDUCTED</b>	
<b>Name :</b>	
<b>Date :</b>	
<b>Sign By Trainer :</b>	

**ABOVE STICKER SHALL BE PASTED ON HELMET OF  
WORKERS AFTER SAFETY INDUCTION TRAINING**



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### TRAINING MATRIX

Name of topic	Executives	Super visors	Skilled Workmen	Other Workers
Safety Induction	Y	Y	Y	Y
Accident - Causes, factors, cost	Y	Y	Y	-
Industrial hazards & Accident Prevention	Y	Y	Y	-
Investigating, reporting, records	Y	Y	-	-
Personal Protective Equipment	-	Y	Y	Y
Construction Safety & Role of Supervisory personnel	-	Y	-	-
Permit to Work (PTW)	-	Y	Y	y
Statutory Provisions (BOCW Act/Rules, Factories Act 1948 etc.)	Y	Y	y	y
Material handling	-	y	Y	Y
Emergency Management	Y	Y	Y	-
Electrical Safety	-	Y	Y	-
Fire safety	Y	Y	Y	Y
First Aid & CPR (cardiopulmonary resuscitation)	-	Y	Y	Y (Selected)
Safety in Welding & Cutting	-	-	Y	-
Safety Audit	Y	Y	-	-
Safety in Lifting Tools & Tackles	-	Y	Y	y
Safety in Working at height	-	Y	Y	Y
Safety in Confined space work	-	Y	Y	Y
Defensive Driving	-	Y*	Y*	Y*

Note:

1. \*for construction vehicle operators, helpers & crane operators Y=YES
2. Subcontractor shall prepare a training plan/ matrix covering all hazards and implement the same after approval of BHEL.
3. It is to be ensured that every worker undergoes Job-Specific training once every 3 months.
4. Records of training programmes along with attendance shall be maintained by the subcontractor
5. Each worker to be issued a Card indicating the types of trainings undergone.





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<b>9.3</b>	<b>HSE TOOLBOX TALK</b>																
<b>1</b>	<p>HSE tool Box talk shall be conducted by frontline foreman/supervisor of contractor to specific work groups prior to the start of work and shall be randomly attended by contractor engineers/ officials. The agenda shall consist of the following:</p> <table border="1"> <tr> <td>A</td><td>Details of the job being intended for immediate execution.</td></tr> <tr> <td>B</td><td>The relevant hazards and risks involved in executing the job and their control and mitigating measures.</td></tr> <tr> <td>C</td><td>Specific site condition to be considered while executing the job like high temperature, humidity, unfavorable weather etc.</td></tr> <tr> <td>D</td><td>Recent non-compliances observed.</td></tr> <tr> <td>E</td><td>Appreciation of good work done by any person.</td></tr> <tr> <td>F</td><td>Any doubt clearing session at the end.</td></tr> </table>	A	Details of the job being intended for immediate execution.	B	The relevant hazards and risks involved in executing the job and their control and mitigating measures.	C	Specific site condition to be considered while executing the job like high temperature, humidity, unfavorable weather etc.	D	Recent non-compliances observed.	E	Appreciation of good work done by any person.	F	Any doubt clearing session at the end.				
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<b>2</b>	Tool box talk to be conducted before start of work in every shift.																
<b>3</b>	During toolbox talk, visual check-up of workers regarding health, any signs of fatigue, intoxication etc. shall be conducted and any suspected workers to be acted upon.																
<b>4</b>	Record of Tool box talk shall be maintained as per format no. HSEP:14-F04																
<b>9.4</b>	<p><b>PRE JOB BRIEFING (OJT- On Job Training)</b></p> <p>A separate documented daily pre job briefing must be conducted at the actual job/work site location with the supervisor and work crew, to cover working environment/conditions, safe work practices for the activities to be carried out, required PPE and review of the work package, JSA and permit requirements. Each crew member and the supervisor will sign off on the pre job briefing form, and form will be submitted to the HSE department at the end of each shift.</p>																
<b>9.5</b>	<b>TRAINING ON HEIGHT WORK</b>																
<b>1</b>	Training on height work shall be imparted to all workers working at height by in-house/external faculty at least once every 3 months.																
<b>2</b>	The training shall be of minimum 2-hour duration, through audio-visual medium and followed by evaluation. In case of poor scoring, training shall be repeated.																
<b>3</b>	<p>The training shall include following topics:</p> <table border="1"> <tr> <td>A</td><td>Proper use of PPEs - safety harness, lanyard, fall arrester, retractable fall arrester, life line, safety nets etc.</td></tr> <tr> <td>B</td><td>Provision of Secondary means of Fall Protection i.e. Retractable Fall Arrester (RFA), Safety Net etc.</td></tr> <tr> <td>C</td><td>Safe climbing through monkey ladders.</td></tr> <tr> <td>D</td><td>Inspection of PPEs.</td></tr> <tr> <td>E</td><td>Medical fitness requirements.</td></tr> <tr> <td>F</td><td>Mock drill on rescue at height.</td></tr> <tr> <td>G</td><td>Dos &amp; Don'ts during height work.</td></tr> <tr> <td>H</td><td>Accident case Studies</td></tr> </table>	A	Proper use of PPEs - safety harness, lanyard, fall arrester, retractable fall arrester, life line, safety nets etc.	B	Provision of Secondary means of Fall Protection i.e. Retractable Fall Arrester (RFA), Safety Net etc.	C	Safe climbing through monkey ladders.	D	Inspection of PPEs.	E	Medical fitness requirements.	F	Mock drill on rescue at height.	G	Dos & Don'ts during height work.	H	Accident case Studies
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<b>9.6</b>	<b>HSE TRAINING DURING PROJECT EXECUTION</b>																		
<b>1</b>	<p>Other HSE training shall be arranged by BHEL/ contractor as per the need of the project execution and recommendation of BHEL/ HSE committee of site. Specifically:</p> <table border="1"> <tr> <td><b>A</b></td><td><b>Regular on-the-job training for hazardous activities (Frequency: every 3 months) :-</b> The training shall cover all workers involved in hazardous activities including but not limited to height work , hot work, lifting &amp; rigging, confined space work, radiography, excavation, electrical work, storage/ preservation/ chemical handling, material handling, waste disposal etc.</td></tr> <tr> <td><b>B</b></td><td><b>Re-induction training (Frequency: every 6 months) :-</b> This training shall be conducted for each and every worker, and shall be a pre-requisite for renewal of Gate Pass/ ID card. For details, refer Clause 9.0.</td></tr> </table>	<b>A</b>	<b>Regular on-the-job training for hazardous activities (Frequency: every 3 months) :-</b> The training shall cover all workers involved in hazardous activities including but not limited to height work , hot work, lifting & rigging, confined space work, radiography, excavation, electrical work, storage/ preservation/ chemical handling, material handling, waste disposal etc.	<b>B</b>	<b>Re-induction training (Frequency: every 6 months) :-</b> This training shall be conducted for each and every worker, and shall be a pre-requisite for renewal of Gate Pass/ ID card. For details, refer Clause 9.0.														
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<b>2</b>	The training shall be of minimum 2-hour duration, through audio-visual medium and followed by evaluation. In case of poor scoring, training shall be repeated.																		
<b>3</b>	Contractor shall ensure a training calendar/ plan and nominate workers as per requirement for training.																		
<b>4</b>	<p>The topics of the HSE training shall be as follows but not limited to:</p> <table border="1"> <tr><td><b>A</b></td><td>Hazards identification and risk analysis (HIRA)</td></tr> <tr><td><b>B</b></td><td>Work Permit System</td></tr> <tr><td><b>C</b></td><td>Incident investigation and reporting</td></tr> <tr><td><b>D</b></td><td>Fire fighting</td></tr> <tr><td><b>E</b></td><td>First aid</td></tr> <tr><td><b>F</b></td><td>T &amp; Ps fitness and operation</td></tr> <tr><td><b>G</b></td><td>Electrical safety</td></tr> <tr><td><b>H</b></td><td>Welding, NDE &amp; Radiological Safety</td></tr> <tr><td><b>I</b></td><td>Storage, Preservation &amp; Material handling</td></tr> </table>	<b>A</b>	Hazards identification and risk analysis (HIRA)	<b>B</b>	Work Permit System	<b>C</b>	Incident investigation and reporting	<b>D</b>	Fire fighting	<b>E</b>	First aid	<b>F</b>	T & Ps fitness and operation	<b>G</b>	Electrical safety	<b>H</b>	Welding, NDE & Radiological Safety	<b>I</b>	Storage, Preservation & Material handling
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<b>5</b>	A matrix shall be maintained to keep an up-to-date record of attendance of training sessions carried out.																		
<b>6</b>	Each Skilled labour i.e. fitter, electrician, rigger, scaffolder, carpenter etc. will pass through the trade test (oral, written and/ or practical) conducted at site by the respective engineer. A pass sticker of qualified person to be marked on their ID Card/Gate Pass.																		
<b>7</b>	Training records of all workers along with attendance, signatures, faculty details etc. shall be maintained in soft/ hard copy.																		
<b>8</b>	HSE induction for Visitors: No visitors are allowed to visit the construction site without safety induction, mandatory PPEs and All official while on tour.																		
<b>9</b>	Safety Induction for all (Staff/ Engineers/ Sub-Contractor officials/ Supervisors): it is compulsory to provide safety induction and briefing about the site HSE Management systems, requirements and individual's roles and responsibility to carry out the activities in safe manner, before deploying them.																		



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<b>9.7</b>	<b>HSE PROMOTION-SIGNAGE, POSTERS, COMPETITION, AWARDS ETC</b>
1	Display of HSE posters and banners shall be installed as indicated in Annexure – B (HSE DISPLAYS)
A	Contracting agencies shall arrange for display of safety hoardings depicting suitable safety cartoons/messages/ cautionary notices at appropriate places of project site to remind the workers to perform their duties safely.
B	Apart from safety hoardings, each agency should maintain a safety bulletin board at all their work locations. Such safety bulletin boards should depict the activities being planned for the day, good practices, permit details etc.
C	Safety suggestion boxes shall be kept at each subcontractor's office at site for obtaining safety suggestions from the workers. Best suggestions should be implemented and may be rewarded suitably to encourage the workers for safety.
D	Safety awareness campaigns, competitions, plays, movie shows, songs etc. to be organized for workers at Site and Labour colony from time to time to enhance Safety Awareness
E	Contractor shall arrange appropriate HSE posters, banners, slogans in local / Hindi / English languages at work place, walkways, stair cases etc. understood by all workers. Posters should have minimum 60% graphic content and shall be weather proof.
2	<b>Display of HSE signage</b>  Appropriate HSE signage shall be displayed at the work area to aware workmen and passersby about the work going on and do's and don'ts to be followed. Signage for evacuation plan, emergency assembly location and route shall also be displayed.
3	<b>HSE Rewards &amp; Incentive Scheme</b>  Contractor shall arrange competition (i.e. Slogan, poster, essay, extempore etc.) on HSE topic time to time (i.e. National Safety Day, BHEL Day, World Environment Day etc.) and winner will be suitably awarded. Monthly safety shall be observed by BHEL/Customer. Agency site in charge along with his safety team and workers are to compulsory participate in these monthly safety meetings. Agency has to display safety poster/ banners at stores/office/workplace and need to be changed from time to time. No. of safety poster shall be decided by BHEL. Implement a reward & incentive scheme for workers & supervisors displaying adherence to safety principles. Such workers shall be felicitated in a monthly function, attended by Contractor top management and BHEL representatives. Suitable gift shall be given to such workers for encouragement.
4	<b>HSE Awareness Programme for Officials</b>  Contractor shall arrange monthly HSE awareness programme on different topics including medical awareness for all engineers/ supervisors / officials working at site. This programme can be part of progress/ safety review meetings
<b>9.8</b>	<b>PENALTY TRAINING: -</b>  The personnel/ worker involved in Safety Violations/ Incidents shall mandatory undertake penalty training pertaining to the violation/ incident. Penalty training shall be at least half-day duration.



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## 10.0 HSE COMMUNICATION AND PARTICIPATION

10.1	REPORTING AND INVESTIGATION OF ACCIDENTS AND DANGEROUS OCCURRENCES:	
1	Reporting of accidents: Notice of any accident (the prescribed format is annexed to the manual) to a worker at the building or construction site that	
	a.	Causes loss of life; or
	b.	Disables a worker from working for a period of 48 hours or more immediately following the accident; Shall forthwith be sent by Telegram, Telephone, Fax, Email or similar other means including special Telephone/ Messenger within four hours in case of fatal accidents and 72 hours in case of other accidents, besides the Engineer-in-charge, to
		I. The Regional Labour Commissioner (Central); II. The Board with which the worker involved was registered as a beneficiary; III. Director General of Building and other construction (regulation of employment and conditions of service) Act/Rules; and IV. The next of kin or other relative of the worker involved in the accident; V. The Regional Labour Commissioner (Central); VI. The Board with which the worker involved was registered as a beneficiary; VII. Director General of Building and other construction (regulation of employment and conditions of service) Act/Rules; and VIII. The next of kin or other relative of the worker involved in the accident;
2	Further, notice of accident shall be sent in respect of an accident which	
	a.	Causes loss of life; or
	b.	(a) Disables the injured worker from work for more that 10 days to (1) The Officer-in-charge of the nearest Police Station; (2) The District Magistrate or, if the District Magistrate by order so desires, to (3) The Sub-Divisional Magistrate;
3	Where any accident causing disablement that subsequently results in death, notice thereof in writing of such death, shall be sent the Authorities mentioned above within 48 hours of such death.	
4	In case of an accident causing minor injury, first aid shall be administered and that resulting in disability of 48 hours or more, the injured worker shall be given first aid and immediately transferred to a Hospital or other place for medical treatment.	



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5	All near-miss accidents shall be reported to BHEL Engineer and Safety Officer as per prescribed format.
6	Reporting of dangerous occurrences: The following classes of dangerous occurrences shall be reported to the Inspector having jurisdiction, whether or not any disablement or death caused to the worker, namely:
7	Collapse or failure of lifting appliances, or hoist, or conveyors, or similar equipment for handling of building or construction material or breakage or failure of rope, chain or loose gears; or overturning of cranes used in construction work;
8	Falling of objects from height;
9	Collapse or subsidence of soil, any wall, floor, gallery, roof or any other part of any structure, platform, staging, scaffolding or means of access including formwork;
10	Contract work, excavation, collapse of transmission;
11	Explosion of receiver or vessel used for storage at a pressure than atmospheric pressure, of any gases or any liquid or solid used as building material;
12	Fire and explosion causing damage to any place on construction site where building workers are employed;
13	Spillage or leakage of any hazardous substance and damage to their container;
14	Collapse, capsizing, toppling or collision of transport equipment;
15	Leakage or release of harmful toxic gases at the construction site;
16	In case of failure of a lifting appliance, loose gear, hoist or building and other construction work, machinery and transport equipment at a construction site, such appliances, gear, hoist, machinery or equipment and the site of such occurrence shall, as far as practicable, be kept undisturbed until inspected by the Authorities;
17	Every notice given for fatal accidents shall be followed by a written report to the concerned Statutory Authorities and the Engineer In-charge in the specified Form annexed as Schedule, under acknowledgement.
18	Incident / injury statistics shall be maintained by all agencies cause wise.
19	Investigation of accidents and dangerous occurrences
20	Besides reporting, it shall be the responsibility of the contractor to constitute a team (members as per the gravity of the incident) of responsible person to thoroughly investigate all incidents involving near-miss accidents, lost-time and reportable accidents and dangerous occurrences with a view to finding out the causative factor, taking remedial measures and fixing responsibility, and make a copy of the investigation report along with action-plan, specifying a definite time-frame for implementation of the findings, available to the Engineer in-charge forthwith.



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<b>10.2</b>	<b>HSE INCIDENT REPORTING, INVESTIGATION &amp; CORRECTIVE ACTION</b>	
<b>1</b>	The contractor shall submit report of all incidents, fires and property damage etc to the Engineer immediately after such occurrence, but in any case not later than 24 hours of the occurrence. Such reports shall be furnished in the manner prescribed by BHEL. (Refer HSE procedure for incident investigation, analysis and reporting for details)	
<b>2</b>	In addition, periodic reports on safety shall also be submitted by the contractor to BHEL from time to time as prescribed by the Engineer. Compiled monthly reports of all kinds of incidents, fire and property damage to be submitted to BHEL safety officer as per prescribed formats.	
<b>3</b>	HSE incidents of site shall be reported to BHEL site Management as per Procedure for Incident Investigation and Reporting in format no. HSEP:14-F15. Corrective action shall be immediately implemented at the work place and compliance shall be verified by BHEL HSE officer and until then, work shall be put on hold by Construction Manager.	
<b>4</b>	All incidents (near misses, property damage, first aid cases, minor, major and fatal incidents) shall be reported to BHEL as they happen immediately through SMS and Hard/Soft copy as per Format No. HSEP:14-F15	
<b>5</b>	All incidents including near miss, minor, major and fatal incidents shall be recorded	
<b>6</b>	All incidents shall be investigated for Root Causes and corrective actions ensured to prevent recurrence.	
<b>7</b>	Work shall be put on hold in the area till corrective actions are verified by BHEL	
<b>8</b>	The Root Cause Analyses and Corrective actions taken shall be recorded	
<b>10.3</b>	<b>HSE EVENT REPORTING</b>	
<b>1</b>	Important HSE events like HSE training, Medical camp etc. organized at site shall be reported to BHEL site management in detail with photographs for publication in different in-house magazines.	
<b>2</b>	Celebration of important days like National Safety Day, World Environment Day etc. shall also be reported as mentioned above.	
<b>10.4</b>	<b>MONTHLY HSE REPORTING</b>	
<b>1</b>	All routine and non-routine HSE activities shall be reported to BHEL on monthly basis by the contractor. The reporting medium can be hard/soft as per BHEL requirement and format for the same shall be provided to the contractor.	
<b>2</b>	The period of reporting shall be 25 <sup>th</sup> of the preceding month to 24 <sup>th</sup> of the present month and shall be submitted by the end of the calendar month.	
<b>3</b>	Report shall include good quality image or in pdf format for HSE Activities.	
<b>10.5</b>	<b>HSE COMMUNICATION</b>	
<b>10.5.1</b>	<b>MONTHLY &amp; WEEKLY HSE REPORTING</b>	
	<b>A</b>	HSE information of Site shall be reported monthly and weekly through Monthly/Weekly Site HSE report (MSHR) as per format no. (HSEP:14-F05).
	<b>B</b>	Weekly, Monthly safety meeting conducted by BHEL/Customer are to be attended compulsorily by site in charge, senior area engineers, safety officers.
	<b>C</b>	In case Site-In-charge is not available on meeting day, next in command has to attend meetings.





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	<b>D</b>	Preparation of MSHR shall be done as per" Guidelines for filling up Monthly HSE report"
	<b>E</b>	The period of reporting shall be 25 <sup>th</sup> of the preceding month to 24 <sup>th</sup> of the present month and shall be submitted to Regional HQ by the end of the calendar month.
	<b>F</b>	<p>The following documents and reports are to be maintained at site, but not limited to:</p> <ul style="list-style-type: none"> <li>• HSE induction sign in roster</li> <li>• Pre-employment Health Record Form 31-A.</li> <li>• HSE Inspections and audit reports</li> <li>• Environmental monitoring documentation</li> <li>• Method Statements and JSA</li> <li>• Training records</li> <li>• HSE corrective action tracking sheets</li> <li>• 3<sup>rd</sup> party inspection report of crane, lifting tools &amp; tackles</li> <li>• PPE inspections</li> <li>• First report of incident</li> <li>• Incident investigation reports</li> <li>• Chemical inventory documentation</li> <li>• MSDS of chemicals</li> <li>• PTW and separate permits of critical activities</li> <li>• Vehicle and equipment inspections</li> <li>• Toolbox talk</li> <li>• Pre job briefings</li> <li>• Trade test details</li> <li>• Safety statistics monthly</li> <li>• Noise monitoring reports</li> <li>• Written safety violations</li> <li>• HSE committee and other MOM</li> <li>• HSE Plan &amp; Emergency Plan</li> <li>• Weekly &amp; Monthly HSE report</li> </ul>
<b>10.5.2</b>	<b>INCIDENT REPORTING</b>	
<b>1</b>	HSE incidents of site shall be reported to Regional HQ and PS-HQ as per HSE procedure for incident investigation, analysis and reporting.	
<b>2</b>	Corrective action shall be immediately implemented at the work place and compliance shall be verified by HSE officer until then work shall be put on hold by Construction Manager.	
<b>10.5.3</b>	<b>HSE EVENT REPORTING</b>	
<b>1</b>	Important HSE events like HSE training, Medical camp etc. organized at site shall be reported to PS Regional HQ in detail with photographs for publication in diff house magazines.	



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<b>2</b>	Celebration of important days like National Safety Day, World Environment Day etc. shall also be reported as mentioned above.
<b>10.5.4</b>	<b>DAILY HSE ACTIVITY REPORTING</b> Daily HSE activities shall be reported by contractor to BHEL as per Format No. HSEP:14-F31A
<b>10.5.5</b>	<b>HSE SUGGESTIONS</b> All workers and employees shall be encouraged to provide suggestions for improvement in Health, Safety & Environment performance at site. The suggestions shall be recorded in a "Suggestions Register". Suggestions found suitable for implementation shall be implemented and recognition / reward to be given to the submitter. Suggestion register to be maintained & placed at site and Labour colony. This suggestion register shall be reviewed on periodic basis.
<b>10.5.6</b>	<b>COMMUNICATON FROM BHEL/CUSTOMER</b> All HSE related communication from BHEL, customer (2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST OF CSPGCL) / external statutory and regulatory agencies to be handled on priority. Same to be recorded and issues to be resolved in expeditious manner.



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## 11.0 SAFETY DURING WORK EXECUTION

11.1	<p><b>HSE SYSTEMS AND PROCEDURES</b></p> <p><b>Safety during work execution shall be ensured by following appropriate Safety Rules, providing adequate resources, deploying competent and trained manpower, regular training &amp; inspection and non-conformity resolution. Main aspects are indicated as under:</b></p> <p>BHEL Power Sector HSE Management System (HSEMS) shall be referred for carrying out HSE activities at site. Contractor shall get familiar with and follow the HSEMS documents provided by BHEL, as required for implementation of HSE, which are listed as follows:</p> <p><b>BHEL POWER SECTOR HSE MANAGEMENT SYSTEM</b></p> <p>The Systems and procedures of BHEL Power Sector HSE Management System shall be implemented by the subcontractor, including:</p> <ul style="list-style-type: none"> <li>• HSE PROCEDURE FOR REGISTER OF OHS HAZARDS AND RISKS</li> <li>• HSE PROCEDURE FOR REGISTER OF ENVIRONMENTAL ASPECTS AND IMPACTS</li> <li>• HSE PROCEDURE FOR REGISTER OF REGULATIONS</li> <li>• HSE PROCEDURE FOR TRAINING AND AWARENESS</li> <li>• HSE PROCEDURE FOR EMERGENCY PREPAREDNESS AND RESPONSE PLAN</li> <li>• HSE PROCEDURE FOR PERMIT TO WORK</li> <li>• HSE INSPECTION AND OTHER FORMATS</li> <li>• HSE OBSERVER APP</li> </ul> <p><b>Note:</b></p> <ol style="list-style-type: none"> <li>I. BHEL reserves the right to revise/ update these systems and procedure as per requirement to address any changing HSE needs             <ol style="list-style-type: none"> <li>a. BHEL will provide hard / soft copies of applicable HSE Procedures, Work Permits (Must be raised through HSE Observer app), Operational Control Procedures, Inspection/ Other Formats etc. that are necessary for ensuring safe work to the successful Contractor at Site. It is the responsibility of the subcontractor to ensure availability of these documents before commencing work at site.</li> </ol> </li> <li>II. The subcontractor can get soft copies of these documents from respective Region SCT/ HSE for reference. The signed hard copies of the same shall not be required to be submitted along with tender document</li> <li>III. Subcontractor shall use the Digital (Web &amp; App-Based) HSE management Software Systems provided by BHEL whenever provided. In case not provided, hard copy systems will continue to be used. All information technology resources (Computers, mobile phones, mobile data, internet access etc.) for the use of such systems shall be ensured by the subcontractor.</li> </ol>
A	<p><b>HSE Procedures:</b></p> <p>All HSE Procedures as referred in various sub-clauses of this Section as given in Annexure – 3 ( LIST OF HSE PROCEDURES).</p>



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### B

#### OPERATIONAL CONTROL PROCEDURES

In order to reduce the risk associated with hazardous activities, all applicable OCPs (Operational control procedures) will be followed by contractor as per BHEL instructions, outcomes of Hazard Analysis & other requirements. This will be done as part of normal scope of work. Illustrative list of reference OCPs is given below.

#### LIST OF REFERENCE OCPs

SL. NO	TOPIC	SL. NO	TOPIC
0	General Safety	31	Storage in open yard
1	Safe Handling of chemicals	32	Drilling, reaming and grinding(machining)
2	Electrical safety	33	Stress relieving
3	Energy conservation	34	Hydraulic test
4	Welding and gas cutting operation	35	Trial run of rotary equipment
5	Fire safety	36	Batching
6	Use of hand tools	37	Cable laying/tray work
7	First aid	38	Spray insulation
8	Food safety at canteen	39	Compressor operation
9	Safety in Use of cranes	40	Gas distribution test
10	Storage and handling of gas cylinders	41	Cleaning of Hot well / Deaerator
11	Manual arc welding	42	Electrical maintenance
12	Use of helmets	43	O&M of control of AC plant & system
13	Good house keeping	44	Material preservation
14	Safe excavation	45	Electro-resistance heating
15	Working at height	46	Blasting
16	Safe Filling of hydrogen in cylinder	47	Transformer charging
17	Illumination	48	Handling of battery system
18	Handling and erection of heavy metals	49	DG set
19	Safe Acid cleaning	50	Sanitary maintenance
20	Safe Oil flushing	51	Piling rig operation
21	Safe Alkali boil out	52	Passivation
22	Steam blowing	53	EDTA Cleaning
23	Working in confined area	54	Chemical cleaning of Pre boiler system
24	Operation of passenger lift, material hoists & cages	55	Boiler Light up
25	Vehicle/ Crane maintenance	56	Rolling and Synchronization
26	Radiography	57	Loading of Unit
27	Waste disposal	58	Air compressor



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28	Handling & storage of mineral wool	59	Hydra/ Farana Operation
29	Working at night	60	Duct Pre-assembly
30	Computer operation		
61	Resumption of construction activities after lockdown and prevention of coronavirus infection during site operations.		
61 A	Prevention of Covid-19 infection in labour colony		
62	Truss/ Structure fit-up and alignment		

However, these are only reference OCPs and following shall be ensured with information of BHEL:

- a. The cost implications to implement these OCPs shall be borne by the contractor
- b. The reference OCPs shall be suitably modified by contractor as per specific requirements.
- c. In case any other OCP is found to be applicable during the execution of work at site, then contractor will prepare and follow those as well, within quoted rate.

## 11.2 WORK PERMIT SYSTEM

1

The following activities shall come under Work Permit System

- I. General Work Permit
- II. Work at Height Permit
- III. Burning/ Welding/ Hot Work Permit
- IV. Confined Area Work Permit Excavation Permit
- V. Radiation/ Radiography Permit
- VI. Heavy / Complex / Critical Lifting Activity Permit
- VII. Night / Holiday Work Permit
- VIII. Material Loading / Unloading Permit
- IX. Grating, Safety Net, Safety Facility Removal Permit
- X. Lockout / Tag out Permit – (viz. Live Electrical Maintenance etc.)
- XI. Beam / truss/ duct/ structure alignment permit
- XII. Drilling & Blasting Permit
- XIII. Winch Operation Permit
- XIV. Batching Plant Operation Work Permit
- XV. Elect Motor Operated Sky Climber Operation Work Permit
- XVI. Abrasive Shot Blasting Permit
- XVII. Scaffolding Erect & Dismantle Permit
- XVIII. Construction Db Installation Work Permit

2

HSEP12: HSE Procedure for Work Permit System” Rev-01 shall be followed while implementing permit system. Where customer is having separate Work Permit System the same shall be followed.

3

The Work Permit Formats shall be provided by BHEL at Site. It is the responsibility of the subcontractor to ensure their availability.

4

The above list is not exhaustive. BHEL reserves right to introduce additional Permits or modify requirements for usage of existing Permits. The conditions for using the Permit are specified in the Format (General Requirements).



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5	Where customer is having separate Work Permit System the same shall be followed in conjunction / merged to ensure all activities and checks are covered in all systems.
6	Details of working Group to be attached along with work permit request
7	All the Permits along with JSA/HIRA must be initiated by Agency Execution Team
8	Permit applicant shall apply for general work permit and other permits as referenced above of particular work activity at particular location before starting of the work with Method Statement and HIRA/Job Hazard Analysis.
9	In case any Permit requirement is not available, work will not be allowed/ stopped till it is made available.
10	Signatory shall physically visit the area of work and ensure all required safe guard before signing the work permit.
11	Signatories shall periodically visit the area to confirm the availability of required safeguards throughout the currency of Permit
12	All Permit signatory (including contractor's package in-charge and safety officer) shall check that all the control measures necessary for the activity are in place and issue the permit to the permit holder. Only then the permit shall be issued.
13	Permit holder shall implement and maintain all control measures during the period of permit. He will close the permit after completion of the work. The closed permit shall be archived in HSE Department of site.

11.3

### SAFETY DURING HAZARDOUS OPERATIONS

The philosophy of hierarchy of controls as below shall be followed







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	<p>It shall be ensured that there are multiple protections against any accident/ incident. For example, for height work there shall be safe platforms and walkways, Safety Nets and Lifelines for hooking double lanyard Safety harness by workers.</p> <p>Monitoring and modifying worker behavior shall be part of ensuring safety. All personnel should be competent and trained for the job.</p> <p>Brief Safety guidelines for various hazardous activities are indicated below, besides the mandatory requirements based on Hazard Identification studies, HSE Procedures, Operational Control Procedures, Work Permits, applicable Indian Standard Codes and other provisions detailed in this document. Constant supervision at all times to be maintained by Execution &amp; Safety Team to ensure implementation of these provisions.</p>
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<b>11.4</b>	<b>POWER SUPPLY &amp; UPKEEP OF INSTALLATION –</b>
<b>1</b>	Only licensed person shall maintain and operate power installations.
<b>2</b>	All distribution boxes shall be locked and the key controlled by site management of concerned contractor.
<b>3</b>	Electrical appliance shall have proper earthing and for appliances equal to & more than 415V shall have two separate earthing as per IS: 3043:1987
<b>4</b>	All temporary connection should be provided through 30mA ELCB/RCCB using 3 core double insulated cable and only 3 pin industrial plug top will be used for connection.
<b>5</b>	The working condition and sensitivity of ELCB/RCCB shall be checked periodically.
<b>6</b>	All fuses and fuse wires shall be of standard size and rating.
<b>7</b>	All power supplies through cables shall be underground or overhead via insulated j hook over pole with height > 3mtrs.
<b>8</b>	TAG IN/ TAG OUT must be in force in Switch Room and all Distribution Boxes for live power line. The authorized person's name and contact no shall be displayed

<b>11.5</b>	<b>WORK AT HEIGHT:</b>
<b>1</b>	Height work is defined as any activity carried out 2 m above ground/ excavation
<b>2</b>	All height workers to be trained in height work and shall be tested and cleared in vertigo test. No untrained/ medically checked person shall be allowed to work at height.
<b>3</b>	Height workers shall be identifiable through Gate Pass and helmet marking.
<b>4</b>	All height workers shall wear double lanyard safety harness. The primary lanyard is never unhooked until the secondary lanyard is secure. Under no circumstances, worker to have both lanyards unhooked while at height.



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11.6	<b>PRECAUTIONS AGAINST THE FALL OF MATERIALS AND PERSONS AND COLLAPSE OF STRUCTURE: -</b>
1	Adequate precautions should be taken such as the provision of fencing, or barriers to protect any person who might be injured by the fall of materials, or tools or equipment being raised or lowered. Cradle may be used for lifting materials or men- however this shall be made of MS angles and flats only and duly certified by the HSE officer. Operators may also use bags or box or sound ropes for lifting small tools.
2	Guardrails (including scaffolding) erected over/adjacent working areas must have the guardrails screened (opening < 0.5), to prevent material from falling outside the platform/decking.
3	Guardrails must be able to withstand a 200 pound force exert in any one direction.
4	Where necessary to prevent danger, guys, stays or supports should be used or other effective precautions should be taken to prevent the collapse of structures or parts of structures that are being erected, maintained, repaired, dismantled or demolished.
5	All openings through which workers are liable to fall should be kept effectively covered or fenced and indicated in the most appropriate manner. As far as practicable, guard-rails and toe-boards in accordance with Indian laws and regulations as depicted below:
6	<p><b>Guardrails and toe-board/barricades and sound platform conforming to IS:4912-1978 should be provided.</b></p> <p style="text-align: center;"><b>Guard Rail System</b></p> <p style="text-align: center;">Maximum Posts 8 ft. Spacing</p> <p>3.5"+ Toeboard Height</p> <p>42"± 3" Toprail Height</p> <p>15"+ Midrail Height</p> <p>30"+ Midrail Height</p> <p>1/4"Max. Gap between Floor &amp; Toeboard</p>
7	Use of retractable fall arrestor (as Second Line of Protection) to be ensured in critical/ tricky areas
8	Safety Net as per IS: 11057:1984 should be used extensively for prevention/ arrest of men and materials falling from height. The safety nets shall be fire resistant, duly tested and shall be of ISI marked and the nets shall be located as per site requirements to arrest or to reduce the consequences of a possible fall of persons working at different.
9	Reaching beyond barricaded area without lifeline support, moving with support of bracings, walking on beams without support, jumping from one level to another, throwing objects and taking shortcut must be discouraged.



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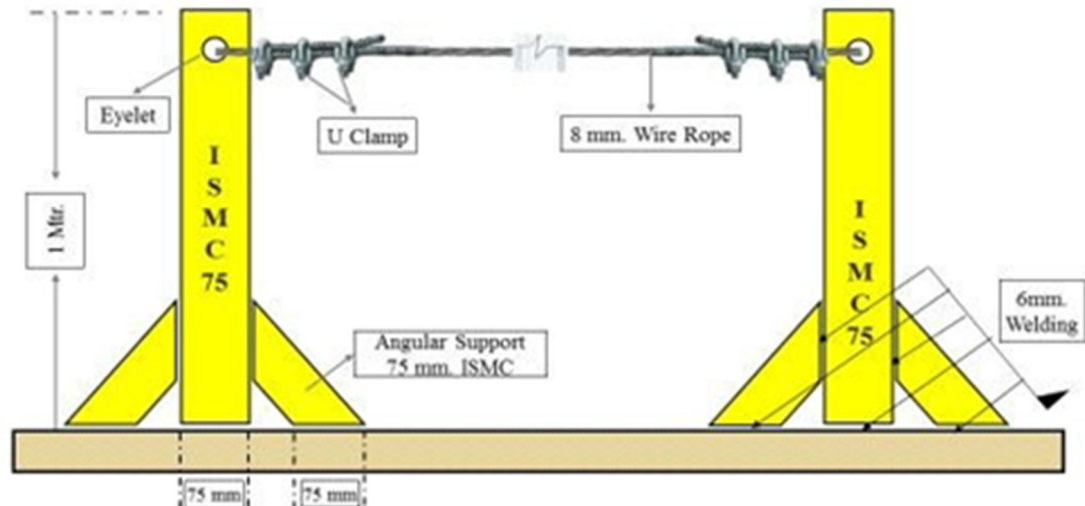
<b>10</b>	Use of Rebar steel for making Jhoola and monkey-ladder (Rods welded to vertical or inclined structural members), temporary platform etc. must be avoided. Jhoola should be made with angles and flats and tested like any lifting tools before use.
<b>11</b>	Monkey Ladder should be properly made and fitted with cages.
<b>12</b>	Lanyard must be anchored always and in case of double lanyard, each should be anchored separately.
<b>13</b>	In case of pipe-rack, persons should not walk on pipes and walk on platforms only.
<b>14</b>	In case of roof work, walking ladder/ platform should be provided along with lifeline and/ or fall arrestor.
<b>15</b>	Empty drums must not be used.
<b>16</b>	For chimney or structure painting, both hanging platform and men should be anchored separately to a firm structure along with separate fall arrestor. Rope ladder should be discouraged.
<b>17</b>	<p>Guardrails shall be provided to protect workers from falling from elevated work places. The rails are generally made of MS pipes of suitable dia. Rebar shall not be used for any handrails, ladder or cover purpose. Wherever the guard-rails and toe-boards cannot be provided:</p> <ul style="list-style-type: none"> <li>(a) adequate safety nets or safety sheets shall be erected and maintained; or</li> <li>(b) adequate safety harnesses shall be provided and used and or</li> <li>(c) adequate fall arrestor shall be provided and used.</li> </ul> <p>As mentioned under PPE clause, all these PPEs shall be defect free and regularly inspected for any defect. The full body safety harness shall have double lanyard only with max 2 m length.</p> <p>The monkey ladders shall have sufficient fall arrestors. Adequate lifelines of 8mm steel wire rope shall be provided across the work area.</p> <p>The HSE officer shall recommend appropriate PPEs after analyzing hazards and risks involved.</p> <p>Wherever necessary, life-line (8mm SS) and fall arrestor along with Polyamide rope or Retractable lifeline should be provided. Lifelines shall be connected to independent &amp; rigid structure. Lifeline is not to be installed on a structure which is temporary/ hanging for example a load being aligned.</p>

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**DIAGRAM : LIFELINE POST**



- The Support at Vertical Post shall be fixed at End-to-End. The maximum length of one end to another end shall be 18 Mtrs.
- If the length of Lifeline is more than 18 Mtrs. then Intermediate Vertical Post(s) are to be used. Such Intermediate Post(s) will act as supports and the Lifeline Rope should simply pass through the eyelets (holes) of such supports without being anchored.
- The Lifeline need not be wrapped/clamped to any Intermediate Post.
- Such Intermediate Posts must be used at an interval of every 18 Mtrs.
- The Post(s) in which the horizontal Lifeline is to be installed should be capable of sustaining a tensile stress of 5000 Lbs.(2268 Kgs.).
- In a horizontal Lifeline installation maximum allowable sagging is 500-600 NM.
- For a Single Spun Lifeline no more than 2 persons are allowed to work; for more than two workmen another Lifeline should be installed.
- Horizontal Lifeline should be so installed that it does not impede safe movement of workers.
- All the installation work must be carried out by competent persons with adequate knowledge.

#### 11.7 SAFETY NETS: -

1	All safety net systems shall meet the requirements of Indian Standard (IS: 5175)
2	Double Net System with one higher mesh size and lower mesh size to be used whenever work at height is in progress. Safety nets to be of 02 layers.
3	Safety net mesh openings shall have a maximum size of 6 inches' x 6 inches and be secured at each crossing to prevent elongation of the opening. All nets must meet IS: 5175 standard.
4	Safety nets must be installed with sufficient clearance to prevent contact with the surface or structures under them.
5	Safety nets shall be installed as close as possible to the working level but in no case more than 25 feet below the working level.
6	The safety nets shall extend out at least 8 ft. from the side of the open edge.
7	Material, equipment and other items that fall into the net are to be promptly removed.
8	Safety nets are to be inspected before use and then daily for wear or damage caused by falling materials.
9	Safety net installation shall be inspected by a competent person.



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10	Safety nets must be installed below the working decks of the super structure for protection from falls of personnel and material.
11	<p>Safety nets and safety net installations must be drop-tested at the jobsite:</p> <ul style="list-style-type: none"> <li>• After initial installation and before being used.</li> <li>• Whenever relocated.</li> <li>• After major repair.</li> <li>• At 6-month intervals if left in one place.</li> </ul>
12	The drop test consists of a 400-pound bag of sand 28-32 inches in diameter dropped into the net from the highest surface at which employees are exposed to fall hazards, but not from less than 42 inches above that level.
13	When the employer can demonstrate that it is unreasonable to perform the drop-test described above, the employer or a designated competent person shall certify that the net and net installation have sufficient clearance and impact absorption by preparing a certification record prior to the net being used as a fall protection system. The certification must include:
14	Identification of the net and net installation.
15	Date that it was determined that the net and net installation were in compliance.
16	Signature of the person making the determination and certification.

11.8	<p><b>NIGHT SHIFT WORK EXECUTION/ ACTIVITY</b></p> <p><b>Night shift operation shall be avoided to the extent possible, so shall be any complicated or heavy job. However, prior administrative approval shall be obtained from BHEL for such operation and a detailed work plan developed. The following shall be ensured:</b></p>
1	Adequate illumination along access, work area and egress
2	Supervision
3	Issue of strict instruction to workmen not to stray away from the work area and earmarked approach
4	Non-deployment of women workforce
5	Non-deployment of fatigued workforce
6	Vacating the area immediately on completion of the job
7	Informing Medical Centre and ambulance in advance

11.9	<b>SAFETY WHILE WORKING AT HEIGHTS</b>
1	All working platforms, ways and other places of construction work shall be free from accumulations of debris or any other material causing obstructions and tripping.
2	Every opening at elevation from ground level through which a building worker, vehicle, material equipment etc. may fall at a construction work shall be covered and/or guarded suitably by the contractor to prevent such falls.



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3	Wherever the workers are exposed to the hazards of falling from height, the contractor shall provide full harness safety belts fitted with fall arresting systems to all the employees working at higher elevations and life line of 8 mm diameter wire rope with turn buckles for anchoring the safety belts while working or moving at higher elevations.
4	Safety nets shall also be provided for saving them from fall from heights and such equipment should be in accordance with BIS standards.
5	Wherever there is a possibility of falling of any material, equipment or construction workers while working at heights, a suitable and adequate safety net should be provided.
6	The safety net should be in accordance with BIS Standards.
7	The contractor shall provide standard prefabricated ladders on the columns where the workers are required to use them as an access for higher elevations till permanent staircase is provided.
8	The workers shall be provided with safety belts fitted with suitable fall arresting system (fall arrestors) for climbing/getting down through ladders to prevent fall from height.
9	The only permissible personal fall arrest system is an industry approved safety harness. Employees can use positioning belts with Two-D ring attachment points as long as they are used in conjunction with a safety harness. Safety harnesses must be secured to an overhead object of substantial capacity capable of supporting weight. In order to accomplish this and ensure 100% protection, the worker may need to use two lanyards. The primary lanyard is never unhooked until the secondary lanyard is secure.
10	Secondary line of protection from fall (i.e. Retractable Fall Arrestor, Safety Net etc.) shall be provided during Working at Height.
11	<b>For execution of any height work, strict supervision of work in presence of agency safety officer/ package in charge/ BHEL Official is must and mandatory.</b>
11.9.1	<b>WORKING PLATFORMS</b>
1	Working platforms, gangways and stairways shall be so constructed wherever required irrespective of any height for execution to avoid any near miss at site.
2	Every opening in the floor or a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 90 cm.
3	Suitable scaffolds shall be provided for workmen for all works that cannot safely be done from the ground, or from solid construction except in the case of short duration of work which can be done safely from ladders. The scaffolds shall be duly checked and tagged by certified scaffolding inspector.
4	Safety related to chutes (i.e. used for removal of material shall be closed on all sides except their opening during construction & use) shall be ensure during execution / erection.





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<b>11.10</b>	<b>SAFETY IN THE USE OF HAND TOOLS AND POWER-OPERATED TOOLS</b>
<b>11.10.1</b>	<b>General provisions</b>
<b>1</b>	All hands and power tools and similar equipment, shall be maintained in safe condition.
<b>2</b>	All job-made/field-made tools are prohibited, unless designed with engineered stamp.
<b>3</b>	When power operated tools are designed to accommodate guards, they shall be equipped
<b>4</b>	with such guards, when in use;
<b>5</b>	Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains and other reciprocating, rotating or moving parts of the equipment shall be similarly guarded;
<b>6</b>	Personnel using hand and power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapours, or gases shall be provided with the particular personal protective equipment necessary to protect them from the hazards;
<b>7</b>	All hand-held powered platen sanders, grinders, grinders with wheels of 5 cm or less, routers, planers, laminate trimmers, nibblers, shears, scroll saws and jigsaws with blade shanks of 0.5 cm wide or less shall be equipped with only a positive on-off control.
<b>8</b>	All hand-held powered drills, tappers, fastener drivers, horizontal, vertical or angle grinders with wheels greater than 5 cm in diameter, disc sanders, belt sanders, reciprocating saws, saber saws and other operating powered tools shall be equipped with a momentary contact on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.
<b>11.10.2</b>	<b>WALKWAYS AND PLATFORMS</b>
	Walkways and platforms, at least two in each orthogonal direction, shall be provided inside the tower at distribution pipe level. Walkways shall be at least 1000mm wide with 50 mm (minimum) safety toes along each edge. These walkways and platforms shall provide safe and clear access to all sprayers and all distribution pipes. A FRP platform of 1500 mm clear width shall be provided around the tower periphery which will be a means of access to next walkways and all end valves. Access ways shall be clear of all obstructions such as distribution pipe support beams, drift eliminator support beams, etc. The walkways shall be provided with transverse slots or other opening which will permit the free passage of air and water.
<b>2</b>	Contractor shall provide necessary approach & Platforms for all the instruments required during commissioning and testing. These approach platforms shall be provided to meet all required safety norms and these shall be of permanent nature.



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<b>11.11</b>	<b>SCAFFOLDING SAFETY</b>
<b>11.11.1</b>	<b>SCAFFOLDS</b>
	The contractor shall take all precautions to prevent any accidental collapse of scaffolding or fall of persons from scaffolding. The contractor should ensure that scaffoldings are designed by a competent person and its erection 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. The material used for scaffold should conform to the BIS / International standards.
<b>1</b>	Every Scaffolds in their component shall be adequate construction, made of sound material & free from any defect and safe for the purpose for which it is intended for use.
<b>2</b>	The safe and efficient erection, use, dismantling, and storage of scaffolds, ladders and elevated work platforms are considered important objectives in maintaining a safe work environment. This procedure provides the guidelines for erection, use, dismantlement, and storage of scaffolding and elevated work platforms.
<b>3</b>	There is no such thing as a temporary scaffold. All scaffolds must be erected and maintained to conformed standard (IS 3696 & IS 4014).
<b>4</b>	The Scaffold Tagging defines satisfactory, incomplete or defective scaffolds.
<b>5</b>	Management must ensure or have each worker who performs work while on a scaffold trained by a person qualified in the subject matter to recognize the hazards associated with the type of scaffold being used and to understand the procedures to control or minimize those hazards.
<b>6</b>	Agency has to engage and retain trained scaffolding inspectors from statutory authorities/institutes in sufficient numbers right from job starting till job completion.
<b>7</b>	Scaffolding inspectors have to issue fitness certificates for each scaffolding and apply tags for safe use for respective job application to take care of load, heights etc.
<b>8</b>	Scaffolding pipes, clamps, safety nets, floor grills for working platforms are to be made of good quality with proper certifications as per IS Codes.
<b>9</b>	Scaffolding's to be used by sub-agencies should be of good quality
<b>10</b>	All Indian Standard (IS Code) related to Scaffolding Safety shall ensure/implemented during execution.
<b>11</b>	No Scaffold shall be erected, added, altered or dismantled except under the supervision of HSE Official.
<b>12</b>	In case of Scaffolding can't be used during execution, necessary warning notice/ scaffolding Tag shall be used all display at scaffold.
<b>13</b>	Adequate measure is taken to prevent displacement of standard of scaffold either by providing base plate or sole plate, as necessary.
<b>14</b>	All the safety measure related with scaffold platform shall ensure before use. Board, plank and decking used in working platform shall be adequate, uniform size & strength.



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<b>15</b>	Adequate measure shall be taken to prevent injury which may be caused by fall of material or object by using toe guard at platform, safety Nets, temporary barricading, hard barricading area or other suitable means.
<b>16</b>	No material, concrete, other debris shall be allowed to accumulate at any platform on a Scaffold.
<b>17</b>	No worker shall be permitted to work on scaffold that has been damaged or weakened unless adequate safety measure have been taken to ensure the safe use of scaffold.
<b>18</b>	There shall be no opening in any working platform allowing access to such working platforms. However, in case opening in platform is unavoidable, necessary safety measure along with safety net, safety belt etc shall be provided for protection against falling of object or worker.
<b>19</b>	Safe Access shall be provided for movement of worker from one working platform to another working platform.
<b>20</b>	Each side of working platform must be covered with suitable & safe guard and toe guard of adequate strength to prevent fall of any materials, tools & Workers.
<b>21</b>	In case of any rectification, alteration or modification in a scaffold or part thereof, needed to suit its use, shall be made in consultation with the BHEL HSE Official or Competent Authority.
<b>22</b>	The Contractor shall ensure all the necessary measures to prevent workers from coming into contact with the electrical wire or any dangerous equipment.
<b>23</b>	No part of the building shall be used as a support or part of scaffolding unless such a part of building is made of sufficient strength if any.
<b>24</b>	Hanging scaffolding shall not be used in areas of general movement.
<b>25</b>	After use, scaffolding shall be removed after clearing the area and taking necessary Work Permit for Safety Facility Removal.
<b>11.11.2</b>	<p><b>SCAFFOLD TAGGING</b></p> <p>Scaffolds being erected, modified or dismantled must be tagged as suitable for use. The scaffolds can only be accessed by those involved with the process. Tagging shall be done with standard tag holder. Scaffolding tag should be certified by scaffolding inspector having valid certificate.</p> <p><b>GREEN</b> scaffold tag- shall be fixed when scaffold is complete and safe for use, signed and dated by the scaffolding competent person daily.</p> <p><b>RED</b> scaffold tag – to be fixed if scaffold is defective and cannot be used, or is still under erection.</p> <p><b>YELLOW</b> scaffold tag – to be fixed if scaffold is in under construction/ maintenance.</p> <p>Examples of scaffold tags:</p>



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**FIG. SAMPLE SCAFFOLD TAGS AND TAG HOLDER**

<b>11.11.2A</b>	<b>T&amp;P TAGGING:</b>
	<b>All deployed Wire Rope Slings, Chain Pulley Blocks, Hooks, slings etc. shall be Tagged using aluminum or any other metal tag with punching.</b>
<b>11.11.3</b>	<b>LADDER SAFETY</b>
<b>1</b>	Safe means of access shall be provided to all working places.
<b>2</b>	Every ladder shall be securely fixed and extended about 1 meter above top platform.
<b>3</b>	No portable single ladder shall be over 9 m in the length while the width between side rails in rung ladder shall in no case be less than app.29.2 cm for ladder up to and including 3 m in length. For longer ladders this width shall be increased at least ¼” for each additional foot of length.
<b>4</b>	Monkey ladders shall be protected with cage(s).
<b>11.12</b>	<b>RADIOGRAPHY:</b>
<b>1</b>	Wherever the process requires examination by radiography,
<b>2</b>	CONTRACTOR /sub-contractor shall use approved radiography contractor for the work on site.
<b>3</b>	Site radiography shall be carried out after advance notification to the HSE officer and client personnel. All radiography on the site shall be subject to receipt of client/BHEL work permit and shall normally be performed outside of normal working hours. No ionizing radiation sources shall be left unsupervised whilst on site.
<b>4</b>	A minimum of 2 qualified persons from the radiography contractor are required for each activity involving ionizing radiation. Adequate warning signs shall be posted on barriers and the work area shall be marked off at a safe distance with tape or hard barricades prior to starting radiography by concerned job sub-contractor.
<b>5</b>	All personal executing radiography operations shall carry calibrated radiation monitoring devices at all times.
<b>6</b>	The storage of radioactive sources on the site is prohibited, they shall be present only for the time required to complete the work. Whilst not in use, radiation sources and their container shall be secured in a safe location with adequate warning signs displayed as per Atomic Energy Regulatory Board (AERB) guidelines.



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11.13	WELDING & GAS CUTTING SAFETY
1	When possible, items to be welded, cut, heated, etc. shall be moved to a safe location free of combustible or flammable material. If this is not possible, then all combustibles/flammables that can be removed from the area shall be removed within a 35-foot circumference and a positive means of confining arcs and sparks generated by the process shall be taken and additional person(s) shall be stationed as fire watch for the area(s) still exposed, along with obtaining the Hot Work Permit as applicable.
2	Appropriate fire-fighting equipment is to be available in close proximity of any welding and gas cutting operations at all times.
3	Drums, tanks, and similar containers that have contained flammable or toxic material shall not be welded, cut, or heated until they have been made safe by water filling, thorough cleansing, or similar accepted practices. The container shall also be ventilated during the welding, cutting, or heating process.
4	Proper ventilation is required for any welding or torch operations performed in a confined space.
5	Any welding or gas cutting operations performed on metals of toxic compounds or coating such as zinc, stainless steel, lead, cadmium, chromium, and beryllium shall be properly ventilated and/or proper respiratory protection shall be worn by any person that could be exposed to fumes, vapors, and gasses created by the welding and gas cutting processes.
6	Wherever it is practical, all arc welding operations shall be shielded to prevent direct light rays or sparks from contacting persons in the vicinity or from reaching areas normally used to travel through or into the vicinity. Where this is not practical, persons who shall be in the area are to use proper eye and skin protection. Other persons who are not participating in the welding or gas cutting operations are not to be allowed into the hazard zone.
7	Welders and other employees who are exposed to arc welding radiation shall wear suitable clothing and protective apparel to prevent burns and other types of ultraviolet radiation damage to the skin.
8	Arc welding machines shall be shut down when being moved or when they are not in continuous use.
9	Electrode holders left unattended shall have electrodes removed and shall not be left where they might contact employees or conducting objects.
10	Arc welding power supply cable shall be of proper rating and material, e.g. copper.
11	Welders shall guard against allowing materials adjacent to or behind them to reflect radiation back toward them or towards others in the area. Reflected radiation can cause skin burns and eye flash burns.
12	Compressed gas cylinders shall always be secured from tipping or falling, whether in use, in storage or in transit. The cylinders shall always be secured upright, except during times when actually being hoisted or carried.
13	Valve caps shall be in place when cylinders are not in use. Valve caps shall never be used for lifting the cylinder vertically.



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14	Regulators shall be removed when cylinders are not in use or are in transit, unless the cylinder is firmly secured on a special carrier designed for this purpose.
15	Cylinders being transported by a powered vehicle shall be secured in an upright position. Gas cylinders are not allowed to be used in man-basket when occupied.
16	Cylinders containing oxygen or fuel gasses shall not be taken into confined spaces.
17	Oxygen cylinders shall be stored a minimum of (6) meters from fuel gas cylinders or shall have an approved firewall between them.
18	Torches shall only be lit by approved strikers; never with matches, cigarette lighters, or hot work.
19	While carrying out job at height, the sparks or molten slag shall be prevented from falling down by putting a fire-resistant (non-asbestos) sheet or even MS Sheet. If such cannot be provided, the passage of falling sparks or molten slag shall be barricaded till ground floor and any cable/ tubes/ any other objects interfering in the passage shall either be removed or covered with Fire-resistant sheet or M S Sheet.
20	Separate sheds for all kinds of gases with clear demarcation/partition of empty & full cylinders/partly filled cylinders of gases are to be by agency.
21	Welding cable must be free from any repair or splices. However in case of any broken cable use, a minimum distance of 10 feet from the cable end to which the electrode holder is connected shall be used, except that cables with standard insulated connectors or with splices whose insulating quality is equal to that of the cable are permitted.
22	All safety precautions shall be taken for welding and cutting operations as per IS-818.
23	Flashback arrestors, ISI marked, shall be ensured at both cylinder and torch ends.
24	Pressure gauges shall be ensured and in working condition
25	Cylinders shall be protected from falling splinters by proper metallic cover

11.14	<b>RIGGING (Safe Rigging Practices):-</b>
1	Review the planned operation and requirements with the operator and rigging crew.
2	Ensure a pre-lift meeting is conducted with crane operator, tagline operator, signal personnel, and Safety Manager.
3	Designate a qualified person from the rigging crew to observe clearance of the equipment and give timely warning for all operations where it is difficult for the operator to maintain the desire clearance by visual means.
4	Clear the lift area of all unnecessary personnel.
5	Farana shall only be allowed for loading & unloading works & shall not be allowed to move with load. Farana are not allowed for materials transport.
6	Cranes, D-Shackles, Slings all lifting equipment are to tested by statutory authorities/approved by Third Party agency. Agencies with in their cost has to do it at least once in a year or as per applicable clauses regarding frequency of testing, inspection, fitness certification requirement.





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7	Rigging equipment shall not be loaded in excess of its recommended safe working load. Rigging equipment, when not in use, shall be removed from the original work area so as not to present a hazard to employees.								
8	To enhance HSE culture and create safe working environment at project site rigging Handbook/ Leaflet shall be provided to all riggers & their gangs. Rigger hand book / leaflet attached as Annexure-7 in this HSE plan.								
11.15	<b>LIFTING OPERATION SAFETY</b>								
1	It will be the responsibility of the contractor to ensure safe lifting of the equipment, taking due precaution to avoid any incident and damage to other equipment and personnel.								
2	<p>All the cranes and lifting tools &amp; tackles shall be inspected on daily basis and as well as monthly by expert and as per the law, third party for annual certification. These shall be tested and certificates of fitness shall be obtained from 3<sup>rd</sup> party State Govt. approved competent agency before deploying at site and later periodically. The last date of Third Party Inspection and the next Due date shall be conspicuously displayed on all cranes. A copy of certificate shall be pasted on operator's cabin of all the lifting equipment.</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center;">A</td><td>The manufacturer's instruction for maintenance shall also be followed. All safety measures shall be followed.</td></tr> <tr> <td style="text-align: center;">B</td><td>All tools tackles, lifting appliances, material-handling equipment etc. used by the contractor shall be of safe design and construction.</td></tr> <tr> <td style="text-align: center;">C</td><td>The operators, slingers and signalers shall be qualified as per IS 13367 (part-1):2003 "Safe use of cranes- code of practices".</td></tr> <tr> <td style="text-align: center;">D</td><td>There shall be a person responsible for co-ordination among cranes where multiple cranes are used, and lifting over 75% of the crane capacity to be avoided.</td></tr> </table>	A	The manufacturer's instruction for maintenance shall also be followed. All safety measures shall be followed.	B	All tools tackles, lifting appliances, material-handling equipment etc. used by the contractor shall be of safe design and construction.	C	The operators, slingers and signalers shall be qualified as per IS 13367 (part-1):2003 "Safe use of cranes- code of practices".	D	There shall be a person responsible for co-ordination among cranes where multiple cranes are used, and lifting over 75% of the crane capacity to be avoided.
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4	Any Heavy equipment (crane, winch machine, etc.) manufactured less than 15 years from the current year shall be only allowed to be used at our project Site's. Pre-SAFETY Inspection of the equipment by SAFETY dept. shall be done before mobilizing the equipment at our project site.								

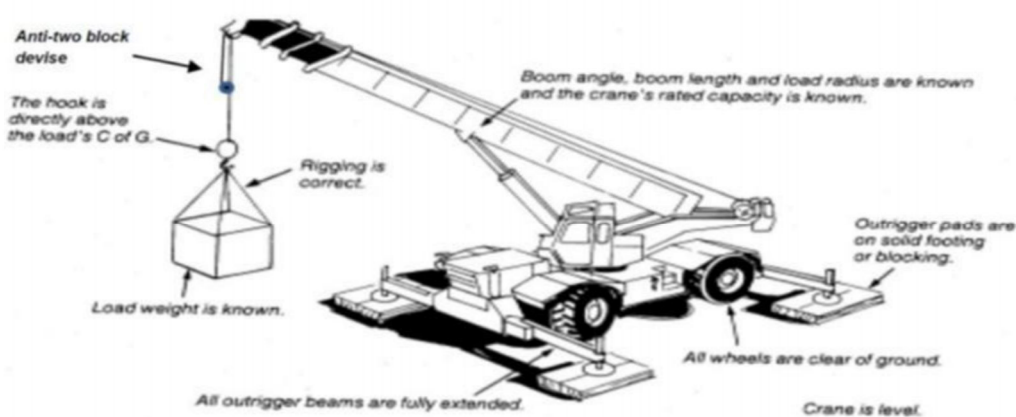
11.16	<b>CRITICAL LIFTS</b>
	A written rigging procedure and plan must be prepared for:-
1	Lifts or movements over 50 tons
2	Lifting over 75% of crane capacity
3	Erection of process columns, towers or vessels, NSSS and turbine/generator systems.
4	Lifts over operating units/equipment
5	Other instances deemed prudent by the Company.



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6	Lifts or movements of unusual difficulty, geometry or rigging.
7	Where required by contract.
8	Lifting a Personnel Basket.
	<b>Note: - Tandem operation for materials handling/ erection/ lifting/ lowering from heights needs to be approved by BHEL/ Customer.</b>
11.17	<b>CRANE APPLIANCE/EQUIPMENTS:</b>
1	On every crane or piece of hoisting equipment notices of all rated load capacities, recommended operating speeds, and any hazard warnings or special instructions shall be conspicuously posted. All instructions and warning shall be visible from the equipment operator's station.
2	Cranes shall have an Anti-Two-block safety device installed
3	All mobile cranes shall have overload and backup alarms
4	Load angle indicators and limit switch: -
5	All areas within swing radius of cranes that are potentially accessible by pedestrian, vehicular, or equipment movement shall be barricaded to prevent anyone or any vehicle or equipment from being struck by the crane or hoisting equipment, or its load(s).
6	No part of the lifting equipment or its load shall be within the distance as specified in the Indian Electricity Act from an energized power line
7	Cranes shall have annual certified third party inspection and be inspected before use by the operator. Any defects shall be corrected before use. Logs of crane inspection shall be kept with the crane.
8	Make certain that the rigging personnel, material, and equipment have the necessary capabilities for the job and are in safe condition.
9	Communicate with person(s) directly responsible for accomplishing the work and / or work area to establish requirements/responsibilities and make certain that all preparatory work is complete.
10	Mats/Pads must be used on all lifting equipment, equipped with outriggers.
11	Pick and carry must have the load secured to the rig in front.
12	<p>Proper Crane Setup:-</p>  <p>The diagram shows a crane with a load being lifted. Labels include: 'Anti-two block device' pointing to the hook area; 'The hook is directly above the load's C of G.'; 'Load weight is known.'; 'Rigging is correct.'; 'Boom angle, boom length and load radius are known and the crane's rated capacity is known.'; 'Outrigger pads are on solid footing or blocking.'; 'All wheels are clear of ground.'; 'All outrigger beams are fully extended.'; and 'Crane is level.'</p>



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11.18	<p><b>COMPETENCY OF OPERATORS/ DRIVERS OF CRANE, WINCH, LIFTING/ CONSTRUCTION EQUIPMENT ETC.</b></p> <ul style="list-style-type: none"> <li>i. The Operators / Drivers of crane, winch, construction/ lifting equipment etc. shall be experienced and have valid driving license for the class of vehicle / machinery as applicable (like Crane/ Forklift/ Rig, Construction equipment driving license etc.).</li> <li>ii. Minimum HMV driving license is required for all heavy equipment/ heavy vehicle (trailer/ Hyva /dumper /TM) operators at site.</li> <li>iii. The subcontractor shall certify competence of these persons in writing as and when they are posted at site.</li> <li>iv. Crane, Winch, Construction &amp; lifting equipment operator should have certificate on subject course or experience certificate in employer letterhead.</li> <li>v. Where state is providing license for operating crane, tractor and other construction vehicles, same to be ensured.</li> </ul> <p><b>Note:</b></p> <ul style="list-style-type: none"> <li>1. In case the statutory requirements i.e. State or Central Acts and / or Rules as applicable like the Building and Other Construction Workers' Regulation of Employment and Conditions of Service- Act,1996 or State Rules (wherever notified), the Factories Act, 1948 or Rules (wherever notified), etc. are more stringent than above, the same shall be followed.</li> <li>2. In case of any stringent requirement of BHEL's customer over and above the specifications mentioned in current document, the same shall also be required to be complied at site by contractor.</li> </ul>
11.19	<p><b>HOISTING APPLIANCE/EQUIPMENT</b></p>
	<p>Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safe guards.</p> <p><b>Fencing of Machinery</b></p> <p>The contractor shall provide suitable fencing or guard to all dangerous and moving parts of machinery. The contractor shall not allow any of the employees to clean, lubricate, repair, adjust or examine during machinery in motion, which may cause injury to the person.</p>
11.20	<p><b>CYLINDERS STORAGE AND MOVEMENT (OR COMPRESSED GAS CYLINDER)</b></p>
1	<p>Hose lines shall be adequately protected, inspected and tested for leaks in line with the safety Requirements. Flash back arrestor /NRV must be used at both ends of the hoses and all hose should be free from damage and fixed properly preferably using crimping clamps. Leakage test must be done before every use by soap solution and physical inspection of hose must be carried out regularly. Only trolley attached with wheel will be used for cylinder transportation in which cylinders must be kept secured with chain. Only Industrial type regulator fitted with two stage double dial pressure gauge is allowed to be used.</p>
2	<p>All gas cylinders shall be stored in upright position.</p>



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3	Suitable trolley shall be used.
4	There shall be flash-back arrestors conforming to IS-11006 at both cylinder and burner ends.
5	Damaged tube and regulators must be immediately replaced.
6	No of cylinders shall not exceed the specified quantity as per OCP
7	Cylinders shall be moved by tilting and rolling them on their bottom edges.
8	They shall not be intentionally dragged, struck or permitted to strike each other violently.
9	When cylinders are transported by powered vehicle they shall be secured in a vertical position.
11.21	<b>PAINTING</b> Painting requirements — prior to commencement of painting job, provide a detailed procedure to be implemented by all concerned employees and sub-contractor involved in painting activities.
11.22	<b>DEMOLITION WORK</b> Contractor and Subcontractor must take prior permission from BHEL/ Customer (2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST OF CSPGCL) and statutory body (if required) before any demolition work is commenced and also during the process of the work the following shall be ensured:
1	All roads and open areas adjacent to the work site shall either be closed or suitably protected.
2	No electric cable. or apparatus which is liable to be a source of danger nor a cable or an apparatus used by the operator shall remain electrically charged.
3	All water supply line, Gas line etc. shall be put off and suitably capped before start of demolition work.
4	All practical steps shall be taken to prevent danger to persons employed from the risks of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render them unsafe.
5	All the laying material in exterior opening shall be removed before commencing any demolition work.
6	Ensure Safety / protection of adjacent structure, wall, partition if any during demolition work.
7	Ensure continues inspection to observe any hazard related to Floors or Walls or Loosen Material etc. during the demolition work. All the hazard observed shall be compliance immediately.
8	Ensure adequate display of Warning Sign, Safety Posters, barricading at the demolition area.
9	No persons other than Building workers & other persons essential to the operation of demolition work shall be permitted to enter a demolition zone along with substantial barricades.



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<b>11.23</b>	<b>TOOLS &amp; PLANTS</b>
<b>1</b>	All T&Ps/ MMEs should be of reputed brand/appropriate quality & must have valid test/calibration certificates bearing endorsement from competent authority of BHEL. Contractor to also submit monthly reports of T&Ps deployed and validity test certificates to BHEL safety Officer as per the format/procedure of BHEL.
<b>2</b>	All requisite tests and inspection of handling equipment, tools & tackle shall be periodically done by the contractor by engaging only the Competent Persons as per law.
<b>3</b>	Defective equipment or uncertified shall be removed from service.
<b>4</b>	Any equipment shall not be loaded in excess of its recommended safe working load.
<b>5</b>	<b>Handling of Hazardous Chemicals :- The contractor will notify well in advance to the BHEL/ Customer for any hazardous chemicals used at site.</b>
<b>i</b>	The Contractor will notify well in advance to the authorized representative of BHEL/ CSPGCL at site of his intention to bring to the Site any container filled with liquid or gaseous fuel or explosive or petroleum substance or such chemicals which may involve hazards. Employer shall have the right to prescribe the conditions, under which such container is to be stored, handled and used during the performance of the works and the Contract shall strictly adhere to and comply with such instructions.
<b>ii</b>	The authorized representative of BHEL/ CSPGCL at site shall have the right at his sole discretion to inspect any such container or such construction plant / equipment for which material in the container is required to be used and if in contractor opinion, its use is not safe, Contractor may forbid its use. No claim due to such prohibition shall be entertained by Employer and Employer shall not entertain any claim of the Contractor towards additional safety provisions / conditions to be provided for / constructed.
<b>iii</b>	Further, any such decision of the authorized representative of BHEL/ CSPGCL at site shall not, in any way, absolve the Contractor of his responsibilities and in case, use of such a container or entry thereof into the Site area is forbidden by Employer, the Contractor shall use alternative methods with the approval of the Employer without any cost implication to the Employer or extension of work schedule.
<b>iv</b>	Where it is necessary to provide and / or store petroleum products or petroleum mixtures and explosives, the Contractor shall be responsible for carrying-out such provision and / or storage in accordance with the rules and regulations laid down in Petroleum Act 1934, Explosives Act 1948, and Petroleum and Carbide of Calcium Manual published by the Chief Inspector of Explosives of India. All such storage shall have prior approval of the authorized representative of BHEL/ CSPGCL at site. In case any approvals are necessary from the Chief Inspector (Explosives) or any statutory authorities, the Contractor shall be responsible for obtaining the same.
<b>11.24</b>	<b>CHEMICAL HANDLING</b>
<b>1</b>	Displaying safe handling procedures for all chemicals such as lube oil, acid, alkali, sealing compounds etc. at work place where it is necessary to provide and/or store petroleum products or petroleum mixture & explosives, the contractor shall be responsible for carrying out such provision / storage in accordance with the rules & regulations laid down in the relevant petroleum act, explosive act and petroleum and carbide of calcium manual, published by the chief inspector of explosives of India. All such storage shall have prior approval if necessary from the chief inspector of explosives or any other statutory authority. The contractor shall be responsible for obtaining the same.



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2	MSDS (Material Safety Data Sheets) for all chemicals shall be prominently displayed near respective storage areas
3	Availability of running service water near the activity area should be ensured.
4	Suitable and safe place for draining and neutralization of used chemicals should be kept identified.
5	Chemical must be away from heat/steam and must be keep away from sunlight.
6	Disposal plan of chemicals must be ensured if required. ( Disposal plan can jointly prepared with BHEL/ Customer (2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST OF CSPGCL).
7	<b>EMERGENCY PROVISIONS:</b> <ol style="list-style-type: none"> <li>a. Flushing and washing water supplies: Ample supplies of tepid flushing and washing water supplies shall be provided at all possible points of discharge, spillage or escape of chemicals.</li> <li>b. Adequate provisions shall be made for emergency treatment of the eyes, comprising eye wash bottles, located conveniently to places where discharge, spillage or escape of chemicals can occur.</li> <li>c. Safety shower and eye washer shall be provided near the location of chemical handling place.</li> <li>d. Safety shower arrangement shall be provided in close proximity to the Ammonia dosing skid. i.e. Two (2) numbers of safety shower units and two (2) number of Eye-fountains.</li> <li>e. A suitable first aid treatment room with outside telephone facilities shall be provided within a reasonable distance of the place where chemicals are being used. Chemicals shall be stored with proper identification and with necessary caution boards.</li> <li>f. The protective clothing and apparatus required for emergency use shall be made available also near the acid cleaning area.</li> <li>g. If signs of skin irritation occur the persons should be removed from contact and referred for medical opinion/ emergency. In the event of the splashing of the chemical to skin, the affected area should be washed thoroughly avoiding spreading contamination to the face and eyes.</li> <li>h. Temperature limitations specified for various steps/ area should not be exceeded wherever applicable.</li> </ol>
8	Posters & Danger boards sign for chemicals.
9	<b>Safety requirement above ground Track Hopper area:</b> <ol style="list-style-type: none"> <li>a. Proper walkway and handrail all along the Track Hopper length shall be provided as per the specification.</li> <li>b. Steel grating (as specified elsewhere) shall be provided securely at Hopper top.</li> <li>c. Proper barricading of the Crane/Hoist floor opening shall be provided.</li> <li>d. Proper illumination shall be provided throughout the entire area of Track Hopper Complex.</li> <li>e. Track Hopper walkway area shall be free from any intermediate crossing of utility pipes, structures, cables etc.</li> </ol>





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<b>10</b>	<b>Safety requirement underground Track Hopper area &amp; equipment:</b>
	<ul style="list-style-type: none"> <li>a. Direct Communication from track Hopper (inside) &amp; Paddle Feeder with the Control Room shall be provided.</li> <li>b. Side walkway inside Track Hopper shall be of adequate width &amp; free from any intermediate crossing of utility pipes, structures, cables etc. Width/height of central walkway shall be sufficient for ease working of maintenance people.</li> <li>c. Proper illumination shall be provided inside Track Hopper area so that Side walkways &amp; central portions between two Track hopper conveyors and Hopper table shall be clearly visible. Emergency lighting shall also be provided in case of tripping of regular lighting supply.</li> <li>d. Staircase inside Track Hopper shall be with minimum 1200 width with proper Hand railing &amp; toe guards.</li> <li>e. All drains and sump pump pit inside hoppers shall be covered with gratings.</li> <li>f. Underground area shall be well ventilated as specified elsewhere</li> </ul>
<b>11</b>	<b>Earthling &amp; Shielding</b>
<b>A</b>	A complete earthling system with double path to the ground for all equipment and ESP structure shall be furnished. Each casing shall be provided with two earthing pads located on diagonally opposite corners of each casing. The pad surfaces shall be tinned, drilled and shall be connected to earthling mat by 50x6 galvanized steel flats.
<b>B</b>	Manual safety earthling switches shall be furnished so that individual equipment can be grounded during maintenance. All access doors, gas distribution baffles or perforated plates located in the inlet or outlet nozzles of the precipitators shall have ground straps connected to the precipitators casing if they are not welded permanently to the casing.
<b>C</b>	In case special earthling requirement is needed for electronic cabinets the same shall be furnished by the Bidder.
<b>12</b>	<b>Safety Interlocks</b>
<b>A</b>	Contractor shall provide a full proof manual key sequence type interlock system for the safety of operating personnel from contacting energized high voltage equipment. Key interlocks shall be provided such that for a particular ESP casing any TR set cannot be energized until all insulator housing compartments, disconnect switch boxes, casing inspection doors are locked and emitting and collecting electrode rapping motors are prevented from energization. Also it shall prevent opening of any inspection door unless all TR sets of that stream are de-energized and all HV disconnect switches are opened to earthed position. Rapping motors operation shall be prevented under this condition unless interlock is specifically defeated for testing.
<b>B</b>	Key interlock system shall be simple, robust, weather proof in construction suitable for outdoor mounting and positive in action. It shall be suitable for high degree of repeatability without wearing out.



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11.25	CHEMICAL CLEANING
1	The Contractor shall provide adequate safety and protective equipment for all his employees and ensure that they are worn at all times of danger. Specialized treatment equipment (such as required for first aid when using hydrofluoric acid/chemical) must be provided at the place of handling acid/chemical.
2	The hazardous substances and chemicals shall be stored in a cool, well ventilated, dry and covered space with restricted entry only
3	The loading, unloading, issue and use of these materials shall be strictly in accordance with the Material Safety Data Sheet (MSDS) and under strict supervision. Every supply shall accompany a MSDS as per standard purchase order clause.
4	The site HSE team shall maintain MSDS of all these items and the same shall be shared with the stores or the user as and when required.
5	Each container shall be labeled.
6	Damaged containers are replaced or repaired immediately.
7	The stores shall check the expiry date of perishable chemicals while receiving and store in such a fashion so as to follow First-in-first-out queue.
8	There shall be enough space for movement of material and people in the stores.
9	Bulk chemical storage areas with secondary containment shall be provided so as to arrest spillage from spreading.
10	Dispose the cleanup waste to an industrial waste site or approved temporary storage location.
11	There shall be sufficient fire extinguishers and sand buckets in the stores and at point of use. In case of any spillage, dry sand shall be put on the spill and soaked sand shall be disposed as per the procedure for hazardous waste.
12	Control measures on use of flammable and combustible fluids shall be undertaken to limit quantities in storage area and cabinets.
13	There shall be provision of water preferably flowing one and a face shower at stores and point of use.
14	The persons handling these items shall strictly wear appropriate PPEs like Gum Boots & helmets, rubber/neoprene gloves, apron, required transparent face Mask shield etc.
15	No smoking signage should be displayed.
16	Availability of First Aid Box containing dilute ammonium hydroxide, 50% Sodium bicarbonate solution, eye lotion, Bandage, Tincture iodine, Cotton, Burnol etc. should be ensured



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<b>11.26</b>	<b>EXPLOSIVES</b>
	The contractor shall take all precautions while handling, using, storing or transporting of all explosives. Before usage of any explosive necessary warning / danger signals be erected at conspicuous places to warn the workers and general public. The contractor should strictly ensure that all measures and precautions required to be complied for use, handling, storing or transportation of explosives under the rules framed under the Explosives Act, 1884.
<b>1</b>	As specified by the appropriate authority and only Permissible explosives shall be used.
<b>2</b>	Smoking and open flames shall not be permitted near explosives and detonators storage magazine.
<b>3</b>	All the local laws, rules & regulations and relevant statutory provisions, shall be complied with.
<b>11.27</b>	<b>ELECTRICAL SAFETY</b>
<b>1</b>	Only electricians licensed by appropriate statutory authority shall be employed by the contractor to carry out all types of electrical works.
<b>2</b>	All electrical supply shall be provided through ELCB of 30mA sensitivity.
<b>3</b>	The working condition and sensitivity of ELCB shall be checked periodically.
<b>4</b>	Providing adequate no. of 24 V sources and ensure that no hand lamps are operating at voltage level above 24 Volts.
<b>5</b>	Fulfilling safety requirements at all power tapping points.
<b>6</b>	High/ Low pressure welders to be identified with separate color clothing. No welders will be deployed without passing appropriate tests and holding valid welding certificates. Approved welding procedure should be displayed at work place.
<b>7</b>	The contractor shall not use any hand lamp energized by Electric power with supply voltage of more than 24 volts in confined spaces like inside water boxes, turbine casings, condensers etc.
<b>8</b>	All portable electric tools used by the contractor shall have safe plugging system to source of power and be appropriately earthed. Details of earth resource and their test date to be given to BHEL safety officer as per the prescribed formats of BHEL
<b>9</b>	The contractor shall use only properly insulated and armored cables which conform to the requirement of Indian Electricity Act and Rules for all wiring, electrical applications at site.
<b>10</b>	BHEL reserves the right to replace any unsafe electrical installations, wiring, cabling etc. at the cost of the contractor.
<b>11</b>	All electrical appliances used in the work shall be in good working condition and shall be properly earthed.
<b>12</b>	No maintenance work shall be carried out on live equipment.
<b>13</b>	The contractor shall maintain adequate number of qualified electricians to maintain his temporary electrical installations.



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14	Area wise Electrical safety inspection is to be carried out on monthly basis as per "Electrical Safety Inspection checklist" and the report is to be submitted to BHEL safety officer
15	Adequate precautions shall be taken to prevent danger for electrical equipment. No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public
16	The contractor shall carefully follow the safety requirement of BHEL/ the purchaser with the regard to voltages used in critical areas.
17	Lockout/ Tag out Permit shall be taken for work on live installations
18	Double earthing protection must be provided for every electrical equipment and earthing value should be less than 1 Ohm
19	Deployment of trained, experienced & licensed electrician as well as licensed electrical supervisor must be ensured at site as per the Indian Electricity Rules, 1956.
20	All PPE's used while being involved in electrical work must be as per IS Standards available for electrical work
21	All motor/ rotatory equipment shall be with key operated switch.
22	Adequate/ Good Quality Meggers & tester/ electric tester must be used to check the availability of Low Voltage (up to 415V).
23	Adequate/ - Good quality Insulation tester must be used for charging of electrical equipment's or LV/MV/HV power cables
24	Adequate ELCB feeder must be used for checking of ELCB/ RCCB.
25	Adequate/ Suitable quality earth rods must be used before coming in close contact of shutdown equipment's for any maintenance.
26	Rubber mat must be used whenever applicable (i.e. electric panel/ connection shed/room etc)
27	Whenever applicable fuse pullers must be used for insertion & removal of fuses along with electrical gloves.
28	Cable locator to be used before excavation at the workplace.
29	High Voltage buried cables to work with electrical safety TAG above the ground for alarm/attention.
30	Suitable Fire Extinguisher must be used during Electrical Fire accident. (i.e. dry type fire extinguisher etc.)
31	Electrical Insulation mats in front of every switchgear/MCC shall be provided as per relevant Indian standards.
32	All trailing cables/festooning arrangement in trippers, hoists etc., shall be easily accessible with proper approach for operation & maintenance people.
33	All lighting fixtures in TPs, Crusher house shall be wall mounted type and shall be easily accessible with proper approach for operation & maintenance people.



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34	"Earth Mat of CHP Area" shall be connected to nearest "main plant area earth mat" at minimum of two locations. All buildings/structures shall be interconnected together by minimum two parallel conductors.
35	Where a transformer or transformers are used, suitable provision shall be made, either by connecting with earth, a point of the circuit at the lower voltage or otherwise, to guard against the danger by reason of the said circuit becoming accidentally charged above its normal voltage by leakage from or contact with the circuit at the higher voltage.
36	Where the oil filled transformers with capacity more than 2000litres are installed, suitable baffle walls of four hours fire rating shall be provided.
37	Only dry type transformers shall be used inside the buildings.
38	All Switchgear/ MCC Shall be "Closed door" operation type.
39	Metallic frame of all electrical equipment shall be earthed by two separate and distinct connections to earthing system, each of 100% capacity. Crane rails, tracks, metal pipes and conduits shall also be effectively earthed at two points. Steel RCC columns, metallic stairs and rails etc., of the building housing electrical equipment shall be connected to the nearby earthing grid conductor by one earthing ensured by bonding the different sections of hand rails and metallic stairs.
40	All switchgear room shall have minimum two exit doors suitable for two hours of fire rating.
41	All cable shall be Fire Retardant Low Smoke (FRLS) type having minimum two hours of fire rating.
42	All cable trestles and trenches shall have a minimum of clear 600mm walkway for ease of accessibility.
43	All cables shall be segregated by voltage wise as HV/MV/LV/Control/ instrumentation type and a minimum of 300mm clearances shall be maintained between cable trays of each type.
44	Suitable Earth flat shall be laid along the cable trays and connected to nearest earth riser at every 50 meters.
45	All push button stations in CHP area shall be IP65 degree of ingress protection.
46	CHP 220V DC system shall be separate and independent from other DC systems of plant. The DC emergency lighting fixtures shall be fed from Contractor's 220 V LDBs through DC lighting panels so that tracing and isolation of DC earth fault is convenient. Each switchgear/MCC room shall have a DC LDB and corresponding LPs.
47	The DC emergency lighting fixtures shall be mounted suitably on wall/columns at strategic locations for safe movement of operating personnel and access to important control points during an emergency, when the normal AC lighting system fails. The supply to the DC lighting panels shall be automatically switched on in case of loss of AC supply. The DC supply will be automatically switched off after about 3 minutes following the restoration of AC lighting system.
48	Four (4) nos. 240V AC lighting fixtures fed from UPS shall be provided on each stacker re-claimer machine as emergency lighting.
49	The contractor should ensure use of single / double insulated hand tools or low voltage i.e., 110 volts hand tools.



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<b>50</b>	<p>100W,220V incandescent (or equivalent LED) DC Emergency lighting shall be provided as follows:</p> <p>One (1) no. in each local control area</p> <p>Three (3) nos. in each MCC/ Switchgear room and control room</p> <p>One (1) no in each office room and each pump house</p> <p>Six (6) nos. in Track hopper shed</p> <p>Twelve (12) nos in track hopper tunnels</p> <p>Two (2) nos in each underground portion of TPs</p> <p>One (1) no at every 5.0m height interval in the staircases of various TPs and buildings and one no in each drive floor in each TP</p>
<b>11.28</b>	<b>FIRE SAFETY (i.e. Fire Tender along with firefighting staff etc.)</b>
<b>11.28.1</b>	<b>Fire Tender of 5000 Ltr Tank Capacity along with Pressure Pump (proposed 2250 LPM) and firefighting Staff - 02 Nos Driver and 04 Nos Crew for 24 Hrs. Service (1 nos. Driver &amp; 2 nos Crew for 12 hours each) and this fire tender must be equipped with essential firefighting accessories.</b>
<b>1</b>	<b>Fire tender as required above shall be centrally arranged by BHEL on cost recovery model basis &amp; shall be used by all contractor. Fire tender with complete equipment/ accessories shall be available at site for all the emergency fire condition at site.</b>
<b>2</b>	<b>Out of pocket expenses or Total expenditure for hiring of Fire tender &amp; 2 nos DCPO &amp; 4 nos Firefighting staff/ crew (including fuel cost to run fire tender &amp; fire tender pump, Accommodation, transportation of Firefighting staff etc.) be apportioned among all the working contractor's proportionate to their Awarded Contract value. This expenses shall be proportionate deducted from contractor monthly RA bill.</b>
<b>3</b>	<b>Maintenance of fire tender is in scope of Rate contracting agencies, which is part of Rate contract for Fire tender, however in case of any additional expenses which is to be incurred for maintenance, then same shall apportioned among all the working contractor's proportionate to their Awarded Contract value. This expenses shall be proportionate deducted from contractor monthly RA bill.</b>
<b>11.28.2</b>	<b>Fire prevention, protection &amp; preparedness –</b>
<b>1</b>	The Fire Prevention, Protection and Preparedness Program is an integral part of the overall HSE Program. Effort and consideration must be given to safety, life and potential for delays in construction schedules and plant startup, as well as protection of property on a given project.
<b>2</b>	<p>The purpose of which is to prevent –</p> <ul style="list-style-type: none"> <li>• Inception of fire</li> <li>• Loss of life or personal injury</li> <li>• Loss of Property</li> <li>• Interruption of operations</li> </ul>
<b>3</b>	Site-in-charge / Safety Officer will make periodical review of the site Fire Protection, Prevention Preparedness Programme, Site conditions and available fire protection equipment. In addition to deployment of fire tender mention under clause 11.28 and sub clause 11.28.1.





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4	Fire Protection, Prevention and Preparedness Inspections - The Contractor /Sub-Contractor will be required to make frequent fire prevention inspections of his work site and operating facilities. Deficiencies will be corrected at once.
5	Area where Hot work activities are carried out (Gas cutting / Welding/ any other spark producing work) above a working spot, a GI / fire-resistant non-asbestos sheet or suitable material shall be placed to prevent the fall of hot sparks. A bucket of water shall be kept nearby while doing hot work
6	Hot work shall be preferably carried out in a designated area with a standing Hot Work Permit, to be renewed monthly. The designated area shall have fire extinguishers.
7	Any hot work outside designated area shall require a Hot Work permit and fire watch.
8	Emergency telephone number to be displayed at all conspicuous places.
9	All the safety requirements recommended in NFPA -2001 or as specified by listing authorities shall be incorporated in the installation by the contractor.

Fire Extinguisher Chart						
Extinguisher		Type of Fire				
Colour	Type	Solids (wood, paper, cloth, etc)	Flammable Liquids	Flammable Gasses	Electrical Equipment	Cooking Oils & Fats
	Water	✓ Yes	✗ No	✗ No	✗ No	✗ No
	Foam	✓ Yes	✓ Yes	✗ No	✗ No	✓ Yes
	Dry Powder	✓ Yes	✓ Yes	✓ Yes	✓ Yes	✗ No
	Carbon Dioxide (CO2)	✗ No	✓ Yes	✗ No	✓ Yes	✓ Yes

11.28.3	<b>General flammable material storage requirements:</b>
1	All flammable material shall be stored in deigned areas and/or in flammable storage cabinets, as necessary.
2	Fire extinguishers shall be located nearby and have unobstructed access
3	Numbers and types of Fire Extinguishers shall be ensured as per Annexure – 4 (Numbers and type of Fire Extinguishers)
4	Providing appropriate firefighting equipment at designated work place and nominate a fire officer/warden adequately trained for his job.
5	Contractor shall provide enough fire protecting equipment of the types and numbers at his office, stores, temporary structure in labour colony etc. Such fire protection equipment shall be easy and kept open at all times.



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6	The fire extinguishers shall be properly refilled and kept ready which should be certified at periodic intervals. The date of changing should be marked on the Cylinders.
7	All other fire safety measures as laid down in the "IS Codes for fire safety at construction site" issued by safety coordinator of BHEL shall be followed.
8	Non-compliance of the above requirement under fire protection shall in no way relieve the contractor of any of his responsibility and liabilities to fire incident occurring either to his materials or equipment or those of others.
9	Emergency contacts nos must be displayed at prominent locations
10	Tarpaulin being inflammable should not be used (instead, only non-infusible covering materials shall be used) as protective cover while preheating, welding, stress relieving etc. at site.
11	Fire extinguishers shall be inspected at least annually by a certified person and visually inspected monthly and documented by the Contractor
12	No smoking shall be allowed at or in the vicinity of operations, which constitute fire hazards and shall be conspicuously posted with No smoking or open flame signs.
13	The contractor shall educate his or his contractors' men working in the vicinity of fire risk, on how to operate this equipment and know in particular circumstances which type of extinguishers is to be used

11.29	<p><b>EXCAVATION</b></p> <p>All safety precautions shall be taken for foundation and other excavation marks as per IS-3764. Wherever there is open excavation in ground, they shall be fenced off by suitable railing and danger signals installed at night so as to prevent persons slipping in to the excavations.</p> <p>The contractor shall take all necessary measures during excavation to prevent the hazards of falling or sliding material or article from any bank or side of such excavation which is more than one and a half meter above his footing by providing adequate piling, shoring, bracing etc. against such bank or sides. Adequate and suitable warning signs shall be put up at conspicuous places at the excavation work to prevent any persons or vehicles falling into the excavation trench. No worker should be allowed to work where he may be stuck or endangered by excavation machinery or collapse of excavations or trenches.</p>
	<b>The following safety measures are to be ensured before and during excavation:</b>
1	Check for underground utilities like electrical / telephone cables, sewage, water lines and proper care has to be exercised to protect and prevent damage to it.
2	Proper and adequate slope is maintained while excavating.
3	Adequate shoring or sheeting is done wherever require to prevent soil sliding.
4	Safe access through ladder or steps for exit & entry to excavation.
5	No material /excavated soil is kept within one meter from the edge.
6	Safe way is planned and provided for movement of HEM /transport equipment near excavation.
7	Safety helmet and shoes/gum boots are provided and worn by the workmen at excavation works.
8	Wherever waterlogging is observed, appropriate dewatering arrangements shall be ensured. All electrical connections related to the dewatering pump must be safe and secure.



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9	Stop blocks are provided to avoid vehicles reversing into the excavated trenches.
10	Danger signs /Caution boards are displayed at work spot.
11	Barricading is provided at excavated pits.
12	Ensure adequate illumination at workplace where excavation works are carried out.
13	Ensure adequate safety for worker in the affected zone or in the work area of excavation from collapse.
14	All struts, brasses and walls if any in excavation shall be adequately secured along with all safety measures so as to prevent any accident.
15	No loose material shall be kept very close to excavated area, possibility of falling into excavated area, a safe distance or at least 1 meter shall be maintained.
16	To carry out safe excavation, it is to ensure any hazard related to excavation shall be compliance or all the safety measure to avoid unsafe condition to such excavation.
17	Suitable warning sign or safety poster shall be displayed at prominent places to create awareness among workers.
18	Ladders, staircases or ramps are provided, as the case may be, for safe access to and egress from excavation where the depth of such excavation exceeds one point 1.5 m and such ladders, staircases or ramps comply with the relevant national standards (IS Code).
19	Any machinery used in excavation work shall be positioned and operated in such a way that such machinery will not endanger the operator of such machinery or any other person in/worker the vicinity.
20	Suitable breathing apparatus shall be provided to a building worker while working in compressed air environment for his use at excavation work and such breathing apparatus shall be maintained in good working condition at all times.
21	Signal man along with whistles shall be made available at all times at the locations as are necessary for the safety of persons at excavation area for vehicle movement.
22	Adequate number and types of fire extinguishers, in accordance with relevant national standards, shall be provided and made readily available to fight any outbreak of fire at an excavation or tunneling work.
23	Fire extinguishers with vaporizing liquids and high pressure carbon dioxide shall not be used in tunnels or other confined spaces.
24	All portable electrical hand tools and inspection lamps used underground or in a confined space shall be operated at a voltage not exceeding 24 V.
25	Adequate numbers of differential ground fault circuit breakers shall be installed for every electrical distribution system and its sub-systems used at an excavation work.
26	There shall be no exposed live wire in working areas at an excavation work which are accessible to building workers other than those authorized to work on such live lines.
27	Ensure NO entry to person who has consumed alcoholic drink.
28	Deep excavation for Track Hopper shall be done as per approved excavation and dewatering scheme. It shall adhere IS: 3764 safety code for excavation work. Due care for dewatering shall be taken care while excavation and construction.



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<b>11.30</b>	<b>BATCHING PLANT</b>
<b>1</b>	Installation of external Electric moto-vibrators in the feeding hopper of all batching plants to reduce human intervention.
<b>2</b>	Installation of safety devices like pull-chord on both the sides of conveyor for stopping the conveyor in emergency
<b>3</b>	Workers carrying cement / sand to be given appropriate PPEs like respiratory masks & gloves.
<b>4</b>	Conveyor belt/rotating parts must be guarded properly.
<b>5</b>	Safety awareness shall be inculcated in workmen about the risk involved in rotating parts.
<b>6</b>	The agency shall ensure to erect the batching plant as per original drawing including installation of all safety devices as provided by manufacturer and witnessed by BHEL in-charge before starting of machine in future.
<b>7</b>	Adequate/ Suitable safety norms must be followed at ASH Silo. (If required Checklist shall be prepared at Project site).
<b>11.31</b>	<b>HSE PREPAREDNESS FOR ADVERSE CLIMATES AND WEATHER</b>
<b>1</b>	The contractor shall ensure HSE precautions for adverse weather and climatic conditions, epidemics & pandemics as per Annexure – 5 (Precautions for adverse weather & climate conditions, epidemics & pandemics).
<b>2</b>	In addition, site to remain updated on possible adverse weather conditions through reliable sources and all precautions taken accordingly.
<b>11.32</b>	<b>ENVIRONMENTAL CONTROL &amp; SOCIAL RESPONSIBILITY</b>
<b>1</b>	Environment protection has always been given prime importance by BHEL. Environmental damage is a major concern of the principal contractor and every effort shall be made, to have effective control measures in place to avoid pollution of Air, Water and Land and associated life. Banned substances like asbestos and Chlorofluorocarbons such as carbon tetrachloride and trichloroethylene shall not be used. Waste disposal shall be done in accordance with the guidelines laid down in the project specification.
<b>2</b>	Any chemical including solvents and paints, required for construction shall be stored in designated bonded areas around the site as per Material Safety Data Sheet (MSDS).
<b>3</b>	In the event of any spillage, the principle is to recover as much material as possible before it enters drainage system and to take all possible action to prevent spilled materials from running off the site. The contractor shall use appropriate MSDS for clean-up technique
<b>4</b>	All contractors shall be responsible for the cleanliness of their own areas.
<b>5</b>	Regular dust suppression using sprinklers shall be carried out in respective area.
<b>6</b>	The contractors shall ensure that noise levels generated by plant or machinery are as low as reasonably practicable. Where the contractor anticipates the generation of excessive noise levels from his operations the contractor shall inform to Construction Manager of BHEL accordingly so that reasonable & practicable precautions can be taken to protect other persons who may be affected.
<b>7</b>	It is imperative on the part of the contractor to join and effectively contribute in joint measures such as tree plantation, environment protection, contributing towards social upliftment, conversion of packing woods to school furniture, enhancing good relation with local populace etc.
<b>8</b>	The contractor shall carry out periodic air and water quality check and illumination level checking in his area of work place and take suitable control measure.



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	<b>EXCESSIVE NOISE:</b>
<b>A</b>	Adequate measures shall be taken against the harmful effects of an excessive noise;
<b>B</b>	Use of earplugs/muffs and anti-vibration gloves shall be ensured to protect the workers from the impact of exposure to such dangers;
<b>C</b>	The noise level in no case shall exceed as prescribed under the Indian standard.
<b>D</b>	The ambient noise should not exceed the limits prescribed under the concerned rules, Noise Pollution (Regulation and Control) Rules, 2000.
<b>E</b>	Generally for brownfield projects background noise is in the range of 58-60 DB, however it shall be responsibility of contractor to collect and measure the latest noise data at site.
<b>11.33</b>	<b>HOUSEKEEPING</b>
<b>1</b>	The contractor shall ensure that their work area is kept clean, tidy and free from debris generated by their activities. All debris/scrap should be stored in separate bins. The work areas must be cleaned on a daily basis and a full cleaning session of each area shall be conducted on a weekly basis. All equipment, materials and vehicles shall be stored in an orderly manner. Access to emergency equipment, exits, telephones, safety showers, eye wash stations, fire extinguishers, pull boxes, fire hoses, etc. shall not be blocked or otherwise disturbed, restricted or delayed.
<b>2</b>	<b>Keeping the work area clean/ free from debris, removed scaffoldings, scraps, insulation/sheeting wastage /cut pieces, temporary structures, packing woods etc. will be in the scope of the contractor. Such cleanings have to be done by contractor within quoted rate, on daily basis by an identified group.</b>  <b>If such activity is not carried out by contractor /BHEL is not satisfied, then BHEL may get it done by other agency and actual cost along with BHEL overheads will be deducted from contractor's bill. Such decisions of BHEL shall be binding on the contractor.</b>
<b>3</b>	Proper housekeeping to be maintained at work place and the following are to be taken care of on daily basis.
<b>4</b>	All surplus earth and debris are removed / disposed of from the working areas to identified locations.
<b>5</b>	Unused/Surplus cables, steel items and steel scrap lying scattered at different places/elevation within the working areas are removed to identified locations.
<b>6</b>	Different work places for easy collection of scrap/waste. Scrap chute shall be installed to remove scrap from high location.
<b>7</b>	Workmen shall be educated through tool box talk about the importance of housekeeping and encourage not to litter.
<b>8</b>	Labour colony area shall be kept clear and materials like pipes, steel, sand, concrete, chips and bricks, etc. shall not be allowed in the Labour colony to obstruct free movement of men and machineries.
<b>9</b>	Fabricated steel structures, pipes & piping materials shall be stacked properly.
<b>10</b>	No parking of trucks/trolleys, cranes and trailers etc. shall be allowed in the camp, which may obstruct the traffic movement as well as below LT/HT power line.





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<b>11</b>	Utmost care shall be taken to ensure over all cleanliness and proper upkeep of the working areas Keeping the work area clean/ free from debris, removed scaffoldings, scraps, insulation/sheeting wastage /cut pieces, temporary structures, packing woods etc. will be in the scope of the contractor. Such cleanings have to be done by contractor within quoted rate, on daily basis by an identified group. If such activity is not carried out by contractor / BHEL is not satisfied, then BHEL may get it done by other agency and actual cost along with BHEL overheads will be deducted from contractor's bill. Such decisions of BHEL shall be binding on the contractor.
<b>12</b>	Dedicated Housekeeping gangs shall be deployed, who shall be provided all required PPEs and safety training.
<b>13</b>	Mass housekeeping shall be carried out for half a day in a week.
<b>14</b>	Sufficient waste bins shall be provided at different work places for easy collection of scrap/waste. Scrap chute shall be installed to remove scrap from high locations.
<b>15</b>	Fabricated steel structures, pipes & piping materials shall be stacked properly.
<b>16</b>	Utmost care shall be taken to ensure over all cleanliness and proper upkeep of the working areas.
<b>17</b>	Access & egress (stair case , gangways, ladders etc.) path should be free from all scrap and other hindrances.
<b>18</b>	All wooden scrap , empty wooden cable drums and other combustible packing materials, shall be removed from workplace to identified locations.

<b>11.34</b>	<b>ACCESS TO AND FROM THE WORKPLACE</b>
<b>1</b>	Safe, clean, well lit, unencumbered access and egress to and from work areas shall be maintained at all times in normal operating conditions.
<b>2</b>	The number and location of accesses and egresses from and to the workplace shall be adapted to the number of people likely to be present at any time, and therefore to evacuate from the workplace in case of emergency.
<b>3</b>	If access and egress to work areas are restricted due to operational conditions (e.g. access restricted due to pressure testing, etc.), alternative access and egress ways must be implemented, so far as is reasonably practicable. If this is not reasonably practicable, all concerned organizations and persons must be informed of the access restrictions, and work scheduling must be adapted in consequence.
<b>4</b>	Temporary access to height or into ground openings shall be of purpose made material such as scaffolds, stair cases/towers and ramps, which incorporate guardrails.
<b>11.35</b>	<b>WASTE MANAGEMENT</b>
<b>1</b>	There are operations on construction projects that may create hazardous waste, which would require handling, storage, transferring, and transporting. Therefore, hazardous waste guidelines apply for Hazardous Waste Planning:
<b>2</b>	Take suitable measures for waste management and environment related laws/legislation as a part of normal construction activities. Compliance with the legal requirements on storage/ disposal of paint drums (including the empty ones), Lubricant containers, Chemical Containers, and transportation and storage of hazardous chemicals will be strictly maintained.
<b>3</b>	Details of E-Waste , Hazardous Waste, Biomedical waste etc. and their disposal plan, shall be submitted to BHEL every 6 months as per formats Provided by BHEL.





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<b>11.35.1</b>	<b>MINIMUM REQUIREMENTS:</b>
<b>1</b>	Contractor must designate a Material Manager who is responsible for checking delivered materials as potential hazardous waste and informing the Contractor's Safety Manager.
<b>2</b>	Contractor who create, may be expected to create or could accidentally create a material that could be classified to be hazardous waste must provide Disposal number (or equivalent) and other pertinent information on file.
<b>3</b>	All hazardous waste or waste which could be considered hazardous waste, as determined by the methodology and definitions from environmental regulators must be stored and collected in special areas and properly disposed of by the Contractor.
<b>4</b>	No waste haulers, disposers, recyclers, or scavengers will be allowed on the site without the permission of the owner. It will be the responsibility of the Contractor to provide copies of all licenses, permits, and authorizations to the.
<b>5</b>	No waste may be removed from the site by any person without the authorization of the Contractor. No waste may be brought onto the site and disposed of using the Contractor's systems or facilities.
<b>6</b>	Take suitable measures for waste management and environment related laws/legislation as a part of normal construction activities. Compliance with the legal requirements on storage/ disposal of paint drums (including the empty ones), Lubricant containers, Chemical Containers, and transportation and storage of hazardous chemicals will be strictly maintained.
<b>7</b>	Details of E-Waste, Hazardous Waste, biomedical waste etc. and their disposal plan, shall be submitted to BHEL every 6 months as per Formats No HSEP:14-F17 and HSEP:14-F18.
<b>11.36</b>	<b>BINS AT WORK PLACE</b>
<b>1</b>	Sufficient rubbish bins shall be provided close to workplaces.
<b>2</b>	Bins should be painted yellow and numbered.
<b>3</b>	Sufficient nos. of drip trays shall be provided to collect oil and grease.
<b>4</b>	Sufficient qty. of broomsticks with handle shall be provided.
<b>5</b>	Adequate strength of employees should be deployed to ensure daily monitoring and service for waste management.
<b>11.37</b>	<b>STACKING AND STORAGE PRACTICE</b>
<b>1</b>	Contractor/ Agency shall ensure stacked material is bonded on a stable and level footing capable of carrying the mass of the stack. Adequate clearances shall be provided between the sides of the stack and top to facilitate unimpeded access to service equipment like overhead wiring, cranes, forklifts and firefighting equipment, and hoses. Circular items shall be sufficiently choked with wedges not with odd bits of materials. Free-standing stacks of gunny bags and sacks such as Cement bags shall be stacked to prescribe safe stacking heights with layers formed for stable bonding, preventing slippage causing accidents. Stacking against walls shall not be permissible.
<b>2</b>	Contractor shall maintain the premises and surrounding areas in clean and clear manner with safe access and egress. There shall be sufficient and adequate storage racks, shelving, bins and pallets and material handling equipment to stack his construction materials such as Pipes, Structural and his construction enabling materials. Unwanted materials shall be promptly moved away for efficient material movement.



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3	Any temporary store shed will be built in conformity with fire safety requirements. The stores must be provided with adequate lighting arrangement (Flame proof / intrinsically safe depending upon the Zone category) and must be equipped with sufficient fire extinguishing arrangement. "No Smoking" and other relevant signage must be displayed conspicuously at strategic locations and safety precautions must be strictly enforced.
11.38	<b>OVERHEAD PROTECTION</b>
1	The contractor shall ensure that any area exposed to risk of falling materials, articles or objects is roped off or cordoned off or otherwise suitably guarded from inadvertent entry of any person.
2	Wherever there is a possibility of falling of any material, equipment or construction workers while working at heights, a suitable and adequate safety net should be provided. The safety net should be in accordance with BIS Standards.
11.39	<b>STORAGE AND COLLECTION</b>
1	Different types of rubbish/waste should be collected and stored separately.
2	Paper, oily rags, smoking material, flammable, metal pieces should be collected in separate bins with close fitting lids.
3	Rubbish should not be left or allowed to accumulate on construction and other work places.
4	Do not burn construction rubbish near working site.
11.40	<b>SEGREGATION</b>
1	Earmark the scrap area for different types of waste.
2	Store wastes away from building.
3	Oil spill absorbed by non-combustible absorbent should be kept in separate bin.
4	Clinical and first aid waste stored and incinerated separately.
11.41	<b>DISPOSAL</b>
1	Sufficient containers and scrap disposal area should be allocated.
2	All scrap bin and containers should be conveniently located.
3	Provide self-closing containers for flammable/spontaneously combustible material.
4	Keep drainage channels free from choking.
5	Make schedule for collection and disposal of waste.
11.42	<b>WARNING AND SIGNS</b>
1	Appropriate sign to be displayed at scrap storage area
2	No toxic, corrosive or flammable substance to be discarded into public sewage system.
3	Waste disposal shall be in accordance with best practice.
4	Comply with all the requirements of Pollution Control Board (PCB) for storage and disposal of hazardous waste.
11.43	<b>TRAFFIC MANAGEMENT SYSTEM</b>
11.43.1	<b>SAFE WORKPLACE TRANSPORT SYSTEM</b>
1	Traffic routes in a work place shall be suitable for the persons or vehicles using them. This shall be sufficient in number and of sufficient size. This shall reflect the suitability of traffic routes for vehicles and pedestrians.



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2	Where vehicles and pedestrians use the same traffic routes there shall be sufficient space between them. Where necessary all traffic routes must be suitably indicated. Pedestrians or vehicles must be able to use traffic routes without endangering those at work. There must be sufficient separation of traffic routes from doors, gates and pedestrian traffic routes.
3	For internal traffic, lines marked on roads / access routes and between buildings shall clearly indicate where vehicles are to pass.
4	Temporary obstacles shall be brought to the attention of drivers by warning signs or hazard cones.
5	Speed limits shall be clearly displayed for each kind of vehicle.
6	Speed ramps preceded by a warning signs or marker are necessary.
7	The traffic route should be wide enough to allow vehicles to pass and re-pass oncoming or parked traffic and it may be advisable to introduce on-way system or parking restrictions.
8	Safest route shall be provided between places where vehicles have to call or deliver.
9	Avoid vulnerable areas/items such as fuel or chemicals tanks or pipes, open or unprotected edges and structures likely to collapse.
10	Safe areas shall be provided for loading and unloading.
11	Avoid sharp or blind bends. If this is not possible hazards should be indicated e.g. blind corner.
12	Ensure road crossings are minimum and clearly signed.
13	Entrance and gateways shall be wide enough to accommodate a second vehicle without causing obstruction.
14	Set sensible speed limits which are clearly sign posted.
15	Where necessary ramps should be used to retard speed. This shall be preceded by a warning sign or mark on the road.
16	Forklift trucks shall not pass over road hump unless of a type capable of doing so.
17	Overhead electric cable, pipes containing flammable hazardous chemical shall be shielded by using goal posts height gauge posts or barriers.
18	<b>Road traffic</b> signs shall be provided on prominent locations for prevention of incidents and hazards and for quick guidance and warning to employees and public. Safety signs shall be displayed as per the project working requirement and guideline of the state in which project is done. Vehicles hired or used shall not be parked within the 15m radius of any working area. Any vehicle, that is required to be at the immediate/near the vicinity, shall be approved by the person in-charge of the site.
<b>11.43.2</b>	<b>TRAFFIC ROUTE FOR PEDESTRIANS</b>
1	Where traffic routes are used by both pedestrians and vehicles road shall be wide enough to allow vehicles and pedestrians safely.
2	Separate routes shall be provided for pedestrians to keep them away from vehicles. Provide suitable barriers/guard at entrances/exit and the corners or buildings.
3	Where pedestrian and vehicle routes cross, appropriate crossing shall be provided.
4	Where crowd is likely to use roadway e.g. at the end of shift, stop vehicles from using them at such times.
5	Provide high visibility clothing for people permitted in delivery area.



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11.43.3	<b>WORK VEHICLE</b>											
	Work vehicle shall be as safe stable efficient and roadworthy as private vehicles on public roads. Site management shall ensure that drivers are suitably trained. All vehicle e.g. heavy motor vehicle forklift trucks dump trucks mobile cranes shall ensure that the work equipment conforms to the following:											
1	A high level of stability.											
2	A safe means of access/egress.											
3	Suitable and effective service and parking brakes.											
4	Windscreens with wipers and external mirrors giving optimum all round visibility.											
5	Provision of horn, vehicle lights, reflectors, reversing lights, reversing alarms.											
6	Provision of seat belts.											
7	Guards on dangerous parts.											
8	Driver protection - to prevent injury from overturning and from falling objects/materials.											
9	Driver protection from adverse weather.											
10	No vehicle shall be parked below HT/LT power lines.											
11	Valid Pollution Under Control certification for all vehicles											
12	Wheel stopper shall be use during the parking of vehicle.											
13	Helper to be deployed in each vehicles as per site requirement.											
11.43.4	<b>DAILY CHECK BY DRIVER</b>											
1	There should also be daily safety checks containing below mentioned points by the driver before the vehicle is used. <table><tr><td>Brakes</td><td>Mirrors</td><td>Warning signals</td></tr><tr><td>Tires</td><td>Windscreen waters</td><td>Specific safety system i.e. control interlocks</td></tr><tr><td>Steering</td><td>Wipers</td><td></td></tr></table>			Brakes	Mirrors	Warning signals	Tires	Windscreen waters	Specific safety system i.e. control interlocks	Steering	Wipers	
Brakes	Mirrors	Warning signals										
Tires	Windscreen waters	Specific safety system i.e. control interlocks										
Steering	Wipers											
2	Management should ensure that drivers carry out these checks.											
11.43.5	<b>TRANSPORTATION OF PERSONNEL AND MATERIALS BY VEHICLES</b>											
1	All drivers shall hold a valid driving License for the class of vehicle to be driven and be registered as an authorized BHEL driver with the Administration Department.											
2	Securing of the load shall be by established and approved methods, i.e. chains with patented tightening equipment for steel/heavy loads. Sharp corners on loads shall be avoided when employing ropes for securing.											
3	All overhangs shall be made clearly visible and restricted to acceptable limits											
4	Load shall be checked before moving off and after traveling a suitable distance.											
5	On no account is construction site to be blocked by parked vehicles Drivers of vehicles shall only stop or park in the areas designate by the stringing foreman.											
6	Warning signs shall be displayed during transportation of material.											
7	All vehicles used by BHEL shall be in worthy condition and in conformance to the Land Transport requirement.											
8	Wheel stopper shall be use during the parking of vehicle.											



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9	Helper to be deployed in each vehicle as per site requirement.
11.43.6	<b>MAINTENANCE</b>
	All Vehicles used for transportation of man and material shall undergo scheduled inspections on frequent intervals to secure safe operation. Such inspections shall be conducted in particular for steering, brakes, lights, horn, doors etc. Site management shall ensure that work equipment is maintained in an efficient, working order and in good repair. Inspections and services carried out at regular intervals of time and or mileage. No maintenance shall be carried below HT/LT power lines.
11.44	<b>EMERGENCY PREPAREDNESS AND RESPONSE PLAN</b>
	The contractor shall prepare an emergency action plan approved by his competent authority to handle any emergency occurred during construction work. Regular mock drills shall be organized to practice this emergency plan. The Emergency Action Plan should be widely circulated to all the employees and suitable infrastructure shall be provided to handle the emergencies.  This plan covers fire, medical and other environmental incidents. It aims at controlling the emergency and generally mitigating the adverse effects of a major Incident. This plan is applicable to all activities carried at the project site. Determination of hazard potential and identification and assessment of hazards is the first part in emergency planning. This requires systematic study of the site / plant to identify emergencies that can occur.
1	Emergency preparedness and response capability of site shall be developed as per Emergency Preparedness and Response plan issued by BHEL
2	Availability of adequate number of first aiders and fire warden shall be ensured with BHEL and its contractors
3	All the contractor's supervisory personnel and sufficient number of workers shall be trained for fire protection systems. Enough number of such trained personnel must be available during the tenure of contract. Contractor should nominate his supervisor to coordinate and implement the safety measures.
4	Assembly point shall be earmarked and access to the same from different location shall be shown
5	Fire exit shall be identified and pathway shall be clear for emergency escape.
6	Appropriate type and number of fire extinguisher shall be deployed as per Fire extinguisher deployment plan and validity shall be ensured periodically through inspection
7	Adequate number of first aid boxes shall be strategically placed at different work places to cater emergency need. Holder of the first aid box shall be identified on the box itself who will have the responsibility to maintain the same.
8	In addition to medical Centre along with first aid amenities mention under clause no. 8.8.5 separate/ additional first aid facility near work place/ construction activity area shall be developed by contractor with first aid box & First aider.
9	Emergency contact numbers (format given in EPRP) of the site shall be displayed at prominent locations.
10	Tie up with hospital to be made by agency at his cost, in case customer is not having hospital.
11	Disaster Management group shall be formed at site
12	Mock drill shall be arranged at regular intervals. Monthly report of the above to be given to BHEL safety Officer as per prescribed BHEL formats



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<b>13</b>	Mock drill shall be conducted on different emergencies periodically to find out gaps in emergency preparedness and taking necessary corrective action
<b>14</b>	<p>The contractor shall ensure that an Emergency Management Plan is prepared to deal with emergencies arising out of:</p> <ul style="list-style-type: none"> <li>• Fire and explosion;</li> <li>• Collapse of lifting appliances and transport equipment;</li> <li>• Collapse of building, sheds or structure etc.;</li> <li>• Gas leakage or spillage of dangerous goods or chemicals;</li> <li>• Drowning of workers, sinking vessels, and</li> <li>• Landslides getting workers buried; floods, storms and other natural calamities.</li> </ul>
<b>15</b>	While arrangements shall be made for emergency medical treatment and evacuation of the victim in the event of an accident or dangerous incident occurring, the chain of command and the responsible persons of the contractor with their telephone numbers and addresses for quick communication shall be adequately publicized and conspicuously displayed in the workplace.
<b>16</b>	It is also required that there is a tie-up with the hospitals located in the neighborhood for attending to the casualties promptly and emergency vehicle kept on standby duty during the working hours for the purpose.
<b>17</b>	It shall be the responsibility of the contractor to keep the Local Law & Order Authorities informed and seek urgent help, as the case may be, so as to mitigate the consequences of an emergency. Prompt communication to BHEL, telephonic initially and followed by a written report, shall be made by the contractor.





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### 12.0 HSE INSPECTION

Inspection on HSE for different activities being carried out at site shall be done to ensure compliance to HSEMS requirements. The contractor shall maintain and ensure necessary safety measures as required for inspection and tests HV test, Pneumatic test, Hydraulic test, Spring test, Bend test etc. as applicable, to enable inspection agency for performing Inspection. If any test equipment is found not complying with proper safety requirements then the Inspection Agency may withhold inspection, till such time the desired safety requirements are met.

Formats & Checklists as indicated in this document including those referred in Annexure - 09 (Formats used for inspection & checklist and penalty details) and part of the HSE Systems & Procedures referred to shall be used for inspections a minimum, and maintained for records. BHEL shall reserve the right to modify any Format in this document or introduce new Formats as per requirement.

#### **A. NON-CONFORMANCE'S: -**

**Contractor shall identify separate worker gang to resolve HSE issues.**

Any non-conformance identified during inspection observed shall be addressed immediately.

In case immediate closure of non-conformity is not possible:

- a. work to be halted in the area
- b. Non-conformance to be generated and submitted to responsible person and BHEL.
- c. non-conformance to be resolved through responsible agency / person Only after closure of non-conformance, work to be allowed to resume.

#### **B. INSPECTION PLAN: -**

- Subcontractor shall prepare an inspection plan covering all areas/ activities/ equipment/ hazards and implement the same after getting approval of BHEL. Responsibility to ensure coverage of all areas/ activities rests with the subcontractor.
- All Inspections shall be witnessed by BHEL - only then they shall be considered as valid

#### **C. INSPECTION REPORTS: -**

- Monthly inspection reports as per plan shall be submitted to BHEL HSE Head

**D. Online/ App-based HSE inspection system shall be used for inspection whenever provided by BHEL otherwise Hard-copy based system shall continue.**

	<input checked="" type="checkbox"/> <b>OK</b>	<input type="checkbox"/> <b>NOT OK</b>
Contractor Name:		
Equipment Identification No :		
Inspection Date :		
Next Inspection Date :		
Inspected By :		

**Every Inspected Equipment shall display above sticker**



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12.1	DAILY HSE CHECKS											
	Both the Site Supervisors and safety officer of Contractor are to conduct daily site Safety inspection around work activities and premises to ensure that work methods and the sites are maintained to an acceptable standard. The following are to form the common subjects of a daily safety inspection: <div><div>1. Personal Safety wears &amp; gear compliance.</div><div>2. Complying with site safety rules and permit-to-work (PTW).</div><div>3. Positions and postures of workers.</div><div>4. Use of tools and equipment etc. by the workers.</div></div> The inspection should be carried out just when work starts in beginning of the day, during peak activities period of the day and just before the day's work ends.											
12.2	INSPECTION OF PPE											
1	PPEs shall be inspected by HSE officer at random once in a week as per format no. HSEP:14-F06 for its compliance to standard and compliance to use and any adverse observation shall be recorded in the PPE register.											
2	The applicable PPEs for carrying out particular activities are listed below.											
12.3	INSPECTION OF T&Ps & COLOR CODING											
1	A master list of T&Ps shall be maintained by each contractor.											
2	All T&Ps being used at site shall be inspected by HSE officer once in a month as per format no. HSEP:14-F07 for its healthiness and maintenance.											
3	The T&Ps which require third party inspection shall be checked for its validity during inspection. The third party test certificate should be accompanied with a copy of the concerned competent person's valid qualification record.											
4	BHEL shall be given advance intimation of Third Party Inspection. BHEL shall associatewith Inspection as per discretion.											
5	The validity of T&P shall be monitored as per "Status of T&Ps" format no. HSEP:14-F08											
I	Inspections and tests shall be documented by means of color coding which shall verify that inspections or testing are current and that all receptacles, portable Power tools, Lifting Tools & Tackles have been inspected and tested as required. The Proposed color codes used onthe project shall be as follow (colour code may vary as per BHEL/Customer instruction): <table><tr><td>GREEN</td><td>BLUE</td><td>YELLOW</td><td>PURPLE</td></tr><tr><td>January February March</td><td>April May June</td><td>July August September</td><td>October November December</td></tr></table>				GREEN	BLUE	YELLOW	PURPLE	January February March	April May June	July August September	October November December
GREEN	BLUE	YELLOW	PURPLE									
January February March	April May June	July August September	October November December									
	T&P COLOR CODING PROCEDURE:											
II	The cycle of colors shall be Quarterly. The color code tape / Sticker shall be clearly visibleto designate the period for which the inspections and tests were conducted.											
III	Following the initial inspection, the equipment must be color-coded quarterly as per color-coding instructions that will be issued by the contractor.											
IV	Fire extinguisher with the current month color-coding inspection sticker must be providedand secured in the platform.											



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<b>V</b>	All slings shall be regularly inspected in accordance with the requirement of the project for frequent and periodic inspections and removed from the job site if they fail to meet the minimum requirements of the project.
<b>VI</b>	The Contractor's Safety Officer shall ensure that all PPE is inspected prior to its issue. He is to ensure all contractor personnel are using safe and proper PPE equipment. Regular inspections on the PPE shall be carried out and personnel not adhering to those inspections shall be removed immediately from the site.
<b>VII</b>	A Ten (10) day interval period shall be given into each monthly color code change. During this Ten (10) day period either color shall be acceptable.
<b>12.4</b>	<b>INSPECTION OF CRANES AND WINCHES</b>
<b>1</b>	Cranes and winches shall be inspected by the operator through a daily checklist for its safe condition (as provided by the equipment manufacturer) before first use of the day.
<b>2</b>	Cranes and Winches shall be inspected by HSE officer once in a month as per format no. HSEP:14-F09 (A&B) for healthiness, maintenance and validity of third party inspection.
<b>3</b>	The date of third party inspection and next due date shall be painted on cranes and winches.
<b>4</b>	The operators/drivers shall be authorized by contractor based on their competency and experience and shall carry the I-card.
<b>5</b>	The operator should be above 18 years of age and should be in possession of driving license of HMV man & goods), vision test certificate and should have minimum qualification so that he can read the instructions and check list.
<b>6</b>	Ensure Proper protection shall be provided to the winch machine & operator against abnormal weather.
<b>7</b>	The power supply shall shut off, if the Crane and Winch is left unattended. Control levers shall be secured in the neutral position.
<b>8</b>	The operator should be above 18 years of age and should be in possession of driving license of HMV man goods), vision test certificate and should have minimum qualification so that he can read the instructions and check list.
<b>12.5</b>	<b>INSPECTION OF HEIGHT WORKING</b>
<b>1</b>	Any activity carried out at more than 2 m height is classified as height work
<b>2</b>	Inspection of height working shall be conducted daily by Supervisors before start of work to ensure safe working condition including provision of <ol style="list-style-type: none"> <li>Fall arrestor</li> <li>Lifelines – connected to rigid &amp; independent structure</li> <li>Safety nets deployed below all height work activities</li> <li>Fencing and barricading</li> <li>Warning signage</li> <li>Covering of opening</li> <li>Proper scaffolding with access and egress.</li> <li>Illumination</li> </ol>
<b>3</b>	For full duration of height work, constant supervision to be maintained by dedicated HSE personnel
<b>4</b>	Inspection on height working shall be conducted once in a week by HSE officer as per format no. HSEP:14-F10.
<b>5</b>	Medical fitness of height worker shall be ensured.
<b>6</b>	Height working shall not be allowed during adverse weather.



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<b>12.6</b>	<b>INSPECTION OF WELDING AND GAS CUTTING OPERATION</b>
<b>1</b>	Supervisor shall ensure that no flammable items are available in near vicinity during welding and gas cutting activity.
<b>2</b>	Inspection during welding and gas cutting operations shall be carried out by HSE officer once a month as per format no. HSEP:14-F11.
<b>3</b>	Use of fire blanket to be ensured to avoid falling of splatters during welding or gas cutting operation at height.
<b>4</b>	Availability of fire extinguisher at vicinity shall be ensured
<b>5</b>	Inspection during welding and gas cutting operations shall be carried out by HSE officer once a month as per format provided by BHEL.
<b>6</b>	Use of fire blanket to be ensured to avoid failing of splatters during welding or gas cutting operation at height.
<b>12.7</b>	<b>INSPECTION OF ELECTRICAL INSTALLATION / APPLIANCES</b>
<b>1</b>	Ensure proper earthing in electrical installation
<b>2</b>	Use ELCB at electrical booth
<b>3</b>	Electrical installation shall be properly covered at top where required
<b>4</b>	Use appropriate PPEs while working
<b>5</b>	Use portable electrical light < 24 V in confined space and potentially wet area.
<b>6</b>	Monthly inspection shall be carried out as per format provided by BHEL.
<b>12.8</b>	<b>INSPECTION OF ELEVATOR</b>
<b>1</b>	Elevators shall be inspected by concerned supervisors once in a week as per format no. HSEP:14-F13.
<b>2</b>	All elevators shall be inspected by competent person and validity shall be ensured.
<b>3</b>	The date of third party inspection and next due date shall be painted on elevator.
<b>4</b>	<b>EMERGENCY SAFETY DEVICES:</b>  The lift shall be provided with safety Device attached to the lift car frame and placed beneath the car. The safety device shall be capable of stopping and sustaining the lift car up at governor tripping speed with full rated load in car.
<b>5</b>	Elevator shall have Floor announcement system & Braille switches
<b>12.9</b>	<b>INSPECTION OF EXCAVATION</b> Excavation activities shall be inspected as per Format HSEP:14-F13E
<b>12.10</b>	<b>INTERNAL/ EXTERNAL HSE AUDIT / INSPECTIONS</b>  <b>1 ) All non-conformities and observations on HSE identified during internal or external HSE audit shall be disposed of by site in a time bound manner and reported back the implementation status.</b>  <b>2) Corrective action and preventive action on HSE issues raised by certification body issued by BHEL shall be implemented by site and reported to Site management.</b>



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12.11

#### INDICATIVE LIST OF INSPECTIONS AND PERIODICITIES

Indicative list & periodicity of Inspections is given as under. It is the responsibility of the subcontractor to develop an inspection plan covering all areas & activities in the scope.

SL. No.	Format Name	Frequency of check (if applicable)
01	Inspection of First Aid Box	Weekly
02	Inspection of PPE	Weekly
03	Inspection of T&Ps	Monthly
04	Inspection of Cranes	Monthly
05	Inspection of Winches	Monthly
06	Inspection on Height Working	Weekly
07	Inspection on Welding & Gas Cutting	Monthly
08	Inspection on Electrical Installation	Monthly
09	Inspection on Elevator	Weekly
10	Inspection of Excavation	Weekly
11	Inspection of Labour Colony	Monthly
12	Inspection of Illumination Levels	Weekly

The checklists shall be provided by BHEL at Site. It is the responsibility of the subcontractor to ensure their availability before start of work. This list is indicative list and in future for inspection BHEL shall be issue other format if required.



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### 13.0 HSE PERFORMANCE

<b>13.1</b>	Contractor shall be assessed on monthly basis for HSE Compliance by BHEL Safety In-charge at site.
<b>13.2</b>	The HSE compliance shall be based on Online HSE Evaluation System of BHEL as perFormat No. HSEP:14-F33.
<b>13.3</b>	BHEL shall reserve the right to use this assessment for evaluating agency capacity for future tenders.
<b>13.4</b>	Suitable HSE reward system shall be developed at site level to promote HSE complianceamongst workmen by the contractor.
<b>13.5</b>	To decide HSE reward, performance towards HSE shall be evaluated for workmen and it shall be awarded regularly in public gathering.
<b>13.6</b>	If safety record of the contractor in execution of the awarded job is to the satisfaction of safety department of BHEL, issue of an appropriate certificate to recognize the safety performance of the contractor may be considered by BHEL after completion of the job





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#### 14.0 HSE PENALTIES

14.1	Nonconformity of safety rules and safety appliances will be viewed seriously and BHEL has right to impose fines on the contractor for every instance of violation noticed.
14.2	As per contractual provision HSE penalties shall be imposed on contractors for non-compliance on HSE requirement as per format no. HSEP:14-F14.
14.3	The list in the format is only indicative. For any other violation, not listed in the format, the minimum penalty amount is to be decided as per BOCW act.
14.4	If principal customer/statutory and regulatory bodies impose some penalty on HSE due to the non-compliance of the contractor the same shall be passed on to them.
14.5	The penalty amount shall be recovered by Site Finance department from contractors from the RA/Final bill.
14.6	Any other non-conformity noticed not listed in this HSE plan/ above will also be fined as deemed fit by BHEL. The decision of BHEL engineer is final on the above. The amount will be deducted from running bills of the subcontractor. The amount collected above will be utilized for giving award to the employees who could avoid incident by following safety rules. Also the amount will be spent for purchasing the safety appliances and supporting the safety activity at site.
14.7	<b>If any penalty is imposed by the customer on BHEL due to safety violations (e.g., minor, major, fire, etc.) caused by the contractor or the contractor's subcontractor, the same amount of penalty will be passed on to the contractor or subcontractor responsible for the unsafe act or unsafe condition or Safety violation at the site."</b>
14.8	If the Contractor fails in providing safe working environment as per BHEL HSE Plan for site operations by contractor / 2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST OF CSPGCL or continues the work even after being instructed to stop the work by the Engineer, I/C as provided in the relevant Clause of BHEL's contract with the customer. the Contractor shall be penalized till the instructions are complied by Engineer I/C.
14.9	Permanent disablement shall have the same meaning as indicated in The Workmen's Compensation Act' 1923. The penalty mentioned above shall be in addition to the compensation payable to the workmen/ employees under the relevant provisions of the workmen's Compensation laws as applicable from time to time.
14.10	<p>If two or more fatal accidents occur at same BHEL/ 2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST OF CSPGCL site under the control of contractor during the period of contract and he has</p> <ol style="list-style-type: none"> <li>I. not complied with keeping adequate PPEs in stock or</li> <li>II. defaulted in providing PPEs to his workmen</li> <li>III. not followed statutory requirements BHEL/ 2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST OF CSPGCL safety rules</li> <li>IV. been issued warning notice/s by BHEL/ 2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST OF CSPGCL head of the project on non-observance of safety norms</li> <li>V. not provided safety training to all his workmen, the contractor can be debarred from getting tender documents in BHEL/ 2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST OF CSPGCL for two years from the date of last accident.</li> </ol>



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<b>14.11</b>	The safety performance will also be one of the overriding criteria for evaluation of overall performance of the contractors by BHEL/ 2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST OF CSPGCL. The contractor shall submit the accident data including fatal / non-fatal accidents for the last 3 years where he has undertaken the construction activities Projects-wise along with the tender documents. This will also be considered for evolution of tender documents. If the information given by the contractor found incorrect, his contract will be liable to be terminated.								
<b>14.12</b>	The Contractor will make available minimum quantity of all safety equipment's and safety PPEs of required specifications as per suggestive list included bidding documents as a part of "List of minimum T & P". Further Contractor will ensure availability of additional requirement for individual worker and safety equipment as per site requirement during execution of the contract till its completion.								
<b>14.13</b>	<p>The Contractor shall abide by the following during Construction and Erection activities:</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="text-align: center; width: 10%;">I</td><td>Chain pulley block shall not be used for Holding loads more than 2 (Two) ton.</td></tr> <tr> <td style="text-align: center;">II</td><td>Hydra shall not be used for material transport and any work at site.</td></tr> <tr> <td style="text-align: center;">III</td><td>Cage shall necessarily be used to Monkey ladders of height more than 4m.</td></tr> <tr> <td style="text-align: center;">IV</td><td>Fencing shall be provided to all Electrical Distribution boards and transformers for safety.</td></tr> </table> <p>Note – Only Farana is allowed for work at site and BHEL Material Yard etc.</p>	I	Chain pulley block shall not be used for Holding loads more than 2 (Two) ton.	II	Hydra shall not be used for material transport and any work at site.	III	Cage shall necessarily be used to Monkey ladders of height more than 4m.	IV	Fencing shall be provided to all Electrical Distribution boards and transformers for safety.
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### 15.0 OTHER REQUIREMENTS

<b>15.1</b>	In case of any delay in completion of a job due to mishaps attributable to lapses by the contractor, BHEL shall have the right to recover cost of such delay from the payments due to the contractor, after notifying the contractor suitably.
<b>15.2</b>	If the contractor fails to improve the standards of safety in its operation to the satisfaction of BHEL after being given reasonable opportunity to do so and/or if the contractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instruction regarding safety issued by BHEL, BHEL shall have the right to take corrective steps at the risk and cost of the contractor after giving a notice of not less than 7 days indicating the steps that would be taken by BHEL.
<b>15.3</b>	If the contractor succeeds in carrying out its job in time without any fatal or disabling injury incident and without any damage to property BHEL may, at its sole discretion, favorably consider to reward the contractor suitably for the performance.
<b>15.4</b>	In case of any damage to property due to lapses by the contractor, BHEL shall have the right to recover the cost of such damages from the contractor after holding an appropriate enquiry.
<b>15.5</b>	The contractor shall take all measures at the sites of the work to protect all persons from incidents and shall be bound to bear the expenses of defense of every suit, action or other proceeding of law that may be brought by any persons for injury sustained or death owing to neglect of the above precautions and to pay any such persons such compensation or which may with the consent of the contractor be paid to compromise any claim by any such person, should such claim proceeding be filed against BHEL, the contractor hereby agrees to indemnify BHEL against the same.
<b>15.6</b>	The contractor shall not employ men below the age of 18 years and women on the work of painting with products containing lead in any form. Wherever men above the age of 18 are employed on the work of lead painting, overalls shall be supplied by the contractor to the workmen and adequate facilities shall be provided to enable the working painters to wash during the cessation of work.
<b>15.7</b>	The contractor shall notify BHEL of his intention to bring to site any equipment or material which may create hazard.
<b>15.8</b>	BHEL shall have the right to prescribe the conditions under which such equipment or materials may be handled and the contractor shall adhere to such instructions.
<b>15.9</b>	BHEL may prohibit the use of any construction machinery, which according to the organization is unsafe. No claim for compensation due to such prohibition will be entertained by BHEL.



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### 16.0 HSE AUDITS/ INSPECTION

<b>16.1</b>	<b>INTERNAL HSE AUDIT</b>
<b>1</b>	Internal HSE Audit shall be carried out as per HSE audit calendar at least once in 6 months
<b>2</b>	Qualified HSE auditor shall be engaged for the internal HSE audit.
<b>3</b>	HSE checklist shall be used for carrying out audit and report shall be submitted to Head (HSE) of the Region with a copy to concerned site. Final audit report will be issued by Head (HSE) of the Region.
<b>4</b>	All non-conformities and observations on HSE shall be disposed off by site in a time bound manner.
<b>5</b>	Corrective action and Preventive action on HSE issues issued by Regional HQs shall be implemented by site and reported to HQ.
<b>16.2</b>	<b>EXTERNAL HSE AUDIT</b>
<b>1</b>	External HSE audit may be carried out once in a year by third party or by BHEL/customer (2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST OF CSPGCL)/consultant as second party audit or by certification body/government body as third party audit, with prior intimation to Customer and BHEL Safety Dept. The audit report along with time bound action plan should be submitted to BHEL.
<b>2</b>	Contractor shall facilitate smooth conduct of HSE audit and make available all the necessary information data which are not confidential in nature.
<b>3</b>	All non-conformities and observations on HSE identified during external HSE audit shall be disposed of by contractor in a time bound manner and reported back the implementation status.
<b>4</b>	Corrective action and Preventive action on HSE issues raised by certification body issued by CONTRACTOR Regional HQs shall be implemented by site and reported to HQ.
<b>5</b>	In case External audit conducted through third party, the external auditing agency should be reputed SAFETY institution or a certified SAFETY Auditor under any statutory legislation. The audit report along with time bound action plan should be submitted to BHEL HSE Head/ site CM/ Site GM/PD.
<b>6</b>	Apart from above, Electrical Safety Audit shall be conducted quarterly by a site team comprising Electrical engineer, Safety representative of Agency, BHEL and Customer representative covering the following and submit the report to BHEL/ Customer.
<b>6 - i</b>	Electrical incidents investigation findings and remedial measures implemented.
<b>6 - ii</b>	Adequacy of power supply requirements, Power distribution system in place and covered by temporary, Electrical protection devices – ELCBs, O/L protections etc.
<b>6 - iii</b>	Earth or ground connection and earth pit maintenance shall be maintain.
<b>6 - iv</b>	Education and training of electrical personnel undertaken.
<b>7</b>	All non-conformities and observations on HSE identified during internal or external HSE audit shall be disposed of by site in a time bound manner and reported back the implementation status.
<b>8</b>	Corrective action and Preventive action on HSE issues raised by certification body issued by BHEL shall be implemented by site and reported to Site management.



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### 17.0 MONTHLY HSE REVIEW MEETING

<b>1</b>	<p>BHEL shall hold HSE review meeting every month to discuss and resolve HSE issues of site and improve HSE performance. It will also discuss the incidents occurred since previous meeting, its root cause and Corrective action. The agenda is given below:</p> <ol style="list-style-type: none"> <li>a. Implementation of earlier MOM points</li> <li>b. HSE performance</li> <li>c. HSE inspection</li> <li>d. HSE audit and CAPA</li> <li>e. HSE training</li> <li>f. Health check-up camp</li> <li>g. HSE planning for the erection and commissioning and installation activities in the coming month</li> <li>h. HSE reward and promotional activities</li> </ol>
<b>2</b>	The meeting shall be Site In-charge of Contractors and HSE officers of Contractors.
<b>3</b>	MOM on the discussion along with HSE observations will be circulated to the concerned (contractor) for action/ compliance.
<b>4</b>	The Subcontractor shall close the observations to the satisfaction of BHEL within stipulated time frame.



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### 18.0 FORMATS USED

**List OF FORMATS USED (Formats in Annexure - 9). The frequency is indicative and can be modified as per requirement by BHEL**

SL. No.	Format Name	Format No.	Frequency of check (if applicable)
01	Inspection of First Aid Box	HSEP:14-F01	Weekly
02	Health Check Up	HSEP:14-F02	With new Induction
03	HSE Induction Training	HSEP:14-F03	With New Inductions
04	Tool Box Talk	HSEP:14-F04	Daily before job start
05	Monthly Site HSE Report	HSEP:14-F05	Monthly
06	Inspection of PPE	HSEP:14-F06	Weekly
07	Inspection of T&Ps	HSEP:14-F07	Monthly
08	Status of T&Ps	HSEP:14-F08	-
09	Inspection of Cranes	HSEP:14-F09A	Monthly
10	Inspection of Winches	HSEP:14-F09B	Monthly
11	Inspection on Height Working	HSEP:14-F10	Weekly
12	Inspection on Welding & Gas Cutting	HSEP:14-F11	Monthly
13	Inspection on Electrical Installation	HSEP:14-F12	Monthly
14	Inspection on Elevator	HSEP:14-F13	Weekly
15	HSE Penalty	HSEP:14-F14	-
16	Incident Reporting Format	HSEP:14-F15	
17	Format for Inspection of Labour Colony	HSEP:14-F16	Monthly
18	Format for Maintaining Records of E-waste Handled / Generated	HSEP:14-F17	Annually
19	Format for Maintaining Records of Hazardous Waste at the Facility	HSEP:14-F18	Annually
20	Inspection of Illumination Levels	HSEP:14-F19	Weekly
<b>(Note: Serial Numbers from F20-F29 and F32 intentionally excluded)</b>			
21	Monthly HSE Planning & Review Format		Monthly Twice
22	Daily HSE Reporting Format	HSEP:14-F31A&B	Daily
23	HSE Performance Evaluation Checklist	HSEP:14-F33	Monthly (by BHEL)





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### 19.0 BHEL GENERAL SAFETY RULES

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2	Safety in material handling and waste disposal	120-124
3	Safety in welding and gas cutting	125-128
4	Safety in the use of electricity	129-132
5	Safety in the use of hand tools and power operated tools	133-135
6	Safety in the use of ladders and stairs	136-139
7	Safety in the use of lifting appliances and machines	140-150
8	Safety in the use of transport, earth-moving equipment and the other construction machinery	151-153
9	Safety in the use of runways and ramps	154
10	Safety in storage, handling and use of explosives	155-161
11	Safety in excavation and tunneling work	162-172
12	Safety in piling work	173-174
13	Safety in erection, use and dismantling of scaffolds	175-178
14	Safety in the construction of structural formwork	179-180
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16	Safety in construction, repair and maintenance of steep roofs	184
17	Safety in construction of catch platforms, hoardings & chutes	185
18	Safety in the work on or adjacent to water	186
19	Safety in the building of cofferdams & caissons	187
20	Safety in demolition work	188-190
21	Fire Extinguishers & other appliances of fire fighting	191-192



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#### INTRODUCTION :-

#### RESPONSIBILITIES OF CONTRACTORS FOR IMPLEMENTATION OF BHEL GENERAL SAFETY RULES:

The Safety Rules for 2x660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST of CSPGCL, as outlined hereunder, while setting out a broad parameter of safety norms, are not exhaustive. The contractor and his agencies are advised to follow BHEL general Safety Rules along with all aforesaid condition mention in this HSE plan. However statutory provisions as amended from time to time for details and strict compliance therewith.

#### FOR GREENFIELD PROJECTS:

Building and Other Construction Workers (regulation of employment and conditions of service) Act, 1996 (briefly referred to as BOCW Act),

Building and other construction workers (regulation of employment and conditions of service) Central Rules, 1998 (briefly referred to as BOCW Rules) as adopted by the various State Governments,

#### FOR EXPANSION, MODIFICATION, ALTERATION AND, OR CONSTRUCTION ACTIVITY WITHIN AN EXISTING PLANT OPERATING AS PER APPROVED SITE PLAN UNDER THE FACTORIES ACT;

- a. Factories Act, 1948,
- b. Factories Rules, as adopted by the various State Governments
- c. BOCW Act
- d. BOCW Rules
- e) In case a new act/ statutory guideline/ modification/ consolidation of acts is implemented the same shall be required to be adhered by the subcontractor.
- f) The latest amendment of the above-mentioned acts/ rules shall be followed at site.

#### The contractor is also required to ensure compliance with all the relevant Acts/Rules in addition to above.

shall be incumbent on the contractor to ensure that the requirements of safety, statutory or otherwise specified, are fully met. Thus the onus of implementation of the norms so prescribed shall squarely rest with the contractor concerned or, on his behalf, his sub-contractor or any other agency deployed by him, indemnifying BHEL/ 2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST OF CSPGCL from all the liabilities that may arise out of any failure to comply with the above mentioned Acts/Rules or any contravention thereof by the contractor or any other sub- agency on his behalf.

Safety cannot be ensured solely through Rules and Regulations or Codes. It is the responsibility of the Contracting Agency to ensure that basic safety principles are incorporated in the planning stage of their mobilization, execution, installation of machines, equipment, storage, etc., and initiate and maintain safety programs. It is desirable to have a planned programme and secure adequate cooperation of senior management, EICs, sub-contracting agencies, supervisory personnel and workers involved to ensure the implementation of the provisions of these Rules in true spirit so as to achieve the ultimate goal of accident prevention.

It shall also be the responsibility of the contracting agency to provide amenities and safety requirements on each construction job in order to reduce or to eliminate hazards of construction activities and also to provide necessary first aid facilities nearby construction activity area and coordinate for ambulance for prompt transportation of injured persons to a physician or hospital.

It is also mandated that the authorized representative of BHEL, namely, Project Director/ Construction Manager & 2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST OF CSPGCL, namely, the Engineer-in-charge, may, at his convenience, exercise such superintendence, supervision and, or control as may be deemed necessary, but this shall not absolve the contractor of his basic responsibility for strict compliance with the norms, standards and, or legal provisions as applicable under the Factories Act/Rules and the Building and other construction (regulation of employment and conditions of service) Act/Rules.



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Section wise checklist of provisions of BOCW Act/Rules is given hereunder for ready reference of the contractor. (This list has been prepared in chronological order with primary importance to Section of Act and secondary importance to Rules).

#### MEETING FOR SAFETY AFTER AWARD OF THE CONTRACTOR

Representatives of contracting agency along with safety Officer/executive shall meet the concerned EIC of the particular activity prior to start of construction activities for the purpose of discussing safety standards and requirements applicable to the work under contract. The person representing the agency should be a responsible person for all their site activities.

#### SAFETY MESSAGE PROPAGATION:

1	Contracting agencies shall arrange for display of safety hoardings depicting suitable safety cartoons/messages/ cautionary notices at appropriate places of project site to remind the workers to perform their duties safely. Minimum one safety message board/hoarding of appropriate size for every 10 workers
2	to be provided and maintained by the concerned agency.
3	Apart from safety hoardings, each agency should maintain a safety bulletin board at all their work locations. Such safety bulletin boards should depict the activities being planned for the day, good practices, permit details etc.
4	Safety suggestion boxes shall be kept at each contractor's office at site for obtaining safety suggestions from the workers. Best suggestions should be implemented and may be rewarded suitably to encourage the workers for safety.

#### COMPETENCY OF EMPLOYEES:

1	Throughout the course of the contract, persons employed by agency shall be physically fit, qualified/experienced to perform their assigned duties/ jobs.
2	Employees shall not, knowingly be permitted to work in a manner that their ability or alertness is so impaired because of fatigue, illness or any other reason, that it may expose them and or others to injury.
3	No worker, vehicle operator shall be less than 18 years of age. And the vehicle operator shall have a valid license as per requirements of Motor Vehicle Act.
4	Contractor shall comply with all applicable state/central laws and codes related to employment of operators for Hoist, Shovel, Crane, Tractor, Bull-dozer, any other howling heavy equipment/vehicle.



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<b>1</b>	<b>Safety at workplace and equipment</b>
<b>1.0</b>	<b>GENERAL PROVISIONS:</b>
<b>1.1</b>	<b>Housekeeping:</b>
a	The contractor shall be primarily responsible for maintaining Good housekeeping and safety standards in the workplace;
b	Loose materials that are not required for use shall not be placed or left behind so dangerously as to obstruct workplaces or passageways;
c	All projecting nails shall be removed or bent to prevent injury;
d	Equipment, tools and small objects shall not be left lying unattended or unsecured from where they could fall or cause a person to trip;
e	Scrap, waste or rubbish shall not be allowed to accumulate in the site as these combustibles can create serious fire hazards and affect safe working;
f	Workplaces and passageways that become slippery owing to spillage of oil or other causes shall be cleaned up or strewn with sand, ash or the like;
g	Portable equipment shall be returned after use to their designated storage place.
<b>1.2</b>	<b>Means of access and egress shall consist of</b>
a	Adequate and safe means of access and egress shall be provided in all workplaces;
b	The means of access and egress shall be maintained in a safe condition;
<b>1.3</b>	<b>Lighting and ventilation</b>
a	All practical measures shall be taken to prevent smoke, fumes etc. from obscuring any workplace or equipment at which any worker is engaged;
b	The Contractor shall provide and maintain at its own expense all lighting, fencing, and watching when and where necessary for the proper execution and the protection of the Facilities, or for the safety of the owners and occupiers of adjacent property and for the safety of the public/ workers/ employee etc.
c	Adequate and suitable artificial lighting shall be provided where natural lighting is not sufficient as per IS 3646 (Part II). The artificial lighting so provided shall not cause any incidental any danger, including that of producing glare or disturbing shadows;
d	To prevent danger to health from air contamination by dust generated during grinding, cleaning, spraying or manipulation of materials as also to provide protection against dangerous gases, fumes, vapors, mist, etc. effective arrangements shall be made for ventilation;
e	Workers shall be provided with suitable respiratory protective equipment, if it is not technically possible to have uncontaminated air. To this end, a study by a competent person shall be made to decide on the due protection. Sufficient illumination at all times for maintaining safe working conditions shall be provided where building workers are required to work or pass, and for passageways, stairways and landings such illuminations shall not be less a than 0.5 foot candles at the floor level;
f	Where natural lighting is not adequate to prevent danger, adequate and suitable lighting shall be provided as per IS: 3646 — Part II;
g	Artificial lighting shall not cause any danger due to a brightness greater than 10 foot candles per square inch, except where the angle of inclination from the eye to the source or the part pf the fitting as the case may be exceeds 200, including that of producing glare or disturbing shadows;
h	Where necessary to prevent danger to health from air contamination by dust from the grinding, cleaning, spraying, or manipulating of materials or objects, arrangements shall be made to limit the concentration of the pollutants by thorough ventilation, and dust generated due to movement of earth-moving machinery and other construction equipment, by spray of water in the area from time to time;



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i	Adequate ventilation by the circulation of fresh air shall be maintained in such places where the concentration of pollutants is likely to affect the health of the workers;
j	Special care shall be taken to ventilate the workplace where gas cutting, welding or other operations involving generation of dangerous fumes, vapors, mists, gases etc is likely;
k	Where it is technically not possible to eliminate dust or noxious or harmful fumes or gases sufficiently to prevent injury to the health of the workers, the contractor shall provide suitable respiratory equipment like dust mask or gas/fume mask or breathing apparatus or other suitable respiratory equipment.
l	Proper lighting of all construction / erection areas. Bidder shall erect adequate number of high lighting masts in main plant, offsite, office and store areas for lighting during night. DG sets of adequate capacity shall be provided for emergency backup. The street lighting along the roads shall also be prioritized along with road construction. The construction power ring main shall be planned and erected immediately after the award.
<b>1.4</b>	<b>Dangerous and harmful environment:</b>
a	When an internal combustion engine exhausts into confined space or excavation or tunnel or any other workplace where neither natural ventilation nor artificial ventilation system is adequate to keep the carbon monoxide content of the atmosphere below fifty parts per million, adequate and suitable measures shall be taken at such workplace in order to avoid exposure of building workers to health hazards;
b	No building worker shall be allowed to enter any confined space or tank or trench or excavation wherein there is given off any dust fumes or other impurities of such nature and to such extent as is likely to be injurious or offensive to the building worker or in which explosives, poisonous, noxious or gaseous material or other harmful articles have been carried or stored or in which dry ice has been used as a refrigerant, or which has been fumigated or in which there is a possibility of oxygen deficiency, unless all practical steps have been taken to remove such dust, fumes or other impurities and dangers which may be present and to prevent any further ingress thereof, from such workplace or tank or trench or excavation;
c	No worker shall be allowed to enter any such space unless a responsible person has certified it safe and fit for the entry of such building workers.
<b>1.5</b>	<b>Fumes/gases due to Welding and gas-cutting operations: When welding or cutting operations are carried out in a confined space:</b>
a	Adequate ventilation, by means of exhaust fans or forced draught, as the condition may require, shall be constantly provided; otherwise enough quantity of air shall be circulated by means of air compressors to dilute the contaminant within permissible limits;
b	Workers shall take necessary precautions to prevent unburned combustible gas or oxygen from escaping inside a tank or vessel or other confined space;
c	Welding or cutting operations on any container that has held explosives or where inflammable gases may have been generated, shall be undertaken after the container has been thoroughly cleaned by steam or other effective means; and
d	Gas-test shall be carried out ensure that the confined space is completely free from combustible gases and vapors.
<b>1.6</b>	<b>Dust, gases, fumes</b>
a	Concentration of dust, gases or fumes shall be prevented by providing suitable means to control their concentration within the permissible limit so that they may not cause injury or create health hazard to a building worker;
b	For protection against such hazardous substances, besides efficient and effective means of control, personal protective equipment like dust masks, breathing apparatus, other respiratory appliances, goggles, as the case may be, shall be provided.





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<b>1.7</b>	<b>Excessive noise:</b>
a	Adequate measures shall be taken against the harmful effects of an excessive noise;
b	Use of earplugs/muffs and anti-vibration gloves shall be ensured to protect the workers from the impact of exposure to such dangers;
c	The noise level in no case shall exceed as prescribed in the concerned Rules and exposure in excess of 115 dBA over the period of a quarter of an hour cannot be permitted;
<b>1.8</b>	<b>Corrosive substances:</b>
a	All corrosive substances, including alkalis and acids, shall be stored and used by a person dealing with such substances at a building or other construction work in such a manner that it does not endanger the building worker and suitable protective equipment shall be provided by the employer to a building worker during handling or use of such substances at a building or other construction work and in case of spillage of such substances on the building worker, immediate remedial measures shall be taken;
b	While protection of the body could be ensured by use of corrosion resistant apparel/overalls, suitable goggles, gloves, apron, gum boots etc. shall be made available to all concerned personnel;
c	To deal with an accidental spillage of a corrosive substance on the body of a worker, the facility of eyewash fountain or water shower, as the case may be, shall be installed, within the easy reach of the workplace.
<b>1.9</b>	<b>Eye protection:</b>
a	Suitable personal protective equipment for the protection of eyes shall be provided and used by the building worker engaged in operations like welding, cutting, chipping, grinding or similar operations which may cause hazard to his eyes;
b	Goggles or face shield or welding screen with suitable shade of glass/filters etc shall be provided for the protection of the eyes.
<b>1.10</b>	<b>Overhead protection:</b>
a	It shall be ensured that at the building or other construction site, overhead protection is erected along the periphery of every building under construction that shall be of fifteen meters or more in height when completed;
b	Overhead protection shall not be less than two meters wide and shall be erected at a height not more than five meters above the base of the building and the outer edge of such overhead protection shall be one hundred fifty millimeters higher than the inner edge thereof or shall be erected at an angle of not more than twenty degrees to its horizontal sloping into the building;
c	It shall be also ensured that at the building and other construction work that any area exposed to risk of falling material, articles or objects is roped or cordoned off or otherwise suitably guarded from inadvertent entry of persons other than building workers at work in such area.
<b>1.11</b>	<b>Lifting and carrying of excessive weight:</b>
a	No building worker lifts by hand or carries overhead or over his back or shoulders any materials, articles, tools or appliances exceeding in weight the maximum limits as set out in the following table unless aided by any other building worker or a mechanical device;
b	No worker aided by other workers, lift by hand or carry overhead or over their back or shoulders any materials, articles, tools or other appliances exceeding in weight the sum total of the maximum limits as prescribed in the concerned Rules, unless aided by a mechanical devices:
<b>1.12</b>	<b>Protections against fall of persons –</b>
a	All scaffolds/working platforms at height of two meters or more shall be fenced;
b	All guard-rails for the fencing of floor openings, gangways, elevated workplaces shall be made of sound material, good construction and possess adequate strength and be between 1 m and 1.5 m above platform level, consist of two rails (two ropes or chains may be used if they are sufficiently taut) and supporting stanchions;





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c	Intermediate rails, ropes or chains shall be midway between the top and lower of edges of the top rail;
d	Sufficient number of stanchions or standard poles or uprights shall be maintained to ensure the required stability and resistance;
e	Guard-rails shall be free from sharp edges and be maintained in good repair;
f	Floor openings through which persons could fall, shall be guarded by covering or fencing;
g	If the means of protection is removed to allow the passage of persons or goods or other purpose, the same shall be replaced as soon as possible, while making temporary arrangements for reasonable degree of safety in the meanwhile;
h	Covers for floor opening shall be safe to walk on and if vehicles operate thereon it shall be safe for the same. This will require the contractor to have prior assessment of expected loads;
i	Cover for floor opening shall be secured by hinges, grooves, stops or other effective means against sliding, falling down or lifting out or any other inadvertent displacement;
j	Covers for any openings shall not constitute any hindrance to traffic and, as far as practicable, be flush with the floor;
k	If covers constitute as grids, the bars shall be spread not more than 5 cm apart;
l	Elevated workplaces at more than 2 m above the floor or ground shall be protected on all open sides by guardrails. It is commonly observed that fragile barricade tapes are used as a substitute of a strong and dependable fencing. This practice is prohibited. The barricade tapes can be used as markers/route guide only;
m	Elevated workplaces shall be provided with safe means of access and egress such as stairs, ramps or ladders according to suitability;
n	Persons employed at elevated workplaces or other situations at more than 2m from which they may fall, shall be protected by means of adequate safety nets, or platforms, or be secured by safety belts with the lanyard properly anchored above the head level of the user. All possible effort shall be made to have strong and dependable mechanical arrangement.
o	Persons employed at work below 1.5m from which they may fall, shall be protected by safety belts with the lanyard properly anchored above the head level of the user. All possible effort shall be made to have strong and dependable mechanical arrangement i.e. Working platform / any other suitable arrangement.
<b>1.13</b>	<b>Protection against fall of objects and materials:</b>
a	Materials and objects such as scaffolding materials, waste materials or tools shall not be thrown up or down from heights, as they are liable to cause injury;
b	If materials and other objects cannot be safely lowered from heights, adequate precautions such as the provision of fencing, lookout men or barriers shall be provided to protect any person from injury.
<b>1.14</b>	<b>Protection against entry of unauthorized persons:</b>
a	Construction zones in the site and built up areas alongside main traffic routes shall be barricaded;
b	Unauthorized persons shall not be allowed access to construction sites and visitors shall be provided with the required protective equipment and it be ensured that they use them effectively.
<b>1.15</b>	<b>Head protection and other protection apparel:</b>
	Every building worker who is required to –
a	Pass through or working within the areas where there is hazard of his being struck by falling objects or materials, shall be provided with safety helmets of the type approved and tested in accordance with the national standards;
b	Work in water or in wet concrete or in other similar work, shall be provided with suitable waterproof; Work in rain or in similar wet condition, shall be provided with waterproof coat with hat;



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c	Workers using or handling of alkalis, acid or other similar corrosive substances shall be provided with appropriate protective equipment in accordance with the approved standards;
d	Every building worker engaged in handling sharp objects or materials at a building or other constriction work, which may cause hand injury, shall be provided with suitable hand gloves in accordance with the approved standards.
<b>1.16</b>	<b>Stability of structures:</b>
a	No wall, chimney or other structure or part of a structure shall be left unsupported in such condition that it may fall, collapse or weaken due to wind pressure, vibration or due to any other reason. Entry of persons into such locations where tall structures are being built shall be regulated without a let up.
<b>1.17</b>	<b>Safety of Structures and equipment and other safety concerns</b>
a	Safety of structures like scaffoldings, platforms, gangways/walkways, towers, stairs, ladders, ramps, safety in excavation, formwork, false work, demolition work, storage, handling and use of explosives, inflammable substances and hazardous materials, gas cutting and welding, use of electricity etc.; and equipment viz. construction machinery, crushers and batching plant, boiler and other pressure vessels, transport and material handling equipment, lifting appliances, vehicles etc., shall be operated and maintained as per approved norms and —
a i)	They shall be made of sound material and of good construction, free from patent defects, provided with adequate safe guards, properly maintained, periodically inspected and strong enough to withstand safely the loads and stresses to which they may be subjected;
a ii)	They shall carry enough factor of safety bearing in mind that the possibility of their abuse, which otherwise shall be prevented by constant and adequate supervision, cannot be ruled out altogether;
a iii)	It is incumbent on the contractor to ensure that only competent and authorized persons operate the equipment or attend to electrical & mechanical systems and repair faults or breakdowns etc.
b	Working in the confined space may involve certain serious hazards. Strict adherence to the conditions of Permit-to-work issued for the purpose is required;
c	Control of energy sources shall be ensured through Log-out/Tag-out practices.
<b>1.18</b>	<b>Slipping, tripping, cutting, drowning and falling hazards:</b>
a	The contractor shall keep all passageways, platforms and other places free from accumulations of dust, debris or similar material and from other obstructions that may cause tripping;
b	Any sharp projections or protruding nails or similar projections which may cause any cutting hazard to a building workers shall be removed or otherwise made safe by taking suitable measures;
c	No contractor shall allow any building worker at construction work to use the passageway, or a scaffold, platform or any other elevated working surface which is in slippery and dangerous condition and shall ensure that water, grease, oil or other similar substances which may cause the surface slippery, be removed or sanded/saw-dusted or covered with suitable material to make it safe from slipping hazard;
d	Wherever building workers are exposed to the hazarded of falling into water, they shall be provided with rescuing arrangement from such hazard and if it is considered necessary, well equipped boat or launch manned with trained personnel shall be provided by the contractor at the site of such work;
e	Every open side or opening into or through which a building worker, vehicle or lifting appliance or other equipment's may fall at a BOCW work shall be covered or guarded suitably to prevent such fall except where free access is necessary by reasons of their nature of the work;
f	Wherever building workers are exposed to the hazards of falling from height while employed on such work they shall be provided by the employer with adequate equipment or means for saving them from such hazards, Such equipment's or means shall be in accordance with the standards as laid down;



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g	Whenever there is a possibility of falling of any martial, equipment or building worker at a construction site relating to a BOCW, adequate and suitable safety net shall be provided in accordance with the above stipulation;
1.19	<b>INTERFERENCE WITH MOVING VEHICLES AND PEDESTRIANS</b> The maximum driving speed on site is 15 km per hour and as per the guideline/ instruction from customer.
1.20	<b>Dangerous and Harmful Gases / Equipment</b>
a	<b>The contractor shall ensure that the workers are not exposed to any harmful gases during any construction activity including excavation, tunneling, confined spaces etc.</b>
b	<b>The contractor should not allow any worker to go into the confined space unless it is certified by authorized representative of CSPGCL at site to be safe and fit for the entry to such work place. Proper record and work permits should be followed to carry out such works.</b>



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<b>2.0</b>	<b>SAFETY IN MATERIAL HANDLING AND WASTE DISPOSAL</b>
<b>2.1</b>	<b>GENERAL PROVISIONS:</b>
a	All building materials stored in tiers shall be stacked, racked, blocked, interlocked or otherwise secured safely to prevent sliding, falling or collapse and in an orderly manner to avoid obstruction of any passageway at the place of work. Piles of materials shall be stored or stacked in such a manner as to ensure their stability;
b	Maximum safe load limits of floors within buildings and structures in kg/cm <sup>2</sup> shall be conspicuously posted in all storage areas, except for floor or slab on gradient. Maximum safe load shall not be exceeded. Material or equipment shall not be stored upon any floor or platform in such quantity as to exceed its safe carrying capacity;
c	Aisles and passageways shall be kept clear to provide for the free and safe movement of material handling equipment or persons. Such areas shall be kept in good repair;
d	When a difference in road or working levels exist, means such as ramps, blocking or grading shall be used to ensure the safe movement of vehicles between two levels;
e	Material stored inside buildings under construction shall not be placed within 2 m of any hoist way or inside floor openings nor within 3.2 m of exterior wall which does not extend above the top of material stored;
f	Persons employed required to work on stored material in silos, hoppers and similar storage areas shall be equipped with lifelines and safety belts;
g	Non-compatible materials shall be segregated in storage;
h	Bagged materials shall be stacked by stepping back the layers and cross-keeping the bags at least every 10 bags high;
i	Materials shall not be stored on scaffolds or runways in excess of supplies needed for immediate operations;
j	Bricks stacks shall not be more than 2.2 m in height. When a loose brick stack reaches a height of 1.3 m it shall be tapered back 5 cm in every foot of height above the 1.25 m level;
k	When masonry blocks are stacked higher than 2 m, the stack shall be tapered back on half block per tier above the 2 m level;
l	Material or equipment shall not be 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. Where stacking, unshackling, stowing or unstrapping of construction material or article, or handling in connection therewith cannot be safely carried out unaided, reasonable measures to guard against accident or dangerous occurrences shall be taken by shoring or otherwise to prevent any danger likely to be caused by such handling;
m	Stacking of material or article shall be made on firm foundation not liable to settle and such material or article and shall not overload the floor on which such stacking is made;
n	The material or articles shall not be stacked against partition or walls of a warehouse or stores unless it is known that such partition or the wall is of sufficient strength to withstand the pressure of such materials or articles;
o	The materials or articles shall not be stacked to such a height and in such a manner as would render the pile of such stack unstable and cause hazards to the building workers or the public in general;



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p	Where the building workers are on stack exceeding one point five meters in height, safe means of access to the stack shall be provided;
q	All stacking or unshackling operations shall be performed under the supervision of a responsible person for such stacking or unstacking;
r	The stacking of construction materials or articles shall not be made near the site of excavation, shaft, pit or any other such opening;
s	Stacks that may lean heavily or become unstable or collapse are barricaded shall be avoided;
t	Structural steel, poles, pipe, bar stock and other cylindrical materials, unless racked, shall be stacked and blocked so as to prevent sliding, spreading or tilting.
<b>2.2</b>	<b>LUMBER:</b>
a	Used lumber shall have all nails withdrawn before stacking;
b	Lumber shall be stacked on level and solidly supported sills;
c	Lumber piles shall not exceed 6 m in height provided that lumber is handled manually, shall not be stacked more than 5 m height;
d	Lumber shall be so stacked as to be stable and self-supporting.
<b>2.3</b>	<b>STACKING OF CEMENT AND BAGS CONTAINING OTHER MATERIALS:</b>
a	The cement or other material in bags shall be stacked in a header and stature-wise in rows alternately in not more than 10 numbers and there will be circulation of space of at least 600 mm in between two such rows;
b	While removing bags from the stack pile the stability of such stack pile shall be ensured;
c	Bags containing cement or lime shall be stored on a firm ground;
d	The materials like bricks, tiles or blocks shall also be stored on a firm ground;
e	Reinforcing steel shall be stored according to its shape, size and length and stack of reinforcing steel kept as low as possible;
f	No pipe shall be stored on rack or in stack where such pipe is likely to fall by rolling;
g	The angle of repose shall be maintained where loose materials are stacked;
h	When dust laden material is to be stored or handled, measures shall be taken to suppress the dust produced by such storing or handling and suitable personal protective equipment supplied to and used by the building workers working for such storing or handling.
<b>2.4</b>	<b>DISPOSAL OF DEBRIS AND WASTE MATERIAL:</b>
a	It shall be ensured that debris is
a-i)	Handled and disposed of by a method, which does not cause danger to the safety of a person and not allowed to accumulate so as to constitute a hazard;
a-ii)	Kept sufficiently moist to bring down the dust under control;
a-iii)	Not thrown inside or outside from any height of such building or other construction work;
b	Brought down by suitable means/chutes provided for the purpose and on completion of work, leftover building material, article or other substance or debris shall be disposed off as soon as possible to avoid any hazard to any traffic or person;



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c	Whenever materials are dropped more than 6 m to any point lying outside the exterior walls of the building an enclosed chute of wood, or equivalent material shall be used;
d	When debris is dropped through holes in the floor without the use of chutes, the area where the material is dropped shall be completely enclosed with barricades not less than 1.1 m high and not less than 1.9 m back from the edge of the opening above. Signs warning of the hazard of falling material shall be posted at each level;
e	All scrap lumber, waste material and rubbish shall be removed from the immediate work area as the work progresses;
f	Disposal of waste material or debris as per the guideline issued by CPCB in compliance of Rule 10 sub-rule 1(a) of C & D Waste Management Rules, 2016).
g	All bio-degradable material shall be disposed off in the pit for making compost. Pellets can also be made from bio-degradable material
h	All solvent wastes, oil rags and flammable liquids shall be kept in fire resistant covered containers until removed from the work site.
<b>2.5</b>	<b>HANDLING GAS CYLINDERS:</b>
a	Gas cylinders shall not be lifted on bare slings. For lifting the cylinders, cage of suitable size shall be used and all cylinders shall be horizontally positioned in it. Such cage shall have fencing in such a way that there is no possibility of fall of cylinders from this cage.
<b>2.6</b>	<b>RIGGING EQUIPMENT FOR MATERIAL HANDLING:</b>
a	Rigging equipment for material handling shall be inspected prior to use in each shift as necessary during its use to ensure that it is safe. Defective rigging equipment shall be removed from service;
b	Rigging equipment shall not be loaded in excess of its recommended safe working load, as prescribed in the Indian standards;
c	Rigging equipment, when not in use, shall be removed from the immediate work area so as not to present a hazard to persons engaged in the area;
d	Special custom designed grabs, hooks, clamps, or other lifting accessories, for such units as modular panels, prefabricated structures and similar materials, shall be marked to indicate the safe working loads shall be proof tested prior to use 125% of their rated load;
e	Welded alloy steel chain slings shall have permanently affixed-durable identification standing size, grade, rated capacity and manufacturer.
<b>2.7</b>	<b>FENCING OF MOTORS ETC</b>
a	All motors, cogwheels, chains and friction gearings, flywheels, shafting and the other dangerous and moving parts of machinery (whether or not driven by mechanical power) and steam pipes shall be securely fenced and the fencing of dangerous parts of machinery not removed while such machinery is in motion or in use;
b	No part of any machinery which is in motion and which is not securely fenced, shall be examined, lubricated, adjusted or repaired except by a person skilled and trained for such examination, lubrication, adjustment or repairs and machine parts cleaned only when such machine is stopped;
c	When a machine is stopped for servicing or repairs, adequate measures shall be taken to ensure that such machine does not restart inadvertently and not only tag-out sign is required; it is also essential that an active system of isolating the power be applied.





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<b>2.8</b>	<b>PROTECTION AGAINST LIGHTNING</b>
a	Where necessary, installations shall be protected against lightning, provided further that;
b	No bare conductors or bare current-carrying parts of equipment be permitted to be installed unless adequate precautions are taken to prevent direct or indirect contact;
c	Only flame-proof equipment and conductors shall be installed at places where explosives or inflammable substances are stored, handled or used or where explosive atmosphere exists;
d	Persons competent and authorized only shall attend to electrical breakdowns and other operational faults and give or restore power to an equipment and such persons shall be easily identifiable by their dress or special helmet worn;
e	It will constitute a standard practice to switch off portable tools while shifting from one place to another or while leaving them behind unattended;
f	The contractor shall ensure that a system is in place to always keep tools well maintained.
<b>2.9</b>	<b>VEHICULAR TRAFFIC</b>
a	Whenever any building or other construction work is being carried on, or is located in close proximity to a road or any other place where any vehicular traffic may cause danger to building workers, it shall be ensured that such building or other construction work is barricaded and suitable warning signs and lights displayed or erected to prevent such danger and if necessary, a request in writing made to the concerned authorities to control such traffic;
b	All vehicles used at construction site shall comply with the requirements of the Motor Vehicles Act, 1988 (59 of 1988) and the Rules made hereunder;
c	The driver of a vehicle of any class or description operating at a construction site shall hold a valid driving license under the Motor Vehicles Act. 1988 (59 of 1988).
<b>2.10</b>	<b>USE OF SAFETY BELT OR OTHER FALL ARREST SYSTEMS:</b>
a	Wherever any work at a height of 3 m or more is carried out, use of a suitable fall arrest system is mandatory if the workplace has already not been provided with an otherwise reliable means of protection for preventing the fall of persons from that height, provided further that:
b	Safety belt, lanyard, life lines and devices for the attachment of such life lines shall conform to the approved standards;
c	Every building worker shall be supplied with safety belt and safety life lines for his protection and such building worker shall use such belts and life lines during the performance of his work;
d	All building workers using safety belt and safety life lines shall have the knowledge of safe use and maintenance of such belts and life lines and shall be supplied with necessary instructions for its use;
e	The responsible person for supervising the use of safety belts and safety lifelines shall inspect and ensure that such safety belts and lifelines are fit for use before taking them into use.
<b>2.11</b>	<b>safety net and its use</b>
a	Every safety net shall be of adequate strength, made of sound material and suitable for use and conform to the approved standards;
b	The responsible person for maintenance of safety nets and their use shall ensure safe fixing of such safety nets and provide such safety nets with suitable and sufficient anchorage so that the purposes for which such safety net is intended for use is served;



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c	Use of multi-layer safety net to be ensured to avoid fall of material/objects.
<b>2.12</b>	<b>STORAGE OF SAFETY BELTS AND NETS, ETC:</b>
a	Proper arrangement shall be made for the safe storage of safety belts, safety lifelines and safety nets when they are not in use and are protected against mechanical damage, damages from chemicals and damages from biological agents.
<b>2.13</b>	<b>SAFETY HELMETS AND SAFETY FOOTWEAR</b>
a	The Engineer in-charge may declare whole or part of a site as the hardhat area and in such an eventuality it shall be the responsibility of the contractor to provide safety helmet of the approved quality to all personnel engaged in construction and erection work, including the visitors to the site;
b	Accordingly, wherever safety footwear is required for the safety of the personnel, the contractor shall provide the same of the approved type free of charge.



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<b>3.0</b>	<b>WELDING AND GAS CUTTING OPERATIONS</b>
<b>3.1</b>	<b>GAS WELDING:</b>
<b>3.1.1</b>	<b>GENERAL PROVISIONS:</b>
a	All welders shall be provided with fire resistant protective clothing and equipment, such as fire resistant gauntlets and aprons, helmets and goggles with suitable filter lenses and its usage shall be ensured;
b	The welders shall not be allowed to wear clothing that is not free from grease, oil and other flammable material;
c	Adequate precautions shall be taken to protect persons working or passing near welding operations from dangerous sparks and radiation;
d	When welding or cutting is being done on materials containing toxic or harmful substances or liable to produce toxic or harmful fumes, adequate precautions shall be taken to protect workers from the fumes, either by
d-i)	Exhaust ventilation, or
d-ii)	Respiratory protective equipment;
d-iii)	Arrangement shall be made so that welding sparks do not fall down on the persons working below or material, which are combustible in nature and may be damaged with such sparks.
e	The oxygen pressure for welding shall always be high enough to prevent acetylene flowing back into the oxygen cylinder;
f	Acetylene shall not be used for welding at a pressure exceeding 1 atmosphere gauge;
g	Adequate precautions shall be taken to prevent:
g-i	Fire being started by sparks,
g-ii	Slag or hot metal; and
g-iii	Damage to fiber ropes from heat, sparks, slag or hot metal;
h	Precautions shall be taken to prevent flammable vapors and substances from entering the working area;
<b>3.2</b>	<b>WELDING AT PLACES WITH FIRE RISKS:</b>
a	Unless adequate precautions are taken, no welding or cutting operations shall be allowed near the place where combustible materials are stored, or near materials or plant where explosive or flammable dusts, gases or vapors are likely to be present or given off. If hot work permit system exists at the site, the same shall be followed;
b	Combustible materials and structures that cannot be removed from the vicinity of welding operations shall be shielded by asbestos or protected by other suitable means.
<b>3.3</b>	<b>WELDING IN CONFINED SPACE:</b>
	When welding or cutting operations are being carried out in a confined space;
a	Adequate ventilation, by means of exhaust fans or forced draught as the condition may require, shall be constantly provided; otherwise enough quantity of air shall be blown in by means of compressors to dilute the pollutants;



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b	No blow pipe shall be left unattended inside a tank or vessel or other confined space during meal break or other interruption of the work;
c	The worker shall take all necessary precautions to prevent unburned combustible gas or oxygen from escaping inside a tank or vessel or other confined space; and
d	When necessary to prevent danger, an attendant shall watch the welders from outside.
<b>3.4</b>	<b>WELDING ON CONTAINERS FOR EXPLOSIVE OR FLAMMABLE SUBSTANCES:</b>
a	Welding or cutting operations on containers in which they are explosives or flammable substances shall not be allowed;
a-i	Welding or cutting operations on any container that has held explosive or where flammable gases may have been generated, shall only be undertaken,
a-ii	After the container has been thoroughly cleansed by steam or other effective means; and
a-iii	Found by air tests to be completely free from combustible gases and vapors; or
a-iv	After the combustible gas in the container has been completely replaced by an inert gas or by water;
a-v	If an inert gas is used as laid down in This HSE plan, after the vessel has been filled with gas, the gas shall continue to flow slowly into it thorough out the welding or cutting operations;
a-vi	Before starting any welding operations on, or otherwise applying heat to, closed or jacketed containers or other hollow parts, such containers or parts shall be adequately vented in suitable manner.
<b>3.5</b>	<b>GAS CYLINDERS</b>
a	Gas cylinders shall be inspected, stored, handled and transported in conformity with the requirements of Gas Cylinders Rules, 1981;
b	When in use, cylinders shall be held in upright positions by straps, collars or chains;
c	Devices referred to in this HSE plan shall be such that the cylinders can be rapidly removed in an emergency;
d	Welders shall not temper with or attempt to repair safety devices and valves on gas cylinders;
e	When acetylene cylinders are coupled, flash back arrestor shall be inserted between the cylinder and the coupler block, or between the coupler block and the regulator;
f	Only acetylene cylinders or approximately equal pressure shall be coupled;
g	No gas shall be taken from a cylinder unless a pressure reducing regulator has been attached to the valve;
h	Only the right pressure reducing regulator shall be used for the gas in the cylinder;
i	Cylinder valves shall be kept free from gases, grease, oil, dusts and dirt;
j	Leaky cylinders charged with acetylene or liquefied fuel gas shall be taken into the open air at a safe distance from any open flame or sparks.
<b>3.6</b>	<b>HOSE</b>
a	Only hose especially designed for welding and cutting operations shall be used to connect an oxy- acetylene torch to gas outlet;



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b	Hose lines for oxygen and for oxy-acetylene shall be of different colors and preferably of different size;
c	Hose connections shall be sufficiently light to withstand without leakage a pressure twice the maximum delivery pressure of the pressure regulators in the system;
d	Care shall be taken that hose does not become kinked or tangled, stepped on or run-over or otherwise damaged;
e	Any length of hose in which a flashback has burned, shall be discarded;
f	No hose with more than one gas passage shall be used;
g	Only soapy water shall be used for testing hose for leaks.
<b>3.7</b>	<b>TORCHES</b>
a	When torches are being changed, the gases shall be shut off at the pressure reducing regulators and not by crimping hose;
b	Torches shall be lit with friction lighters or other safe source but not with matches.
c	Electric welding equipment:
d	Welding machines shall be controlled by a switch mounted on or near the machine framework that, when opened, immediately cuts off the power from all conductors supplying the machine;
e	Welding circuit shall be so designed as to prevent the transmission of high potential from the source of supply to the welding electrodes;
f	The maximum open circuit voltage shall be in accordance with Indian Standards;
g	Electrode conductors or cables shall not be excessive in length and shall not be longer than necessary to perform the work;
h	Return conductors shall be taken directly to work and securely connected mechanically and electrically to it or to the work bench, floor etc. and to an adjacent metallic object;
i	Cable shall be supported so as not to create dangerous obstruction;
j	Motors, generators, rectifiers and transformers in arc welding or cutting machines, and all current carrying parts, shall be protected against accidental contact with un insulated live parts;
k	Ventilating slots in transformer enclosures shall be so designed that no live part is accessible through any slot;
l	Frames of arc welding machines shall be effectively earthed;
m	In hand-operated arc welding machines, cables and cable connectors used in arc welding circuits shall be effectively insulated on the supply side;
n	The outer surface electrode holders of hand-operated arc welding machines, including the jaw so far as practicable, shall be effectively insulated;
o	Electrode holders of hand-operated arc-welding machines shall, if practicable, be provided with discs or shields to protect the operator's hands from the heat of the arcs;
p	Only heavy-duty cable with unbroken insulation shall be used;
q	Circuit connections shall be waterproof;
r	When lengths of cable have to be joined, only insulated connectors shall be used on the earth line and the electrode holder line;



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s	Connections to welding terminals shall be made at distribution boxes, socket outlets, etc. by bolted joints;
t	Welding terminals shall be adequately protected against accidental contact by enclosures, covers or other effective means;
u	Electrode holder shall
u-i	Have adequate current capacity;
u-ii	Be adequately insulated to prevent shock, short-circuiting or flashovers.
<b>3.8</b>	<b>OPERATIONS</b>
a	Arc welding and cutting operations that are carried on at places where persons other than the welders are working or passing shall be enclosed by means of suitable stationary or mobile screens;
b	Walls and screens of both permanent and temporary protective enclosures shall be provided to absorb harmful rays from the welding equipment and prevent reflection, and if necessary, be painted or otherwise treated for the purpose;
c	<b>When arc welding is done in damp confined spaces;</b>
c-i	Electrode holders shall be completely insulated; and
c-ii	The welding machines shall be outside the confined space;
d	Welders shall take adequate precautions
d-i	To prevent any part of their body from completing an electric circuit
d-ii	To prevent contact between any part of the body and the exposed part of the electrode, or electrode when in contact with metal; and
d-iii	To prevent wet or damaged clothing, gloves and boots from touching any live part;
e	Welding circuits shall be switched off when not in use;
f	Electrodes shall only be inserted in the holder with insulating means such as insulating gloves;
g	Electrode and return leads shall be adequately protected against damage;
h	Live parts of electrode holders shall be inaccessible when they are not in use;
i	Electric arc-welding equipment shall not be left unattended with current switched on.





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<b>4.0</b>	<b>SAFETY IN THE USE OF ELECTRICITY</b>
<b>4.1</b>	<b>GENERAL PROVISIONS</b>
a	Before commencement of any building or other construction work, adequate measures shall be taken to prevent any worker from coming into physical contact with any electrical equipment or apparatus, machines or live electrical circuit which may cause electrical hazard during the course of his employment and suitable warning signs shall be displayed and maintained at conspicuous places in Hindi and in local language understood by the majority of the building workers;
b	In workplaces where the exact location of underground electric power line is not known, the building workers using jack hammers, crow bars or other hand tools which may come in contact with a live electrical line shall be provided with approved insulated protective gloves and footwear;
c	As far as practicable, no wiring or cable, which may come in contact with water or which may be mechanically damaged or which may result in electric shock shall be left on ground or;
d	All electrical appliances and current carrying equipment used shall be made of sound material and adequately earthed;
e	All temporary electrical installations shall be provided with earth leakage circuit breakers;
f	It is required that all portable power-driven hand tools are provided with double insulation to secure a high degree of protection from electrical hazards;
g	Electrical installations shall comply with the requirements of any law for the time being in force, especially the Indian Electricity Act/Rules in particular with specific reference to the following:
g-i	All parts of installations shall be of standard construction not lower, from the safety point of view, than the national standards, as applicable. All parts of electrical installations shall be so constructed, installed and maintained so as to prevent electrical fires, explosion and shock;
g-ii	Earthing of metal work of electrical equipment, other than the parts which carry current, shall be provided and will conform to Electricity Act and IS: 3042 — 1966 (code of practice for earthing);
h	All parts of electrical installation shall be adequate size and characteristics for the work they may be called upon to do and in particular they shall:
h-i	Be of adequate mechanical strength to withstand working conditions in construction operations; and
h-ii	Be not liable to damage by water, dust or electrical, thermal or chemical action to which they are subjected to in construction operations;
i	All parts of electrical installations shall be so constructed, installed and maintained as to prevent the danger of electric shock; fire and external explosion;
j	It shall be made impossible for circuit breakers to be opened or closed inadvertently, by gravity or by mechanical impact;
k	Before operation of OCBs, oil level must be checked and the event of short, extra quantity must be filled;
l	Use of rubber gloves and rubber gum boots of tested quality where electric shock is likely to occur shall be provided, but these shall not be considered as providing adequate protection against the risk of electric shock in lieu of inbuilt safety arrangement in the system;
m	First aid boxes, instruction for restoration of persons affected by electric shock shall be made;



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n	Arrangement shall be made for sufficient number of CO <sub>2</sub> /chemical powder type fire extinguishers/sand buckets etc.;
o	No electrical circuits shall ever be overloaded to the dangerous extent or beyond the rated capacity;
p	In confined areas, only 24 volt supply shall be used for every equipment, including hand-held portable tools and hand lamps;
q	All electrical appliances and outlets shall be clearly marked to indicate their purpose and voltage.
<b>4.2</b>	<b>FUSES</b>
a	Fuses shall bear markings indicating their rated current, whether they are of the fast or slow-breaking type and, as far as practicable, and their rated breaking capacity. Fuses as per need and of correct rating shall be used in the circuit;
b	Effective measures shall be taken to ensure that persons removing or inserting fuses will not be endangered, in particular by any adjacent live parts;
c	In case of blow of fuses only after finding out and correcting of the fault, new fuses shall be provided in the circuit.
<b>4.3</b>	<b>SWITCHES</b>
a	All switches shall be of enclosed type and so installed and earthed as to prevent danger in their operation;
b	Use of switches, which may connect or disconnect circuit through gravity, shall not be used.
<b>4.4</b>	<b>MOTORS</b>
a	All motors shall be equipped with a switch;
b	When a motor can be cut off from more than one place, where practicable, a stopping device shall be installed in the immediate vicinity of the motor;
c	Motors shall be so installed as to ensure that they can be adequately cooled;
d	Motors shall be effectively protected against over current;
e	Whenever the motors installed are in the open area where there is the possibility of fall of liquid corrosives or otherwise, it shall be suitably protected with covering;
f	Earthling shall be connected to all motors, generators etc. as prescribed in the Indian Electricity Rules, amended from time to time.
<b>4.5</b>	<b>CONNECTIONS</b>
a	At points where conductors are joined, branched or led into apparatus, they shall be:
a-i	Mechanically protected, and
a-ii	Properly maintained;
b	Conductors shall be joined, branched or led into an apparatus through junction boxes, bushings, glands or equivalent connecting devices;
c	Junction boxes or plug-out-socket couplings shall be used for joining cables wherever practicable;
d	When parts of conductors are joined together, or conductors are joined to one another or to an apparatus, the attachment shall be made by screwing, clamping, soldering, riveting, brazing, crimping, or equivalent means. Loose connections shall not be provided in any case;



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e	Cable joints, junction boxes and connectors shall be protected as far as practicable, against traffic, fall of ground, water and other sources of damage;
f	Whenever armored cables are joined, the junction boxes shall be bridged by a suitably conductive bond between the armoring of the cables.
<b>4.6</b>	<b>TRANSPORTABLE AND PORTABLE ELECTRICAL EQUIPMENT:</b>
a	The supply of electricity to portable apparatus shall not exceed 250v;
b	Hand-held and portable machines shall be equipped with a built-in switch to switch off power in case of emergency;
c	Hand-held electrically operated tools shall be provided with built-in switch to disconnect the circuit when the tool is not being used;
d	Portable electrical tools, unless flameproof, shall not be used in flammable or explosive atmosphere;
e	Only three-core cable shall be used for single-phase operated tools with the third core connected to earth
<b>4.7</b>	<b>HAND LAMPS</b>
a	Hand lamps shall be equipped with strong cover of glass or other transparent material;
b	Portable lamp holders shall have:
b-i	All current –carrying parts enclosed;
b-ii	Insulated handle; and
b-iii	They shall operate at 24 v;
<b>4.8</b>	<b>INSPECTION, MAINTENANCE</b>
a	All electrical equipment shall be inspected before it is taken into use to ensure that it is suitable for its purpose of use;
b	At the beginning of every shift every person using electrical equipment shall make a careful external examination of the equipment and conductors for which he is responsible, especially flexible cables;
c	Periodic inspections, testing, maintenance of all electrical equipment is to be made and record of test of transformer oil and pit earthing shall be maintained;
d	Electrical conductors and equipment shall be repaired by the electrician only as far as practicable, no work shall be done live conductors or equipment;
e	Before any work is begun on conductors or equipment that does not have to remain live;
e-i	The current shall be switched off;
e-ii	Adequate precautions shall be taken to prevent the current from being switched on again;
e-iii	The conductors or the equipment shall be tested to ascertain that they are dead;
e-iv	The conductor and equipment shall be earthed and short-circuited; and
e-v	Neighboring live parts shall be adequately protected against accidental contact;
f	After work on conductors and equipment, the current shall only be switched on again on the orders of a competent person;



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g	Electricians shall be provided with adequate tools, and person protective equipment, such as rubber gloves, mats etc.;
h	All conductors and equipment shall be considered to live unless there is certain proof to the contrary.
<b>4.9</b>	<b>WORK IN THE VICINITY OF ELECTRICAL INSTALLATION</b>
a	When work is to be done in the neighborhood of electrical conductors or installations, the contractor shall ascertain the voltage carried and the works shall not be allowed to reach to unsafe distance from them;
b	When any excavation is to be made or any bore-holed sunk, the contractor shall ascertain whether there are any underground conductors, in or in dangerous proximity to, the zone of operations;
c	No work shall be done in dangerous proximity to a conductor or an installation until it has been made dead;
d	Before work begins, work permit shall be obtained from the Engineer in-charge if live electricity lines/circuit are passing in close vicinity;
e	Before the current is restored, the contractor shall ensure that no work remain on the work site;
f	If conductor or an installation in the neighborhood of which work is to be done cannot be made dead, special precautions shall be taken and special instructions given to the workers so as to prevent danger by adequately enclosing or fencing;
g	If mobile equipment has to be employed in the neighborhood of conductors or installations that cannot be made dead, its movement shall be so controlled as to keep it as a safe distance from them.
h	Electrical Installations :- The Contractor shall not interfere or disturb electric fuses, wiring and other electrical equipment belonging to the Employer or other contractors under any circumstances, whatsoever, unless expressly permitted in writing by the authorized representative of CSPGCL at site to handle such fuses, wiring or electrical equipment.
i	Satisfy the authorized representative of BHEL/ CSPGCL at site that the appliance is in good working condition;
ii	Inform the authorized representative of BHEL/CSPGCL at site of the maximum current rating, voltage and phases of the appliances;
iii	Obtain permission of the authorized representative of BHEL/ CSPGCL at site detailing the sockets to which the appliances may be connected. The authorized representative of BHEL/ CSPGCL at site will not grant permission to connect until he is satisfied that: The appliance is in good condition and is fitted with suitable plug; having earth connection with the body. Wherever armored / metallic sheathed multi core cable is used, the same armored / sheathed should be connected to earth.
iv	No repair work shall be carried out on any live equipment. The authorized representative of BHEL/ CSPGCL at site must declare the equipment safe and a permit to work shall be issued by the Employer / contractor as the case may be to carry out any repair / maintenance work. While working on electric lines / equipment's whether live or dead, suitable type and sufficient quantity of tools will have to be provided by the contractor to electricians / workmen /Officers.
v	The contractor shall employ necessary number of qualified, full time Electricians / Electrical Supervisors to maintain his temporary electrical installation. The installations are provided with suitable ELCBs and RCCBs wherever required.



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<b>5.0</b>	<b>SAFETY IN THE USE OF HAND TOOLS AND POWER-OPERATED TOOLS</b>
<b>5.1</b>	<b>GENERAL PROVISIONS</b>
a	All hands and power tools and similar equipment, shall be maintained in safe condition.
b	When power operated tools are designed to accommodate guards, they shall be equipped with such guards, when in use;
c	Belts, gears, shafts, pulleys, sprockets, spindles, drums, fly wheels, chains and other reciprocating, rotating or moving parts of the equipment shall be similarly guarded;
d	Personnel using hand and power tools and exposed to the hazard of falling, flying, abrasive, and splashing objects, or exposed to harmful dusts, fumes, mists, vapours, or gases shall be provided with the particular personal protective equipment necessary to protect them from the hazards;
e	All hand-held powered platen sanders, grinders, grinders with wheels of 5 cm or less, routers, planers, laminate trimmers, nibblers, shears, scroll saws and jigsaws with blade shanks of 0.5 cm wide or less shall be equipped with only a positive on-off control.
f	All hand-held powered drills, tappers, fastener drivers, horizontal, vertical or angle grinders with wheels greater than 5 cm in diameter, disc sanders, belt sanders, reciprocating saws, saber saws and other operating powered tools shall be equipped with a momentary contact on control provided that turnoff can be accomplished by a single motion of the same finger or fingers that turn it on.
<b>5.2</b>	<b>HAND TOOLS</b>
a	The contractor shall not issue or permit the use of unsafe hand tools;
b	Wrenches including adjustable pipe end and socket wrenches shall not be used when saws are sprung to the point that slippage occurs;
c	Impact tools such as drift pins, wedges and chisels shall be kept free of mushroomed heads;
d	The wooden handles of tools shall be kept free of splinters or cracks and shall be kept tight on the tools.
<b>5.3</b>	<b>POWER OPERATED TOOLS</b>
a	Electric power operated tools shall be either of the approved double-insulated type or shall be grounded;
b	The use of electric cords for hoisting or lowering loads shall not be permitted;
c	Pneumatic power tools shall be secured to the hose or whip by some positive means to prevent the tool from becoming accidentally disconnected;
d	Safety clips or retainers shall be securely installed or maintained on pneumatic impact (percussion) tools to prevent attachments from being accidentally expelled;
e	All pneumatically riveting machine staplers and other similar equipment provided with automatic fastener feed, which operate at more than 7 kg/cm <sup>2</sup> pressure at the tool a safety device on the muzzle to prevent the tool from ejecting the fasteners unless the muzzle is in contact with the work surface;
f	Compressed air shall not be used for cleaning purposes except when the pressure is reduced to less than 2 kg/cm <sup>2</sup> and that too with effective chip guarding. The 2 kg/cm <sup>2</sup> pressure requirement does not apply to concrete form, mill scale and similar cleaning purposes;



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g	The manufacturer's safe operating for hoses, pipes, valves, filters and other fittings shall not be exceeded;
h	Only personnel who has been trained in the operation of the particular tool shall be allowed to operate power-actuated tools;
i	The tool shall be tested each day before loading to see that the safety devices are in proper working condition. The method of testing shall be accordance with the manufacturer's recommended procedure;
j	Any tool found not in proper working order, or that which develops a defect during use, shall be immediately removed from service and not used until properly repaired;
k	Tools shall not be loaded until just prior to the intended firing time. Neither loaded nor empty tools are to be pointed at any other person. Hands shall be kept clear of the open barrel end;
l	Loaded tools shall not be left unattended;
m	Fasteners shall not be driven into very hard or brittle materials including, but not limited to, cast iron, glazed tiles, surface hardened steel, glass block, live rock, face brick or hollow tiles;
n	Driving into materials that can be easily penetrated shall be avoided unless backed by a substance that will prevent the pin or fastener from passing completely through and creating a flying missile hazard on the other side;
o	No fastener shall be driven into a palled area caused by an unsatisfactory fastening;
p	Only non-sparking tools shall be used in an explosive or flammable atmosphere;
q	All tools shall be used with the correct shield, guard or attachment as recommended by the manufacturer.
<b>5.4</b>	<b>ABRASIVE WHEELS AND TOOLS</b>
a	All grinding machines shall be supplied with sufficient power to maintain the spindle speed at safe levels under all conditions of normal operation;
b	Grinding machines shall be equipped with suitable safety guards;
c	The maximum angular exposure of the grinding wheel periphery and sides shall not be more than 900, except that when the work requires contact with the wheel below the horizontal plane of the spindle, the angular exposure shall not exceed 1200. In either case, the exposure shall begin not more than 650 above the horizontal plane of the spindle. Safety guards shall be strong enough to withstand the bursting of the wheel;
d	Floor and bench-mounted grinders shall be work-rests, which shall be rigidly supported and readily adjustable. Such work-rests shall be kept at a distance not to exceed 5 mm from the surface of the wheel;
e	Cup type wheels used for external grinding shall be protected by either revolving cup guard or a band type guard;
f	When safety guards are required, they shall be mounted as to maintain proper alignment with the wheel and the guard and the guard and its fastening shall be adequate strength to retain the fragments of the wheel in case of accidental breakage. The maximum angular exposure of the grinding wheel periphery and sides shall not exceed 1800;
g	Portable abrasive wheel used for internal grinding shall be provided with suitable safety flanges;





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h	When safety flanges are required, they shall be used only with wheels designed to fit the flanges. Only safety flanges, of a type and design and properly assembled so as to ensure that the pieces of the wheel will be retained in case of accidental breakage, shall be used;
i	All abrasive wheels shall be closely inspected and ring tested before mounting to ensure that they are free from cracks or defects;
j	Grinding wheels shall fit freely on the spindle and shall not be forced on. The spindle nut shall be tightened only enough to hold the wheel in place;
k	All employees using abrasive wheels shall be protected by suitable eye protection equipment.
<b>5.5</b>	<b>WOODWORKING TOOLS</b>
a	All fixed power driven woodworking tools shall be provided with a disconnect switch that can either be locked or tagged in the off-position;
b	The operating speed shall be attached or otherwise permanently marked on all circular saws over 0.5 m in diameter or operating at over 3000 peripheral rpm. Any saw so marked shall not be operated at a speed other than that marked on the blade. When a marked saw is re tensioned for a different speed, the marking shall be corrected to show the new speed;
c	Automatic feeding devices shall be installed on machines wherever the nature of the work will permit. Feeder attachments shall have the feed rolls or other moving parts covered or guarded so as to protect the operator from hazardous points;
d	All portable power driven circular saws shall be equipped with guards above and below the base plate or shoe. The upper guard shall cover the saw to the depth of the teeth, except for the minimum arc required to permit the base to be tilted for bevel cuts. The lower guard shall cover the saw to the depth of the teeth, except for the minimum arc required to allow proper retraction and contact with the work. When the tool is withdrawn from the work, the lower guard shall automatically and instantly return to the covering position.



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<b>6.0</b>	<b>SAFETY IN THE USE OF LADDERS AND STAIRS</b>
<b>6.1</b>	<b>GENERAL ASPECTS OF SAFETY RELATED TO USE OF LADDERS</b>
a	Every ladder or step-ladder used in building or other construction work shall be of good construction, made of sound material and of adequate strength for the purpose for which such ladder or step-ladder is used;
b	When a ladder is used as a means of communication, such ladder shall be lashed to a fixed structure so that while working on such ladder it does not slip;
c	A ladder or step ladder shall not stand on loose bricks or other loose packing and have a level and firm footing;
d	No ladder shall be used which has a missing or defective rungs or rungs, which depend for support solely on nails, spikes or other similar fixing.
<b>6.2</b>	<b>MATERIALS FOR LADDERS</b>
a	Shall be constructed with upright of adequate strength and are made of straight-grained wood, free from defects and having the grain of such wood running length wise;
b	Shall have rungs made of straight-grained wood free for defects and mortised or securely notched into the upright, reinforcing metal ties, if wedges shall not secure the tenors of such ladders;
c	Where it is required, in case of use of fixed ladders, sufficient foot-hold and hand-hold shall be provided for use by the building worker;
d	Every ladder shall be -
d-i	Secured so as to prevent undue swaying;
d-ii	Equally and properly supported on each of its upright;
d-iii	So used as not to cause undue sagging; and
d-iv	Placed as nearly as possible at an inclination of four in one;
e	The use of all ladders and stepladders shall conform to the approved standards;
f	Wooden ladders shall be constructed with uprights of adequate strength as well as rungs made of wood free from visible defects and having the grains of the wood in the ladders running lengthwise and rungs mortised or rebuted into the uprights;
g	Uprights and rungs of metal ladders shall have a cross-section adequate to prevent dangerous deflection, shall be equal and not less than 25 cm or more than 35 cm;
h	Rungs of metal ladders shall be kept clean so as to prevent them from becoming slippery;
i	Portable ladders shall not exceed 9 m in length;
j	Every ladder or run of ladders rising to a height exceeding 9 m shall be provided with an intermediate landing, providing further that the intervals between landings shall not exceed 9 m. The landings shall be of suitable size and protected by railings;
k	Defective ladders that cannot be satisfactorily repaired shall be tagged Not Fit For Use and destroyed;
l	Wooden ladders shall not be painted, but oiled or covered with clean varnish or other transparent preservatives;



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m	Metal ladders shall be protected against corrosion by being coated with rust-proof paint or by other means unless they are made of non-corrosive metals;
n	Every ladder shall rise at least 1 m above the highest point to be reached and have one of the uprights continued to that height to serve as a hand-rail at the top;
o	Ladders shall not stand on loose bricks or other loose packing but have a level and firm footingso that they are equally supported on each upright;
p	Every ladder shall be securely fixed so that it cannot move from its top and bottom points of rest and if it cannot be secured at the top, it shall be securely fastened at the base and if fastening at the top is also impracticable, it shall have a man stationed at the foot holding the end to prevent it from slipping;
q	Where a run of two or more ladders connects different floors, the ladders shall be staggered and a protective landing with the smallest practicable opening shall be provided at each floor;
r	A ladder having only one upright or a missing or dangerously defective rung shall not be used;
s	When a ladder is placed in position, the distance between the foot of a ladder and the base of the structure against which it rests shall be about one-quarter of its length;
t	Workers using ladders shall leave at least one hand free for climbing up and down, face the ladder, avoid wearing slippery footwear and avoid carrying heavy or bulky loads;
u	A ladder shall not be placed in front of a door that opens towards it unless the door is fastened or locked or guarded;
v	A ladder shall not be placed against a window frame unless the ladder is fitted with a board at the top so that the applied load is safely distributed over the frame;
w	Metal ladders shall not be used in the vicinity of live electrical equipment;
x	Adequate means shall be provided to prevent displacement of the ladder set up in public thoroughfare or where persons, vehicles etc. may accidentally collide with it.
<b>6.3</b>	<b>PORTABLE STEPLADDERS</b>
a	The length of portable stepladders shall not exceed 6 m and their back legs shall be adequately braced;
b	Stepladders exceeding 1.5 m in length shall have two or more cross-ties;
c	The spread between the front and back legs shall be restricted by means of hinged metal flat bars or high-grade fiber or other effective means;
d	When in the open position, treads of stepladders shall be horizontal.
<b>6.4</b>	<b>PORTABLE TRESTLE LADDERS</b>
a	The height of the trestle ladders shall not exceed 5.5 m;
b	The spread between the front and back legs shall be restricted by means of hinged metal flat bars or high-grade fiber or other effective means;
c	The front and back legs shall be joined at the top by bolted steel hinges of adequate dimensions or other effective means;
d	Both legs of trestle ladders shall be equipped with sufficient number of steel crossties.



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<b>6.5</b>	<b>EXTENSION LADDERS</b>
a	The length of extension ladders shall not exceed 15 m;
b	Extension ladders shall be equipped with an effective lock and guide brackets by which the ladder can be extended, retracted or locked in any position;
c	The rungs of overlapping sections shall coincide so as to form double treads and shall be equipped with one or more extension ropes;
d	Extension ropes shall be securely anchored and run over suitable pulleys.
<b>6.6</b>	<b>MECHANICAL LADDERS</b>
a	Mechanical ladder is that ladder, which is a mechanically extendable ladder, mounted on a wheeled frame;
b	Mechanical ladder shall be equipped with guard-rails and toe-boards and a cage of heavy-gauge steel mesh;
c	If mechanical ladder has no railed platform or cage, workers using it shall be secured by suitable safety belt;
d	Mechanical ladders shall not be moved, while a person is on them, unless they have specially designed to ensure that perfect stability is maintained during movement.
<b>6.7</b>	<b>FIXED LADDERS</b>
a	Uprights of fixed ladders shall be at least 40 cm and shall be set an angle of 150 to the vertical;
b	Clearance at the back of the rungs shall be at least 15 cm and no obstruction within 75 cm of the face of the ladder;
c	There shall be at least 7.5 cm clearance between the ladder and the nearest fixed object;
d	When it is necessary for a ladder to pass closely through a hole in a platform or a floor, the edges of the hole shall be padded so as to prevent injury to the users;
e	The length of the runs of fixed ladder shall not exceed 9 m;
f	Landing platform shall be provided for each 9 m or fraction thereof;
g	As far as practicable, runs shall be staggered;
h	Runs from which a person could fall from more than 6 m shall be enclosed in a cage of heavy-gauge mesh or hoops;
i	Fixed ladders shall be firmly bolted or welded in position.
<b>6.8</b>	<b>STAIRS</b>
a	Stairs shall be of adequate strength to withstand safely the loads that they will have to carry;
b	Stairs used for the purpose of construction work shall have a clear width of at least 60 cm;
c	Stairs made of perforated material shall not have openings exceeding 1.2 cm in width;
d	No step of a stairway shall depend for its support solely on nails, spikes, screws or other similar fixing;
e	No stairway with missing or dangerously defective steps shall be used;
f	Every stairway that is at an angle of less than 300 from the vertical shall be provided with a secure handhold at the top landing place, either by extending one upright for at least 1 m or by other effective means;



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g	Movable and removable stairs shall be adequately secured in the position of use;
h	In all building structures permanent stairs shall be constructed as soon as practicable;
i	When work on a building has progressed to a height of more than 18 m above the ground and it has not been practical to construct the permanent stairs, sufficient number of stairs shall be provided to ensure safe access to the working levels.



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<b>7.0</b>	<b>SAFETY IN THE USE OF LIFTING APPLIANCES &amp; GEARS</b>
<b>7.1</b>	<b>CONSTRUCTION AND MAINTENANCE OF LIFTING APPLIANCES:</b>
	All lifting appliances, including their parts and working gear, whether fixed or movable, and any plant or gear used in anchoring or fixing of such appliances -
a	Shall be of sound construction, sound material, and of adequate strength to serve the purpose for which these are to be used and all such appliances shall be free from patent defects, and
b	Maintained in good repair and working condition;
c	Every drum or pulley around which the rope of any lifting appliance is carried, shall be of adequate diameter and sound construction in relation to such rope;
c-i	Any rope that terminates at the winding drum of lifting appliance shall be securely attached to such drum and at least three dead turns of such rope remain on such drum in every operating position of such lifting appliance;
c-ii	The flange of a drum projects twice the rope diameter beyond the last layer of such rope and if such rope and if such projection is not available, other measures like anti-slackness guards shall be provided to prevent such rope from coming off such drum;
d	Every lifting appliance shall be provided with adequate and efficient brakes which shall be:
d-i	Capable of preventing fall of suspended load (including any test load),
d-ii	Effectively controlling such load while it is being lowered, acting without shock and shall be attached with shoes that can be easily removed for running and which shall be simple and have easily accessible means of adjustment;
e	Provided that nothing contained above shall apply to steam-winch that can be operated as safely as with brakes.
<b>7.2</b>	<b>CONTROLS OF EVERY LIFTING APPLIANCE SHALL BE SO;</b>
a	Situated that the driver of such appliance at his stand or seat has ample room for operating and has an unrestricted view of building or other construction work, as far as practicable, and that he remains clear of the load and the ropes, and that no load passes over him;
b	Positioned with due regard to ergonomic considerations for proper operation of such appliance;
c	Located that the driver of such appliance remains above the appliance and shall have upon them or adjacent to them clear markings to indicate their purpose and mode of operations;
d	Provided, where necessary, with a suitable locking device to prevent accidental movement or displacement and shall move, as far as practicable, in the direction of the resultant load movement;
e	Wherever automatic brakes are provided, they shall automatically come to the neutral position in case of power failure.
<b>7.3</b>	<b>TEST AND PERIODICAL EXAMINATION</b>
<b>7.3.1</b>	<b>Test:</b> all lifting appliances including all parts and gears thereof, whether fixed or movable, shall be tested and examined by a competent person before being taken into use for the first time or after It has undergone any alteration or repairs liable to affect its strength or stability or after erection on a site and also once at least in every five years, in the manner as specified;
<b>7.3.2</b>	<b>Examination:</b> all lifting appliances shall be thoroughly examined by a competent person at least in every twelve months and where the competent person making such examination forms





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	the opinion that the lifting appliance cannot continue to function safely, he shall forthwith give notice in writing of his opinion to the contractor.
<b>7.4</b>	<b>AUTOMATIC LOAD INDICATOR</b>
a	Cut-out shall be provided which automatically arrests the movement of the lifting parts of every crane if the load exceeds the safe working load, wherever possible;
b	Wherever the above provisions cannot be applied and if it is not possible to install an automatic safe load indicator, in that case, provision of a table showing the safe working loads at the corresponding inclinations or radii of the jib on the crane shall be considered sufficient.
<b>7.5</b>	<b>INSTALLATION:</b>
a	Fixed lifting appliances shall be installed by a competent person in a manner that Such appliances cannot be displaced by the load, vibration or other influences;
b	The operator of such appliance is not exposed to danger from loads, ropes or drums;
c	The operator can either see over the zone of operation or communicate with all loading and unloading points by signal, or other communication system;
d	Adequate clearance is provided between parts or loads of lifting appliances and between the fixed objects such as walls and posts, or electrical conductors;
e	The lifting appliances; when exposed to wind loading, are given sufficient additional strength, stability and rigidity to withstand such loading safely;
f	No structural alterations or repairs are made on any part of the lifting appliances that affect the safety of such appliances without obtaining the opinion of the competent person to this effect.
<b>7.6</b>	<b>WINCHES</b>
a	Winches shall not be used if their control levers operate with excessive friction or play;
b	Double gear winches shall not be used unless a positive means of locking the gearshift is provided;
c	There shall be no load other than the fall and the hook assembly on the winch while changing gears on a two-gear winch;
d	Adequate protection shall be provided to the winch operator against abnormal weather;
e	Temporary seats or shelters for winch operators that may pose hazard to the winch operator or any other building workers shall not be allowed to be used;
f	Control levers shall be secured in the neutral position and, whenever possible, the power shall shut off if the winch is left unattended.
<b>7.7</b>	<b>IN USE OF EVERY STEAM-WINCH</b>
a	Measures shall be taken to prevent escaping steam from obscuring any part of the construction site or other workplace or from otherwise hindering or injuring any building worker;
b	Extension control levers which tend to fall off their own weight shall be counter-balanced;
c	Winch operators shall not be permitted to use the which control extension levers except for short handles on wheel type controls and that such levers shall be of adequate strength, secure and fastened with metal connections at the fulcrum and at the permanent control lever;
d	In use of every electric winch, no building worker shall be permitted to transfer, alter or adjust electric control circuits in case of any defect in such winch;



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<b>7.8</b>	<b>ELECTRIC WINCHES SHALL NOT BE USED FOR BUILDING WORK WHERE</b>
a	The electromagnetic brake is unable to hold the load; or
b	One or more control points either hoisting or lowering are not operating properly.
<b>7.9</b>	<b>BUCKETS:</b>
a	It shall be ensured that tip-up buckets are equipped with a device that effectively prevents accidental tipping.
<b>7.10</b>	<b>IDENTIFICATION AND MARKING OF SAFE WORKING LOAD:</b>
a	Every lifting appliance and loose gear shall be clearly marked for its safe working load and identification by stamping or other suitable means;
b	Every derrick (other than derrick crane) shall be clearly marked for its safe working load when such derrick is used either in single purchase with lower block or in union purchases in all possible block positions;
c	The lowest angle to the horizontal, to which the derrick may be used, shall be legibly marked;
d	Every lifting appliance having more than one working load shall be fitted with effective means to enable the operator to determine safe working load at each point under all conditions of use;
e	Means to ascertain the safe working load for lifting gears under such conditions in which such gears may be used shall be provided to enable a worker using such gears and such means safely, which shall comprise:
e-i	Marking of the safe working load in plain figures or letters upon the sling or upon a tablet or ring of durable material attached securely thereto in case of chain slings; and
e-ii	The means specified or notices so exhibited as can be easily read by any concerned building worker stating the safe working load for the various sizes of the wire rope slings used.
<b>7.11</b>	<b>LOADING OF LIFTING APPLIANCES AND LIFTING GEARS</b>
a	No lifting appliance, lifting gear or wire rope shall be used in an unsafe way and in such a manner as to involve risk to life of building workers and they are not loaded beyond their safe working load except for testing purposes under the direction of a competent person in the manner as specified in schedule;
b	No lifting appliance and lifting gear, or any other material-handling appliance shall be used if the Inspector having jurisdiction under the Building and Other construction (regulation of employment and conditions of service) Act/Rules is not satisfied with reference to a certificate of test or examination or to an authenticated record maintained as provided under the Rules or if in his view the lifting appliance, lifting gear or any other material handling appliance is not safe for use in building or other construction work;
c	No pulley block shall be used unless the safe working load and its identification are clearly marked on such block.
<b>7.12</b>	<b>OPERATOR'S CAB OR CABIN SHALL</b>
a	Be made of fire resistant material;
b	Have a suitable seat, a foot rest and protection from vibration;
c	Afford the operator an adequate view of the area of operation;
d	Afford the necessary access to working parts in the cab;



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e	Afford the operator adequate protection against the weather;
f	Be adequately ventilated; and
g	Be provided with a suitable fire extinguisher.
<b>7.13</b>	<b>OPERATION OF LIFTING APPLIANCES:</b>
	Operator of every crane or lifting appliance shall possess adequate skill and training in the operation of the particular lifting appliances, provided further that
a	No person under eighteen years of age shall be in control of any lifting machine, scaffold winch, or give signals to the operator;
b	Precaution shall be taken by the trained operator to prevent lifting appliance from being set in motion inadvertently;
c	The operation of lifting appliances shall be governed by signals in conformity with the approved standards;
d	The operator's attention shall not be distracted while he is working;
e	No crane, hoist, winch or other lifting appliance or any part of such crane, hoist, winch or other lifting appliance shall, except for testing purposes, be loaded beyond the safe working load;
f	During the hoisting operation, effective precaution shall be taken to prevent any person from standing or passing under the load in such operation;
g	Operator shall not leave lifting appliance unattended while power is on or the load is suspended to such appliance;
h	No person shall ride on a suspended load of any lifting appliance;
i	Every part of a load in course of being hoisted or lowered shall be adequately suspended and supported to prevent danger;
j	Every receptacle used for hoisting bricks, tiles, slates or other material shall be suitably enclosed as to prevent the fall of any such material;
k	The hoisting platform shall be enclosed when loose material or loaded wheel barrows are placed directly on such platform or lowering such materials or wheel barrows;
l	No material shall be raised, lowered or slewed with any lifting appliance in such a way as to cause sudden jerks to such appliance;
m	In hoisting a barrow, any wheel of such barrow shall not use be as a means of support unless adequate steps have been taken to prevent the axle of such wheel from slipping out of its bearing;
n	Long objects like planks or girders shall be provided with tag line to prevent any possibility of danger while raising or lowering such objects;
o	During the process of landing or material, a building worker shall not be permitted to lean out into empty space for finding out the loading and unloading of such material;
p	When hoisting of load is done in an enclosed space, neither the lifting material nor the boom shall project outside the enclosed space;
q	Adequate steps shall be taken to prevent a load, in the course of being hoisted or lowered from coming into contact with any object to avoid any displacement of such load and appropriate appliances provided and used for guiding heavy loads when raising or lowering heavy loads to avoid crushing of hands of building workers during such raising or lowering of loads.



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<b>7.14</b>	<b>HOISTS</b>
a	Hoist towers shall be designed according to the relevant national standards;
b	Hoist shafts shall be provided with rigid panels or other adequate fencing at the ground level on all sides of such shafts and at all other levels on all sides of the access to such shafts while the walls of hoist shafts, except at approaches, extend at least two meters above the floor or platform of access to such shafts;
c	Approaches to hoist shall be adequately lit and provided with gates that shall be guarded to maintain visibility at least of two meters height; and equipped with a device, which requires such gate to be closed before the platform of such hoist can leave the landing, and prevents the gate from being opened unless such platform is at the landing;
d	The guides of hoist platforms shall offer sufficient resistance to bending and to bucking in the case of jamming, by providing a safety catch;
e	Overhead beams and their supports are capable of holding the total maximum live and dead loads that such beams and supports will be required to carry, with a safety factor of at least five;
<b>f</b>	<b>A clear space shall be provided –</b>
f-i	Above the highest stopping place of a cage or platform to allow sufficient unobstructed travel of such cage or platform in case of over-winding and
f-ii	Below the lowest stopping place of such cage or platform;
g	Adequate covering shall be provided above the top of hoist shafts to prevent materials from falling into such shafts;
h	Outdoor hoist towers shall be erected on adequately firm foundations and securely braced, guyed and anchored;
i	A ladder way shall extend from the bottom to the top of every outdoor hoist tower in case no other ladder way exists within easy reach and such ladder way shall comply with the relevant national standards;
j	The rated capacity of a hoisting engine shall at least be one and a half times the maximum load that such engine will be required to move;
k	All gearing on a hoisting engine shall be securely enclosed;
l	Steam piping of hoisting engine shall be adequately protected against accidental contact of such piping with a building worker;
m	Electrical equipment of a hoisting engine shall be effectively earthed;
n	A hoist shall be provided with suitable devices to stop a hoisting engine as soon as the platform of such hoist reaches its highest stopping place;
o	A hoisting engine shall be protected by suitable cover against weather and falling objects;
p	A hoisting engine set up in a public thoroughfare shall be completely enclosed;
q	All exhaust steam pipes shall discharge steam in such a manner that the steam so discharged does not scald any person or obstruct the operator's view;
r	The motion of a hoist shall not be reversed without first bringing it to rest to avoid any harm from such reverse motion;



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s	A hoist not designed for the conveyance of persons shall not be set in motion from the platform of such hoist;
t	Pawls and ratchet wheels of a hoist, requiring disengagement of such pawls from such ratchet wheels, before the platform of such hoist is lowered, shall not be used;
u	A platform of a hoist shall be capable of supporting such maximum load that such platform may carry with a safety factor of at least three;
v	A platform of a hoist shall be equipped with suitable safety gear which can hold such platform with its maximum load in case its hoisting rope breaks;
w	On platform of a hoist, the wheel barrows or truck shall be efficiently blocked in safe positions;
x	A cage of a hoist or platform where the building workers are required to enter into such cage or to go on such platform at landing levels, shall be provided with a locking arrangement to prevent such cage or platform from moving during the time a worker enters or leaves such cage or platform;
y	The sides of platform of a hoist which are not used for loading or unloading, shall be provided with toe-board and enclosures of a wire mesh or any other suitable means to prevent the fall of any part of a load from such platform, further provided that
y-i	The platform of a hoist, which has any probability of falling of any part of a load from it, shall be provided with an adequate covering to prevent such fall;
y-ii	The counter weights of a hoist consisting of an assemblage of several parts shall be so constructed that such parts shall be rigidly connected together;
y-iii	The counter weights of a hoist shall run between guides;
y-iv	At every level of work the building workers shall be provided with adequate platforms for performing such work;
y-v	A legible notice in Hindi as well as in a local language shall be displayed in a conspicuous place of the platform of a hoist and that such notice shall state the maximum carrying capacity of such hoist in kilograms on the hoisting engine;
y-vi	On a hoist authorized and certified for the conveyance of the persons on the platform or in the cage and such notice shall state the maximum number of persons to be carried on such hoist at one time;
y-vii	On a hoist carrying goods and other materials such notice shall state that such hoist is not meant for carriage of persons.
<b>7.15</b>	<b>FENCING AND MEANS OF ACCESS TO LIFTING APPLIANCES</b>
a	Safe means of access shall be provided to every part of lifting appliances;
b	The operator's platform on every crane or tip driven by mechanical power shall be securely fenced and provided with safe means of access and where access to such platform is by a ladder, the sides of such ladder shall extend to a height reasonable beyond such platform or some other suitable handhold shall be provided in the platform;
c	The handling place on such platform shall be maintained free from obstruction and slipping; and
d	In case the height of such ladder exceeds six meters, the resting platforms shall be provided on such ladder at every six meters of its height and where the distance between last platform so provided and the top end of such ladder is more than two meters then on such top end.



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<b>7.16</b>	<b>RIGGING OF DERRICKS:</b>
	Every derrick shall have current and relevant rigging plans and any other information necessary for the safe rigging of such derrick and its gear.
<b>7.17</b>	<b>SECURING OF DERRICK FOOT:</b>
	Appropriate measures shall be taken to prevent the foot of a derrick from being lifted out of its socket or supports.
<b>7.18</b>	<b>CONSTRUCTION AND MAINTENANCE OF LIFTING GEAR</b>
a	Every lifting gear shall be –
a-i	of good design and construction, sound material and adequate strength to perform the work for which it is used;
a-ii	free from patent defects; and
a-iii	properly maintained in good repair and working order;
b	Components of the loose gear, at the time of its use, shall be renewed if one of its dimensions at any point has decreased by ten per cent or more;
c	A chain shall be withdrawn from use when it is stretched and increased in length which exceeds five per cent of its length or when a link of such chain is deformed or is otherwise damaged or defects in the welds have appeared on it;
d	Rings, hooks, swivels and end links attached to a chain shall be of the same materials as that of such chain;
e	The voltage of electric supply to any magnetic lifting device shall not fluctuate by more than plus or minus 10%.
<b>7.19</b>	<b>TEST AND PERIODICAL EXAMINATION OF LIFTING GEARS</b>
a	A lifting gear shall be initially tested for the manufacturer by a competent person in a manner specified as per schedule annexed before taking into use or after undergoing any substantive alterations which renders it's any part liable to affect its safety and such gear after such test shall subsequently be retested for the use of its owner at least once in every five years;
b	A lifting gear in use shall thoroughly examined once at least in every twelve months by a competent person;
c	A chain in use shall be thoroughly examined at least once every month by a responsible person for its use;
d	Certificates of initial and periodical test and examinations of loose gears shall be obtained in the form annexed.
<b>7.20</b>	<b>ROPES</b>
a	No rope shall be used for building or other construction work unless -
a-i	It is of good quality and free from patent defects; and
a-ii	In the case of wire rope, it shall be tested and examined by a competent person in the manner annexed;
a-iii	Every wire rope of lifting appliance or lifting gear used for building or other construction work shall be inspected by a responsible person for such use, once at least in every three month;





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b	Provided that after if any such wire is broken in such rope, the responsible person shall thereafter inspect it once at least in every month and ensure that;
c	No wire rope shall be used for building or other constructing work if in any length of eight diameters of such wires, the total number of visible broken wires exceed ten per cent of the total number of wires in such rope, or such rope shows signs of excessive wear, corrosion or other defects which in the opinion of the person who inspects it, is unfit for use;
d	Eye splices and loops of ropes for the attachment of hooks, rings and other such parts to wire rope shall be made with suitable thimble;
e	A thimble or loop splice made in any wire rope sling shall conform to the following standards, namely:
e-i	Wire rope sling shall have at least three tucks with full strand of rope and two tucks with one-half of the wires cut out of each of such strand in all cases, such strands shall be tucked against the lay of the rope;
e-ii	Protruding ends of such strands in any splice of wire rope slings shall be covered or treated so as to leave no sharp points;
e-iii	A fiber rope or a rope sling shall have at least four tucks, tail of such tuck being whipped in a suitable manner; and
e-iv	A synthetic fiber rope or rope sling shall have at least four tucks with full strands followed by further tuck with one-half filaments cut out of each of such strand and final tuck with one-half of the remaining filaments cut out from such strands. Any portion of the splices containing such tucks, with reduced number of filaments, shall be securely covered with suitable tape or other materials;
e-v	Provided further that nothing contained above shall apply where any other form of splice, which may be shown to be as efficient as the splice with above standards, shall be used.
<b>7.21</b>	<b>HEAT TREATMENT OF LIFTING GEARS</b>
a	All chains other than bridle chains attached to derricks and all rings, hooks, shackles and swivels used in hoisting or lowering of such derricks shall be effectively annealed under supervision of a competent person and at the following intervals, namely:
a-i	Such chains, rings, hoods, shackles and swivels which are not more than twelve and a half millimeter of length annealed at least once in every six months; and
a-ii	All other such chains rings hooks shackles and swivels shall be so annealed at least once in every twelve months;
b	Provided that the sl.no. (a) above shall not apply to -
b-i	Pitched chains, working on sprocket or sprocket wheels;
b-ii	Rings, hooks and swivels permanently attached to pitched chains, pulley blocks or weighing machines, and
b-iii	Hooks and swivels having ball bearings or other case hardened parts;
c	A chain or a loose gear made of high tensile steel or alloy steel shall be plainly marked with a mark indicating that it is so made;
d	No chain or loose gear made of high tensile steel or alloy steel shall be subjected to any form of heat treatment except where such treatment is necessary for the purpose of repair of such chain or loose gear and that such repair shall be made under the direction of the competent person;



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e	That the wrought iron gear, the past history of which is not traceable, shall be suspected of being heat treated at incorrect temperature shall be normalized before using it on any building or other construction work.
<b>7.22</b>	<b>CERTIFICATE TO BE ISSUED AFTER ACTUAL TESTING AND EXAMINATION ETC:</b>
	A competent person shall issue a certificate after actual testing or examination of the apparatus specified and record of such test or examination shall be maintained for inspection.
<b>7.23</b>	<b>REGISTER OF PERIODICAL TEST, EXAMINATION AND CERTIFICATION THEREOF</b>
a	A register in the form annexed shall be maintained and particulars of such test and examination of lifting appliances, lifting gears and heat treatment as required shall be entered in such register;
b	Certificate in respect of each of the following shall be obtained from a competent person:
b-i	In cases of initial and periodical test and examination of the lifting appliances such as Winches, Derricks and their accessory gears, Cranes or Hoists and their accessory gears;
b-ii	In case of test, examination and re-examination of loose gears;
b-iii	In case of test and examination of wire ropes;
b-iv	In case of heat treatment and examination of loose gears;
b-v	In case of annual thorough examination of the loose gears, except where required particulars of such exemption have been enclosed in the register referred to in Form annexed and such certificates are attached to the register referred to as above and certificates kept at such construction site in case such register and certificate relate to lifting appliances, loose gear and wire ropes and
c	Produced on demand and retained for at least five years after the date of the last entry made in such register;
d	No lifting appliance or lifting gear in respect of which an entry is required to be made in register referred to above and certificate of test and examination are required to be attached in such register in the manner as specified, shall be used for building or other construction work unless the required entries have been made in such register and certificates.
<b>7.24</b>	<b>VACUUM AND MAGNETIC LIFTING GEAR</b>
a	No vacuum lifting gear, magnetic lifting gear or any other lifting gear where the load on it is held by adhesive power, shall be used while workers are performing operations beneath such gear;
b	A magnetic lifting gear used in connection with building or other construction work shall be provided with an alternative supply of power, such as batteries, which may come into operation immediately in the event of failure of the main power supply;
c	No building worker shall work within the swinging zone of the lifting gear or load or building or other construction material suspended to such lifting gear.
<b>7.25</b>	<b>KNOTTING OF CHAINS AND WIRE ROPES:</b>
	No chain or wire rope with a knot in it shall be used in building or other construction work.
<b>7.26</b>	<b>CARRYING OF PERSONS BY MEANS OF LIFTING APPLIANCES ETC.</b>
a	No building worker shall be raised, lowered or carried by a power driven lifting appliance, except
a-i	On the drive's platform in the cage of a crane; or



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a-ii	On as hoist; or
a-iii	On an approved suspended scaffold;
b	Provided that a building worker may be raised, lowered or carried by a power driven lifting appliance:
b-i	In circumstances where the use of a hoist or of a suspended scaffold shall not reasonably be practicable, or
b-ii	On an aerial cableway or aerial ropeway, provided further that the following requirements are met:
b-iii	That the appliance referred to above can be operated from one position only and that
b-iv	Any winch used in connection with the appliance shall also comply with the requirements as laid down above.
c	The appliance referred to above shall not carry any person except:
c-i	In a chair or cage,
c-ii	In a skip or other receptacle at least three feet deep which shall be suitable for safe carriage of a person and any such chair, cage, skip or other receptacle shall be made of good construction, sound material, and adequate strength and properly maintained with suitable means to prevent any occupant therein from falling out of it and shall be free from any material or tools which may interfere with the handhold or foothold of such occupant or otherwise endanger him; and
c-iii	Those suitable measures shall be taken to prevent the chair, cage skip or other receptacle from spinning or tipping in a manner dangerous to any occupant therein.
<b>7.27</b>	<b>HOISTS CARRYING PERSONS</b>
a	No building worker shall be carried with the help of a hoist unless it is provided with a cage which:
a-i	Is so constructed as to prevent, when its gates are shut, any building worker carried by such hoist from falling out of it or from being trapped between any part of such cage and any fixed structure or other moving part of such hoist or from being struck by articles or materials falling down the hoist way on which such hoist is moving; and
a-ii	Is fitted on each of its side from which access is provided to a landing place with a gate which has efficient interlocking or other devices to secure so that such gate cannot be opened except when such cage is at a landing place and that such cage cannot be moved away from any such place until such gate is closed;
b	Every gate in the hoist way enclosure of such hoist used for carrying persons shall be fitted with efficient interlocking or other devices to secure so that such gate cannot be opened except when the cage of such gate is at the landing place and that such cage cannot be moved away from the landing place until such gate is closed;
c	In every hoist used for carrying building workers there are provided with suitable and efficient automatic devices to ensure that the cage of such hoist comes to rest at a point above the lowest point to which such gave may travel.



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<b>7.28</b>	<b>ATTACHMENT OF LOADS</b>
a	When a sling is used to hoist long materials, a lifting beam shall be used to space the sling legs for proper balance and when a load is suspended at two or more points with slings, the eyes of the lifting legs of such slings shall be shackled together and such shackled or eyes of the shackled slings shall be placed on the hook or the eyes of such lifting legs shall be shackled directly to the hoisting block, ball or balance beam, as the case may be;
b	Every container or receptacle used for raising or lowering stone, bricks tiles, slates or other similar objects shall be so enclosed with the hoist as to prevent the fall of such objects;
c	A loaded wheel barrows placed directly on a platform of a hoist for raising or lowering of such wheel barrows shall be so secured that such wheel barrows cannot move and such platform shall be enclosed to prevent the fall of the contents kept in such wheel barrows;
d	Landings of hoists shall be so designed and arranged that building workers on such hoist be not required to lean out into empty space for loading and unloading on any material from such hoist
<b>7.29</b>	<b>TOWER CRANES</b>
a	No person other than the operator trained and capable to work at heights shall be employed to operate tower cranes;
b	The ground on which a tower crane stands shall have adequate bearing capacity;
c	Bases for tower cranes and trucks for rail mounted tower cranes shall be firm and leveled and such cranes erected at a reasonably safe distance from excavations and operated within gradient limits as specified by the manufacturer of such cranes;
d	Tower cranes shall be sited where there is a clear space available for erection, operation and dismantling of such cranes;
e	Tower cranes shall be sited in such a way that the loads on such cranes shall not be handled over any occupied premises, public thoroughfares, railways or near power cables, other than construction works for which such cranes are used;
f	Where two or more tower cranes are sited and operated, every care shall be taken to ensure positive and proper communication between operators of such cranes to avoid any dagger or dangerous occurrences;
g	Tower cranes shall not be used for loading magnet, or demolition ball service, piling operation or other similar operations which could impose excessive load stresses on the crane structure of such cranes;
h	The instruction of the manufacturer of a tower crane and standard safe practices regarding such cranes shall be followed while operating or using such cranes.
<b>7.30</b>	<b>QUALIFICATION OF OPERATOR OF LIFTING WINCHES AND OF SIGNALER ETC.</b>
a	No person shall be employed to drive or operate a lifting appliance whether driven by mechanical power or otherwise or to give signals to driver of operator of such lifting appliance or to work as an operator of a rigger or derricks unless he is
a-i	Sufficiently competent and reliable;
a-ii	Possesses the knowledge of the inherent risks involved in the operation of lifting appliance;
a-iii	Medically examined periodically as specified and
a-iv	Is above eighteen years of age.



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<b>8.0</b>	<b>SAFETY IN THE USE OF TRANSPORT, EARTHMOVING EQUIPMENT &amp; OTHER CONSTRUCTION MACHINERY</b>
<b>8.1</b>	<b>EARTHMOVING EQUIPMENT AND VEHICLES</b>
a	All vehicles and earthmoving equipment shall be made of good material, proper design and sound construction and be sufficiently strong for the purpose for which such equipment are properly used in accordance with standard safe operating practices;
b	Provided that the truck or trailer employed for transporting freight containers shall be of the size sufficient to carry the containers, without over hanging and provided with twist locks conforming to approved standards, at all the four corners of each of such use by an authority under the relevant law for the time being in force and is inspected by a responsible person, at least once in a month and record of such inspection shall be maintained;
c	All transport or earth moving equipment and vehicles shall be inspected at least once a week by a responsible person and in case any defect is noticed in such equipment or vehicle it shall be immediately taken out of use;
d	Power trucks and tractors shall be equipped with effective brakes, headlights and tail lamps and maintained in good repair and working order;
e	Side stanchions on power trucks and trailers for carrying heavy and long objects shall be
e-i	Of sound construction and free from defects;
e-ii	Provided with tie chains attached to the top across the loads for preventing such stanchions from spreading out; and
e-iii	Kept in position while loading and unloading;
e-iv	Safe gangways provided for to and fro movement of building workers engaged in loading and unloading of lorries, trucks, trailers and wagons;
e-v	Trucks and other equipment shall not be loaded beyond their safe capacity and carry workers engaged in loading and unloading of lorries, trucks trailers and wagons in an unsafe condition;
e-vi	Handles of trucks shall be so designed as to protect the hands of the building workers working on such trucks, or such handles provided with knuckle guards;
e-vii	No unauthorized person shall ride the transport equipment employed in such work;
e-viii	A driver of a transport equipment shall maneuver such equipment under the direction of a signaler;
e-ix	Adequate precaution such as isolating the electric supply or erecting overhead barriers of a safe height shall be taken when earth moving equipment or vehicles are required to operate in dangerous proximity to any live electric conductor;
e-x	Vehicles and earth moving equipment shall not be left on a slope with the engine of such vehicles or equipment running;
e-xi	All earth moving equipment, vehicles or other transport equipment shall be operated only by such person who are adequately trained and possess such skills as required for safe operation of such equipment, vehicle or other transport equipment.
<b>8.2</b>	<b>POWER SHOVELS AND EXCAVATOR</b>
a	A shovel or an excavator whether operated by steam or electric or by internal combustion, shall be constructed, installed, operated, tested and examined as per approved standards;



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b	Excavator equipped for use as a mobile crane shall be examined and tested in accordance with the requirements for such mobile cranes as laid down by the manufacturer; and
c	Fitted with an automatic safe working load indicator;
d	Buckets or grabs of power shovels shall be propped to restrict the movement of such buckets or grabs while being repaired or while the teeth of such buckets or grabs are being changed.
<b>8.3</b>	<b>BULLDOZER</b>
a	Operator of every such bulldozer before leaving the dozer shall take the following steps:
a-i	Apply the brakes;
a-ii	Lower the blade and sipper and
a-iii	Put the shift lever into neutral;
a-iv	Dozer left on level ground at the close of the work for which such bulldozer is used;
a-v	The blade of a bulldozer kept low when such bulldozer is moving uphill;
a-vi	The bulldozer blades not used as brakes except in an emergency.
<b>8.4</b>	<b>SCRAPERS</b>
a	A tractor and scraper shall be joined by safety line at the time of its operation;
b	The scraper bowls shall be propped while blades of such scraper are being replaced;
c	A scraper moving downhill shall not be left in gear.
<b>8.5</b>	<b>MOBILE ASPHALT LAYERS &amp; FINISHERS</b>
a	A mixture elevator shall be located within a wooden or sheet metal enclosure with a window for observation, lubrication and maintenance;
b	Bitumen scoops shall have adequate covers;
c	When asphalt plants are working on public road, adequate traffic control shall be established on such road and the building workers working with such plant provided with reflective jackets;
d	A sufficient number of fire extinguishers shall be kept in readiness at such workplace where fire hazards may exist;
e	The materials shall be loaded on the elevator after the drying drain has warmed up of such elevator;
f	No open light shall be used for ascertaining the level of asphalt;
g	Inspection opening shall not be opened till there is a pressure in the boiler, which may cause injury to building workers.
<b>8.6</b>	<b>PAVERS:</b>
	Pavers shall be equipped with guards suitable to prevent building workers from walking under the skip of such pavers.
<b>8.7</b>	<b>Road rollers:</b> Before a road roller is used on the ground, such ground shall be examined for its bearing capacity and general safety, especially at the edges of slopes such as embankment on such grounds and shall not be moved downhill with the engine out of gear.





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<b>8.8</b>	<b>GENERAL SAFETY IN RESPECT OF POWERED CONSTRUCTION MACHINERY</b>
a	Every vehicle or earthmoving equipment shall be equipped with -
a-i	Silencers;
a-ii	Tail lights
a-iii	Power and hand brakes;
a-iv	Reversing alarm; and
a-v	Search light for forward and backward movement, which are required for safe operation of such vehicle or earthmoving equipment;
b	The cab of vehicle or earthmoving equipment shall be kept at least one meter from the adjacent face of a ground being excavated;
c	When cranes or shovel are traveling, the boom of such crane or shovel shall be in the direction of such travel and the bucket or scoop attached to such crane or shovel raised and without load except when such traveling is downhill.



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<b>9.0</b>	<b>SAFETY IN THE PROVISION OF RUNWAYS AND RAMP</b>
<b>9.1</b>	<b>USE OF RUNWAYS AND RAMPS:</b>
a	Runway or ramps shall not be less than 430 mm in width and constructed of not less than 25 mm thick planking or any other material of adequate strength to withstand the required load, supported substantially in relation to the span and braced with such runway or ramp, and design and construction of such runway or ramp shall be in accordance with the approved standards;
b	Every runway or ramp located more than 3 m above the floor or ground shall be on open sides and provided with a guardrail of adequate strength and height of not less than 1 m.
c	Use of runways and ramps by vehicles:
c-i	All runways and ramps shall be of sound construction, strength and securely braced and supported;
c-ii	Every runway or ramp for the use of transport equipment like trailers, trucks or heavier vehicles shall have a width of not less than 3.7 m and provide with timber curbs or any other material of adequate strength with not less than 200 mm by 200 mm in width placed parallel to, and secured to, the sided of such runway or ramp and such runways or ramps or ramps shall be designed in accordance with the approved standards.
<b>9.2</b>	<b>SLOPE OF RAMPS:</b>
	Every ramp shall have a slope not exceeding one in four and the total rise of a continuous ramp used by building workers carrying material or using wheelbarrows shall not exceed 3.7 m, unless broken by horizontal landing of at least 1.2 m in length.
<b>9.3</b>	<b>USE OF RUNWAYS OR RAMPS BY WHEELBARROWS, ETC.</b>
a	Every runway or ramp used for wheelbarrows and carts or hand trucks shall not be less than 1 m width and constructed of not less than 50 mm thick planking, and supported and braced suitably for such use;
b	Every runway or ramp located more than 3 m above the floor or ground shall be provided on the open sides with suitable guardrails of adequate strength.



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<b>10</b>	<b>SAFETY IN HANDLING AND USE OF EXPLOSIVES</b>
<b>10.1</b>	<b>GENERAL PROVISIONS:</b>
a	The use of explosives shall be carried out in a safe manner to avoid injury to any person and under the direct supervision of a responsible person;
b	No person other than authorized and competent one shall be allowed to handle and use explosives;
c	Before using any explosive, necessary warning and danger signals shall be erected, at conspicuous places of such use to warn the building workers and the general public of the danger involved in such use.
d	No person other than authorized and competent one shall be allowed to handle and use explosives.
e	Smoke, open lamps, other type of hot or heat producing items and sparks shall be prohibited in or near explosives magazines or while explosives are being handled, transported or used.
f	No person shall be allowed to handle or use explosives while under the influence of intoxicating liquors or dangerous drugs.
g	The explosives shall be accounted for at all times. No explosives or blasting agents shall be abandoned.
h	No fire shall be fought where the fire is in the imminent danger of contact with explosives. All employees shall be removed to a safe area and the fire area shall be guarded against intruders.
i	Employees authorized to prepare explosive charges or conduct blasting operations shall use every reasonable precaution including but not limited to visual and audible warning signals, flags, or barricades to ensure employee safety.
j	Due precautions shall be taken to prevent accidental discharge of electric blasting caps from current induced by induced voltage, lightning, adjacent power lines, dust storms, or other sources of extraneous electricity or otherwise. These precautions shall include:
k	Short-circuiting of detonators in holes, which have been primed and shunted until wired into the blasting circuit.
l	The suspension of all blasting operations and removal of persons from the blasting area during the approach and progress of an electric storm.
m	The prominent display of adequate signs, warning against the use of radio transmitters, on all roads within 1000 ft of blasting operations. Whenever adherence to the 1000 ft distance would create an operational handicap, a competent and expert person shall be consulted to evaluate the particular situation, and an alternative provided, which are adequately designed to prevent any premature firing of electric blasting of caps. A description of any such blasting shall be reduced to writing and shall be certified as meeting the purposes of this subdivision by the competent person consulted. The description shall be maintained at the construction site during the duration of the work, and shall be available for inspection.
n	Empty boxes and paper and fiber packing materials, which have previously contained high explosives, shall not be used again for any purpose, but shall be destroyed by burning at an approved location.
o	Explosives, blasting agents and blasting supplies that are obviously deteriorated or damaged shall not be used.



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p	Delivery and issue of explosives shall only be made authorized persons into authorized magazines or approved temporary storage or handling areas.
q	Blasting operations in the proximity of overhead power lines, communication lines, utility services, or other services and structures shall not be carried on until the operators and/or owners have been notified and measures for safe control have been taken. In such situations controlled blasting shall be restored to.
r	All loading and firing shall be directed and supervised by competent persons thoroughly experienced in this field.
s	Loaded boreholes shall not be left unattended after the end of the shift.
t	Suitable and sufficient means of egress to ground level shall be provided in all cases of excavations, trenches, all other places where explosives are handled above or below ground level.
u	At an appropriate time before the final blasting warnings, workers in the area shall be removed to a designated safe place.
v	An unmistakable, audible, final warning shall be sounded one minute prior to the detonation of explosives; after completion, when the person in charge has established that safe conditions prevail, an "all clear" shall be sounded.
w	To prevent persons entering any danger zone during blasting operations notices shall be given to all concerned.
x	Notices referred above shall indicate:
x-i	that explosives are in use;
x-ii	the audible warning sound and the "all clear" and state when they will be sounded; and
x-iii	the warning flags in use, including an "all clear" flag.
y	Precautions against lightning shall be provided in accordance with the Indian Electricity Act and Indian Explosives Act and Rules and regulations framed there under.
z	Package containing explosives shall not be dragged, dropped or handled roughly.
aa	Non-sparking tools shall be used to open keys.
bb	The explosives shall not be carried in the box or otherwise on any individual.
cc	Nothing shall be inserted in the open end of the blasting cap except fuses.
dd	dd. Deteriorated or damages explosives shall not be used but shall be disposed or destroyed strictly in accordance with the approved methods and in the doing so the manufacturers or the appropriate authority's instructions shall be followed.
ee	lightning shall be in accordance with Indian Electricity Act/Rules
ff	All workers engaged in or present near the blasting area must wear appropriate and approved Personal Protective Equipment (PPE) such as safety helmets, face shields or goggles, ear protection, blasting suits, gloves, and safety shoes. Strict compliance with PPE usage is mandatory to ensure safety during blasting operations.
<b>10.2</b>	<b>TRANSPORTATION OF EXPLOSIVES</b>
a	Keep safe distance and to use non-sparking tools while opening packages containing explosives;



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b	Stop the use of explosives and handling thereof while the weather conditions are not suitable for such use or handling;
c	Due precautions shall be taken to prevent accidental discharge of electric blasting caps from current induced by induced voltage, lightning, adjacent power-lines, dust storms or other sources of extraneous electricity or otherwise. These precautions shall include —
c-i	Suspension of all blasting operations and evacuation of persons;
c-ii	All warning signs shall be displayed within 200 m of blasting operations and in case putting up a sign at 200 m is impractical, the contractor shall consult the Engineer-in-charge for alternatives;
c-iii	All loading and firing shall be directed and supervised by competent persons thoroughly experienced in the field;
c-iv	To prevent persons entering any danger zone during blasting operations, notices shall be given to all concerned;
d	In addition to these provisions, all measures and precautions that are required to be observed for use, handling, storing or transportation of explosives under the Rules framed under the Explosives Act, 1884 (4 of 1884) shall be observed;
e	All the relevant statutory provisions, local laws and rules and regulations shall be complied with.
f	Where the magazine is located near the construction site and blasting operation continues daily, actual requirement of explosives shall be drawn from the magazine and transported to the site. Any leftovers shall be returned to the magazine each time after the blast. In case of work at scattered places and for a small duration, portable magazines shall be used and kept within a fence in safe place and properly guarded.
g	For carrying higher quantity (more than 5 kg of explosives) specially designed insulated containers shall be used. These containers shall be constructed of finished wood not less than 5cm thick or plastic not less than 6mm thick or pressed fiber not less than 10mm thick. There shall be no metal parts (not even nails, bolts, screws etc.) and the containers shall be provided with suitable non-conductive carrying device, such as rubber, leather or canvas handle or strap.
h	Vehicles to be used for transportation explosives shall be in good working condition and shall have a tight wooded or non-sparking metal (copper, brass and the like) floor with sides and ends high enough to prevent the explosives from falling off the vehicle. In open bodied vehicles, the explosives shall be covered with a waterproof and fiber tarpaulin.
i	Electrical wiring in vehicle shall be fully insulated so as to prevent the danger of short-circuiting and at least two fire extinguishers of carbon dioxide type shall be carried. The vehicle shall be properly marked indicating adequate warning to the public in regard to the nature of cargo.
j	No metals except approved metal truck shall be allowed to come in contact with cases of explosives, metal, flammable, or corrosive substance shall not be transported with explosives. As far as possible, transportation of any material along with explosives shall be prohibited.
k	Smoking shall be prohibited in the vehicle carrying explosives.
l	No unauthorized person shall be allowed in the vehicle, carrying explosives.
m	Loading and unloading of explosives shall be done carefully.
n	Explosives and detonators or blasting caps shall not be permitted to be transported in the same vehicle.



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o	Detonators and other explosives for blasting shall be transported to the site of work in the original containers or in securely locked separate non-metallic containers and shall not be carried loose or mixed with other materials.
<b>10.3</b>	<b>STORAGE OF EXPLOSIVES AND BLASTING AGENTS</b>
a	Explosives and related materials shall be stored in approved facilities.
b	Blasting caps, electric blasting caps, detonating primers, and primed cartridges shall not be stored in the same magazine with other explosives or blasting agents.
c	Smoking and open flames shall not be permitted within 50 feet of explosives and detonators storage magazine.
d	No Explosives or blasting agents shall be permanently stored in any underground area until the area has been developed to the point where at least two modes of exit have been provided.
e	Permanent underground storage magazine shall be at least 300 feet from any shaft or other active underground working area.
f	Permanent underground magazines containing detonators shall not be located closer than 50 feet to any magazine containing other explosives or blasting agents.
<b>10.4</b>	<b>DRILLING AND LOADING</b>
a	Before planning out the drilling operations for blasting purposes, nature of stratum and the over burden shall necessarily be examined to avoid possibilities of landslides after blasting.
b	The face or rock shall be carefully examined before drilling to determine the presence of unfired explosives. No attempt shall be made to drill at a site if un-detonated explosives are suspected. In such case the boreholes shall be thoroughly cleaned before a cartridge is inserted. Wooden tamping rods (not pointed, but cylindrical throughout) shall be used in the charging the holes. The cartridge will be on the top.
c	The borehole shall be carefully checked for length, presence of water dust, etc. with a wooden tamping pole or a measuring tape before loading.
d	Surplus explosives shall not be stacked near working areas during loading/unloading.
e	The line of detonating fuse extending into a borehole shall be cut from the spool before loading the remainder of the charge.
f	A bore shall not be loaded with explosives after springing (enlarging the hole with explosives) or upon completion of drilling without making sure it is cool and it does not contain any hot smoldering material. Temperatures in excess of 65o C are dangerous.
g	A bore near another hole loaded with explosives shall not be sprung.
h	No force shall be used for inserting cartridges or any explosives into a bore hold or pass any obstruction in a borehole.
i	No force shall be used for inserting a blasting cap or an electric blasting cap into explosive. The cap shall be inserted into a hole made with a pickers designed for the purpose. A hitch of the electric blasting cap leading wire shall be made on the primer cartridge so as to prevent pulling out the electric blasting cap from the explosive charge. In case of fuse, the fuse shall be tied to the explosive cartridge so that the blasting cap is not pulled out. Care shall be taken so that the blasting cap is not pulled out. Care shall be taken so that the electric blasting cap, leading wire or the length of the fuse does not get damaged during loading of the charge.
j	No attempt shall be made to slit, drop, deform or abuse the primer.





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k	Blasting caps or electric blasting caps shall not be connected to detonating fuse except by methods recommended by the manufacturers of caps.
l	Explosive cartridge shall not be cut, nor explosive removed from the cartridge for use.
m	Metallic devices of any kind shall not be used in tamping. Wooden tamping tools with not exposed metal parts except non-sparking metal connectors for jointed poled shall be used. Violent tamping shall be avoided. Primer shall not be tamped.
n	Care shall be taken to confine the explosives in the bore hold with sand, earth clay or other suitable combustible stemming material.
o	Kinking or injuring of fuse or electric blasting cap wires shall be avoided when tamping.
<b>10.5</b>	<b>ELECTRICAL SHOT-FIRING CIRCUIT</b>
a	In deciding the sizes of wires, fuses, circuits, blasting switches, etc., instructions issued by the manufacturers of these articles shall be followed, if they do not contradict with Indian Explosives Act or framed under it.
b	No person shall attempt to uncoil the wires and open out the short-circuited bare leading wires of the electric blasting cap during approach of dust storm or near any source of large charge of static electricity or near a radio transmitter. The manufacturer of the cap or the Inspectorate of Explosives shall be consulted regarding the distance from the transmitter beyond which electric short firing shall be conducted.
c	Firing circuit shall be kept completely insulated from the ground of the other conductors, such as wires, rails, pipes or other paths or stray current.
d	There shall not be any electric live wires or cables of any kind near electric blasting caps or other explosives except at the time and for the purpose of firing the blast.
e	All electric blasting caps shall be tested singly and also when connected in a circuit in series using only an approved type of circuit continuity tester or ohmmeter.
f	No attempt shall be made to use in the same circuit either electrical blasting caps made by more than one manufacturer or electric blasting caps of different design or function even if made by the same manufacturers unless such use is approved by the manufacturers.
g	No attempt shall be made to fire a circuit of electric blasting caps with less than the minimum current specified by the manufacturer of that electric blasting cap.
h	Care shall be taken to ensure that all wire ends to be connected are bright and clean.
i	The electric cap wires or leading wires shall be kept short circuited until ready to fire.
j	When energy for blasting is taken from power circuits the voltage shall not exceed 220v. The wiring controlling arrangements shall conform to the following:
k	The blasting switch shall be strictly according to the specifications, externally operated double-throw switch, which when locked in the open position will short circuit and ground the leading wires. The switch shall be installed at the location where the firing is to be controlled.
l	A 'safety' switch of the same type as the blasting switch shall be installed between the blasting switch and the firing circuit and lead lines, at a distance not to exceed 180cm from the blasting switch.
m	Both the safety switch and the blasting switch shall be locked in the open position immediately after the shot and before any person is permitted to return to the blasting area. Key to the switches shall remain in the possession of the blaster at all times.



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n	Rubber covered or other adequately insulated copper wires in good condition shall be used for firing lines and shall have solid cores of appropriate gauge. Sufficient firing line shall be provided to permit the blaster to be located at a safe distance from the blast. Single conductor lead lines shall be used.
o	Blasting operations in the proximity of overhead power lines, communication lines, utility lines, or other structures shall not be carried on until the operator or the owner, or both of such lines as been notified and precautionary measures deemed necessary, have been taken.
p	All holes loaded on a shift shall be fired on the same shift.
q	As far as possible, blasting shall be carried out using suitable exploder with 25 per cent excess capacity. Electric power from the mains shall be used only when it is absolutely necessary.
<b>10.6</b>	<b>SHOT-FIRING WITH SAFETY FUSE</b>
a	The fuse shall be carefully handled to avoid damaging the covering. In very cold weather the fuse shall be slightly warmed before using so as to avoid cracking the waterproofing.
b	Short fuse shall not be used. The length of a fuse shall not be less than 120cm. The rate of burning of the fuse shall be known and it would be necessary to make sure that it will take sufficient time in burning so as to enable all persons to reach a place of safety. The burning rate of the fuse shall not be more than 60 cm/min.
c	The fuse shall not be cut until the operation to insert the fuse into a blasting cap is ready. The fuse shall be cut off about 2.5 to 5 cm to ensure a dry end. It shall be cut squarely across with a clean and sharp blade. The fuse shall be seated lightly against the cap charge and care shall be taken to avoid twisting after it has been placed in position.
d	Blasting caps shall not be crimped by any means except by a cap crimper designed for the purpose. It shall be necessary to make sure that the cap is squarely crimped to the face.
e	The fuse shall be lighted with a fuse lighter designed for the purpose. If a match is used, the fuse shall be slit at the end and the match head held in then slit against the power core and then the match head rubbed against an abrasive surface to light the fuse.
f	The fuse shall not be lighted until sufficient stemming has been placed over the explosives to prevent sparks of live match heads from coming into contact with the explosives.
g	The explosives shall not be held in hands when lighting the fuse.
<b>10.7</b>	<b>UNDERGROUND WORK</b>
a	Only permissible explosives and in the manner as specified by the appropriate authority shall be used.
b	Excessive quantities of explosives shall not be taken underground at any time. Black blasting powder or pellet powder shall not be used with any other explosive in the same borehole.
<b>10.8</b>	<b>BEFORE AND AFTER FIRING</b>
a	Before firing, sufficient warning shall be given to enable the people working in the area to get off the danger zone. The danger zone shall be suitable cordoned off and flag men posted at important points.
b	No loose materials, such as tools, drilling implements etc. Shall be left on the rock surfaces to be blasted.
c	Blasting in the open shall be carried out during the fixed hours every day or on fixed days in the week. This information shall be amply publicized and the following precautions observed:



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d	On the project sites, where blasting operations are carried out, daily blasting hours shall be clearly printed on the sign-boards on all the roads approaching that area.
d-i	Road closing barriers should be provided to close the traffic on these roads, at least 400 meters away when the firing is to take place.
d-ii	The beginning of the firing shall follow loud sirens and similarly loud sirens shall succeed the completion of the firing.
e	The shot-firer shall not be allowed to return to the blasting site after firing, until at least 5 min have elapsed. In case of electric shot firing, the shot holes shall be examined after firing and in case of misfire no person shall be allowed to approach the blasting site for at least 5 min. In case of shot firing with safety fuse, utmost care shall be taken to count the number to ensure that all the shots have fired and in the event of misfire, no person shall be allowed to approach the blasting site for at least 30 min. In any case, a careful inspection for the remaining un-detonated explosive shall be made after firing the shots. All misfired shot holes shall be cross-marked. No other person than those duly authorized shall approach the holes until one of the following operations has been performed in respect of each of the misfired holes:
f	If the misfire is due to a faulty cable or faulty electrical connection the defect shall be remedied and the shot fired.
g	The stemming shall be floated out by use of water or air jet from hose until the hole has been opened to within 60 cm of the charge, whereupon water will be siphoned or pumped out, then a fresh new charge placed and duly detonated. Or
g-i	A careful search shall be made of unexploded material in the debris of the charge.
g-ii	If a shift charge is unavoidable, the person in-charge of one shift before leaving the work shall inform the person relieving him for the next shift of any cases misfired and shall point out their position duly cross marked and also state clearly what action has to be taken in the matter.
<b>Note:</b>	The rules are made considering statutory provisions and other National/International standards. However, if any statutory provision overruling these laws is made, the statutory provisions shall overrule the BHEL / 2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST OF CSPGCL HSE Plan.



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<b>11</b>	<b>SAFETY IN EXCAVATION &amp; TUNNELING WORK</b>
	<b>SAFETY IN EXCAVATION</b>
<b>11.1</b>	<b>GENERAL PROVISIONS</b>
a	Before undertaking any activity, the soil shall be tested and in case of availability of any explosive gas, necessary arrangements must be made to remove/dilute such gases and in case they are found to be toxic or poisonous, the workplace must be purged and continuous ventilation maintaining the contamination below the permissible level ensured;
b	The position of underground installations such as sewers, water pipes and electrical cables shall be verified and in case of their existence, they must be isolated;
c	If they cannot be isolated or removed or shutdown, they shall be fenced, hung up or otherwise protected. On every part likely to be visited by persons or where transport vehicles ply, the area shall be suitably fenced, guarded or barricaded to prevent fall of persons, vehicles or livestock into the excavated area;
d	Warning signs shall be erected and the in the night hours the area shall be illuminated to warn pedestrians and vehicular traffic;
e	Arrangements shall be made to prevent external vibrations due to rail/road traffic;
f	Blasting shall be carried out in accordance with the norms applicable in this regard. Special care shall be taken to control the impact of vibrations/tremor caused by blasting to protect excavations from cave-ins;
g	Arrangements shall be made to save other buildings/structures in the affected zone or in the vicinity of the area of excavation, from collapse;
<b>11.2</b>	<b>SHORING AND TIMBERING</b>
a	Site of excavations, where workers are exposed to danger from moving ground, shall be made safe by maintaining due slope not exceeding the angle of repose of different types of soil or otherwise by shoring, portable shields or other effective means;
b	All trenches in the soil, other than rock or hard compact soil more than 1.5 m deep into which men enter, shall be securely shored and timbered under the supervision of a competent person and only the trained workers shall be allowed to substantially alter or dismantle the shoring or timbering;
c	All struts, braces and walls in excavation shall be adequately secured so as to prevent their accidental displacement;
d	In all excavations in soft or fissured rock or hard soil exceeding 2 m in depth, except those which are sloped to within 1.5 m of the bottom into which men enter, shall be securely shored and timbered;
e	Where the sides of the excavations are sloped as outlined above, but not within the 1.5 m of the bottom, vertical sides shall be shored and the shoring shall extend at least 30 cm above the vertical sides. When open spaced sheathing is used, a toe-board shall be provided to prevent material rolling down the slope and falling into the excavated.
<b>11.3</b>	<b>SHEATHING</b>
a	The sheathing should be placed against the side of the trench so that length of each piece of sheathing is vertical. It should be held securely in place against the wales by ensuring that sheathing is kept firmly pressed against the wall of the trench. Where the trench excavated is loose, sandy or soft soil or soil which has been previously excavated or soil which is under



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	hydrostatic pressure, each piece of sheathing shall be driven into the bottom of the trench so as to firmly hold it in place;
b	Where two or more pieces of sheathing are used one above another, the sheathing shall be so arranged that the lower pieces of sheathing shall overlap the lowest wales supporting the piece of sheathing next above it. These pieces of sheathing shall be firmly driven into the soil and securely supported by wales and struts, as the trench is made deeper.
<b>11.4</b>	<b>WALES</b>
a	The wales shall be parallel to the bottom or the proposed bottom of the trench. Each wale shall be supported on cleats spiked to the sheathing or by posts set on the wales next below it and in the case of the lowest wale on the bottom of the trench itself. Where necessary, wedges may be provided between a wall and the sheathing it supports so that roughly uniformity is given to all individual pieces of sheathing.
<b>11.5</b>	<b>STRUTS</b>
a	Struts shall be horizontal and at right angles to the wales or sheathing supported thereby. Struts shall be cut to the proper length required to fit in tightly between the wales. Where necessary, the struts shall be held securely in place by wedges, driven between the struts and the wales;
b	Struts shall be placed on cleats spiked or bolted to the posts supporting the Wales.
<b>11.6</b>	<b>LOOSE SITE MATERIALS:</b>
	No loose material shall be kept very close to the excavation creating possibility of its fall into the excavated area. A safe distance of at least 1 m shall be maintained.
<b>11.7</b>	<b>PLANT &amp; MACHINERY:</b>
	Movement of vehicles and heavy equipment shall be kept at a distance least equal to the depth of the excavation or at least 6 m for excavation deeper than 6 m and the workers shall be provided with proper tools.
<b>11.8</b>	<b>MEANS OF ACCESS</b>
a	For trenches deeper than 1.5 m, safe means of access and egress shall be provided at intervals of every 15 m. Where it is not possible to provide safe means of access and egress as above, ladders shall extend from the bottom of the trench to at least 90 cm above the ground;
b	Walkways, runways and sidewalks shall be kept clear of excavated materials or other obstructions and no side walls shall be undermined-undercut unless it is capable of carrying a minimum live load of 125 lbs. per square feet;
c	If planks are used for raising walkways, runways or sidewalks, they should be parallel to the length of the walk and fastened together against displacement;
d	Lone worker shall not be allowed to work in the excavated area.
<b>11.9</b>	<b>INSPECTIONS:</b>
	A competent person shall make inspections every day and necessary measures shall be taken to safeguard against possible cave-ins or slide or collapse of the excavations.
<b>11.10</b>	<b>NOTIFICATION OF INTENTION TO CARRY OUT EXCAVATION AND TUNNELING WORK</b>



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a	Within thirty days, prior to the commencement of such excavation or tunneling work, the contractor shall inform in writing the detailed layout plans, method of construction and schedule of such excavation or tunneling work to the Engineer in-charge of 2X660 MW SUPER CRITICAL TPP, HTPS, KORBA WEST OF CSPGCL;
b	In case compressed air is used in such excavation or tunneling work or any work incidental to or required for such excavation or tunneling work, the technical details and drawings of all man-locks and medical-locks together with names and addresses of all construction medical officers duly qualified and so appointed by such contractor for the purpose of such excavation or tunneling work shall be sent to the Engineer in-charge.
<b>11.11</b>	<b>PROJECT ENGINEER</b>
a	The contractor undertaking any excavation or tunneling work shall appoint a Project Engineer for safe operation of such projects;
b	Such Project Engineer shall exercise overall control of the operations and the activities at such project and be responsible for carrying out the activities safely.
<b>11.12</b>	<b>RESPONSIBLE PERSON</b>
a	The contractor undertaking excavation or tunneling work at construction site of a building or other construction work shall appoint a responsible person for safe operation of such excavation or tunneling work;
b	The name and addresses of such responsible persons shall be forwarded to the Engineer in-charge;
c	Duties and responsibilities of the responsible person referred to above person shall include
c-i	To carry out smoothly such excavation or tunneling work;
c-ii	To inspect and rectify any hazardous situation relating to such excavation or tunneling work;
c-iii	To take remedial measures to avoid any unsafe practice or conditions relating to such excavation or tunneling work.
<b>11.13</b>	<b>WARNING SIGNS AND NOTICES</b>
a	Suitable warning signs or notices, required for the safety of building workers carrying out the work of an excavation or tunneling, shall be displayed or erected at conspicuous places in Hindi and in language understood by the majority of such building workers at such excavation or tunneling work;
b	Such warning signs and notices with regard to compressed air working shall include:
b-i	The danger involved in such compressed air work;
b-ii	Fire and explosion hazards;
b-iii	The emergency procedures for rescue from such danger or hazards.
<b>11.14</b>	<b>REGISTER OF EMPLOYMENT</b>
a	The contractor shall ensure that at a construction site of a building or other construction work where an excavation or tunneling work is being carried on, a register of employment of building workers carrying out such excavation or tunneling work is maintained and produced on demand;
b	Periods of work of such excavation or tunneling work shall be maintained in a register on day-to-day basis and such register shall be produced on demand





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<b>11.15</b>	<b>ILLUMINATION</b>
a	All contractors carrying out excavation or tunneling work at a construction site of a building or other construction work shall provide for emergency generators on such construction site to ensure adequate illumination at all work places where such excavation or tunneling work is being carried out;
b	In case of power failure, all workplaces where excavation or tunneling works are carried out shall be adequately illuminated
<b>11.16</b>	<b>PNEUMATIC TOOLS:</b>
	Supply lines to pneumatic tools used within a tunnel are fitted with water trap or safety chain or safety wire, as the case may be.
<b>11.17</b>	<b>STABILITY OF STRUCTURE DURING GENERAL EXCAVATION &amp; TUNNELING:</b>
	The contractor shall ensure that where there is any doubt as to the stability of any structure adjoining the workplace or other areas to be excavated or where tunneling work is to be carried out
a	The Project Engineer shall arrange for measures like underpinning, sheet piling, shoring, bracing or other similar means to support such structure and to prevent injury to any building worker working adjacent to such structure or damage to property or equipment adjacent to such structure;
b	Where any building worker engaged in excavation is exposed to hazard of falling or sliding material or article from any bank or side of such excavation which is more than 1.5 m above his footing, such worker shall be protected by adequate piling and bracing against such bank or side;
c	The excavation and its vicinity shall be checked by a responsible person after every rain, storm or other occurrences carrying hazards and in case a hazard is noticed at such checking, adequate protection against slides and cave-in to prevent such hazard shall be provided;
d	Temporary sheet piling installed for the construction of a retaining wall after excavation shall not be removed, except on the advice of the responsible person after an inspection carried out by such responsible person;
e	Where banks of an excavation are undercut, adequate shoring shall be provided to support the material or article overhanging such bank;
f	Excavated material shall not be stored at least 0.5 m from the edge of an open excavation or trench and the banks of such excavation or trench shall be stripped of loose rocks and other materials which may slide, roll or fall upon a building worker working below such bank;
g	Adequate and suitable warning signs shall be put-up at conspicuous places at the excavation work to avoid any person falling into the excavations or trenches;
h	The responsible person shall ensure at the excavation that no building worker is permitted to work where such building worker may be struck or endangered by the excavation machinery or material or article used in such excavation.
<b>11.18</b>	<b>SAFE ACCESS AND EGRESS:</b>
	Ladders, staircases or ramps are provided, as the case may be, for safe access to and egress from excavation where the depth of such excavation exceeds one point 1.5 m and such ladders, staircases or ramps comply with the relevant national standards.
<b>11.19</b>	<b>TRENCHES</b>
a	A trench or excavation shall be protected against falling of a person by suitable measures if the depth of such trench or excavation exceeds 1.5 m and such protection shall be an



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	improved protection in accordance with the design and drawing of a Professional Engineer, where such depth exceeds 4 m;
b	Where the depth of a trench requires two lengths of sheet piling, one above the other, the lower piling shall be set inside the bottom strings or wales of the upper piling and such sheet piling shall be driven down and braced as the excavation continues;
c	All metal sheet piles used in excavation or a trench shall be welded end-to-end and secured by other similar means.
<b>11.20</b>	<b>POSITIONING AND USE OF MACHINERY:</b>
	Any machinery used in excavation and tunneling work shall be positioned and operated in such a way that such machinery will not endanger the operator of such machinery or any other person in the vicinity.
<b>11.21</b>	<b>BREATHING APPARATUS:</b>
	Suitable breathing apparatus shall be provided to a building worker while working in compressed air environment for his use at excavation or tunneling work and such breathing apparatus shall be maintained in good working condition at all times.
<b>11.22</b>	<b>SAFETY MEASURES FOR TUNNELING OPERATIONS</b>
a	Where there is a danger of falling or sliding of material from the roof face or wall of a tunnel, adequate measures such as shoring, supporting by means of rock bolts, segments or steel sets shall be taken for the safety of building workers;
b	The excavated areas shall be made safe by use of suitably designed and installed steel sets, rock bolts or similar other safe means;
c	The responsible person shall examine and inspect the workplaces in a tunnel before the commencement of work in such tunnel and at regular intervals thereafter to ensure safety of the building workers in such tunnel;
d	The portal areas of a tunnel with loose soil or rock, likely to cause injury to a person shall be adequately protected with supports.
<b>11.23</b>	<b>SURROUNDINGS OF A SHAFT</b>
a	Surroundings of a shaft used in excavation or tunnel work shall be protected from being washed away by construction of sufficient height;
b	Where a building worker is required to enter a shaft at an excavation or tunneling work, safe means of access shall be provided for such entry;
c	Every shaft at excavation or tunneling work shall be provided with a steel casing, concrete piping, timber shoring or other materials of adequate strength for the safety of building workers working in such shaft;
d	Such casing and bracing shall be provided to shafts at an excavation or tunneling work according to the appropriate design for such casing and bracing;
e	A reinforced concrete raft and beam shall be provided around the opening of a shaft at an excavation or tunneling work if the ground surrounding such opening is unstable or unsafe.
<b>11.24</b>	<b>LIFT FOR SHAFT:</b>
	Lift shall be provided for transport of building workers and materials or articles at an excavation or tunneling work required to descend more than 50 m in a shaft.



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<b>11.25</b>	<b>MEANS OF COMMUNICATION</b>
a	Reliable and effective means of communication such as telephone or walkie-talkie shall be provided and maintained in working order for arranging better and effective communication at an excavation or tunneling work at the following locations, namely:
a-i	Working chamber of an excavation;
a-ii	Intervals of hundred meters along the tunnel;
a-iii	Working chamber side of a man lock near the door of such man lock;
a-iv	Interior or each chamber of a man lock;
a-v	Location conspicuous lock attendant's situation;
a-vi	A compressor plant;
a-vii	A Medical Centre;
a-viii	Outside the portal or the top of a shaft;
a-ix	Such number of bells and whistles shall be made available at all times at the locations as are necessary for the safety of persons at such locations.
<b>11.26</b>	<b>SIGNALS:</b>
	The standard audio or video signals shall be used in excavation or tunneling work and conspicuously located or displayed near entrance to the workplace and in such other locations as may be necessary to bring such signals to notice of all building workers employed in such excavation or tunneling work.
<b>11.27</b>	<b>CLEARANCES</b>
a	The minimum lateral clearances of 0.5 m shall be maintained between any part of a vehicle and any fixture or any equipment used in an excavation or tunneling work after allowing the throw or swing of such fixture or equipment;
b	The overhead clearance for a locomotive drive at excavation or tunneling work shall not be less than 1.20 m above the seat of such driver and not less than 2 m above the platform where such driver stands or of any other dimension in accordance with the approved standard.
<b>11.28</b>	<b>SHELTERS:</b>
	The adequate number of shelters for the safeguard of the building workers are provided where, in the course of working, they are liable to be struck by a moving vehicle or other material handling equipment in a tunnel.
<b>11.29</b>	<b>USE OF INTERNAL COMBUSTION ENGINE:</b>
	No internal combustion engine shall be used underground in excavation or tunneling work unless such engine is so constructed that the air entering the engine gets cleared before entry and the engine emits no fumes or sparks.
<b>11.30</b>	<b>INFLAMMABLE OILS:</b>
	Inflammable oils with the flash point below the working temperature that is likely to be encountered in a tunnel shall not be used in excavation or tunneling work.
<b>11.31</b>	<b>COUPLING AND HOSES:</b>



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	All high-pressure Hydraulic hoses and couplings shall be adequately protected against any possible damage in excavation or tunneling work.
<b>11.32</b>	<b>HOSE INSTALLATION:</b>
	All Hydraulic lines and plants working at a temperature exceeding 750 c shall be protected by adequate insulation or otherwise against accidental human contact in excavation or tunneling work.
<b>11.33</b>	<b>FIRE RESISTANT HOSES:</b>
	No fire Hydraulic hoses other than fire resistant Hydraulic hoses are used when Hydraulically activated machinery and equipment are employed in tunnels.
<b>11.34</b>	<b>FLAMEPROOF EQUIPMENT:</b>
	Only flameproof equipment of appropriate type as per approved standards shall be used where there is a danger of flammable or explosive atmosphere being prevalent inside the tunnel.
<b>11.35</b>	<b>STORING OF OIL AND FUEL UNDERGROUND:</b>
	All oils, greases or fuels stored underground in excavation or tunneling work shall be kept in tightly sealed containers and in fire resistant areas at safe distances away from explosive and other flammable chemical and appropriate flameproof installation shall be used in such storage areas.
<b>11.36</b>	<b>USE OF GASES UNDERGROUND</b>
a	Petrol or liquefied petroleum gas or any other flammable substances shall not be used or stored inside the tunnel except with the prior approval of the Project Engineer;
b	After the use of the petroleum or liquefied petroleum gas, or highly inflammable substances, all remaining petroleum or liquefied petroleum gas or highly inflammable substances shall be removed immediately from such tunnel;
c	No oxy-acetylene gas shall be used in a compressed air environment in excavation or tunneling work.
<b>11.37</b>	<b>WATER FOR FIRE FIGHTING</b>
a	Adequate number of water outlets shall be provided on excavation or tunneling work and readily made accessible throughout the tunnel for firefighting purposes and such water outlets shall be maintained for effective fire lighting;
b	All air locks shall be equipped with firefighting facilities at excavation or tunneling work;
c	An audible fire alarm shall be provided to warn the building workers whenever a fire breaks out on an excavation or tunneling work;
d	Adequate number and types of fire extinguishers, in accordance with relevant national standards, shall be provided and made readily available to fight any outbreak of fire at an excavation or tunneling work;
e	Fire extinguishers with vaporizing liquids and high pressure carbon dioxide shall not be used in tunnels or other confined spaces;
f	The instructions regarding steps to be followed to fight outbreak of fire, at an excavation or tunneling work, written in Hindi or local language understood by the majority of the building workers employed on such excavation or tunneling work, shall be displayed at conspicuous and vulnerable places of such excavation or tunneling work.



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<b>11.38</b>	<b>FLOODING</b>
a	Water tight bulkhead doors shall be installed at the entrance of a tunnel to prevent flooding during a tunneling work where more than one tunnel is driven from a shaft;
b	All necessary measures shall be taken to ensure that no building worker is trapped in any isolated section of a tunnel when any bulkhead door of such tunnel is closed;
c	Where there is likelihood of flooding or water rushing into a tunnel during a tunneling work, arrangements shall be made for immediate starting of water pumps to take out water of such flooding or water rushing and for giving alert signals to the building workers and other persons to keep them away from danger.
d	Airtight steel curtains shall be provided in areas liable to flooding at tunneling work and in case of descending tunnels, such curtains shall be provided in the top half of such tunnels to ensure the retention of pockets of air for rescue purpose.
<b>11.39</b>	<b>REST SHELTERS</b>
a	Where building workers employed in a compressed air environment in a tunneling work are required to remain at the work site for one hour or more after de-compression from pressure exceeding one bar, adequate and suitable facilities shall be provided for such building workers to rest;
b	Every man-lock, medical-lock and any other facility inside these locks in a tunneling work shall be maintained in a clean state and in good repairs;
c	A first aid room shall be provided and readily available at a construction site for a tunneling work;
d	Each man-lock attendant at the station shall be provided with a first aid box.
<b>11.40</b>	<b>PERMISSIBLE LIMIT OF EXPOSURE OF CHEMICALS</b>
a	The working environment in a tunnel or a shaft in which building workers are employed shall not contain any of the hazardous substances in concentrations beyond the permissible limits;
b	The responsible person referred to shall conduct necessary test before the commencement of a tunneling work for the day and at suitable intervals as fixed by the Engineer in-charge, to ensure that the permissible limits of exposure are not exceeded and a record of such test shall be maintained and made available for inspection.
<b>11.41</b>	<b>VENTILATION:</b>
	All working areas in a free air tunnel shall be provided with the approved ventilation system and the fresh air supplied in such tunnel shall not be less than 6 m <sup>3</sup> per minute for each building worker employed underground in such tunnel and the free air-flow movement inside such tunnel not less than 9 m <sup>3</sup> per minute.
<b>11.42</b>	<b>AIR SUPPLY INTAKE POINT:</b>
	The air intake points for all air compression shall be located at places where such intake air does not get contaminated with dust, fumes, vapor and exhaust gases or other contaminants.
<b>11.43</b>	<b>EMERGENCY GENERATORS</b>
	Every compressed air system in a tunnel shall be provided with emergency power supply system for maintaining continued supply of compressed air in such compressed air system, which shall be capable of operating air compressor and ancillary systems of such compressed air system;



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	The emergency power supply system shall be maintained and made readily available at all times.
<b>11.44</b>	<b>AIR MAINS:</b>
	Every air-main supplying air to the working chamber, man-lock or medical-lock used at an excavation or tunneling work shall be protected against accidental damage and where it is not practicable to provide such protection, a stand-by air-main shall be provided.
<b>11.45</b>	<b>BULKHEAD AND AIR LOCKS</b>
a	A bulk head or air tight diaphragms retaining compressed air, when used within a tunnel or a shaft, shall be constructed to withstand the maximum pressure at 1.25 the maximum working pressure of such bulk head or diaphragm and such bulk head or diaphragm shall be tested before its each use by a responsible person to ensure that such bulk head or diaphragm is in proper working order;
b	Such responsible person shall keep the record of each test and such record shall be produced for inspection.
c	The bulk head or diaphragm shall be made of sound material of adequate strength, which shall be able to withstand the maximum pressure on which they are subjected to at any time of their use;
d	A bulkhead anchorage and air lick shall be tested at its work place at an excavation or tunneling work immediately after their installation at such place.
<b>11.46</b>	<b>DIAPHRAGM:</b>
	All diaphragms, which are in the form of horizontal decks across a shaft used at excavation or tunneling work, shall be securely anchored
<b>11.47</b>	<b>PORTABLE ELECTRICAL HAND TOOLS:</b>
	All portable electrical hand tools and inspection lamps used underground or in a confined space shall be operated at a voltage not exceeding 24 V.
<b>11.48</b>	<b>CIRCUIT BREAKER</b>
a	Adequate numbers of differential ground fault circuit breakers shall be installed for every electrical distribution system and its sub-systems used at an excavation or tunneling;
b	Work and the sensitivity of each of circuit breaker shall be adjusted in accordance with the requirement set out in accordance with the approved standards;
c	No semi-enclosed fuse unit shall be used in underground place.
<b>11.49</b>	<b>TRANSFORMER:</b>
	The contractor shall ensure no transformer is used in any section of a tunnel under compressed air unless such transformer is of the dry type and conforms to the approved standards.
<b>11.50</b>	<b>LIVE WIRES:</b>
	There shall be no exposed live wire in working areas at an excavation or tunneling work which are accessible to building workers other than those authorized to work on such live lines.
<b>11.51</b>	<b>WELDING SETS:</b>
	All welding sets used in a tunnel shall be of adequate capacity and of suitable type, duly approved.





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<b>11.52</b>	<b>QUALITY AND QUANTITY</b>
a	Every working chamber at an excavation or tunneling work where compressed air is used, the supply of such air shall be maintained at not less than 0.3 m <sup>3</sup> per minute per person working therein;
b	A reserve supply of compressed air shall be made available at all times for man-locks and medical locks used at a tunneling work;
c	The air supplied in a compressed air environment at a tunneling work shall be, as far as practicable, free from contaminants, namely, dust, fumes and other toxic substances.
<b>11.53</b>	<b>WORKING TEMPERATURE:</b>
	The temperature in any working chamber at an excavation or tunneling work where building workers are employed shall not exceed 290 c and the arrangement shall be maintained for keeping records in which the temperatures measured by dry bulb and wet bulb inside such working chamber once in every hour and for producing such records for inspection on demand.
<b>11.54</b>	<b>MAN-LOCKS AND WORKING IN COMPRESSED AIR ENVIRONMENT</b>
a	Man-locks used at a tunneling work shall be of adequate strength, made of sound material and designed to withstand any pressure, internal or external, to which it may be subjected in the normal use or in an emergency;
b	Doors of man-locks at an excavation or tunneling work shall be made of steel and used at a tunneling work for keeping the work airtight and devices shall be provided for sealing the doors when such locks are under pressure. The anchorage of a man-lock used at tunneling work shall have adequate strength to withstand the pressure exerted by air on the man-lock. There shall be adequate room available for the workers for working in the man-locks;
c	Where work is carried out in any compressed air tunnel, a Man-lock in accordance with the approved standards shall be used;
d	Where a man-lock is used, safety Instructions in Hindi and in local language understood by majority of building workers employed there, shall be displayed at conspicuous places;
e	Except in an emergency, compression and de-compression operations shall be carried out in a man-lock and in an emergency any material-lock may be used;
f	A record of compression and de-compression shall be kept in writing and produced for inspection on demand;
g	Material lock shall be used with the permission of the Engineer in-charge where it is impracticable to install both the man-lock and the material-lock at;
h	The man-lock at tunneling work shall not be used for any purpose
i	other than compression or de-compression of building workers;
j	No de-canting of building workers at tunneling work shall be carried
k	out without prior approval of the Engineer in-charge except in an emergency;
l	In case a building worker collapses or is taken ill during his de-compression in a man-lock, the lock attendant of such man-lock shall raise the pressure to a level equal to the maximum pressure which that building worker was exposed to in the working chamber prior to such de-compression and such lock attendant shall immediately report the matter relating to such collapse to the medical lock attendant and medical officer on duty;



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m	A building worker who had previously received training with a trained building worker to work in a compressed air environment at tunneling work shall be employed to work independently in such a compressed air environment;
n	A building worker who had undergone three de-compressions from a pressure exceeding one bar in a period of eight hours at tunneling work shall not be allowed to enter a compressed air environment except for the purpose of carrying out rescue work;
o	A building worker employed in a compressed air environment for a period of eight hours in a day at tunneling work shall not be employed again in such environment unless he has spent not less than twelve consecutive hours of rest at atmospheric pressure;
p	No building worker shall be engaged in a compressed air environment at a pressure, which exceeds three bars at a tunneling work unless prior permission, in writing, has been obtained from the Engineer in-charge;
q	No building worker shall be employed in a compressed air environment for more than fourteen consecutive days in a month;
r	A register of employment of all building workers in compressed air environment shall be maintained;
s	An identification badge shall be supplied to a building worker employed in compressed air environment;
t	The badge of a building worker shall contain particulars of his name, location of the medical-lock allotted to him for work, the telephone number of the Construction Medical Officer concerned for his treatment and the instructions in case of his illness of unknown and doubtful causes;
u	Record of all identification badges supplied to building shall be kept in a register;
v	Every building worker whose name appears in the register shall wear the badge supplied to him at all times during his duty hours;
w	Suitable warning signs shall be displayed in the compressed air for the prohibition of the following, namely:
w-i	Use of alcoholic drinks;
w-ii	Use and carrying of lighters, matches or other sources of ignition;
w-iii	Smoking; and
w-iv	No entry to person who has consumed alcoholic drink
<b>11.55</b>	<b>SAFETY INSTRUCTION:</b>
	All building workers employed in compressed air environment at tunneling work shall follow the instructions issued for their safety in the course of such employment.
<b>11.56</b>	<b>MEDICAL-LOCK</b>
a	A suitably constructed medical lock shall be maintained at tunneling work where building workers are employed in a working chamber at a pressure exceeding one bar;
b	Where more than one hundred building workers are employed in a compressed air working environment exceeding one bar at tunneling work, one medical-lock is provided for every one hundred building workers or part thereof and such medical lock shall be situated as near as possible to the main-lock used at such tunneling work.



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<b>12</b>	<b>SAFETY IN PILING WORK</b>
<b>12.1</b>	<b>GENERAL PROVISIONS</b>
a	All pile driving equipment shall be of good design and sound construction, taking into account the ergonomic principles and properly maintained;
b	A pile driver shall be firmly supported on a heavy timber sill, concrete bed or other secured foundation;
c	In case a pile driver is required to be erected in dangerous proximity to an electrical conductor, all necessary precautions shall be taken to ensure safety;
d	The hoses of steam and air hammer shall be securely lashed to such hammer so as to prevent them from whipping in case of connection or break;
e	Adequate precaution shall be taken to prevent the pile driver from over turning and hammer from missing the pile;
f	A responsible person for inspecting pile-driving equipment shall inspect such equipment before taking it into use and takes all appropriate measures as required for the safety of building workers before commencing piling work by such equipment;
g	Where there is any question of stability of a structure for its adjoining areas to be piled, such structure shall be supported, where necessary, by underpinning, sheet piling, shoring, and bracing or by other means to ensure safety and stability of such structure and to prevent injury to any person.
<b>12.2</b>	<b>PROTECTION OF OPERATOR:</b>
	The operator of every pile driving equipment shall be protected from falling objects, steam, cinders or water by substantially covering or otherwise or by other means.
<b>12.3</b>	<b>INSTRUCTION TO AND SUPERVISION OF BUILDING WORKERS WORKING ON PILE-DRIVING EQUIPMENT:</b>
	Every building worker working on a pile driving equipment shall be given instructions regarding safe work procedure to be followed in piling operation and shall be supervised by a responsible person throughout such work.
<b>12.4</b>	<b>ENTRY OF UNAUTHORIZED PERSON:</b>
	The contractor shall ensure at a construction site of a buildings or other construction work that all piling areas where pile-driving equipment is in use are effectively cordoned off to prevent entry of unauthorized persons.
<b>12.5</b>	<b>INSPECTION AND MAINTENANCE OF PILE DRIVING EQUIPMENT</b>
a	Pile-driving equipment shall not be taken into use until it has been inspected by a responsible person and found to be safe for such use;
b	A responsible person for such inspection at suitable intervals to ensure safety to the building worker working on such equipment shall inspect pile driving equipment in use;
c	All pile lines and pulley blocks shall be inspected by a responsible person before the beginning of each shift of piling operations.
<b>12.6</b>	<b>OPERATION OF PILE-DRIVING EQUIPMENT</b>
a	Only experienced and trained building worker shall operate pile driving so as to avoid any probable danger from such operation;



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b	Pile-driving operations shall be governed generally prevalent and accepted signals so as to prevent any probable danger from such operations;
c	Every building worker employed in pile driving operation or in the vicinity of such pile driving operation shall wear ear protection and safety helmet or hardhat and safety shoes;
d	Piles shall be prepared at a distance, at least equal to twice the length of the longest pile, from the place of pile-driving operations;
e	When a pile driver is not in use, the hammer of such pile driver shall be blocked at the bottom of the heads of such pile driver.
<b>12.7</b>	<b>WORKING PLATFORM ON PILING FRAMES:</b>
	Where a structural tower supports the lead of a pile driver, leads at which it is necessary for the building workers to work and such platforms except on the hammer of such pile driver or lead sides of such platform and where such platforms cannot be provided with such railing and toe boards, a safety belt shall be provided to each such building worker.
<b>12.8</b>	<b>PILE TESTING</b>
a	The testing of pile shall be conducted under the supervision of a responsible person for such testing;
b	All practicable measures like displaying of warning notices, barricading the area and other similar measures shall be taken to protect the area where the pile testing is carried out;
c	Entry to a pile testing area shall be prohibited to general public to ensure safety.
<b>12.9</b>	<b>PILING, SHORING AND BRACING</b>
a	Planks used for sheet piling in excavation or tunneling work shall be of sound material with adequate strength;
b	Shores and braces used in excavation or tunneling work shall be of adequate dimensions and so placed as to be effective for their intended purposes;
c	Earth supported shores or braces used in excavation or tunneling work shall bear against a footing of sufficient area and stability to prevent the shifting of such shores or braces.



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<b>13</b>	<b>SAFETY IN THE ERECTION, USE AND DISMANTLING OF SCAFFOLDS</b>
<b>13.1</b>	<b>SCAFFOLD CONSTRUCTION</b>
a	Every scaffold and every component thereof shall be of adequate construction, made of sound material and free from defects and safe for the purposes for which it is intended for use;
b	In case bamboo is used for scaffolding, such bamboo shall be of suitable quality, good condition, free from protruding knots and stripped off to avoid any injury to building workers during handling such bamboo;
c	All metal scaffolds used in building or other construction work shall conform to the approved standards;
<b>13.2</b>	<b>SUPERVISION BY A RESPONSIBLE PERSON:</b> No scaffold shall be erected, added, altered or dismantled except under the supervision of a responsible person.
<b>13.3</b>	<b>Maintenance</b>
a	The scaffold used in building or other construction work shall be maintained in good repairs and the measures taken against its accidental displacement or any other hazard;
b	No scaffold or part thereof shall be partly dismantled and allowed to remain in such a condition unless —
b-i	The stability or safety of the remaining portion of such scaffold has been ensured by a responsible person for the safety of such scaffolds;
b-ii	In case the remaining part of such scaffold cannot be used by the building workers, necessary warning notice written in Hindi and in a language understood by the majority of the building workers that such scaffold is unfit for use, shall be displayed at the place where such scaffold is erected.
<b>13.4</b>	<b>STANDARDS, LEDGERS, PUTLOGS</b>
a	Standards of a scaffold shall be plumb, where practicable, fixed sufficiently close together to secure the stability of such scaffold having regard to all the possible working situations and conditions for the intended use of such scaffold, spaced, as close as practicable, to ensure safety and stability of such scaffold;
b	Adequate measures are taken to, prevent displacement of a standard of a scaffold either by providing sole plate or a base plate, as necessary;
c	Ledgers of metal scaffold are placed at vertical intervals with due regard to safety and stability of such scaffold;
d	Bamboo ledgers are kept as nearly as possible and are placed and fastened to the standards of a scaffold with due regard to the stability of such scaffold.
<b>13.5</b>	<b>WORKING PLATFORM</b>
a	Working platform shall be provided around the face or edge of a building adjoining at every upper most permanent floor of such building under construction and at any level where construction work of such building is carried out;
b	A platform shall be designed to suit the number of building workers to be employed on each bay of a scaffold work on such platform and the materials or articles and tools to be carried with them in such bay;



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c	The safe working load and the number of building workers to be employed in each bay of a scaffold shall be displayed for the information of all the building workers employed at such construction site.
<b>13.6</b>	<b>BOARD, PLANK AND DECKING</b>
a	Board, plank and decking used in the construction of a working platform shall be of uniform size and strength and shall be capable of supporting the load and number of building workers keeping in view the safety of such building workers;
b	Metal decking, which forms part of a working platform, shall be provided with non-skid surface;
c	No board or plank which forms the working platform shall be projected beyond its end support unless it is effectively prevented from tripping or lifting and board, plank or decking shall be fastened and secured;
d	At any one time, not more than two working platforms per bay, shall be used to support building workers or materials or articles at such bay;
e	Adequate measures shall be taken to prevent injury which may be caused by falling material and objects by using safety nets or other suitable means;
f	Concrete, other debris or materials shall not be allowed to accumulate at any platform on a scaffold;
g	Where a work is to be done at the end of a wall, working platform at such workplace shall be faced or, wherever practicable, at least 0.6 m beyond the end of such wall.
<b>13.7</b>	<b>REPAIR OF DAMAGED SCAFFOLD</b>
a	No building worker shall be permitted to work on a scaffold that has been damaged or weakened unless adequate safety measures have been taken to ensure the safety of such building worker;
b	Necessary warning signs shall be displayed at such places where repairs of scaffold are undertaken.
<b>13.8</b>	<b>OPENING</b>
a	There shall be no opening in any working platform except for allowing access to such working platform;
b	Wherever opening on a platform is unavoidable, necessary measures for protection against falling of objects or building workers from such platform shall be taken by providing suitable safety nets, belts or any other similar means;
c	Access from one working platform to another platform on a scaffold, if required, shall be provided with suitable and safe ladder for the use of building workers working on such platforms;
d	Every opening or shaft in the floor shall be provided with suitable means to protect the fall of a person or material by providing suitable fencing or railing of height not less than 900 mm.
<b>13.9</b>	<b>GUARDRAILS:</b> Every side of a working platform from which a person is liable to fall shall be provided with suitable and safe guardrails and toe board of adequate strength to prevent fall of any building worker, material or tools from such platform.
<b>13.10</b>	<b>SCAFFOLD USED BY BUILDING WORKERS OF DIFFERENT EMPLOYERS</b>
a	Where a scaffold or a part of a scaffold is used, which has previously been used by another employer for his building workers, such scaffold or part thereof shall be used only after its inspection and examination by a responsible person for ensuring that such scaffold or part thereof is safe and fit for such use;





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b	If any rectification, alteration or modification in a scaffold or part thereof, needed to suit its use, shall be made in consultation with the responsible person.
<b>13.11</b>	<b>PROTECTION AGAINST ELECTRIC POWER LINE:</b>
	The contractor shall ensure that all necessary and practical measures for protection are taken to prevent any building worker, working on a scaffold, from coming into contact with the electric wires or dangerous equipment.
<b>13.12</b>	<b>SCREENING NET AND WIRE NETS:</b>
	Where a scaffold is erected in an area where the construction activities may pose hazards to pedestrians or vehicular traffic nearby from the falling of objects, wire nets or screening nets shall be used to envelope such scaffold.
<b>13.13</b>	<b>TOWER SCAFFOLD</b>
a	The height of every tower scaffold used in building or other construction work shall not be more than eight times the lesser to the base dimension of such scaffold;
b	A tower scaffold shall be lashed to a building or a fixed structure before being used by the building workers;
c	Any tower scaffold which can be moved or catered shall be –
c-i	Constructed with due regard to the stability and, if necessary, adequately weighted at the base;
c-ii	Used only on plain and even surface; and
c-iii	Has casters provided with positive locking devices to hold such scaffold in position;
d	No building worker shall remain on board scaffold or leave behind tools and material when it is being shifted from one position to another position.
<b>13.14</b>	<b>GEAR FOR SUSPENSION OF SCAFFOLD</b>
a	Chains, ropes or lifting gears used for suspension of a scaffold shall be of adequate strength, made of sound material and suitable for the purpose of their use and maintained in good repairs;
b	Chains, wires, ropes or metal tubes used for the suspension of a scaffold shall be:
b-i	Properly and securely fastened to every anchorage point and to the scaffold ledgers of other main supporting members used for the support of such scaffold; and
b-ii	So positioned as to ensure stability of the scaffold.
<b>13.15</b>	<b>TRESTLE SCAFFOLD AND CANTILEVER SCAFFOLD</b>
a	No trestle scaffold shall be constructed with more than three tiers or if its working platform is more than 4.5 m above the ground or floor or other surface upon which such scaffold is erected;
b	Trestle scaffold shall be designed by professional engineer and shall have the approval of the Engineer in-charge before being taken into use.
c	No trestle scaffold shall be erected on a suspended scaffold;
d	No cantilever or jib scaffold shall be used unless it is adequately supported, fixed and anchored on opposite side of its support and have out triggers of adequate length and, where necessary sufficiently, supported and braced to ensure safety and stability of such scaffold;
e	No working platform resting on bearers let into a wall at one end and without other support shall be used unless such bearers are of adequate strength, braced through the wall and securely fastened on the other side.



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<b>13.16</b>	<b>SCAFFOLD SUPPORTED BY BUILDING</b>
a	No part of a building shall be used as support or part of a scaffold unless such part of the building is made of sufficient strength and made of sound material to afford safe support;
b	Overhanging eaves gutters shall not be used for supporting scaffold;
c	Suspended scaffold shall be made of in accordance with the approved standards before being used by the building workers.
<b>13.17</b>	<b>USE OF WINCHES AND CLIMBERS FOR SUSPENDED SCAFFOLD</b>
a	No scaffold shall be raised or lowered by winches or climbers unless such scaffold is made of sound material, adequate strength and has been tested and certified safe for use of winches or climber by a competent person before being taken into use;
b	All suspended scaffolds counter-balanced by counter weights shall be of approved types before being taken into use for building or other construction work;
c	The working platform of a suspended scaffold shall be securely fastened to the building or structure as to be safe and to prevent such platform from swing;
d	The safe working load that a suspended scaffold can carry, shall be displayed where such scaffold is being used
<b>13.18</b>	<b>SAFETY DEVICES FOR SUSPENDED SCAFFOLD</b>
a	Every suspended scaffold, raised or lowered by the winches or climbers, shall be provided at each of its suspension point with a safety rope with automatic safety device mounted on each of such rope so that such safety rope with such automatic safety device support the platform of such
b	scaffold in the event of failure of the primary suspension wire ropes, winches, climbers or any part of the mechanism used for raising or lowering such suspended scaffold;
b-i	Provided that the sl.no. (a) shall not apply -
	Where the platform of such scaffold is supported at two independent suspension wire rope at or near each end of such platform so that in the event of failure of one of such suspension wire rope, the other wire rope is capable of sustaining the weights of such platform and its load and prevent it from tilting; or
b-ii	Where a system is incorporated which operates automatically to support the platform of such scaffold and its load in the event of failure of the primary suspension wire rope of such scaffold.



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<b>14.0</b>	<b>SAFETY IN THE ERECTION OF STRUCTURAL FRAME &amp; FORMWORK</b>
<b>14.1</b>	<b>GENERAL PROVISION</b>
a	The trained building worker under the direct supervision of a person, responsible for structural frame and formwork, shall be employed for erection of such structural frame or formwork, dismantling of building and structure and performance of and engineering work formwork, false work and shoring work;
b	Adequate measures shall be taken to guard against hazards arising from any temporary state of weakness or unsuitability of a structure.
<b>14.2</b>	<b>FORMWORK, FALSE WORK AND SHORING</b>
a	Formwork and false work shall be so designed, constructed and maintained that such formwork and false work are able to support the load that may be imposed on them;
b	Such formwork shall be so erected that working platform, means of access, bracings, means of handling and stabilizing could easily be fixed with such formwork.
<b>14.3</b>	<b>ERECTION OR DISMANTLING OF STEEL AND PREFABRICATED</b>
a	Erection or dismantling of any pre-fabricated structure shall be made safe against danger by using appropriate means such as ladders, gangways or fixed platforms, buckets, boatswains chair or other appropriate means suspended from lifting appliances, safety harness, life lines, catch nets or catch platforms, power-operated mobile working platforms etc.;
b	The work of erection or dismantling of buildings or structures or formwork or false work or shoring or any other civil engineering work shall be carried out by trained building workers under the supervision of a person responsible for such work;
c	Steel or prefabricated structures shall be so designed and made that such structures can be safely transported or erected; and weight of each unit of such structures shall be clearly marked on such unit;
d	The design of each such part shall maintain stability of each part of the structures referred to in clauses above when erected, and to prevent danger, the design shall explicitly take into -
d-i	The relevant conditions and methods of attachment in the operations of stripping, transport, storing and temporary support during erection of such parts;
d-ii	Safeguards, such as provision of railings with working platforms, and for mounting such railings and platforms easily on the structural steel or prefabricated parts;
e	The hooks and softer devices built in or provided on the structural steel or prefabricate parts that are required for lifting and transporting such parts shall be so shaped, dimensioned and positioned to withstand the stresses to which such hooks or other devices are subjected;
f	Prefabricated parts made of concrete shall not stripped or erected before such concrete has set and hardened sufficiently to the extent provided for in the plans, and such parts are examined by the responsible person for any sign of damage before their use;
g	Store-places shall be so constructed that –
g-i	There shall be no risk of structural steel of prefabricated parts falling or overturning;
g-ii	Storage conditions shall generally ensure stability and avoid damage having regard to the method of storage and atmospheric conditions; and
g-iii	Racks shall be set on firm ground and designed so that units cannot move accidentally in such store-places;



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h	Structural steel or pre-fabricated parts shall not be subjected to stresses prejudicial to their stability while they are stored or transported or raised or set down;
i	Tongs, clamps and other appliances for lifting structural steel and prefabricated part shall be:
i-i	In such shape and dimensions as to ensure a secure grip without damaging and marked with the maximum permissible load in the most unfavorable lifting conditions; and
i-ii	Structural steel or pre-fabricated parts shall be lifted by such methods and appliances that prevent them from spinning accidentally;
j	Structural steel or pre-fabricated parts shall be provided with railings and working platforms before raising such parts to prevent any danger of falling of building workers, materials or articles at the time of any work with such parts;
k	All reasonably practical measures shall be taken to avoid injury to building workers, building structure or equipment while structural steel or pre-fabricated parts are handled or stored or transported or raised or lowered;
l	Structures shall not be worked on during violent storms or high winds or any other such hazardous situation;
m	The risk of falling to which building workers, moving on high or sloping girders, may be exposed is limited by all means of adequate collective protection or by the use of a safety harness which shall be well secured to a sufficiently strong supports;
n	Structural steel parts, which are to be erected at a great height, shall, as far as practicable, be assembled on the ground;
o	When structural steel or pre-fabricated parts are being erected, a sufficiently extended area underneath the workplace shall be barricaded or guarded;
p	Steel trusses, which are being erected, shall be adequately shored, braced or guyed until they are permanently secured in position;
q	Structural members shall not be forced into place by the hoisting machine while any building worker is in such a position that he is likely to be injured by such operation.
<b>14.4</b>	<b>FORMWORK</b>
a	All formwork shall be properly designed keeping in view the safety of building workers, buildings or structures;
b	A responsible person for structural frame and formwork shall –
b-i	Inspect and examine the material, timber, structural steel and scaffolding for its strength and suitability before being taken into use;
b-ii	Lay-down procedures to cover all stages of such structural frame and formwork;
b-iii	Supervise such structural frame and formwork;
b-iv	Take all necessary steps or measure to correct any situation with a view to prevent accident or dangerous occurrence during performances of such structural frame and formwork.
<b>14.5</b>	<b>DE-SHORING</b>
a	When shoring is removed, sufficient props shall be left in place of such shoring to prevent any possible hazard; and
b	De-shoring shall be adequately braced and tied together with support to prevent any hazard.



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<b>15.0</b>	<b>SAFETY IN CONCRETE WORK</b>
<b>15.1</b>	<b>GENERAL PROVISIONS REGARDING USE OF CONCRETE</b>
a	All construction with the use of concrete or reinforced concrete shall be based on plans including specification of steel and concrete and other material to be used in such construction
a-i	Giving technical details regarding methods for safe placing and handing of such materials and indicating the type, quality and arrangement of each part of a structure of such construction; and
a-ii	Explaining the sequence of steps to be taken for completion of such construction;
b	Formwork and shores used for concrete work shall be structurally safe and properly braced or tied together so as to maintain position and shape of formwork or shores;
c	Formwork structure used shall have sufficient catwalks and other secure access for inspection of such structure if such structure is in two or more tiers;
d	No machinery or any object should fall below by using wire nets, screen nets etc.
<b>15.2</b>	<b>PREPARATION AND POURING OF CONCRETE AND ERECTION OF CONCRETE STRUCTURE</b>
a	A building worker handling cement or concrete shall –
a-i	Wear close-fitting clothing, gloves, helmet or hardhat, safety goggles, proper footwear and respirator or mask to protect himself from danger in such handling;
a-ii	Keep as much of his body covered as is required to protect himself from danger in such handling;
a-iii	Take all necessary precautions to keep cement and concrete away from his skin in such handling;
b	Lime pits shall be fenced or enclosed and filled and emptied by such devices, which do not require workers to go into the pit;
c	Moving parts of the elevators, hoists screens bunkers, chutes, grouting equipment used for concrete work and of other equipment used for storing, transport and other handling ingredients of concrete shall be securely fenced to avoid contact of building workers with such moving parts;
d	Screw conveyors used for cement, lime and other dusty materials shall be completely enclosed.
<b>15.3</b>	<b>BUCKETS</b>
a	Concrete buckets used with cranes or aerial cableways shall be free from projections from which accumulations of concrete could fall;
b	Movements of concrete buckets shall be governed by signals necessary to avoid any danger by such movements.
<b>15.4</b>	<b>PIPES AND PUMPS</b>
a	A scaffolding carrying a pipe for pumped concrete shall be strong enough to support such pipe at a time when such pipe is filled with concrete or water or any other liquid and carry the combined load of the all the building workers who may be on such scaffold at such time, safely;
b	Every pipe for carrying pumped concrete shall be –
b-i	Securely anchored at its end point and at each curve on it;



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b-ii	Provided near the top of such pipe with an air release valve;
b-iii	Securely attached to a pump nozzle by a bolted collar or other adequate means;
c	The operation of concrete pumps shall be governed by standard signals;
d	Building workers employed around a concrete pump shall wear safety goggles;
<b>15.5</b>	<b>MIXING AND POURING OF CONCRETE</b>
a	The concrete mixture shall not contain any material, which may unduly affect the setting of such concrete, weaken such concrete or corrode steel used with such concrete;
b	When dry ingredients of concrete are being mixed in confined spaces such as silos –
b-i	The dust shall be exhausted at the time of such mixing and
b-ii	In case the dust the dust cannot be exhausted, as specified, the workers shall wear respirators at the time of such mixing;
c	When concrete is being tipped from buckets, building workers shall be kept out of the range of any kickbacks of such buckets;
d	Loads shall not be dumped or placed on settling concrete.
<b>15.6</b>	<b>CONCRETE PANELS AND SLABS</b>
a	All parts of a concrete panel or concrete slab shall be hoisted uniformly;
b	Concrete panels shall be adequately braced in their final positions and such bracings shall remain in such positions until such panels are adequately supported by other parts of the construction for which such panels are used;
c	Temporary bracings of concrete panels shall be securely fastened to prevent any part of such panels from falling when such panels are being moved.
<b>15.7</b>	<b>STRESSED AND TENSIONED ELEMENTS</b>
a	Building workers shall not stand directly over jacking equipment while stressing of concrete girders and beams is being done;
b	A pre – stressed concrete unit shall not be handled except at points on such unit and by the devices specified for such work by the manufacture of such devices;
c	During transport, pre-stressed concrete girders or concrete beams shall be kept upright by bracing or other effective means;
d	Anchor fittings for pre-tensioned strands of pre-stressed concrete girders of concert beams are kept in a safe condition in accordance with the instruction of manufacturer of such anchor fittings;
e	Building workers shall not stand behind jacks or in line with tensioning elements and jacking equipment during tensioning operations of pre-stressed concrete girders of concrete beams;
f	Building workers do not cut wires of pre – stressed concrete girders or concrete beams under tension before such concrete used of such girder or beams is sufficiently hardened.
<b>15.8</b>	<b>VIBRATORS</b>
a	A building worker, who is in good physical condition, shall operate vibrators used in concreting work;
b	All practical measures shall be taken to reduce the amount of vibration transmitted to the operators working in concreting work and





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c	When electric vibrators are used in concreting work
c-i	Such vibrators shall be earthed;
c-ii	The leads of such vibrators shall be heavily insulated; and
c-iii	The current shall be switched off when such vibrators are not in use.
<b>15.9</b>	<b>INSPECTION AND SUPERVISION</b>
a	A person responsible for a concreting work shall supervise the erection of the formwork, shores, braces and other supports used for such concreting work, make a thorough inspection of every formwork to ensure that such formwork is safe, regularly inspect the formwork, shores, braces, re-shores and other supports during the placing of concrete, keep all records of inspections referred to above at the workplace relating to such inspection and produce them for inspection upon the demand.
b	Any unsafe condition, which is discovered during the inspections, shall be remedied immediately.
<b>15.10</b>	<b>BEAMS, FLOORS AND ROOFS</b>
a	Horizontal and diagonal bracings shall be provided in both longitudinal and transverse direction as may be necessary to provide structural stability to formwork used in concreting work and shores used in such concreting work shall be properly seated on top and bottom and secured in their places;
b	Where shores used in concreting work rest upon the ground, base plates shall be provided for keeping such shores firm and in level;
c	Where the floor to ceiling height of a concreting work exceeds 9 m or where the formwork deck used in such concreting work is supported by shores constructed in two or more tiers, or where the dead, live and impact loads on the formwork used in such concreting work exceed 700 kilogram per m <sup>2</sup> , the structure of such formwork shall be designed by a professional engineer in the relevant field and the specifications and drawings of such formwork kept at such construction site and produced on demand.
d	Where a professional engineer designs the structure of the formwork used in concreting work, such engineer shall be responsible for the supervision of construction and the stability of such structure.
<b>15.11</b>	<b>STRIPPING</b>
a	Stripping of formwork used in concreting work shall not commence until the concrete on such formwork is fully set, examined and certified to this effect by the responsible person and record of such examination and certification is maintained;
b	Stripped forms in concreting work shall be removed or stock piled promptly after stripping from all areas in which building workers are required to work or pass;
c	Protruding nail, wire ties and other formwork accessories not required for subsequent concreting work shall be pulled, cut or otherwise made safe.
<b>15.12</b>	<b>RE-SHORING</b>
a	Re-shoring used in concreting work shall be provided to a slab or beam for its safe support after its stripping or where such slab or beam is subjected to superimposed loads due to construction above such slab or beam;
b	The provisions applicable to shoring in a concreting work shall also be applicable to reshoring in such work or pass.



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<b>16.0</b>	<b>SAFETY IN CONSTRUCTION, REPAIR &amp; MAINTENANCE OF STEEP ROOFS</b>
<b>16.1</b>	<b>WORK ON STEEP ROOFS:</b>
	All practicable measures shall be provided to protect the building workers against sliding when carrying outwork on steep roofs.
<b>16.2</b>	<b>CONSTRUCTION AND INSTALLATION OF ROOFING BRACKETS</b>
a	Roofing brackets shall be constructed to fit the pitch of steep roof and such brackets shall be used to provide level working platform;
b	Roofing bracket shall be secured in its place by nailing pointed metal projections attached to the underside of such bracket and securely driven into a steep roof on which it is used or secured by a rope passed over the ridgepole and tie of such roof.
<b>16.3</b>	<b>CRAWLING BOARDS</b>
a	All crawling boards used for work on steep roofs shall be of adequate strength, made of sound material and of the type approved for the purpose of their use;
b	Crawling boards shall be kept in good repairs and inspected by a responsible person before being taken into use;
c	Crawling boards shall be secured to a steep roof on which it is used by ridge hooks or other effective means;
d	A firmly fastened lifeline of adequate strength shall be strung beside each crawling board throughout its length while using such crawling boards.



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<b>17.0</b>	<b>SAFETY IN CATCHES PLATFORMS, HOARDINGS &amp; CHUTES</b>
<b>17.1</b>	<b>CATCH PLATFORM</b>
a	Catch platform shall not be used for storage of material or as a working platform;
b	Catch platform shall at least be of 2 m wide and inclined so that the position of outer edge of such platform is 1500 mm higher than the inner edge;
c	The open end of catch platform shall be properly fenced to the height not less than 1 m.
<b>17.2</b>	<b>HOARDINGS:</b>
	Hoardings shall be constructed when the Registering Authority / Assistant Labour Commissioner considers it necessary for protection of building workers and directs such employer to construct such hoardings.
<b>17.3</b>	<b>CHUTES, ITS CONSTRUCTION AND USE</b>
a	Wooden or metal chutes which are at an angle of more than 45° to the horizontal and used for the removal of materials shall be closed on all sides except at their openings used for receiving or discharging of materials or articles;
b	All openings of chutes except their top openings shall be closed when not in use;
c	Every chute –
c-i	Shall be constructed of sound material, adequate strength and suitable for the purpose it is intended for use;
c-ii	Exceeding 12 m in height shall be constructed in accordance with the design and drawings of professional engineer for such;
c-iii	A suitable warning notice shall be displayed at conspicuous locations, written in Hindi and in a local language, at the discharge end of every chute;
c-iv	Shall be cleared when debris has accumulated to a height, which can pose danger to building worker, but such clearance shall be done in no case less frequently than once a day.



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<b>18.0</b>	<b>SAFETY IN WORK ON OR ADJACENT TO WATER</b>
<b>18.1</b>	<b>TRANSPORT OF WORKERS BY WATER</b>
a	When any building worker has to proceed to or from any workplace by water for purposes of carrying on a building or other construction work, proper measures shall be taken to provide for his safe transportation and vessels used for such purpose shall be in charge of a responsible person, properly equipped for safe navigation and maintained in good condition;
b	Maximum number of persons which can be safely carried in a vessel shall be marked plainly and conspicuously on such vessel and such number shall not be exceeded during use of such vessel for carrying persons;
c	Adequate protecting shall be provided to the building workers in such vessel from inclement weather;
d	Such vessel shall be manned by adequate and experienced crew;
e	In case the bulwarks of such vessel are lower than 60 cm from the level of the deck of such vessel, the open edge of such bulwarks shall be fitted with suitable fencing to a height of at least 1 m above such deck and the post and stanchions and similar parts used in such fencing shall not be spaced more than 2 m;
f	The number of life buoys on deck of such vessel shall at least be equal to the number of crew members of such vessel and shall not be less than two;
g	All life buoys on deck of such vessel shall be kept in good state of maintenance and so placed that if such vessel sinks then they will remain afloat and one of such buoys shall be within the immediate reach of the Steersman of such vessel and another is situated after part of such vessel; and
h	The position of the steersman of the vessel shall be such that he has a reasonably free view of all sides.
<b>18.2</b>	<b>PREVENTION FROM DROWNING</b>
a	Where, on or adjacent to the workplace of any contraction site, there is water into which a building worker employed for work on such site, in the course of his employment, may fall and has the risk of drowning, suitable rescue equipment shall be provided and kept in an efficient state of ready use and measures shall be taken to arrange for the prompt rescue of such building worker from the danger of drowning and where there is a special risk of such fall from the edge of adjacent land or from a structure adjacent to or above the water, or from floating stage on such water, secure fencing shall be provided near the edge of such land, structure or floating stage, as the case may be, to prevent such fall, and such fencing may be removed or allowed to remain unerected for the time and to the extent necessary for the access of building workers to such work or the movement of material for such work;
b	For handling rescue equipment, at least two persons knowing diving should be available at such sites.



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<b>19.0</b>	<b>SAFETY IN COFFERDAMS &amp; CAISSONS</b>
<b>19.1</b>	<b>EVERY COFFERDAM AND CAISSON SHALL BE</b>
a	Of good construction, sound material and of adequate strength, provided with adequate means for workers to reach safely at the top of such cofferdam or caisson in the event of an in rush of water and safe means of access to every place where workers shall be employed;
b	Work relating to construction, positioning, modification, dismantling of cofferdams or caissons shall be carried out under the supervision of a responsible person and inspected by the responsible person at the specified intervals;
c	A worker shall be allowed to work in a cofferdam or caisson after such cofferdam or caisson has been inspected and found safe by responsible person within such preceding period as approved and a record of such inspection maintained.
<b>19.2</b>	<b>WORK IN COMPRESSED AIR IN A COFFERDAM OR CAISSON SHALL BE</b>
a	Carried out in accordance with the procedure laid down;
b	Carried out by such building workers who have completed eighteen years of age and are medically examined and found fit for the work;
c	Carried out under the supervision of a responsible person;
d	If the work in cofferdam or caisson is carried out in shifts, a record of the time spent by each worker in each such shift for carrying out the work shall be maintained in a register with particulars or time taken for the compression of such building worker, if any;
e	At every work site or project in a cofferdam or caisson, where workers are employed to work in compressed air environment, a construction medical officer assisted by a nurse or trained first aid attendant, shall be available at all times and there shall be one standby reserve compressor to meet the emergency.
<b>19.3</b>	<b>PRESSURE PLANT AND EQUIPMENT</b>
a	Pressure plant and equipment for which it is used shall be –
a-i	Properly maintained in good repairs and working condition and fitted with a suitable safety valve or other effective device to provide maximum safe discharge pressure from being exceeded at any time; a suitable pressure gauge with a dial range not less than 1.5 time and not exceeding twice the maximum working pressure, easily visible and designed to show at all times, the internal pressure in kilogram per square centimeter and marked with the maximum safe working pressure, a suitable stop valve or valves by which the pressure plant or the system of the pressure plant may be isolated from the source supply of pressure or otherwise;
a-ii	Every pressure plant or equipment shall be thoroughly examined by the competent person, externally, once in every period of six months; internally, once in every period of twelve months; and by Hydraulic test, once in a period of four years.



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<b>20</b>	<b>SAFETY IN DEMOLITION WORK</b>
<b>20.1</b>	<b>PREPARATION</b>
a	All glass or similar material or article in exterior openings shall be removed before commencing any demolition work and all water, steam, electric, gas and other similar supply lines put off and suitably capped and the concerned department of the appropriate authority informed and permission obtained wherever required before commencing;
b	Wherever it is necessary to maintain water, gas or electric line or power during such demolition, such line shall be so located or protected with substantial coverings so as to protect it from damage and to afford safety to the building workers and the general public.
<b>20.2</b>	<b>PROTECTION OF ADJACENT STRUCTURES</b>
<b>20.2.1</b>	<b>Examination of walls etc. of adjacent structures –</b>
a	During demolition process, the contractor shall examine the walls of all structures adjacent to the structure to be demolished to determine the thickness, method of support to such adjacent structures and;
b	In case, such employer has reason to believe that any of such adjacent structure is unsafe or may become unsafe during such demolition process, he shall not perform demolition activity unless stability to such unsafe adjacent structure from collapsing has been taken. All roads and open spaces adjacent to the site of demolition work shall be closed or suitably protected by bracketing.
<b>20.3</b>	<b>DEMOLITION OF WALLS, PARTITIONS, ETC.</b>
a	Any demolition of walls or partitions shall be proceeded in a systematic manner as per the standard safe operating practices approved and all work above each tier of any floor beams shall be completed before the safety of the supports of such beam is impaired;
b	Masonry shall be neither loosened nor permitted to fall in such masses or volume or weight as to endanger the structural stability of any floor or structural supports;
c	No wall chimney or other structure or part of a structure shall be left unguarded in such a condition that it may fall, collapse or weaken due to wind pressure or vibration;
d	In the case of demolition of exterior walls by hand, safe footing shall be provided for the workers employed in, such walls or partitions, which are to be demolished by hand shall be not left standing more than one store high above the uppermost floor on which persons are working.
<b>20.4</b>	<b>METHOD OF OPERATION:</b>  The contractor shall ensure that debris, bricks and other materials or articles are removed by means of chutes, buckets or hoists and through openings in the floors.
<b>20.5</b>	<b>ACCESS TO FLOOR</b>
a	Safe access to and egress from every building shall be provided at all times in the course of demolition by means of entrances hallways, stairways or ladder runs which shall be so protected as to safeguard the workers using such means from falling material or articles;
b	Demolition of structural steel etc. shall be demolished column by column and tier by tier and every structural member, which is being demolished, shall not be under any stress, and such structural member shall be suitably lashed to prevent it from any uncontrolled swinging, dropping or falling or falling;





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c	Large structural members shall not be thrown or dropped from the building, but carefully lowered by adopting suitable safe method;
d	Where a lifting appliance like a derrick is used for demolition, the floor on which such lifting appliance rests shall be completely planked over or supported and such floor shall be of adequate strength to sustain bearing load for such lifting appliance and its operation.
<b>20.6</b>	<b>STORAGE OF MATERIAL OR ARTICLE</b>
a	No materials or articles shall be not stored or kept on platform, floor or stairways of a building being demolished, provided that this clause shall not apply to the floor of a building when such floor is of such strength as to support safely the load to be superimposed by storing such material or articles;
b	No access to any stairway or passageway shall be affected or blocked by storing any material or article;
c	Suitable barricades shall be provided so as to prevent materials or articles from sliding or rebounding into any space used by the workers.
<b>20.7</b>	<b>FLOOR OPENINGS:</b>
	Every opening used for the removal of debris from every floor which is not closed to access, except the top or working floor, shall be provided with an enclosure from such floor to its ceiling, or such opening is so barricaded that no building worker shall access to within a horizontal distance of 6.0 m from such opening through which debris is being dropped.
<b>20.8</b>	<b>INSPECTION:</b>
	A person responsible for demolition work shall make continuous inspections during demolition process so as to detect any hazard resulting from weakened or deteriorated floors or walls or loosened materials or articles, and that no building worker shall be permitted to work where such hazard exist unless remedial measured like shoring or bracing shall be taken to prevent such hazards.
<b>20.9</b>	<b>WARNING SIGNS, BARRICADES, ETC.</b>
a	Barricades and warning sign shall be erected along every side throughout the length and breadth of a building or other construction work to be demolished to prevent unauthorized persons from entering into the during demolition operations;
b	During the demolition of an exterior masonry wall or a roof from a point more than 12 m above the adjoining ground level of such wall or roof, if persons below such wall or roof are exposed to falling objects, suitable and safe catch platform shall be provided and maintained at a level not more than 6 m below the working level except where an exterior built-up scaffold is provided for safe and adequate protection of such persons;
c	Suitable and standard warning signs shall be displayed or erected at conspicuous places or position at the workplace;
<b>20.10</b>	<b>MECHANICAL METHOD OF DEMOLITION</b>
a	The following requirements shall be fulfilled in case the mechanical method of demolition like use of swinging weight, clamshell bucket, power shovel, bulldozer or other similar mechanical methods are used for the purpose of demolition namely —
a-i	The building or structure or structure or remaining portion thereof shall be not more than 12 m in height;



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a-ii	Where a swinging weight is used for demolition, a zone of such demolition having a radius of at least 1.5 times the height of the structure of portion thereof being demolished shall be maintained around the points of impact of such swinging weight;
a-iii	Where a clamshell bucket is being used for demolition, a zone of demolition shall be maintained within eight meters of the line of travel of such bucket;
a-iv	Where other mechanical methods are being used to affect total or partial collapse of a building or other construction work, there shall be maintained, in the area into which the affected portion of such building or other construction work may fall, a zone of demolition at least 1.5 times the height of such affected portion thereof; and
a-v	No person other than building workers or other persons essential to the operation of demolition work shall be permitted to enter a zone of demolition, which shall be provided with substantial barricades.



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21.0	FIRE EXTINGUISHERS & OTHER APPLIANCES OF FIRE FIGHTING																																		
21.1	FIRE EXTINGUISHERS & OTHER MEANS OF PREVENTION AND PROTECTION																																		
a	Every contractor shall have a fire protection and prevention plan developed and implemented keeping in view the following:																																		
a-i	The specific work practices requiring fire control measures;																																		
a-ii	Response measures to be taken in case of fire;																																		
a-iii	Equipment required;																																		
a-iv	Personnel requirements and responsibilities;																																		
a-v	Schedules of daily and weekly inspection;																																		
a-vi	Open flames and fires are prohibited in all underground construction;																																		
a-vii	Readily visible signs to be posted in the fire prone/inflammable/explosive areas prohibiting smoking use of open flames and other hot work.																																		
a-viii	A system of Permit-to-Work.																																		
b	For the protection of the workers from the outbreak of fire, the contractor shall Provide, maintain and regularly inspect the Fire extinguishing equipment, which shall be sufficiently provided to extinguish any probable fire; <table border="1"><tr><td colspan="4">Suitability of portable fire extinguishers</td></tr><tr><td rowspan="2">Class of fire</td><td colspan="3">Type of extinguisher</td></tr><tr><td>Water</td><td>DCP</td><td>CO2</td></tr><tr><td>A</td><td>Yes</td><td>Yes</td><td>Yes</td></tr><tr><td>B</td><td>No</td><td>Yes</td><td>Yes</td></tr><tr><td>C</td><td>No</td><td>Yes</td><td>Yes</td></tr><tr><td>D</td><td>No</td><td>Yes</td><td>Yes</td></tr><tr><td>Electrical</td><td>No</td><td>Yes</td><td>Yes</td></tr></table>				Suitability of portable fire extinguishers				Class of fire	Type of extinguisher			Water	DCP	CO2	A	Yes	Yes	Yes	B	No	Yes	Yes	C	No	Yes	Yes	D	No	Yes	Yes	Electrical	No	Yes	Yes
Suitability of portable fire extinguishers																																			
Class of fire	Type of extinguisher																																		
	Water	DCP	CO2																																
A	Yes	Yes	Yes																																
B	No	Yes	Yes																																
C	No	Yes	Yes																																
D	No	Yes	Yes																																
Electrical	No	Yes	Yes																																
c	Ensure availability of an adequate supply of water at ample pressure;																																		
d	Make available																																		
d-i	Adequate number of trained persons required to operate the fire extinguishing equipment;																																		
d-ii	Properly maintain Fire extinguishing equipment and inspect them at regular intervals of not less than once in a year by the responsible person and a record of such inspections maintained;																																		
e	Portable fire extinguishers provided in the operator's cabin of earthmoving machinery, material handling systems, construction equipment etc. shall be regularly inspected, maintained and replenished/refilled;																																		
f	The operators and the helpers of such equipment shall be trained in the methods operating the equipment and fighting the fire effectively;																																		



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g	All combustion engine power equipment shall be so located that the exhausts are well away from combustible material;
h	No smoking shall be allowed at or in the vicinity of site operation/ while working at site, which constitute fire hazards and shall be conspicuously posted with or open flame signs;
i	In the flammable environment as described in IS: 9570, the electrical fittings and equipment shall be of flame proof type conforming to IS: 2206 & IS; 2148;
j	Arrangements shall be made to contain sparks generated during welding, cutting or other operations and spark shall not be allowed to fall down on combustible material kept below; All means of exit shall be kept free of obstruction at all times;
k	Appropriate type of fire extinguishers according to IS: 5698 shall be kept in fully charged condition at the places which have potential risk of fire;
l	The contractor shall educate his or his sub-contractors' men working in the vicinity of fire risk, on how to operate these equipment and know in particular circumstances which type of extinguishers is to be used;
m	The contractor shall take full responsibility for the upkeep and replenishment/refilling of the fixed and portable fire extinguishers.



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**ANNEXURE - A TO ANNEXURE - I**

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**ANNEXURE – A**  
**As per/ Part of Clause 8.8.5**  
**Medical Centre & Ambulance**

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#### A. Medical Centre

##### 1. Paramedical staff

1.a	When < 500 workers, 1 Trained Male Nurse (round the clock deployment)
1.b	When >=500 workers* *= In case the number of workers is envisaged to exceed 500, a medical practitioner is to be engaged.
1.b.i	Registered Medical Practitioner (Qualified MBBS) to be deployed for at least 8 hours in a day, 5 days per week
1.b.ii	2 Trained Male Nurses (round the clock deployment)
2.	All articles as per Schedule IV of BOCW Central Rules, 1998 to be made available in the Medical Centre (given under for convenience)
3.	Basic Facilities/ Requirements to be provided as per location eg. Refrigerator, Air Conditioner, Anti Venom Serums etc.
4.	Tie-ups with specialty hospitals to be ensured for referring serious patients
SCHEDULE IV (BOCW CENTRAL RULES, 1998) ARTICLES FOR AMBULANCE ROOM [SEE RULE 226 (C)]	
i.	A glazed sink with hot and cold water always available.
ii.	A table with a smooth top at least 180 cm x 105 cm.
iii.	Means for sterilizing instruments.
iv.	A couch.
v.	Two stretchers.
vi.	Two buckets or containers with close fitting lids.
vii.	Two rubber hot water bags
viii.	A kettle and spirit stove or other suitable means of boiling water.
ix.	Twelve plain wooden splints 900 cm x 100 cm x 6 cm.
x.	Twelve plain wooden splints 350 cm x 75 cm x 6 cm.
xi.	Six plain wooden splints 250 cm x 50 cm x 12 cm.
xii.	Six woolen blankets.
xiii.	Three pairs of artery forceps.
xiv.	One bottle of spiritus annemia aremations (120 ml).
xv.	Smelling salt (60 gm).
xvi.	Two medium size sponges.
xvii.	Six hand towels.
xviii.	Four kidney trays.
xix.	Four cakes of toilet, preferably antiseptic soap.
xx.	Two glass tumblers and tow wine glasses.
xxi.	Two clinical thermometers.
xxii.	Two tea spoons.
xxiii.	Two graduated (120 ml) measuring glasses.
xxiv.	Two minimum measuring glasses.
xxv.	One wash bottle (1000 cc) for washing eyes.
xxvi.	one bottle (one liter) carbolic lotion 1 to 20.
xxvii.	Three chairs.
xxviii.	One screen.
xxix.	One electric hand torch
xxx.	Four first aid boxes or cupboards stocked to the standards prescribed
xxxi.	An adequate supply of tetanus toxide.
xxxii.	Injections—morphine, pethidine, atropine, adrenaline, coramine, (6 each).
xxxiii.	Cramine liquid (60 ml).
xxxiv.	Tablets—antihistaminic antispasmodic (25 each).
xxxv.	Syringes with needles—2 cc, 5 cc, 10 cc and 500 cc.
xxxvi.	Three surgical scissors.



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xxxvii.	Two needle holders, big and small.
xxxviii.	Suturing needles and materials.
xxxix.	Three dissecting forceps
xl.	Three dressing forceps
xli.	Three scalpels.
xlvi.	One stethoscope and a B. P. apparatus.
xlvi.	Rubber bandage—pressure bandage.
xlvi.	Oxygen cylinder with necessary attachments.
xlvi.	Atropine eye ointments.
xlvi.	I. V. Fluids and sets 10 nos.
xlvi.	Suitable, foot operated, covered, refuse containers.
xlvi.	Adequate number of sterilized, paired, latex hand gloves.

#### B. Ambulance

1.	When number of workers is <1000: If the distance to a major hospital capable of handling critical injuries expected at Site is ≤ 50 KM from Site, then 1 BLS (Basic Life Support)/ Type B Ambulance otherwise ALS* (Advanced Life Support)/ Type D Ambulance
2.	In case no. of worker more than 1000, then additional 1 nos BLS Ambulance shall be deployed by BHEL under clause no 8.8.5.
3.	If no. of workers increases to >2000 workers another (one) additional BLS Ambulance to be deployed by BHEL under clause no. 8.8.5.
4.	Minimum Articles as per Schedule V of BOCW Central Rules to be ensured in each Ambulance. (given under for convenience)
5	Note :-
*	Final call to be taken at Site in consultation with all the contractors

#### SCHEDULE V (BOCW CENTRAL RULES, 1998) CONTENTS OF AMBULANCE VAN OR CARRIAGE [SEE RULE 227]

The Ambulance Van shall have equipment prescribed as under:

a)	General—a portable stretcher with folding and adjusting devices with the Head of the stretcher capable of being tilted upward. Fixed suction unit with equipment. Fixed oxygen supply with equipment. Pillow with case, sheets, blankets, towels, emergency bag, bed pan, urinal glass.
b)	Safety Equipment-Flares with life of three thousand minutes, floor lights, flash lights, fire extinguishers (dry power type), insulated gantlets.
c)	Emergency Care Equipment—
i.	Resuscitation—Portable suction unit, portable oxygen unit, bag valve mask, hand operated artificial ventilation unit, airways, mouth, gag tracheostomy adapters, short spine board, I.V. FLUIDS with administration unit, B. P. manometer cuff stethoscope.
ii	Immobilization—Long and short padded boards, wire ladder splints, triangular bandage—long and short spine boards.
iii.	Dressing-Gauze pads—100 mx 100 mm universal dressing 250 x 1000 mm, roll of aluminum foils—soft roller bandages 150 mm x 5 mm yards adhesive tape in 75 mm roll safety pins, bandage sheets, burn sheets.
iv.	Poisoning—Syrup of Ipecac, activated charcoal pre packeted dose, snake bite kit, drinking water.
v.	Emergency Medicines—As per requirement (under the advice of construction Medical Officer).



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**ANNEXURE – B**

**HSE DISPLAYS**

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A. Types of Displays					
1. Based on Content					
S.No	Type				
1	HSE Hazards & Precautions Height Work, Housekeeping, Fire Safety, PPEs, Hot Work, Lifting & Rigging Activity, Site-specific Hazards – eg. for Refineries, Nuclear plants etc.; COVID Precautions; Environment Protection etc.				
2	Other Displays, Signage etc.  HSE Policy, ISO Certificate, Safety Statistics, Assembly Area Location/ Route, Emergency Contact Numbers, Site Safety Rules & Regulations, Speed Limit, Work in Progress, Lock- Out Tag-Out (LOTO) Boards etc.				
2. Based on Mounting					
[Type 1]		[Type 2]		[Type 3]	
Flex Sign Boards of Wooden Frame – directly mounted on Structures (walls, stairs, railings etc.)		Flex Sign Boards with Wooden Frame – mounted on metallic/ wooden legs – preferably double-sided		Colored weather-proof Paintings on Walls (after due concurrence of BHEL/ Customer – Type 1 in case of no concurrence/ space)	
B. General Requirements:					
a.	Displays should be weather-proof as per installation location, i.e. rain-proof, wind-proof and sun- proof.				
b.	Installation location and size to ensure visibility for the intended viewers (workers and moving personnel)				
c.	Displays to have at least 50% graphical elements preferably (as applicable). Language should be understandable by majority of the workers				
d.	Displays to be relevant to the hazards in the area				
e.	Proper installation to ensure boards don't obstruct activities and should not be prone to fall so as to pose danger				
f.	In case of multiple elevations (eg. Boiler, Power-house etc.), each elevation to have displays for applicable hazards including Height-Work, Housekeeping				
g.	For temporary work locations, posters/ boards may be erected and shifted after task is over				
h.	Minimum size of displays should be A1 unless otherwise specified				
i.	In case of damage, displays shall be reviewed and repaired/ replaced				
j.	In areas where night work is envisaged, fluorescent displays shall be installed and these should comprise of at least 20-30% of total displays				
k.	Total Number of displays to be not less than 1 per 10 workers and are to be dynamically updated based on number of workers				
C	Area-wise Displays- Below is list of Area-wise displays that are to be installed at Sites (Numbers, locations maybe adjusted for specific requirements)				
SN	Area	Suggested Subjects	Minimum Size	Minimum Quantity	Locations
1	Walls/ Foundations/ Cement Structures etc. belonging to the package area	Safety Hazards Prevention and other HSE Awareness content	[Type 3]	As per BHEL assessment from time to time	



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2	Site Interior Roads belonging to the package area	At least every 20 meters: 1. Speed Limit Indication, Safe Driving board 2. Boards for hazard awareness	1.As needed [Type 2] 2. A1 or equivalent each [Type 2]	As indicated	Sides of Roads; Height to ensure good visibility
3	Specific Package Areas	A. Common At entry to respective Package/ Work Area, each contractor to put up daily updated board with following for each shift: 1. Scope of work and start date 2. Emergency Contact Numbers 3. Emergency Assembly Location, Escape Plan 4. Locations and supervisors of various gangs in the area, 5. Current Work Permit Details 6. Safety Supervisor Location assignments - Names, Mobile Nos., Assigned Locations 7. Details (Name, Contact No. etc.) of Package In-charge - Contractor & BHEL 8. Details (Name, Contact No. etc.) of Safety In-charge - Contractor & BHEL 9. LTI Free Man-days & details of last LTI also to be indicated In addition, Area-Specific Displays as indicated in Table 1	A0 [Type 2]	1 per Package Area	Entry/ Ground Level

**Table 1 (Area/ Package-wise HSE Display Plan - As applicable)**

#### Prepared By (Subcontractor)

S. No.	Area	Suggested Minimum No. of Displays & Types	Type	Numbers Installed
1	Boiler	3 per working elevation	[Type 1]	
2	Powerhouse	5 per elevation	[Type 1]	
3	ESP	5 Per Pass	[Type 1]	
4	Buildings	5 per elevation	[Type 1]	



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5	Cooling Tower (NDCT/ IDCT/ ACC)	20 per Structure	[Type 1]	
6	Chimney	20 per Structure	[Type 1]	
7	Fabrication Yard	10 per Yard	[Type 2]	
8	Batching Plant	5 per Plant	[Type 1]	
9	Material Storage Yard - Open	20 per Yard	[Type 2]	
10	Material Storage Shed - Semi-Closed/ Closed	10 per Shed	[Type 1]	
11	Electrical Booths	2 per booth + Line diagram, Emergency contact details	[Type 1]	
12	Medical Centre	2 per Centre	[Type 1]	
13	Rest Shed	2 per Shed	[Type 1]	
14	Canteen	2 per Canteen	[Type 1]	
15	Drinking Water Area	1 Per Outlet	[Type 1]	
16	Washing Water Area	1 Per Outlet	[Type 1]	
17	Training Centre	10 per room	[Type 1/2]	
18	Assembly Area	5	[Type 1/2]	
19	Stairs	1 per landing elevation	[Type 1]	
20	Cylinder Storage Area	5 + Signage: Type of Gas, Empty, Filled etc.	[Type 1/2]	
21	Labour Colony	Electrical Safety with Distribution Plan/ Line Diagram – 1 , COVID Precautions Posters - 5 Safety Awareness Posters - 10 Hygiene awareness posters - 2	[Type 1]	
22	Others	As per requirement	[Type 1/2]	

Date:

Sign (Contractor)

Sign (BHEL)





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**ANNEXURE – C**

**HSE TOOLS/ EQUIPMENT/ DEVICES**

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#### HSE Tools/ Equipment/ Devices

Following equipment conforming to relevant IS/ISO/BS Codes/ Standards in indicated quantities shall be ensured by subcontractor. This list is tentative, not exhaustive. Quantity and date/ period of deployment shall be as per site requirement.

#### A. HSE Tools/ Equipment/ Devices

SN	Item Name
1	Lifelines
2	Retractable Fall Arrestors
3	Safety Nets (10m X 5m) fire proof double mesh
4	Sky Climbers
5	Fire Blanket
6	Honey Bee Removal Suit & Kit
7	Scaffolding Pipes
8	Flashback Arrestors
9	Barricading Tape
10	Binoculars
11	Walkie-Talkies
12	LOTO kit
13	24-Volt light
14	Sand Buckets
15	Hard barricading Pipes
16	Standby Fire kits
17	Hand-held Megaphone
18	Small Public Address System
19	Foldable Stretcher
20	Height Rescue Kit (Non-Motorized)
	(Others:)

#### B. Test & Measurement Devices

SN	Name of Device
1	ELCB Tester
2	Multi meter (Light cables)
3	Earth Resistance Meter
4	Lux Meter
5	Sound Meter
6	Anemometer
7	Breath Analyzer (Alcohol)
8	Multi-gas dozi-meter/ detector
9	Gas leakage detector / alarm
10	Gas monitor (confined space)
11	Radiation meter & Badges
12	Blood Pressure Monitor
13	Fire detectors
14	Handheld signaling light
	(Others:)



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**ANNEXURE – D**

**REST SHED**

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#### Rest Shed

##### 1. Determining the Number, Sizes and Locations of Rest Shelters

###### i. Numbers:

The number of rest shelters shall be determined based on maximum number of workers at any one time (across all shifts). Formula is:

$W_{max}$  = Maximum number of workers at any time in the Site Space per worker = 1.1 sq meter

Total space required,  $T_{space}$  =  $W_{max} \times 1.1$  Based on total space requirement calculated above, the number of rest sheds can be decided according to availability of locations and concentration of workers - so as to ensure the required space.

###### ii. Locations:

The rest sheds should be so located so as to minimize the distance to be travelled by the workers from their locations of work considering all the practical constraints

iii. Other: The Rest shelter should be fenced so that it cannot be used as parking area.

##### 2. Design & Construction of Rest Sheds

###### a. Permanent/ Long duration Rest Sheds

i. For locations where, permanent rest sheds can be constructed without possibility of removal for relatively long period of time, a semi-closed shed can be constructed covered with tin roof and supported with well-grouted beams. The floor of the shed to be preferably cemented/ solidified.

ii. Adequate structural requirements suitable to the local weather (wind/ rain etc.) to be ensured.

iii. The design of the rest shed to be approved by Civil Engineering Department of BHEL Site before commencing work

###### b. Temporary/ Movable/ Portable Rest Sheds

i. For locations where, permanent rest sheds cannot be constructed either due to non-availability of permanent location or other reasons, temporary rest shed shall be constructed.

ii. Temporary rest sheds shall comprise of Tent arrangement carried out by professional agencies

##### 3. Amenities in Rest Sheds

###### a. Essential Amenities

Following amenities shall be essentially ensured in a rest shed:

i. Hygienic environment with regular cleaning and housekeeping (with records)

ii. Adequate illumination

iii. Adequate ventilation/ heating as per weather conditions

iv. Clean Drinking water source

v. Hand Washing area

vi. Toilets & Urinals

vii. Benches/ mats for sitting/ lying

viii. Any other essential requirement deemed necessary by the Site

ix. Dust bins of sufficient quantity/ size that are vacated each day/ as per requirement

###### b. Additional/ Optional Amenities

Following amenities are optional but are recommended to enhance the level of satisfaction of workforce:

i. Hot/ Cold drinks (Tea, Coffee, Glucose etc.) as per requirement

ii. Snacks

iii. Fans/ Coolers/ Heating arrangements as per requirement and weather conditions

iv. A nice, welcoming interior design, music etc.

v. Water cooler

##### 4. Health & Safety Requirements of Rest Sheds

Use of asbestos in construction is banned and shall not be used.

In addition, following essential Safety features shall be ensured in Rest sheds:

i. Availability of Fire extinguishers (preferably CO2 type)

ii. Display of Safety Posters

iii. Pest/ reptile protection

iv. Mosquito prevention measures

5. Note: Any suitable closed spaces/ newly constructed buildings etc. available at project may also be used for the purpose of rest shed with due concurrence of BHEL



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**ANNEXURE – E**

**LABOUR COLONY**

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Labour Colony	
1	These Guidelines suggest minimum requirements. However, additional requirements based on feasibility and circumstances, while adhering to directions of GOI/District Administration / Local Authority guidelines to be considered
2	Norms for social distancing, training/ awareness, face masks, disinfection, sanitization, gate entry, quarantine, medical, action in case of suspect cases of COVID and other communicable diseases etc. to be followed as per Govt. and BHEL guidelines issued from time to time
3	Labour colony to be developed as close to the Site as possible to avoid lengthy commute
4	A "Suggestion Register" shall be made available at the labour colony for residents. The feedback shall be reviewed on weekly basis and acted upon by concerned Contractor. Same shall be reviewed periodically by authorized BHEL Site Official.
5	Canteens, Latrines & Urinals, Washing Facilities, Creches, Residential Accommodation and other infrastructure/ facilities: Numbers/ Quantities and Features of these facilities shall be in line with the following as applicable:
a.	BOCW Act & State Rules
b.	The Inter-State Migrant Workmen (Regulation of Employment and Conditions of Service) Act & State Rules
c.	Factories Act & State Rules
d.	Other Relevant Acts & Rules
6.	Cleanliness & Hygiene/ Housekeeping :
a.	Regular cleaning of the labour colony to be ensured.
b.	Daily cleaning of Sanitary facilities.
c.	Proper drainage system to prevent water-logging
d.	Regular fogging to prevent spread of mosquitoes
e.	Prevention of foul smell through necessary interventions
f.	Dust suppression as per requirement
g.	Cutting of Grass at regular intervals and other necessary measures to prevent pests & reptiles h. Stray animals to be banned from labour colony.
h.	Outside every common facility, eg. Toilet, washroom, food hall/ canteen etc., provision of washbasin with flowing water and soap (preferably liquid soap) to be ensured
7.	Power Supply Layout:
	Electrical supply Layout of Labour Colony shall have the provision of Safety devices like MCBs, ELCBs etc. and to be clearly displayed
8.	Washing & Drinking Water Availability
a.	Adequate water to be provided in line with : " Estimation of Water Requirements for Drinking and Domestic Use (Source: National Building Code 2016,BIS)"
b.	Drinking water tank to be cleaned every week and sticker for the same pasted on the tank
c.	Drinking water source should be tested as per IS 10500
9.	Waste Disposal:
	Separate bins for dry, wet and biomedical waste to be installed. These bins to be evacuated regularly
10	Training & Awareness/ Displays
a.	HSE Awareness Displays: Posters/ banners/ boards to be displayed in labour colony. Subjects of displays shall be precautions for applicable hazards at work site.
b.	b. Emergency Contact Numbers including that of Doctor, Hospital, Labour Colony Supervisor, HSE Officials to be displayed prominently
11.	Doctor Visits: Regular and need-based visits by Doctors to be ensured through tie-ups etc.
12	Inspection & Review: Regular inspection of labour accommodation to be carried out by the Contractor as per prescribed format. Last inspection date, inspector and next due date to be prominently indicated near main gate
13	Provision of a Fair Price shop in the premises to be ensured as per requirement
14	Adequate arrangements to be ensured in case of children/ families





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**ANNEXURE – F**  
**TOILETS**

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#### Toilets

Toilets (Latrines and urinals shall be ensured at Site and Labour Colony in accordance with the Inter-State Migrant Workmen Act, 1979 as given below:

#### LATRINES

1. Latrines shall be provided in every establishment on the following scale, namely: -

- a. Where females are employed, there shall be at least one latrine for every 25 females;
- b. Where males are employed, there shall be at least one latrine for every 25 males:

Provided that where the number of males or females exceed 190, it shall be sufficient if there is one latrine for 25 males or females, as the case maybe, up to the first 100, and one for every 30 thereafter

2. Every latrine shall be under cover and so partitioned off as to secure privacy, and shall have a proper door and fastenings.

#### URINALS

1. There shall be at least one urinal for male workers up to fifty and one for female up to fifty employed at a time:

Provided that where the number of male or female workmen, as the case may be, exceeds 500 it shall be sufficient if there is one urinal for every fifty females up to the first 500 and one for every 100 or part thereof thereafter.

2. The urinals shall be designed and located so as to ensure privacy.

#### Important:

1. Where workers of both sexes are employed there shall be displayed outside each block of latrine and urinal a notice in the language understood by the majority of the workers 'For Men Only', or For Women Only', as the case maybe.
2. The notice shall also bear the figure of a man or a woman, as the case may be.
3. The latrines and urinals shall be conveniently situated and accessible to workers at all times at the establishment.
4. The latrines and urinals shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times.
5. Latrines and urinals other than those connected with a flush sewage system shall comply with the requirements of the public health authorities.
6. Water shall be provided by the means of tap or otherwise so as to be conveniently accessible in or near the latrines and urinals.
7. At Site, on ground, Modular Bio-toilets as per industry standard specifications and regular professional cleaning shall be ensured. The toilets should be sufficient in number and easily accessible to workers from every work area
8. At Site, in various elevations, suitable urinals with proper drainage to be ensured at each elevation in line with IS 2064 (1993). Same to be cleaned regularly



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**ANNEXURE – G**  
**HSE COMPLIANCE DOCUMENT**

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#### HSE COMPLIANCE DOCUMENT

<b>Bill Ref no:</b>	<b>Date:</b>
<b>NAME OF THE AGENCY:</b>	<b>Work-Area/Package:</b>

Sl. No.	Description	Remarks
1	<b><u>HOUSE KEEPING :</u></b>	
1.1	All working areas at site (specific to the agency) are free from garbage's, scraps & any other undesired non-plant materials. There is no encroachment in safe passage of man, material & T&P to carry out activities safely	
1.2	All the plant materials under the custody of the agency are stacked & stored properly.	
2	<b><u>GENERAL ILLUMINATION :</u></b>	
2.1	ALL the working areas at site & office of the agency including passages are having proper & sufficient illumination.	
3	<b><u>STATUTORY &amp; REGULATORY REQUIREMENT :</u></b>	
3.1	Sufficient water for drinking & other purposes and sanitation in work area and labour colony are available.	
3.2	Periodical Medical check-up of workers & staff done regularly & report submitted to BHEL	
3.3	Regular EYE testing is done for Crane operators/Welders and data's are available with agency	
3.4	All the T&P, Cranes etc used by the agency are having proper T.Cs & Fitness certificate available from competent authority.	
4	<b><u>SAFETY COMPLIANCE:</u></b>	
4.1	Number of Tool box meetings between Safety officers, erection staff & workers of the agency held in this month with location mentioned	
4.2	All precautions & Safety measures including PPE compliances are taken before working at HEIGHT	
4.3	Permit for working at Height is taken & complied accordingly	
4.4	ELCB is used in Construction Power Supply source by the agency & Proper Distribution board and electrical cabling has been used by the agency and regularly checked by electrician & safety officer of the agency	
4.5	Unsafe areas barricaded properly & unsafe opening closed properly	
4.6	Proper Platforms & Hand-rails used In areas earmarked earlier	



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4.7	Proper safety signage's, Slogans & Emergency contact phone numbers including FIRE contact nos. are made available by the agency in locations mentioned	
5	Whether any penalty imposed by BHEL towards non-compliance of above points.	

#### VENDOR'S SIGNATURE

Erection Engineer	
HSE Officer	
Site-in-Charge	

#### BHEL'S SIGNATURE

Erection Engineer	
HSE Officer	
Package-in-Charge	



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**ANNEXURE – H**

**ACTIVITY - SPECIFIC SAFETY PRECAUTIONS / CONTROLS**

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<b>1.</b>	<b>WORK AT HEIGHT:</b>
a.	All work at height above 2 meter above ground level without complete platforms, handrails and other related fall protection shall require a work permit in the prescribed form. This shall require approval by the competent authority. The HSE officer of sub-contractors shall follow the checklist religiously by physically verifying the condition of the work area before recommending for approval.
b.	Prior to the start of work at elevation, the HSE Officer involved with the work must meet the work supervisor to review the scope of work, and must review all the possible fall hazards and effective safety responses. The evaluation / analysis must be documented and kept on file and onsite by the HSE Officer.
c.	Whenever a fall hazard or other exposure exists for working at heights more than 2.0m/6ft, the nature and scope of work will be evaluated for conditions and environmental factors before selecting the appropriate fall protection system (active, passive or a combination of measures, as appropriate).
d.	All Engineering and Administrative Controls including barricading, safe platform, Safety Nets etc. shall be made available at work location. Under no circumstances, there shall be total reliance on PPEs only
<b>e.</b>	<b>SAFETY NETS</b>
i.	Contractor shall maintain sufficient stock of Safety Nets for deployment
ii.	Safety Nets as per IS: 11057:1984 should be used extensively for prevention / arrest men and materials falling from height.
iii.	The safety nets shall be fire resistant, duly tested and shall be of ISI marked.
iv.	Safety Nets shall be deployed below all platforms where height work is envisaged. Duration of work, delay shall be no excuses for non-installation of Safety Net
f.	Reaching beyond barricaded area without lifeline support, moving with support of bracings, walking on beams without support, jumping from one level to another, throwing objects and taking shortcut must be discouraged.
g.	Monkey Ladder shall be fitted with cages. Rope ladder should be discouraged.
h.	For chimney or structure painting, both hanging platform and men should be anchored separately to a firm structure along with separate fall arrestor.
i.	The procedures for the safety response to identified fall hazards developed and rescue plans must be reviewed with all individuals exposed to the hazards.
j.	The HSE Officer must establish an inspection process of fall protection systems. Some equipment requires documented inspections by its manufacture on a regular schedule. Such equipment must have evidence of the inspection and re-certification process on it. This information must be reviewed before the equipment is actually used. Individuals must visually inspect the fall protection equipment before each use. Failure to complete this inspection process could result in serious injury or death.
k.	Immediately remove from service any fall protection equipment that is identified as defective, damaged, or has been subjected to an impact. Damaged fall protective equipment must be destroyed to prevent re- use and not be discarded into trash containers, as the worn or damaged equipment could be unintentionally re-used.
l.	Aerial lifting devices, excluding scissor lifts require the use of full body harnesses and lanyards in any elevated position.
m.	Where Height related works are applicable then rescue team (consist of 5- 10 person) shall be identified and trained for potential rescue.



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<b>1.1</b>	<b>Personnel fall protection system must include:</b>
<b>a.</b>	<b>Safety Harness</b>
	All height workers must use Full Body Safety harness with double lanyards with shock absorber (only). The primary lanyard is never unhooked until the secondary lanyard is secure. The design of the working platform should be such that under no circumstances, worker should have both lanyards unhooked while at height.
<b>b.</b>	<b>Lanyard</b>
i.	The type of work and the environment conditions determine lanyard and lifeline selection. If welding, chemical cleaning that may damage lanyards, connectors or lifelines, sandblasting, etc., either protect the components or use more appropriate type of system.
ii.	Lanyards and lifelines must incorporate, or be used with, an appropriate deceleration (shock absorbing) device. Deceleration devices include rope grabs, rip-stitch lanyards, specially woven lanyards, tearing, or deforming lanyards, automatic self-retracting lifelines and lanyards which dissipate or limit the energy imposed on the employee during fall arrest.
iii.	Once in use, the system's effectiveness is to be monitored. In some cases, a program for cleaning and maintaining the system may be necessary. Lanyard and lifelines must use locking snap hooks only and under no circumstances must two lanyard snap hooks be connected.
<b>c.</b>	<b>Lifeline</b>
	All lifelines in general are to be made of min 12mm dia. steel rope (plastic coated) and tied to columns with 3 clamps at each end. Wherever columns are not available to tie the lifelines, the vertical posts as per the design below are to be provided after carrying out drop load test initially. A load of 240kg to be dropped off the mid-point of lifeline in this test.
<b>1.2</b>	<b>Working Platform</b>
	Working platforms, gangways and stairways shall be so constructed that they do not sag unduly or unequally and if the height of the platform gangways provided is more than 3.6 m aboveground level or floor level, they shall be closely boarded and shall have adequate width, which shall not be less than 750 mm and be suitably fenced.
<b>a.</b>	<b>Precautions against the fall of Materials, Persons and Collapse of Structures:</b>
<b>1.3</b>	<b>Scaffolding</b>
	All scaffolds shall be conformant to the relevant standards including IS 3696 and IS 4014 as applicable. A sketch of the scaffolds proposed to be used shall be prepared and approval of the BHEL Engineer obtained prior to construction / use. Only cup lock type scaffoldings will be allowed in site. Where cup lock type scaffolding arrangement is not feasible by the virtue of the location, in that case only pipe and clamp type scaffolding will be allowed.
<b>a.</b>	The scaffolding work must be carried out by a competent person, who shall train the scaffold users on safety aspects
<b>b.</b>	All scaffolds shall be erected / dismantled by scaffolding crew under direct supervision of competent scaffolding supervisors.
<b>c.</b>	All scaffolds shall be capable of supporting 4 times maximum intended load and erected on sound, rigid footing, capable of carrying the maximum intended load without settling or displacement. Bamboo scaffolding is not permitted for use onsite.
<b>d.</b>	Each employee on the scaffold shall use an approved safety harness attached to an independent lifeline. The lifeline is to be securely attached to substantial members of the structure (not the scaffold itself) or to securely rigged lines, which shall safely suspend a worker in event of a fall.
<b>e.</b>	Guardrails and toe boards shall be installed on all open sides and ends of platforms more than (2) meters aboveground or floor
<b>f.</b>	Scaffold planks must be at least 5 cm x 25 cm (2" x 10") full thickness lumber scaffold grade or better.



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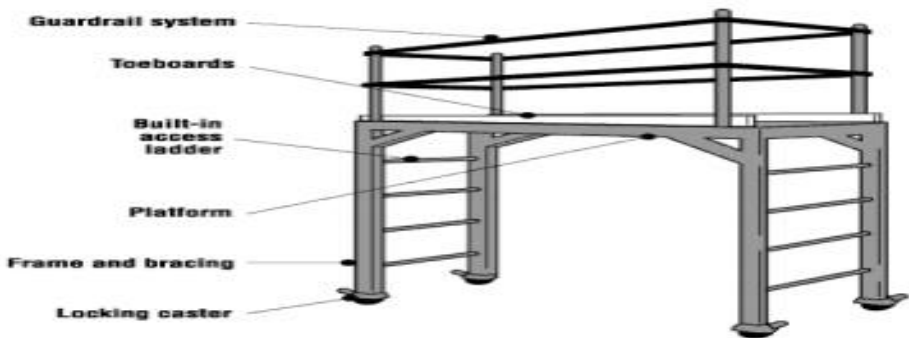
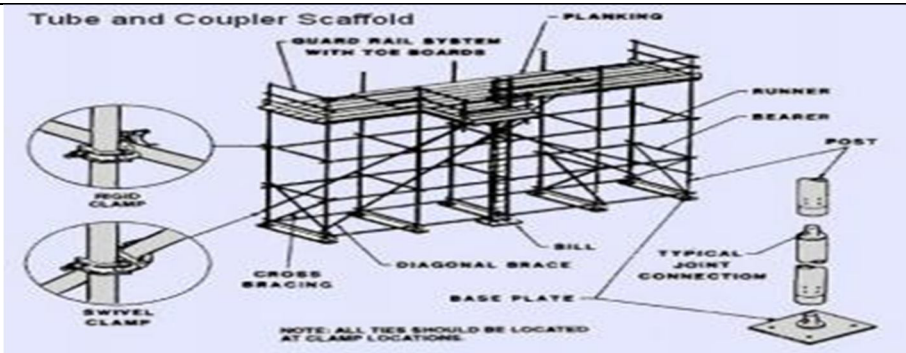
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g.	Scaffold planks shall not span distances greater than 2.5 meters (8 feet).
h.	Scaffold planks shall extend over end supports not less than 6 inches nor more than 12 inches and be secured to the scaffold. Scaffolding and accessories with defective parts shall be immediately repaired or replaced.
i.	All scaffolding must be a minimum of two planks wide. No one may work from a single plank.
j.	Scaffold planks must be inspected before use. Planks that have been damaged must be removed from the site.
k.	Access ladders must be provided for each scaffold. Climbing the end frames is prohibited unless the design incorporates an approved ladder.
l.	Adequate mudsills or other rigid footing capable of withstanding the maximum intended load must be provided.
m.	Scaffolds more the 6 meters (20 feet) in height must be tied to the building or structure at intervals which do not exceed 4 meters (13 feet) vertically and 6 meters (20 feet) horizontally.
n.	Do not overload scaffolds. Material should be brought up as needed. Scaffolding must not be loaded in excess of its rated capacity.
o.	Barrels, boxes, kegs, blocks or similar unstable object must never be used as work platforms or to support scaffold.
p.	Where persons must work under or pass under a scaffold then a 18 gauge wire mesh screen must be installed between the toe board and guard rail.
q.	Employees exposed to overhead hazards while working on a scaffold will be protected by 5 cm (2") thick planks.
r.	Wooden/bamboo ladders shall not be allowed at any cost. Ladder's rungs shall be fitted /welded properly. Before every use the rungs should be checked for safe use.
s.	Wooden scaffolds shall not be used in areas where fire / fire products are expected
t.	Ropes made of jute / Plastic and other fire prone material shall not be used to tie up scaffolding components together
u.	The platform should have permanent handrail and mid rail with Toe board without fail.
v.	All platforms are to be tightly planked for the full width of the scaffold, except as may be necessary for entrance openings. Platforms shall be secured in place.
w.	On suspension scaffolds designed for a working load of 500 pounds, no more than two workers are permitted to work on the scaffold simultaneously. On suspension scaffolds with a working load of 750 pounds, no more than three workers are permitted on the scaffold simultaneously.
x.	Requirements for different types of Scaffolds:
<b>A.</b>	<b>Suspended Scaffold</b>
i.	Suspended scaffolds are platforms suspended by ropes, or other non-rigid means, from an overhead structure.
ii.	Requirements for use are to be preapproved by HSE Head, under a specific Permit to Work.
<b>B.</b>	<b>Rolling Scaffolds</b>
i.	The height of rolling scaffolds shall not exceed three times the minimum base dimension
ii.	The minimum base dimension of rolling scaffold will be 1.25 meters (4 feet).
iii.	Adequate help must be provided when moving a rolling scaffold.



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iv.	Secure or remove all loose materials, equipment and tools before moving a rolling scaffold.
v.	No one is permitted to ride a rolling scaffold when it is being moved. Castor brakes must be locked-on when the scaffold is not being moved.
	
	Rolling Scaffold
	
	Tube & Coupler Scaffold
<b>1.4</b>	<b>Ladder Safety</b>
A sketch of the ladders proposed to be used shall be prepared and approval of the BHEL Engineer obtained prior to construction / use	
<b>a.</b>	<b>Safe Use of Ladders:</b>
i.	Fall protection is required when working on a ladder above 2 meters and when climbing above nearby guardrails.
ii.	Ladders must be inspected prior to use and by a competent person quarterly, with documentation.
iii.	Use portable ladders for height up to 4 M only
iv.	Provide fixed ladders for height above 4 M
v.	Place the ladder at an angle of 75 degrees (approx.) from the horizontal (1:4) vi. Extend ladder at least 1 M above the top landing
vi.	Secure top and bottom of the ladder firmly to prevent displacement- anti skid lining at the bottom
vii.	Ensure that the width of the ladder is not less than 300 mm and distance between rungs is not more than 300 mm
viii.	Provide landings of minimum size 600 x 600 mm at intervals not more than 6 M for fixed ladders. Check the ladders daily for any defects





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ix.	Ensure that the areas around base and top of the ladder are clear. Getting on and off the ladder is more hazardous than using it. Use a mudsill if the ladder is to rest on soft, loose or rough soil
x.	Do not use ladders of conducting material near power lines, and only use ladders near power line or other energize system with exposed parts if they are confirmed locked-out and de-energized.
xi.	Stand no higher than the fourth rung from the top for carrying out any job standing on a ladder.
xii.	Never reach out from a ladder to perform work where your belt buckle protrudes past the ladder rung.
xiii.	Always face the ladder while climbing up or down
xiv.	Maintain three-point contact while climbing up or down a ladder i.e. two hands and one foot or two feet and one hand on the ladder at all the times.
xv.	Avoid climbing up or down a ladder while carrying anything in hands. Lift tools, equipment and materials with a rope.
xvi.	Work from portable and extension ladders near guardrail where fall expose exists over the guardrail regardless of height, and above 2.0 Mtrs. heights from the working/walking surface will require the use of personal fall arrest equipment
<b>2.</b>	<b>EXCAVATION &amp; CIVIL WORKS</b>

All safety precautions shall be taken for foundation and other excavation marks as per IS-3764.

#### 2.1 Excavation

a.	The following safety measures are to be ensured before and during excavation:
b.	All Excavation activities more than with depth of 1.22 meter or more shall require and Excavation Work Permit
c.	Electrical cables and service lines to be identified using cable detector/locator device before carrying out the excavation work
d.	Hard Barricading is provided at excavated pits. It should be made of scaffolding pipe and clamp with reflective nets.
e.	All Excavated area of depth 3mtr or more is to be hard barricaded with pipe.

Soil Type	Height/Depth ratio	Slope Angle
Stable Rock	Vertical	90 deg.
Type A	¾ : 1	53 deg.
Type B	1 : 1	45 deg.
Type C	1½ : 1	34 deg.

Type	Description	Examples
<b>A</b>	Cohesive soils with an unconfined compressive strength of 1.5 tons per square foot or greater.	Clay, silty clay, sandy clay, clay loam and in some cases: silty clay loam and sandy clay loam.
<b>B</b>	Cohesive soils with unconfined compressive strength greater than 0.5 tsf but less than 1.5 tsf.	Angular gravel (similar to crushed rock), silt, silt loam, sandy loam and, in some cases silty clay loam and sandy clay loam.
<b>C</b>	Cohesive soils with unconfined compressive strength greater than 0.5 tsf or less.	Granular soils such as gravel, sand and loamy sand; submerged soil or soil from which water is freely seeping; submerged rock that is not stable.

Fig. Excavation Reference





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#### 2.2 Piling

Ensure the following precautionary measures before starting piling works:

- a. Inspection of piling equipment by responsible person for its condition before initiating piling operation.
- b. Checklist and OCP for piling to be prepared using manufacturer's instructions and used
- c. Testing and its certification wire rope, slings, D-shackles, chain pulley blocks using in the process of piling work by competent person
- d. Adequate support and secured foundation of the piling equipment to avoid toppling e. Hoses should be lashed and adequately secured
- e. Proper work platform is to be provided on piling frame
- f. Safe work procedures and close supervision to prevent unsafe acts of operators/any unsafe conditions that may arise
- g. Only experienced and trained operators are engaged for the piling operation
- h. Provision of Personal Protective Equipment (PPE) like safety shoes/gumshoes/safety helmet/safety belt etc. and its use by their workmen.
- i. Special care and precautions If work is near electrical live cables/ electrical equipment
- j. Cordoning of work area to prevent unauthorized entry
- k. Guarding of revolving parts
- l. Specific measures to prevent overturning of pile driver/missing of hammer/ hammer movement out of range

#### 2.3 Batching Plant Operation

Following Safety considerations for batching plant are to be ensured:

1. Modern type batching plant should be used in which all the moving parts are protected and emergency and safety features are incorporated.
2. Safety audit to also focus on Batching plant.
3. The site shall impose penalty on the agency who has violated the safety norms as per contract.

#### 2.4 Mobile Plant

Mobile plant includes tractors, trailers, dumpers, excavators, bulldozers, road rollers etc. for earthmoving purpose and concrete mixers, concrete transit mixtures, concrete pumps etc for concreting purpose. Due to the very nature of their function and movement in difficult terrains, congested areas, working in tandem with manual work and other operations the danger is inherent.

Automatic reverse camera with reverse horn connected with reverse gear is compulsory for all moving machineries.

Following Safety measures to be ensured for Mobile Plant:

- a. Where movement around site is involved, routes should be planned, obstruction free and well maintained
- b. Observe specified speed limits



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c.	Operating personnel should be aware of associated risks and its preventive measures
d.	Only experienced, trained and authorized persons with valid license (wherever applicable) should operate the mobile equipment/vehicles
e.	Provide and use Warning lights and reverse horn for cautioning the people around
f.	Operation should be on level and stable ground with adequate working clearance
g.	Loading of out riggers/stabilizers should be well within safe ground bearing capacity
h.	No person should be on equipment or vehicle during loading and unloading of material
i.	Operators should be protected by warning barriers or switching off power when working in close proximity of overhead power lines
j.	The equipment /vehicles should be well maintained and provided with effective brake system and other safety devices (wherever require)
k.	Rotating parts of equipment should be adequately guarded
l.	Provide necessary personal protective appliances and ensure its use by the operating personnel Ensure effective measures at source to control harmful emissions, dust, fumes contaminating atmosphere and cause health hazards to the operators and people in the vicinity
m.	No overloading/over stressing of vehicles/plant is allowed
n.	Hoses, pipes, receivers, gauges and valves involved in carrying out hydraulic fluid/ compressed air should be checked for leaks and tested prior to operation.
o.	Adequate safe clearance for swing and movement is to be judged during operation of Concrete mixer p. Setting of machines on firm and level ground with wheel locked to prevent movement of machine
p.	Proper instructions and Special precautions are to be ensured to prevent entry into the danger zone of projectile of bucket while dropping bucket
q.	Operator leaving work spot should ensure that the equipment/vehicle is kept in neutral position and place on firm and level ground.
r.	The hand brake should be kept in position and block road wheels as additional safety measure
s.	Blades/buckets should be kept low while moving
t.	The dozer blades should not be used as brakes except in emergency
u.	The ground should be examined for its bearing capacity and general safety especially when operating road roller at the edges of slopes, embankments.
v.	The roller should not be moved downhill with the engine out of gear
w.	If operating near excavations the following precautionary measures are to be ensured
x.	Barricading, edge protection to prevent fall of persons/vehicles overrunning while reversing etc
y.	Suitable support system and adequate allowance to avoid the danger of side collapsing
z.	Experienced signaler /attendant should be always accompanied with operator/driver for proper direction /signal and also to caution others in the working Zone during operation of mobile plant
<b>2.5</b>	<b>Concrete Vibrators</b>
a.	Revolving parts/belt drives should be adequately guarded and Vibrating unit shall be completely enclosed and have suitable overload relays and effectively earthed
b.	Ensure sufficient length of cable to the Vibrator.
c.	Ensure electric starters and other accessories are firmly fixed adequately supported
d.	Ensure locking of needle load while inserting needle into the vibrator
e.	Ensure periodical lubrication and maintenance
<b>2.6</b>	<b>Concrete Mixers</b>
a.	Setting of machines on firm and level ground with wheel locked to prevent movement of machine
b.	Proper instructions and Special precautions are to be ensured to prevent entry into the danger zone of projectile of bucket while dropping bucket



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<b>3.</b>	<b>WELDING &amp; GAS CUTTING SAFETY (HOT WORK)</b>
a.	All Hot Work shall require a Hot Work Permit
b.	Inbuilt Voltage Reduction Device (VRD) equipped arc welding machine will only be allowed for work.
c.	There shall be flash-back arrestors conforming to IS-11006 at both cylinder and burner ends. Damaged tube and regulators must be immediately replaced.
d.	Appropriate fire-fighting equipment is to be available in close proximity of any welding and gas cutting operations at all times suitable for the type of Fire.
e.	Drums, tanks, and similar containers that have contained flammable or toxic material shall not be welded, cut, or heated until they have been made safe by water filling, thorough cleansing or similar accepted practices. The container shall also be ventilated during the welding, cutting, or heating process.
f.	Splatter / Slag Collector:

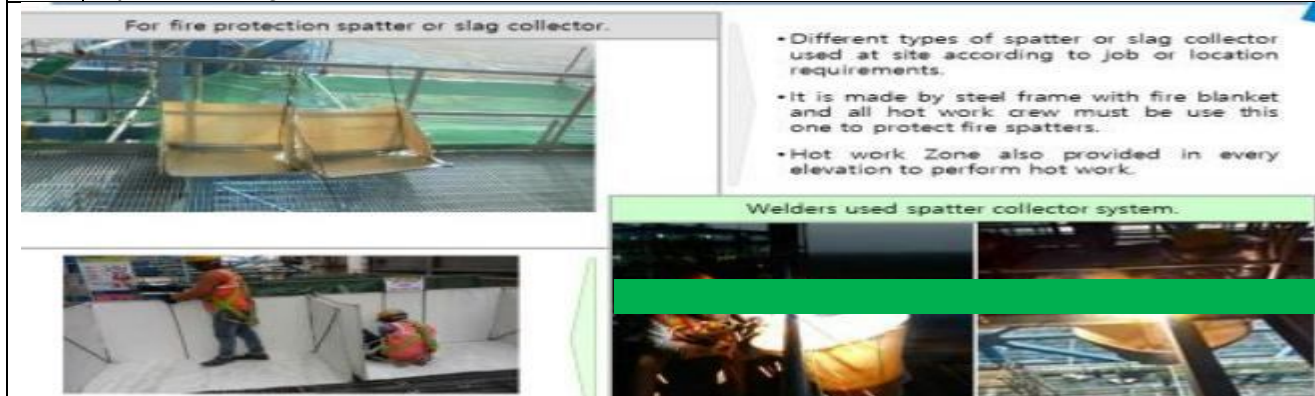


Fig. 4.1 Splatter / Slag Collector

While carrying out job at height, the sparks or molten slag shall be prevented from falling down by putting a fire-resistant (non-asbestos) sheet or patter/ slag collector or even MS Sheet. The passage of falling sparks or molten slag shall be barricaded till ground floor and any cable/ tubes/ any other objects interfering in the passages shall either be removed or covered with Fire-resistant sheet or MS Sheet.

<b>g.</b>	<b>COMPRESSED GAS</b>
i.	All cylinder valves shall be closed when any work is finished and when any Cylinders are empty or being moved. Valve protection caps shall be placed and secured properly before gas cylinders are transported, moved or stored.
ii.	Compressed gas cylinders shall be secured in an upright position with chain or appropriate means during storage & use. However, a trolley shall be used for transportation.
iii.	Compressed gas cylinders shall always be secured from tipping or falling, whether in use, in storage or in transit. The cylinders shall always be secured upright, except during times when actually being hoisted or carried.
iv.	When cylinders are transported by powered vehicle they shall be secured in a vertical position.
v.	Regulators shall be removed when cylinders are not in use or are in transit, unless the cylinder is firmly secured on a special carrier designed for this purpose.
vi.	Gas cylinders are not allowed to be used in man-basket when occupied.
vii.	Cylinders containing oxygen or fuel gasses shall not be taken into confined spaces.
viii.	Oxygen cylinders shall be stored a minimum of 6 meters from fuel gas cylinders or shall have an approved firewall between them.
ix.	All cylinders shall be kept at a safe distance from welding or cutting operations or shielded from arc/ sparks / slag.
x.	All cylinders shall be placed where they cannot become part of the electrical circuit.
xi.	Oxygen and acetylene shall not be stored together. Oxygen must be separated from acetylene (or ANY fuel gas) or combustible material by at least 20ft or a barrier with a 30-minute fire resistance rating.



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xii.	All Cylinders should be stored upright in a designated area with labels for the type of gas. All applicable precautions to be ensured during storage
xiii.	Oxygen and fuel gas regulators, hoses and associated equipment shall not be altered and shall be in proper working order while in use.
xiv.	Compressed air can be extremely dangerous if allowed to penetrate the skin. As such, the use of compressed air to clean off yourself or other workers shall be strictly prohibited.
xv.	All gas cylinders shall be stored in upright position. Suitable trolley shall be used for cylinder movement, the design of which shall be submitted to BHEL Engineer for approval.
xvi.	No of cylinders shall not exceed the specified quantity as per OCP
xvii.	Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dragged, struck or permitted to strike each other violently.
xviii.	All cylinder should be kept only in cylinder trolley.
xix.	Cylinder shall be transported in upright vertical position by suitable mean.
<b>4.</b>	<b>LIFTING &amp; RIGGING SAFETY</b>
a.	All Heavy / Complex Lifting operations as defined in Clause 6.13 (Under Clause 6) shall require a Lifting Work Permit. A written rigging procedure and plan must be prepared for all individual heavy/ complex lifting operations
b.	All the cranes and lifting tools & tackles shall be inspected on daily / weekly basis as well as monthly by expert as per applicable formats.
c.	In addition, inspection / certification as mandated by law shall be carried out wherein these shall be tested and certificates of fitness shall be obtained from 3rd party State Govt. approved competent agency before deploying at site and later periodically. BHEL shall be given advance intimation of any such inspections
d.	The last date of Third-Party Inspection and the next Due date shall be conspicuously displayed on all cranes. A copy of certificate shall be pasted on operator's cabin of all the lifting equipment.
e.	Specifically designed heavy steel plates lifting clamps shall be used for lifting heavy metal sheets. Manmade lifting clamp chapa shall not be used for lifting/shifting of plates.
f.	Mobile phone should be banned for crane operator and lifting operation. Only walkie talkie shall be allowed in rigging/Lifting purpose.
<b>g.</b>	<b>Lifts/Movements between 5 Tons and 20 Tons:</b>
i.	Shall include a rigging plan, detailing schematic representation of the handling/lifting operations that must be included on the Method Statement.
ii.	When performing similar lifts of identical items, only one rigging plan need be prepared, provided each of the lifts can be performed in accordance with the rigging plan.
<b>h.</b>	<b>Lifts/Movements Less Than 5 Tons:</b>
	An equipment rigging plan is not required for lifts less than 5 tons, safety measures are covered in the JSA. This could change as per BHEL requirement
<b>i.</b>	<b>Personnel Lifts (Man-Basket / Jhoola):</b>
The design of personnel man basket shall be submitted to BHEL Engineer for approval before use. Relevant permit (Height work & others as applicable) shall be completed prior to lifting any people, along with a rigging plan.	
i.	A separate Lifeline / fall arrestor anchored to a fixed structure outside of Jhoola shall be provided for the workers inside the basket. All occupants of the basket shall have Safety Harnesses equipped with rope grabs, which are to be hooked to the vertical lifeline.
ii.	Man-basket shall be used where access through ladders or scaffolding is not feasible.
iii.	Man-baskets shall be designed and engineered by a manufacturer (job made man-baskets are not allowed, unless designed and tested by a certified engineer), and built robust with MS Angles and flats or plates or channels only.
iv.	Guard rails top and mid, must be in place and screened-in to avoid material from falling out of basket. The factor of safety shall be 200%.
v.	It shall have a door with double latches and shall open inside. Anchor points shall be identified within the man-basket.



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| vi.   | The man-basket shall be thoroughly inspected and load tested and a trial run performed without personnel before being put to job.  |
| vii.  | It shall be treated as a lifting tool (T&P Item) and shall undergo same certification cycle and inspection as other lifting equipment.   |
| viii. | An additional sling of required lifting capacity shall be fixed the man-basket main lifting point and attached to the crane above the ball or block.                               |
| ix.   | While lifting man-basket, the crane shall maintain a uniform speed of lift without any swing   |
| x.    | Once man-basket reaches the destination, the lift brakes shall be locked as long as the basket a. remains at that point. The same care shall be taken in its descent               |
| xi.   | As for hanging man-basket, the same shall be hung off a rigid structure with help U-shaped handle welded to man-basket. This shall be tested once in a year by a competent person. |
| xii.  | Use of Rebar steel for making and monkey-ladder must be avoided.   |

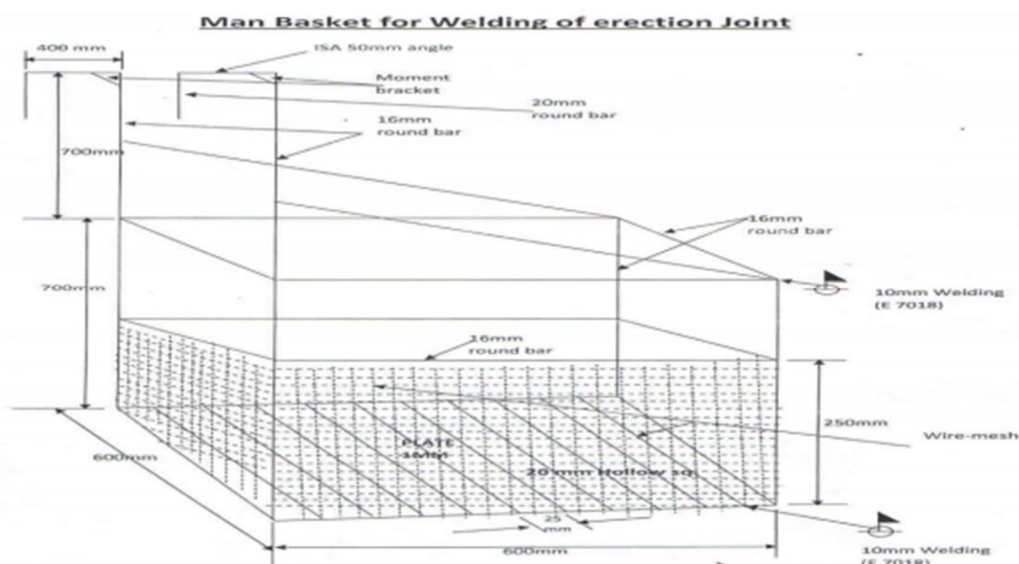


Fig. Man Basket for Welding Erection Joint

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| j. | Only BHEL Approved Plate Lifting Spreader Beam configuration shall be used (Sample in Fig.) |
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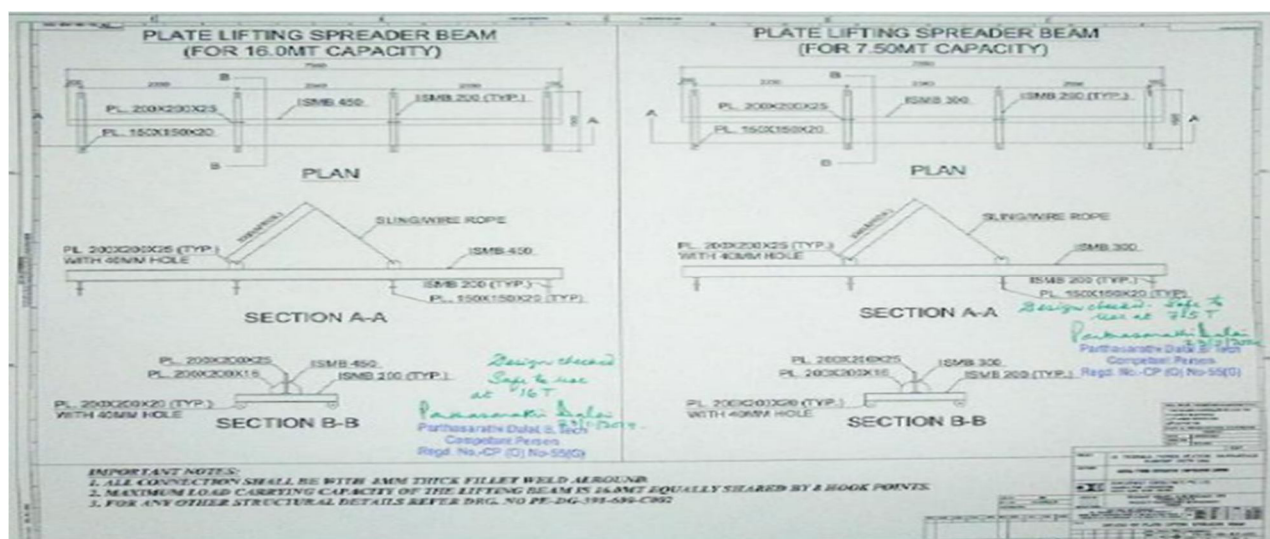


Fig. Typical Plate Lifting Spreader Beam Configuration for 7.5 MT and 15 MT Loads.

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| <b>k.</b> | Crane operators must follow the following:<br>i. Pass an annual Operator's Physical examination<br>ii. Carry a valid training certification card at all time while operating issued by the Govt. or other |
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	recognized institute.
<b>I.</b>	<b>Rules for Safe Rigging</b>
i.	Use loops, thimbles and corner pads to prevent damage to slings when used around corners or on cutting edges.
ii.	Never allow wire rope to lie on the ground for any length of time or on rusty steel or near solvents, chemicals or corrosive substances.
iii.	Slings must not be pulled from between or under loads with load resting on the sling
iv.	Keep all rope away from flame cutting or welding operations.
v.	Never use rope as sling material.
vi.	Never wrap a wire rope completely around a hook.
vii.	Do not bend wire rope near any attached fitting
viii.	The sling must be selected to suite the most heavily loaded leg rather than the total weight when using multi-legged sling to lift loads in which one end is heavier than the other.
ix.	When using 3 and 4-legged sling configurations, any two legs must be capable of supporting the entire load.
x.	Where possible, wire rope choker hitches must include a shackle with the eye around the shackle pin to prevent breaking wires of the choke. The choker hitch must be "snugged down" prior to lifting, not after tension is applied.
xi.	Unless authorized by the hook manufacturer when more than two rope eyes are placed over a hook, install a shackle, pin resting in the hook, and place the rope eyes in the bowl of the shackle
xii.	Properly rig all loads to prevent dislodgment of any part.
xiii.	Use guide ropes or tag lines to prevent the rotation or uncontrolled motion of the load when necessary.
xiv.	Loads must be safely landed and properly blocked before being unhooked and unslung. Tag lines must not be used in situations that jeopardize the safety of the lift.
xv.	Lifting beams must be plainly marked with their weight and designed working load and must only be used in the manner for which they were designed.
xvi.	The hoist rope or chain must never be wrapped around the load. The load must be attached to the hook by slings or other rigging devices that are adequate for the load being lifted
xvii.	Multiple part lines must not be twisted around each other
xviii.	The hook must be brought over the Centre of gravity of load before the lift is started
xix.	If there has been a lack rope condition, determine that the rope is properly seated on the drum and in the sheaves prior to lifting.
xx.	Keep hands away from pinch points as the slack is being taken up.
xxi.	Leather gloves are recommended when handling wire rope.
xxii.	Avoid impact loading caused by sudden jerking when lifting or lowering. Lift the load gradually until the slack is eliminated.
xxiii.	Never ride on a load that is suspended.
xxiv.	Avoid allowing the load to be carried over the heads of any personnel.
xxv.	Never work under a suspended load until the load has been adequately supported from the floor and all conditions have been approved by the supervisor in charge of the operation.
xxvi.	Never leave a load suspended unless emergency evacuation is required.
xxvii.	Never make temporary repairs to sling.
xxviii.	The capacity of a sling is determined by its angle, construction, type of hitch and size.
xxix.	Never lift loads with one leg of a multi-leg sling until the unused legs are made secure.
xxx.	Never point load a hook unless it is especially designed and rated for such use.
xxxi.	Make certain that the load is broken free before lifting and that all legs are taking the load.
xxxii.	When using two or more slings on a load make certain all slings are made from the same materials.
xxxiii.	Lower the loads on to adequate blocking to prevent damage to the slings.
xxxiv.	Materials and equipment being hoisted must be loaded and secured to prevent any movement which could create a hazard in transit.





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xxxv.	The weight of the hook, load block and any material handling devices must be included when determining crane capacity.
xxxvi.	Calculated weights cannot exceed load chart without written approval.
xxxvii.	Personnel must be completely clear of loads being picked up or set down by crane. Tag lines will be used to control the loads. Loads must not be touched by hand while placing/ moving.
<b>m.</b>	<b>Slings</b>
The following are rules for safe use of synthetic slings:	
i.	Synthetic slings must be marked to show the rated capacity for each type of hitch and type of web material.
ii.	Nylon web slings must not be used where fumes, vapors, sprays or mists or liquids of acids or phenolic are present. Web slings with aluminum fittings must apply in this category.
iii.	Synthetic web slings must be removed from service and destroyed if any of the following conditions are present:
a.	Acid or caustic burns
b.	Melting or charring of any part of the sling surface
c.	Snags, punctures, tears or cuts
d.	Broken stitches
e.	Distortion of fittings
f.	Synthetic web slings of polyester or nylon must not be used at or come in contact with temperatures in excess of 82°C
g.	Polypropylene web slings must not be used at or come in contact with temperatures in excess of 93°C
h.	Insulated hooks must be tested yearly to ensure insulation integrity to at least manufacturer's specifications.
<b>n.</b>	<b>Wire Rope Slings must be removed from service and destroyed if any of the following conditions are present:</b>
i.	In (10) randomly distributed wires broken in one (1) rope lay, or five (5) broken wires in one (1) strand in one (1) rope lay.
ii.	Wear or scraping of one-third the original diameter of outside wires.
iii.	Kinking, crushing, bird caging or any other damage resulting in distortion of the wire rope structure such as:
iv.	Evidence of heat damage.
v.	End attachments that are cracked, deformed worn.
vi.	Corrosion of the rope or end attachments.
<b>o.</b>	<b>Metal mesh slings must be immediately removed from service if any of the following conditions are present:</b>
i.	A broken weld or broken brazed joint along the sling edge.
ii.	Reduction in wire diameter of 25 percent due to abrasion or 15 percent due to corrosion.
iii.	Lack of flexibility due to distortion or corrosion.
<b>p.</b>	<b>Requirements of Plate Clamps:</b>
i.	The rated load of the plate clamp must be marked on the main structure.
ii.	Care must be taken to make certain the load is correctly distributed for the plate clamp being used.
iii.	Do not allow load or plate clamp to come into contact with any obstruction.
iv.	The plate clamp must not be used for side pulls or sliding the load.
v.	When lifting stainless steel or special alloys, ensure plate clamp is designed for use on the specific metal.
<b>q.</b>	<b>Signaling Practices:</b>

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- The "slinger" is responsible for attaching and detaching the load to and from the crane. He shall:
  - have received appropriate training on general safe lifting operations;
  - be capable of selecting lifting gears suitable for the loads;
  - liaise with the operator and direct the movement of the crane safely.
- The "signaller" is responsible for relaying the signal from the slinger to the crane operator. He shall:
  - have received appropriate training on general safe lifting operations;
  - be able to direct the movement of the crane and loads.

#### Suggested hand signals



**Note:** During the lifting operation, either the slinger or signaller shall communicate with the operator. Other communication methods (e.g., wireless walkie-talkies, telephones, etc.) may also be used.

Fig. Recommended Signaling Practices

#### 5. DEMOLITION WORK

Before any demolition work is commenced and also during the process of the work the following shall be ensured, besides using the Work Permit:

#### 6. T&PS GENERAL

- a. Tagging and punching in all lifting tool is compulsory with SWL, sr. no. and due date.
- b. All T&Ps shall be inspected by authorized Third Party agency as per applicable frequency. BHEL shall be kept informed of any such scheduled inspection
- c. All T&Ps shall be internally inspected in each quarter and color coded.

#### 7. ELECTRICAL SAFETY

- a. Only electricians licensed by appropriate statutory authority shall be employed by the subcontractor to carry out all types of electrical works. The contractor shall maintain adequate number of qualified electricians to maintain his temporary electrical installations.
- b. No PDB or any other distribution board shall be more than 03 (three) years of purchase. Only modern PDB with industrial sockets as shown in layout below to be allowed to use at site.
- c. Power supply to all equipment at site to be routed through MCBs of appropriate rating. A 'Power Supply Distribution Plan' shall be prepared and submitted to BHEL Engineer for approval
- d. All power supplies through cables shall be underground or overhead with height > 3mtrs.
- e. All power distribution boxes shall be locked and the key controlled by site management of concerned subcontractor.
- f. All individual equipment & tools at site shall be powered through Earth Leakage Circuit Breakers of 30 mA sensitivity.



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g.	These MCBs and ELCBs shall be regularly tested and documented in BHEL format.
h.	All fuses and fuse wires shall be of standard size and rating.
i.	All electrical appliances used in the work shall be in good working condition and shall be properly double earthed other than armor earthing.
j.	All extension boards shall have separate switches for all sockets / connections.
k.	All portable electric tools used by the subcontractor shall have safe plugging system (industrial top & socket) to source of power and be appropriately earthed.
l.	Providing adequate no. of 24 V sources and ensure that no hand lamps are operating at voltage level above 24 Volts especially in confined spaces like inside water boxes, turbine casings, condensers etc.
m.	Electrical appliance shall have proper earthing and for appliances equal to & more than 415V shall have two separate earthing (as per IS-3043-1987)
n.	Portable Electric Lights
i.	Portable electric lights used in wet or potentially wet locations must be either low voltage type (24 volts or less) or protected by a GFI (ground fault interrupter).
ii.	They must be visually checked before each use and periodically while in use to assure their original integrity is maintained.
iii.	Cords with cuts, breaks, deep abrasions, etc. shall be taken out of service immediately.
iv.	Repairs to extension cords shall only be performed by qualified/ licensed electricians.
v.	Must not be allowed to lie in wet or potentially wet areas.
o.	Underground Cables:
i.	Every electric line or cable of unknown origin that is discovered or exposed during a digging, drilling, probing, or similar operation is to be considered as energized and life threatening.
ii.	The senior company employee on the site will ensure that all necessary safety precautions are taken in order to isolate the line from all workers and the public.
iii.	Such precautions may include halting the operation if appropriate.
iv.	The senior company employee on the site is to then contact the proper authorities to have the line identified and either confirmed to be abandoned and/or made safe for continuing the work.
v.	Any and all underground lines that are discovered or become severed must be considered energized on both sides, and be treated accordingly.
p.	Details of earth resource and their test date to be given to BHEL safety officer as per the prescribed formats of BHEL
q.	The subcontractor shall use only properly insulated and armored cables and conform to the requirement of Indian Electricity Act and Rules for all wiring, electrical applications at site.
r.	BHEL reserves the right to replace any unsafe electrical installations, wiring, cabling etc. at the risk & cost of the subcontractor.
s.	No maintenance work shall be carried out on live equipment
t.	Adequate precautions shall be taken to prevent danger for electrical equipment. No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public
u.	The subcontractor shall carefully follow the safety requirement of BHEL/ the purchaser with the regard to voltages used in critical areas.
v.	Wiring and Branch Circuits Must be protected by a proper amperage over-current device such as a HRC fuse or circuit breaker. Such installations must be located so as to prevent physical damage to the wire conductors & panels.
w.	The sub-contractor shall supply modern power distribution board of different combination (1-phase & 3- phase). All the distribution of power should be through modern PDB. Equipment drawing is mentioned below.



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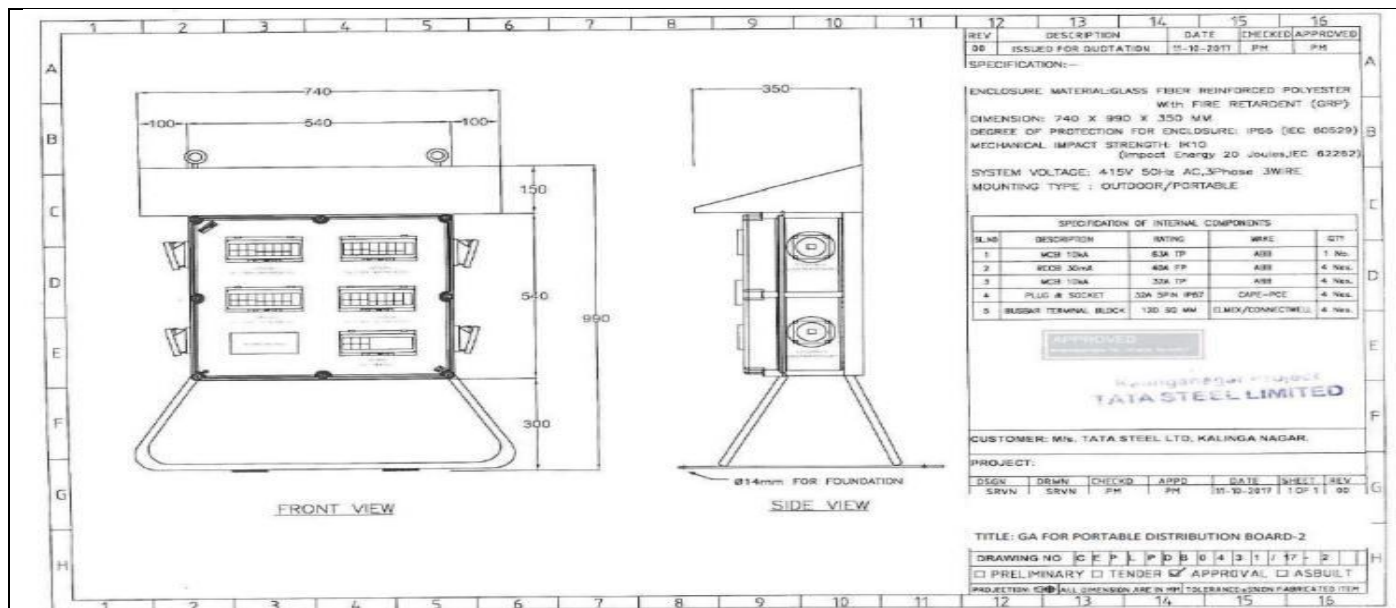


Fig. Layout of a modern Power Distribution Board




<b>x.</b>	<b>General Electrical Safety</b>
i.	In general, equipment or machinery being moved or transported must maintain minimum clearances of 25 ft. to all power lines.
ii.	TAG IN/ TAG OUT must be in force in Switch Room and all Distribution Boxes for live power line. The authorized person's name and contact no shall be displayed
iii.	Ensure "double insulated" three - core cables and three pin connectors are used and are properly ground "all insulated" types, all electrical tools and appliances must be manufactured for industrial use.
iv.	All connections shall be electrically and mechanically sound and properly insulated. Taped joints are not permitted. Connections to socket outlets must be made with proper plugs (industrial top and socket).
v.	Splices in electrical cords are not permitted. Repairs must be made at the socket connection and retain the same mechanical and dielectric condition of the original connection.
vi.	Damaged or defective electric tools, equipment and extension cords, etc. must not be used and shall be tagged out of service, removed from the work area and taken back to stores.
vii.	Only licensed electricians are authorized to repair and work on electrical equipment. Tampering with electric tools or equipment by others could result in termination.
viii.	Temporary electric cabling should be elevated 2.2 meters above the floor/ground or covered for protection. It must be kept clear of walkways and other locations where it may be exposed to damage or create a tripping hazard.
ix.	Energized wiring junction boxes, circuit breaker panels and similar places must be covered and locked at all times.
x.	Areas with live high voltage wires or terminals must be barricaded against entry and warning signs posted Danger - High Voltage and Authorized Personnel Only.
xi.	Personnel should never work on energized equipment, de-energizing (lockout/tag out) the equipment is always the first requirement.
xii.	The lockout and tag out procedure will be used when testing or working on, or around, energized installation.
xiii.	Working around energized equipment should never be done alone. A second electrician must always be available for assistance.
xiv.	If lockout/tag out of the work is infeasible (must be demonstrated), work on energized electrical circuits must be approved by the Site In-charge. All safety precautions necessary must be taken, PPE use must be evaluated per the exposure and used, i.e high/low voltage gloves, insulated shoes, overcoats/aprons, face shields, and other protective equipment like insulated





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	tools, blankets, mats, etc. must be used.
xv.	The welding machines earth leads shall be properly fixed without loose contacts. The earth cable only has to be used. No steel members shall be used as earth leads.
xvi.	Electrical crews must be qualified for the equipment and tools they work on, including being trained in Cardio-Pulmonary Resuscitation (CPR) methods and First Aid for rendering help in the event of electric shock.
y.	Qualified Persons for Electrical Works (One who is trained and wiremen licensed to Govt. of Respective State and familiar with the construction, operation and safety hazards of the equipment upon which they are permitted to work. )
i.	Qualified persons are intended to be only those who are well acquainted/experienced with and thoroughly conversant in the electric equipment and electrical hazards involved with work being performed.
ii.	Only qualified persons may be permitted to work on or near exposed energized parts. Such persons are required to have been trained in three specific areas:
iii.	Qualified persons must be capable of working safely on energized circuits;
iv.	Must be familiar with the proper use of special precautionary techniques and procedures bases on equipment and exposure; and
v.	Must be familiar with required personal protective equipment, insulating and shielding materials, and insulated tools.
vi.	Qualified persons are expected to be able to evaluate unknown situations and adjust their activities in such a way that only safe work practices are used. Such behavior is the responsibility of the qualified person.
vii.	It is possible and likely for an individual to be 'qualified' with regard to certain equipment in the work place, and unqualified on other equipment they must know their limitation and stop work if not qualified on what equipment they were to work on.
viii.	An employee who is undergoing on-the-job training, who, in the course of such training, has demonstrated an ability to perform duties safely at his or her level of training, and who is under the direct supervision of a qualified person is considered to be a qualified person for the performance of those duties. The process must be documented as proof.
<b>z.</b>	<b>Mandatory PPEs of electrical work on LV &amp; HV</b>
i.	HV arc flash suit with protective hood (for protection of face and head) as specified for hazard risk category-4 in NFPA-70E or similar IS specification for working on HT switchgear (for all voltage >690 V) to the concerned licensed electrician or competent person
ii.	LV arc flash jacket/FR as specified for hazard risk category-4 in NFPA-70E or similar IS specification having ATPV rating of 8.5 to 9 cal/cm <sup>2</sup> for working on LV (>260V and ≤690V) to the concerned licensed electrician or competent person.
  	
iii.	The LV arc flash jacket as shown above shall be worn continuously while working on LV (>260V and ≤690V). The color specification of LV arc flash jacket should be blue.
iv.	Electrical hand gloves should have following specification: Flame resistance, arc flash and cut protection of voltage rating (>260V and ≤690V).
v.	Electrical safety overshoe of relevant IS make for foot protection of licensed electrician or competent person while working in HV & LV line or equipment.



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<b>8.</b>	<b>PAINTING:</b>
<b>a.</b>	Requirements provide a detailed procedure to be implemented by all concerned employees and sub- contractors involved in painting activities.
<b>b.</b>	Significant Environmental Hazards:
i.	Chemical hazard due to inhalation of lead fumes (lead containing paint)
ii.	Chemical hazard due to inhalation of VOC's from painting operations
iii.	VOC's from painting and coating operation
iv.	Disposal of paints and coats drums
<b>c.</b>	Control Procedure for Painting:
i.	Chemical products used in painting and coating operation shall have proper MSDS sheet in place. Whenever any doubt arises with respect to handling and safety point of view it should be accessed to all concerned.
ii.	Toxic substances and hazards relate the toxic chemicals shall be identified.
iii.	Proper PPE shall be used including plastic gloves appropriate overall etc.,
iv.	Arrangement for cleaning of spillage shall be ensured
<b>d.</b>	Only trained workers shall be allowed and proper training should be imparted to the works.
<b>e.</b>	Exposure limits of the toxic substances shall be checked before starting the work and nobody shall be allowed to carry the work beyond the permissible limit.
<b>f.</b>	Ventilation or exhaust facility shall be provided at place where painting and coating operations are carried out.
<b>g.</b>	Overalls shall be supplied by the contractors/subcontractors to the workmen and adequate facilities shall be provided to enable the painters to wash at the cessation of work.
<b>h.</b>	Smoking, open flames or sources of ignition shall not be allowed in places where paints and other flammable substances are stored.
<b>i.</b>	A caution board in national /regional language "smoking strictly prohibited" shall be displayed in the vicinity.
<b>j.</b>	Suitable fire extinguishers/sand buckets shall be kept available at places where flammable paints are stored, handled or used.
<b>k.</b>	In case of indoor painting or painting in confined spaces, exhaust ventilating shall be provided. If adequate ventilation is not provided a proper respirator shall be provided and used by persons who are trained and fit tested.
<b>l.</b>	The VOC's from painting and coating operations shall not exceed the permissible level of CPCB/SPCB norms. The paints and coats must be selected as per the guidelines.
<b>m.</b>	Workers shall thoroughly wash their hands and feet before leaving the work.

### 9 "HAZARDOUS ENERGY" CONTROL PROCEDURE/ LOCKOUT/TAGOUT (LOTO)

Hazardous Energy Control Procedures, known as "Lockout/Tag out (LOTO)" refers to specific practices and procedures to safeguard employees from the unexpected energization or startup of machinery and equipment, or the release of hazardous energy during service or maintenance activities. Contractors must develop and submit a written LOTO program This requires that a designated qualified individual turns off and disconnects the machinery or equipment from its energy source(s) before performing service or maintenance and that the authorized employee(s) either lock and tag the energy- isolating device(s) to prevent the release of hazardous energy and test the machine or equipment to verify that the energy has been isolated effectively.

**a.** Minimum Requirements: The following are minimum requirements that must be included in the Contractor's LOTO program:

i.	Inspection of equipment by a trained individual who is thoroughly familiar with the equipment operation and associated hazards.
ii.	Identification and labeling of lockout devices. Purchase of locks, tags, and blocks Development of a standard written operating procedure, permitted through a controlling authority that is followed by all workers.





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**b. General Requirements-** The following steps must be taken to protect workers that install or service equipment and systems: Follow the hazardous energy procedures and statutory regulations. Follow the manufacturer's service/repair instructions. Identify and label all sources of hazardous energy. Before beginning work, accomplish the following:

- |       |   |
|-------|---|
| i.    | De-energize all sources of hazardous energy:  |
| ii.   | Disconnect or shutdown engines or motors  |
| iii.  | De-energize electrical circuits.  |
| iv.   | Block fluid (gas or liquid) flow in hydraulic or pneumatic systems.   |
| v.    | Block or secure machine parts against motion.   |
| vi.   | Block or dissipate stored energy.   |
| vii.  | Discharge capacitors.   |
| viii. | Release or block springs that are under compression or tension.   |
| ix.   | Vent fluids from pressure vessels, tanks, or accumulators—but never vent toxic, flammable, or explosive substances directly into the atmosphere |

**c.** Lockout and tag out all forms of hazardous energy including electrical breaker panels, control valves, etc. Make sure that only one key exists for each of your assigned locks and that access to the key is controlled. Verify by test and/or observation that all energy sources are de- energized.

**d.** After completion of the work, accomplish the following:

- |      |  |
|------|--|
| i.   | Inspect repair work before removing the lock and activating the equipment.             |
| ii.  | Make sure that only the worker that installed the lock removes his/her assigned lock.  |
| iii. | Make sure that all workers are clear of danger points before re-energizing the system. |

**e. LOTO Procedure**

#### PURPOSE AND SUMMARY

This procedure provides the requirements and responsibilities of Hazardous Energy Control and the process for Lockout / Tag out (LOTO) of energy isolating devices (valves, circuit breakers, disconnect, etc.). Its use shall ensure that machinery, equipment, or systems are isolated from all potentially hazardous energy to prevent unexpected energization, startup, or release of stored energy which may cause personnel injury or property damage.

This procedure applies to all BHEL personnel and subcontractors working on the WBPDC (1X660MW) STAGE- III projects where equipment must be taken out of service for the performance of work activities such as installation, maintenance, repair, construction, or equipment removal. The procedure may also be used to isolate equipment of which the energization or operation may present danger to personnel or property.

Lockout / tag out are not required for electrical equipment that can be unplugged from the source and the person performing the work has control of the plug.

This procedure shall be applied to prevent injury or damage caused by the unexpected release of active or stored energy. Hazardous energy sources could be in the form of the following:

- Electrical
- Hydraulic
- Chemical
- Thermal
- Mechanical
- Pneumatic

Preplanning of work activities includes the identification of all potential hazardous energy sources so that they may be properly controlled and isolated, locked, and tagged out. Prior to initiating work activities on or around locked out / tagged out equipment, the equipment must be tested and tried by or in the presence of the person(s) performing the work activities.

#### RESPONSIBILITIES

- The Engineers in Charge is responsible for implementing and enforcing this procedure and approving lockouts /tag outs that impact the operation of the project.
- The Engineer in Charges responsible for authorizing Lockout /Tag out Requests.
- The Lockout / Tag out Coordinator is responsible for maintaining the Lockout / Tag out Log. Each shift should have a designated Lockout / Tag out Coordinator.



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- The Isolator is responsible for determining the proper isolation devices and device positions required to isolate all potential energy sources so that the work stated on the Lockout /Tag out Request Permit maybe safely performed. The Isolator must be familiar with the equipment and energy type(s) that require isolation. For this reason, in some cases the Isolator may be more than one person (i.e. Engineer, System Operator and/or Electrician). The Isolator shall position the specified device points, and apply locks and tags, and sign the tags and the LOTO Permit isolation point blocks.
- The Safety Manager is responsible for conducting an annual audit that is documented to ensure all procedures and requirements are current and being followed as written.

#### DEFINITIONS

**Affected Employee:** -

An employee whose job requires him/her to operate or use machinery or equipment on which servicing or maintenance is being performed under a lockout/tag out procedure or whose job requires him/her to work in an area in which servicing or maintenance is being performed under a lockout/tag out procedure

**Authorized Employee:** - An employee who implements a lockout/tag out procedure on machinery, equipment, or systems in order that servicing or maintenance may be performed. Often an authorized employee and an affected employee may be the same person.

**Danger "Do Not Operate" Tag**

A tag used to identify energy isolation devices and specify the required position of the device. The tag should be affixed to the isolation device such that it is in plain view of anyone attempting to operate the device. The tags shall be sequentially numbered and shall specify the lockout/ tag out request number. The tag shall also state the purpose, and the expected duration of the lockout /tag out

**Isolation Device**

A device that is designed and intended to prevent the passage of energy. These devices, usually located at the energy source, are typically valves, circuit breakers, etc. Isolation devices should have a means of being locked in position

**Lockout Device**

A device that uses a positive physical means such as a lock, either key or combination type to maintain an energy isolation device in the safe position and prevent the in inadvertent energization of machinery, equipment, or systems. Device locks should serve no other purpose other than hazardous energy control isolation

**Lockout Tag out Request Permit**

A pre-numbered form used to request that machinery, equipment or systems be taken out of service. A Lockout/ Tagout Request Permit may be initiated by anyone requiring energy isolation for work activities or for taking faulty equipment out of service

**Lockout / Tag out Request Log**

A record of all Lockout /Tag out Request Permits shall be maintained by the Lockout /Tag out Coordinator.

#### PROCEDURE

##### 1. REQUESTING A LOCKOUT / TAGOUT PERMIT

When machinery, equipment, or systems are partially or completely taken out of service for work activities or equipment protection, a lockout / tag out shall be requested. The requester shall be familiar with scope of work required and shall provide a brief description of the work on the Lockout / Tag out Request Permit. The requester shall also provide the proposed start time and estimated duration of lockout / tag out. If familiar with the machinery, equipment, or system to be taken out of service, the requester may identify the devices that are required to be isolated. The LOTO Request Permit shall be forwarded to the Authorized Lockout / Tag out Coordinator for reviewed and signature, along with Permit to Work number to be entered on the LOTO Request Permit.

- |           |  |
|-----------|--|
| <b>a.</b> | The Lockout / Tag out Coordinator shall record the necessary information on the Lockout / Tag out Request Log and forward the request to the Engineer in Charge for approval.  |
| <b>b.</b> | The Safety Manager or Engineer in Charge shall review the Lockout / Tag out Request Permit for impact on project operations. Project operations could be impacted by the equipment being taken out of service or by the required isolation to take the equipment out of service. If project operations are impacted by the Lockout / Tag out, the request shall be forwarded to the Engineer in Charge for approval. |



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c.	The Engineer in Charge shall provide the lockout / tag out isolation points necessary to perform the task stated on the request. The device identification, device location, device position, and locking mechanism shall be entered into the appropriate blocks on the Lockout / Tag out Request Permit.
d.	The Engineer in Charge indicates approval of the Lockout / Tag out Request Permit by signing in the appropriate space on the request. If the Lockout /Tag out Request Permit is rejected, the Engineer in Charge shall return it to the requestor, via the Lockout / Tag out Coordinator with a written explanation of the rejection.
e.	Once approved, the Lockout / Tag out Request Permit shall be forwarded to the Lockout / Tag out Coordinator to assign tags and locks.
f.	The log shall show current status of all Lockout / Tag out Request Permits from submittal to approval, through lifting of locks and tags to final closeout. The log shall be maintained by the Lockout / Tag out Coordinator in their office.

### 2. PLACEMENT OF LOCKS AND TAGS

a.	The tags shall be filled out to match the information on the LOTO Request Permit. Appropriate locks for the types of isolation devices specified shall be collected and placed with the tags and the Lockout / Tag out Request Permit.
b.	The isolator(s) shall take the device locks, tags, and the Lockout / Tag out Request Permit to position the specified isolation devices, sign and hang the tags, and place the locks. If the isolator does not agree with or understand the Lockout / Tag out Request Permit, or has a problem performing the isolation, the problem should be brought to the attention of the Safety Representative or Area Supervisor immediately and the lockout / tag out should be postponed until the situation is resolved.
c.	Once the Isolator has placed all "locks" on isolation points, they will "test" and "try" the machinery, equipment, or system to ensure all hazardous energy has been completely removed and the isolation is one totally accomplished, and has initialed and signed the Lockout /Tag out Request Permit indicating all isolation points have been confirmed. Examples of "lock", "test" and "try": <ul style="list-style-type: none"> <li>• by checking that all locks on the LOTO Request Permit have been applied and are in the specified position open/closed, on/off, etc.; metering test of electrical circuits, opening of drain valves, checking pressure gauges or indicators; and try by pushing start buttons and on/off switches, etc.</li> <li>• Testing shall be performed by person(s) knowledgeable of the energy source(s) being isolated (e.g., an electrician should meter electrical circuits).</li> </ul>
d.	A copy of the completed Lockout /Tag out Request Permit shall remain with the Work Package and used as part of the daily Pre-Job Briefings

### 3. WORKING UNDER A LOCKOUT / TAGOUT REQUEST

a.	Prior to starting the work activity, the person(s) performing the work shall review the Lockout / Tag out Request Permit and place the necessary tags and personal locks on the identified isolation devices. Personal locks may be placed only on devices that have already been locked and tagged in accordance with the Lockout / Tag out Request Permit. <ul style="list-style-type: none"> <li>• All personal locks shall be accompanied by a tag that is signed and dated by the worker(s) and specifies the work activity being performed.</li> <li>• Personal locks should be of a different color than device locks for ready identification.</li> </ul>
b.	Verification of the effectiveness of the isolation by the Isolator shall be performed for Worker's working under the lockout / tag out, by demonstrating the checks on "lock", "test" and "try",
c.	When the work activity is finished, personal locks and tags shall be removed and the Safety Representative shall be notified that the Lockout / Tag-out is no longer required. If work under a lockout / tag out is to be delayed or interrupted for a period in excess of 24 hours, personal locks shall be removed until the work restarts. Personal locks shall be removed prior to the worker(s) leaving the project at the end of shift unless the key(s) are maintained at the project.

### 4. REMOVAL OF LOCKS AND TAGS

a.	When the lockout / tag out is no longer required, the Safety Representative or Area Supervisor shall obtain the Lockout / Tag-out Request Permit from the work package for LOTO removal. Prior to removing locks or tags that may allow equipment to be energized, a check shall be made to
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	verify that the equipment is free to safely operate (i.e., will not cause damage or injury). The locks and tags shall be removed and returned to the Lockout / Tag-out Coordinator. Isolation devices maybe re positioned at the discretion of the Engineer in Charge according to operational requirements. The Isolator shall complete the Lockout / Tag-out Request Permit indicating each lock and tag has been removed and the Safety Representative or Area Supervisor forward to the Lockout / Tag-out Coordinator.
b.	The Lockout / Tag-out Coordinator shall discard the tags and maintain the completed Lockout / Tag-out Request Permit for future reference.
c.	<p>In the event that an employee leaves the job site without removing the personal lock Itag, the following measures shall be taken and documented. The measures listed below area minimum set of guidelines and under all circumstances, refer to the site-specific safe work plan for detailed procedures:</p> <ul style="list-style-type: none"> <li>• Attempt calling / contacting the employee to return to the site for removal.</li> <li>• In the event an employee cannot be contacted, the Site Manager and Safety Manager shall sign an Emergency Lockout/Tag-out Removal Form, which has been completed by the Area Supervisor.</li> <li>• Employee shall be notified upon returning to the site, prior to beginning any work.</li> </ul>

#### 5. INTERRUPTION OF A LOCKOUT / TAGOUT

##### Operational Emergency

The Engineer in Charge / Safety Manager /Area Supervisor may deem it necessary to temporarily remove the locks and tags from isolation devices, prior to the end of the work activity. The standard procedure for removal of locks and tags shall be followed. Extreme caution shall be taken by the Isolator removing the locks and tags to prevent personnel injury.

##### Testing

When the performance of a work activity requires the functional testing of a machine, component, or system, the locks and tags may be temporarily removed in accordance with the tag removal, to perform the test. As a result of the testing, if it is determined that the equipment needs further work, the locks and tags shall be positioned back on to the device. If it is not necessary to replace all the locks and tags, then the unnecessary locks and tags may be returned to the Lockout / Tag-out Coordinator. The Engineer in Charge shall initial the Lockout / Tag out Request Permit in the removal block to indicate that these locks and tags have been removed. When testing has been satisfactorily completed, the locks and tags shall be removed.

##### ISOLATION DEVICES

- In most industrial applications, there are isolation devices that were not designed to accommodate a locking device. In these instances, an acceptable alternative that physically obstructs or prevents the use of the isolation device shall be found. Chains shall be placed on valves or electrical panels. Wires shall be determinate, pulled back, taped, and secured.
- If an isolation device does not accept a lock, a tag only is acceptable; however, all possible precautions shall be undertaken to provide a level of safety for the workers. The tag shall be readily visible to anyone attempting to operate the device.
- If more than one Lockout / Tag-out Request Permit requires that a single isolation device be locked and tagged, a lock and tag for each request shall be placed. Each lock in itself prevents the inadvertent operation of the device.

##### GROUP / COMPLEX LOCKOUT

In a multiple lockout / tag out procedure, each person working on the machinery or equipment must place a lock or tag on the energy isolating device. If the energy isolating device will not accept multiple locks or tags, a hasp (a multiple lockout device, may be used. The locks or tags must be placed in such away that energy cannot be restored to the machinery or equipment until every lock or tag is removed. As each employee involved no longer needs to maintain lockout / tag out protection that employee removes his - her lock and/or tag. The employee attaching the lock or tag is the only person authorized to remove the lock or tag.

#### 6. TRAINING

The training must include recognition of hazardous energy source, type and magnitude of energy available, methods and means necessary for energy isolation and control. Each authorized employee shall receive





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adequate training. The training should address that all affected employees are instructed in the purpose and use of the energy control procedure. There should be training provisions included for any other employee whose work operations are or may be in an area where energy control procedures may be utilized. The employee training should also address when tag out systems are used including the limitations of a tag (tags are warning devices and do not provide physical restraint). The training should also include that a tag is not to be removed without authorization. The tag is never to be ignored or defeated in any way. Retraining is required when there is a change in job assignments, in machines, a change in the energy control procedures, or a new hazard is introduced. All training and I or retraining must be documented with employee's name and dates of training.

### 7. PROGRAM REVIEW

The lockout / tag out program must be reviewed at least annually. The review must ensure that procedures are being followed and that they are effective. A documented review of the inspection must include the date, the equipment, employees involved & the inspector. The inspector must be someone other than those actually using the lockout / tag out in progress.

### ATTACHMENTS


#### #1. Danger (DO NOT OPERATE) Tags



#### #2. Device & Personal Locks and Multi Lock Hasp:



#### #3. Lockout / Tag out Request Permit

	LOCKOUT ITAGOUT REQUEST PERMIT		LOTO Request Permit No.:
			Work Permit No.:
Equip. Out of Service:	LOTO Date Required by: / /	Estimated Duration:	LOTO Requested Date:
Scope of Work:			LOTO Authorization Signed by:
			Date:



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					LOTO Removal Authorization Signed by:			
					Date: _____ Time: _____			
Tag No.	Device to be Tagged / Locked I.D. No.	Device Location	Device Position OPEN / CLOSE D -	Lock No.	Tag/ Lock Placed by Print/Sign		Tag / Lock Removed by Print/Sign	
					- Date/Time		- Date/Time	
Comments Instructions:					Attachment 3.Lockout / Tag out Request Permit:			

#### #4. Lockout / Tag out Request Log

LOTO Permit No.	Request or Name	Equipment & Location	Est. Work Completed Date	Approval Date	LOTO Placed Date	LOTO Removed Date	Comments

### 10. RISK ASSESSMENT

#### Risk and Hazard Analysis

In order to produce an overall Project EHS Plan, a project must be assessed for its risks. There are two components to the risk and hazard analysis. The procedure used to examine and plan for the identified risks and hazards is called a General Hazard and Risk Assessment.

#### JSA/HIRA review

Prior to commence the following activities Method statement and JSA/HIRA to be prepared by the concern engineer in coordination with EHS officer and submit to the client for review and approval. After getting approval the work will be started under PTW after clearance. For HIRA and criteria for the defining the high, medium & low risk the relevant BHEL HSE Procedure for HIRA shall be referred. In case any deviations required in the approved method statement the concerned engineer/supervisor has to prepare additional HIRA/JSA to cover the new activities and associated risk. Following activities to be covered,





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- Deep excavation (more than 5 feet)
- Significant concrete pouring (like heavy foundation, TG deck, Slab casting etc.)
- Confined entry
- Blasting
- Working on electrical/ energized equipment's
- Steel erection more than 5-Ton weight
- Working at height prior to completion of stairs/ladders/hand railing etc.

### Hazard Analysis Document

• For high risk and dangerous work identified, the Applicant shall complete and submit a Hazard Analysis Document together with the PTW request. It will be a JSA (Job Safety Analysis) or Preliminary Hazard Analysis Checklist. And it shall be reviewed and approved by respective Construction and HSE Representatives.

• Issues such as work interface, coordination, drawings, toolbox meetings and work type/duration shall be detailed and included with supporting documentation for the Applicant's request for PTW.

• If applicable, Hazard Analysis Document shall be used as the foundation for development of Safe Work Method Statement. Each hazard identified shall be addressed in the Safe Work Method Statement and be submitted as part of the Applicant's submitter package.

### Evaluation of Sub-contractor Risk Assessments includes

- Experience and expertise in performing similar type work.
- Duration of work performed
- Location of the work to be performed.
- Nature of the work to be performed.
- Potential for exposure to work site hazards.
- Potential for a subcontractor performing the work to expose themselves, other persons or employees, to hazards.

### Review of Subcontractor specific issues

Preventive and protective measures must be introduced according to the following order of priority

- Eliminating the hazard by removing the activity from the work process. Examples include substitution with less hazardous chemicals, using different manufacturing processes, etc.
- Controlling the hazard at its source through use of engineering controls. Examples include local exhaust ventilation, isolation rooms, machine guarding, acoustic insulating, etc.
- Minimizing the hazard through design of safe work systems and administrative or institutional control measures. Examples include job rotation, training safe work procedures, lock-out and tag-out, workplace monitoring, limiting exposure or work duration, etc.
- Providing appropriate personal protective equipment (PPE) in conjunction with training, use, and maintenance of the PPE.

## 11. PREVENTION OF COVID-19 (COVID-19 HERE TO BE READ AS COVID-19 AND OTHER PANDEMICS/ COMMUNICABLE DISEASES) AT PROJECT SITE & LABOUR COLONY:

Resumption of Construction Activities after Lock Down and Prevention of Coronavirus Infection during Site Operations and OCP 61A: Prevention of COVID-19 Infection in Labour Colony will be strictly followed.

### A. Preventive measures at project site:

- BHEL and Agencies shall nominate COVID Marshalls, who will be responsible for monitoring the COVID prevention measures and apprising management on the same.
- Mandatory health check-up for every worker/ official joining the site required as per nature of their work.
- All activities to be carried out using least amount of paperwork and physical proximity as far as possible.
- HSE Observer App to be used to monitor HSE Activities and follow up with agencies for closure of non-conformities.

### a. Strict Control at the Gate/ Banning Entry to Anyone Not Wearing Masks

- i. Security personnel at the gate may erect a barricade preferably approx. 10 meters from the gate and only allow personnel who are wearing proper masks inside.



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ii.	Public address system may be used to warn any non-compliant visitors
iii.	Near entry gate, round markers at minimum 1-meter distance to be ensured so that distancing is ensured
iv..	A hand-wash or hand sanitizer facility is preferable at the gate to allow entry after hand wash or hand sensitization. These are also to be provided at key locations to enable hand wash / hand sensitization before starting work, before eating, etc
v.	Gutkha, Paan, tobacco etc. to be banned from the site. Spitting to be strictly prohibited.
<b>b. Screening at Gate with Contactless Thermometer &amp; Action on Suspected Cases</b>	
i.	Security Personnel at the Gate to screen each person entering the premises using anon-contact infrared thermometer, which is duly serial numbered and calibrated.
ii.	In case any site worker/ official is found to have fever more than 99 Degrees Fahrenheit or found coughing/ sneezing, he/she may be advised rest till recovery and entry to be permitted after obtaining clearance from medical officer/assistance/attendants.
<ul style="list-style-type: none"> <li>• Parcel to be collected from gate by concerned person preferably with provision of Special Box</li> <li>• Any construction material received at site, unless properly sanitized, to be kept undisturbed for at least 3 days and to be used only after that period.</li> <li>• During Toolbox Talks, minimum 1-meter distance between any two workers to be ensured</li> </ul>	
<b>c. During site execution activities:</b>	
For all site execution activities, social distancing is to be maintained. In case this is not possible due to nature of work, specialty of work, etc., ensure sensitization of the labour/staff involved and use of appropriate PPEs, especially mandatory facemask. In any case, close working to be allowed only in special circumstances and ensuring these activities are preferably time staggered to the extent possible	
<b>d. In office premises:</b>	
i.	Sharing of items like pens, water bottles etc. in office premises to be avoided
ii.	Doors preferably to be in open condition to avoid contact
iii.	All common touch points to be frequently disinfected in a day.
<b>e. Regular disinfection of all Areas, Equipment and facilities</b>	
i.	A dedicated disinfectant gang to be identified for the task by each agency. The disinfectant gang to be provided full bodysuits for the task.
ii.	All areas (including office premises, site areas, chairs, tables, furniture etc.), tools & equipment to preferably be disinfected by dedicated gang every day before resumption of work.
iii.	Common touch points like handrails, lift buttons, door/window knobs or handles, vehicle door handles, taps, conference room & dining hall tables/chairs, common sofas/chairs, visitor sofa/chairs, files & folders, etc. to preferably be disinfected regularly at frequent intervals every day.
iv.	Pool vehicles, to be disinfected after every use. Social distancing to be maintained inside the common pool vehicles as per Govt./ statutory body guidelines.
<b>f. Disinfecting the operator/driver touch points of Vehicles/cranes, T&amp;Ps etc.</b>	
Disinfection to also be carried out for all Cranes, Vehicles, Equipment, consoles, T&Ps etc. which come into contact with operating personnel.	
<b>g. Posters on COVID-19</b>	
Sufficient Posters on COVID-19 to be ensured across the site in languages understood by most workers.	
<b>h. Brief guidelines for handwashing areas below:</b>	
i.	Soap to be provided at each washbasin and replenished regularly.
ii.	Washing with soap for at least 20 seconds is recommended.
iii.	As a general guideline, for every 100 workers, 1 wash-basin may be provided at site areas.
iv.	Close queue to be avoided near wash-basins and 1-meter distance to be maintained. Round markers at 1-meter distance can be ensured as guidance
<b>Composition of Disinfectant:</b>	
i.	Readily available 1% hypochlorite solution or 4%
ii.	Liquid chlorine-1% solution
iii.	Surgical spirit-95% alcohol content



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iv.	Hand sanitizer should have: Isopropyl alcohol-75%, Glycerol-1.45%, Hydrogen Peroxide-0.125%
<b>B. Prevention of COVID-19 Infection in Labour Colony:</b>	
<ul style="list-style-type: none"> <li>Spacing of minimum 2 meters between living areas of workers inside a room maybe maintained. Preferably, the living area of each worker may be partitioned using sheet of cloth, plastic etc.</li> <li>Rooms to be properly ventilated as far as possible</li> <li>Sanitation to be given prime importance and personal hygiene to be promoted</li> <li>Face masks shall be worn by everyone inside the colony premises</li> <li>Spitting of Pan. Gutkha etc. inside the colony and urinating etc. outside the toilets to be strictly avoided</li> <li>Regular visits by Doctors to the labour colony can be arranged on non-working day for check-up of all workers</li> </ul>	
• Identification of "COVID Wardens" (CWs) by each agency for maintaining the following:	
i.	Keeping an eye on the health of workers and report any suspected cases of fever, coughing etc. to the management
ii.	Keeping an eye on the social distancing measures in the labour colony and report any non-conformances to the management.
iii.	Educate the workers about social distancing and COVID prevention measures.
• Training/ Awareness regarding COVID-19 to be provided to workers regularly.	
• Workers to be instructed to maintain social distancing of minimum 1 mat all time	
• Posters on COVID-19:	
Sufficient Posters on COVID-19 to be ensured across the labour colony in languages understood by most workers.	
• All workers to be instructed to inform any suspected cases of illness (individual or others) to an emergency contact number of CW, the emergency contact numbers and CW contact numbers to be displayed at prominent locations	
• Inspection & Review	
i.	Daily Inspection by concerned COVID Wardens and reporting to Agency
ii.	Regular inspection by Agency & BHEL

### 12. NOISE MITIGATION

High noise is harmful to the human health and it can cause impairment if exposed for long duration at regular intervals, and also cause disruption in nearby communities.

- Noise monitoring shall be carried out in all construction locations periodically.
- Use of silent DG is allowed at site during construction.
- Low noise generation equipment's to be preferred.
- Work areas where noise levels exceed the 85db shall be posted as hearing protection required.
- Use of PPEs / ear plug/ear muff for personnel entering into high noise area.
- Activities generation High noise will be planned in day shift.

#### Noise Level Chart

Parameter	Night Noise level dBA	Daytime Noise Level dBA
At 1-meter from each piece of equipment	85	85
At Property boundary	70	70



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**ANNEXURE – I**

**VERTIGO TEST**

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#### Vertigo Test

##### Vertigo Test Procedure/ Guidelines

This document specifies minimum requirements for vertigo test. These may be supplemented by any additional requirements deemed fit by the medical examiner/ HSE department)

Fear of height may be physiological or psychological. Therefore, to rule out any possibility of physiological factor, detailed medical check-up of workers is carried out before vertigo test. Medical check-up of workers includes the following:

history of past illnesses (like epilepsy, drug allergy, diabetics/ hypertension, unconsciousness etc.), general physical examination (like height, weight, BMI, build and nourishment etc.), measurement of pulse rate, Blood Pressure, respiratory rate.

After this check-up, those who are found suitable for height work by examining doctor, are allowed to undergo vertigo test.

During this health check-up, psychology of workers is also studied. If any worker finds it extremely difficult/ frightening to climb the monkey ladder & walk on the beam, during/after performing vertigo test or even before performing, then he is treated as disqualified.

As per standard, during vertigo test, worker is allowed to climb on a foundation through monkey ladder, walk on a beam, then steps down at the other end of beam, through monkey ladder. Height of the beam should be at least six feet from ground level. All necessary safety precautions are taken during this test. Worker has to wear full body harness with double lanyard. A horizontal lifeline is run parallel to the beam and worker has to put his lanyards into the lifeline. Additionally, a safety net is also put below the beam for rescue of the victim in case of a fall from beam.

Following activities are suggested to be carried out during testing:

##### 1. Walking Bench Training:

a. Person should walk over the channel. He should maintain balance & walk without much problem.

b. If the person has problem to balance himself on repeated chances, he may be having flatfoot or some other problem. So, he may not be fit for height work.

##### 2. Rope Climb Training:

Person should be able to climb the rope up to the top channel for ensuring that in case of fall, a person hanging on the safety harness, will be able to safely climb back to the platform within minimum time period before the safety harness starts breaking down under the load

##### 3. Height Work Training:

Person should walk freely on the middle channel while holding the top channel with the help of safety harness.

##### 4. Ladder for Vertical fall arrestor Training: Vertical fall arrestor rope is fixed from top to bottom of the ladder. It will ensure:

- Usage of vertical fall arrestor.
- Usage of two lanyards of a safety harness.
- Ensure 3-point contact on the ladder while climb.

##### 5. Chair for work at height Training:

- Climb through vertical ladder with two lanyard ropes.
  - Hooking of two lanyard ropes to lifeline. With this safe arrangement, he can walk to chair.
  - Sits in the chair safely, comes out & walks back to the vertical ladder & comes down from vertical ladder.
- After completion of vertigo test, blood pressure of worker is again measured. If it is not within acceptable limits for any worker, concerned worker is denied height pass.

Only those who pass the above training are to be considered as fit for height work.



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**ANNEXURE - 1 TO ANNEXURE - 10**

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#### ANNEXURE - 1

**List of Safety Equipment's & safety Personal Protective Equipment's, the list of minimum suggestive Safety Equipment's & Safety Personal Protective Equipment's to be deployed necessarily by the Contractor is furnished below. However, the actual deployment at site shall not be limited to these and additional equipment's if required shall be mobilized by the contractor. Safety Gadgets, Equipment and Measurement Devices to be ensured in total throughout the duration of the project.**

Sl. No.	Minimum Suggested List of Safety Equipment's and Safety Personal Protective Equipment's	Minimum Quantity
1	<b>Safety Net (Conforming IS 11057:1984)</b> Safety Net (Net Size: 10m x 5m, Mesh Size: 25 mm, Mesh Rope: 2mm double cord, Border/Tie Cord: 12mm diameter polypropylene rope (tested as per IS: 5175). Two meters length shall be provided at all four corners.	240 Nos.
2	<b>Fall Arrestor 'Rope grab fall arrestor' &amp; anchorage line.</b>  Anchorage Line: 14mm- 16 mm diameter, three strand twisted Polyamide rope.  Rope Grab fall arrestor: Openable & Guided type Fall Arrestor (on flexible line) conforming EN 353-2 & works on 14-16 mm diameter polyamide rope. material: Nickel Chrome plated Steel  Connector: Karbiner conforming to EN 362 (Minimum Strength 22 KN), material: Steel	200 nos. of Rope Grab Fall arrestor' and Karbiner each.  90 nos. anchorage line, 30 meter long each,  30 nos. anchorage line, 40 meter long each
3	<b>Horizontal life line</b>  Stainless Steel Wire rope of 8mm diameter. Minimum six nos. of steel U-bolt clips are required for clamping each wire rope to a rigid support (03 nos. of U-bolt clips at each end).	40 nos. of wire rope, each 40 meter long  90 nos. of wire rope, each 25 meter long.
4	<b>Ladders on column</b> The minimum design live load on metallic ladder shall be a single concentrated load of 100 kilo grams. All rungs shall have a minimum diameter of 1.90 centimeters, and minimum clear length of rungs shall be 40.6 centimeters. The distance between rungs shall not exceed 30.5 centimeters. Each ladder shall have maximum height of 9.0 meter. The ladder shall have proper fastenings for attaching it to a column using positive means such as bolt, weld or other type of fasteners.	cumulative length of ladders is 1200 meters
5	<b>Safety PPEs (Industrial Safety helmet &amp; Industrial Safety Shoes)</b> Industrial Safety Helmet (IS:2925-1984 marked). Industrial Safety/Electrical Shoes (IS:15298-2002 marked). Full body Safety Harness (conforming IS:3521)	1575 nos. 1575 nos. 395 nos.
<b>Note</b>	a. Above mention quantity is for whole project as per customer contract, however separate annexure/ document will be issued to each contractor at the time of execution of work by Safety officer BHEL with approval of construction manager/ GM/ PD. PPEs Quantity annexure/ document issued by BHEL site will be final and agency must fulfill the same during exaction of work.	



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- b. Other materials like cables, sling, gloves, goggles, safety belts, safety helmets, heating oven, pre-heating / post weld heat treatment arrangement, material for making platform and platform support etc. shall be mobilized as per requirement.
- c. Other equipment though required for the timely completion of the job but not listed above shall be deployed by the contractor, as per the job requirements and as directed by the HSE Engineer/ BHEL Official.
- d. The contractor shall make suitable provisions for repairs and maintenance of the equipment mobilized and always keep them in good working conditions, as the repair facilities for such equipment are not available at the project site.

### ANNEXURE - 1 Cont.

**List of Safety Equipment's & safety Personal Protective Equipment's mention in this table are, the list of minimum suggestive Safety Equipment's & Safety Personal Protective Equipment's. However, all the Safety Equipment's & Safety Personal Protective Equipment's to be deployed necessarily by the Contractor wherever required or as per instruction from BHEL HSE officer/ construction manager.**

**The actual deployment at site shall not be limited to these and additional equipment's if required shall be mobilized by the contractor. Safety Gadgets, Equipment and Measurement Devices to be ensured in total throughout the duration of the project.**

Safety Gadgets & Equipment			
	Name	Quantity	Unit
1	Lifelines-steel wire rope min 8mm insulated (Length-100mtr)		
2	Retractable fall arrestors		
3	Safety nets (10m X 5m) or (10mX10m) or (15m X 15 m) etc.		
4	Sky climbers		
5	Fire blanket (5mX 5m)		
6	Honey Bee Removal Suit & Kit		
7	Flashback arrestors		
8	Barricading Tape (100mX 100 nos )		
9	Binoculars		
10	Walkie-Talkies		
11	LOTO kit		
12	24-Volt light		
13	Sand Buckets		
14	Hard barricading		
15	ELCB for welding machine & winches		
16	Fire extinguishers		
17	First aid box covering medicines as per BOCW		
18	Temporary platform material (grating)		
19	Small size u clamps to tie life lines		
20	Vertical lifeline ( 16mm polyamide rope with fire resistant )		
21	Rescue harness		
22	Mini fogging machine		
23	Gas Welding Igniter		
24	Toe boards (height-150mm)		
25	Portable Aluminum ladder (Length- 3mtrX400mm)		
26	Eye/ Hand wash station		
27	Whistle		
28	Sintex plastic water tank-1000L		



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29	Earth pits each electrical per panel & connected load		
30	Electrical shed covered for keeping welding machine and electrical panels		
31	Earth flat (Aluminum) (50mmX 400 m) for earthling		
32	Gas cylinder trolley for gas cutting sets.		
33	Sheds for segregating filled and unfilled gas cylinders		
34	100 W LED & its fixture/cable		
35	250 W LED & its fixture/cable		
36	Painting safety kit		
37	Double lanyard full body harness with shock absorber		
38	Multi-purpose Ladder		
39	Urinal provision		
40	As per requirement		
41	Tool carrying bags		
42	Bigger sized Bins for floor for scrap collection		
43	Ladder clamps for beam type of columns		
44	Ladder clamps for box type of columns (with stoppers where inclined or vertical boxes)		
45	Helmet torches		
46	Torches with good capacity		
47	Mobile Tower ladder with platform provision for hopper cavity 350x350		
48	Laser Distance meter		
49	Man Cage for standard wt and with standard wire ropes		
50	Temporary Ladders 3 meters		
51	Exhaust fans		
	<b>Measurement Instruments (All measuring instrument must be calibrated)</b>		
	<b>Name</b>	<b>Quantity</b>	<b>Unit</b>
1	ELCB/RCCB Tester		
2	Multi meter (Light cables)		
3	Electric Tester (to checked low voltage up to 415 V)		
4	Earth Resistance Meter		
5	Lux Meter		
6	Anemometer		
7	Breath Analyzer (Alcohol)		
8	Multi-gas dozi-meter		
9	Gas leakage detector / alarm		
10	Gas monitor (confined space)		
11	Radiation meter & Badges		
12	Blood Pressure Monitor		
13	Fire detectors		
14	Sound level meter		
15	SCBA (Self-contained breathing apparatus)		
16	Siren		
17	Public address system		
18	Emergency lamp – (rechargeable)		
19	Oxygen Meter (while working in confined space etc)		



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#### ANNEXURE - 2

##### **Details & Contents of First Aid Box as per Contract Labour (Regulation & Abolition Act), Central Rules, 1971**

(1)	The first aid box shall be distinctively marked with a Red Cross on a white background and shall contain the following items, namely
(A)	For establishments in which the number of contract labour employed does not exceed fifty, each first aid box shall contain the following equipment
(i)	6 small sterilized dressings
(ii)	3 medium size sterilized dressings
(iii)	3 large size sterilized dressings
(iv)	6 pieces of sterilized eye pads in separate sealed packets.
(v)	6 roller bandages 10 cm wide.
(vi)	6 roller bandages 5 cm wide.
(vii)	One tourniquet
(viii)	A supply of suitable splints
(ix)	Three packets of safety pins.
(x)	Kidney tray.
(xi)	3 large sterilized burn dressings.
(xii)	1 (30ml) bottle containing a two percent alcoholic solution of iodine
(xiii)	1 (30 ml) bottle containing Sal volatile having the dose and mode of administration indicated on the label
(xiv)	1 snake bite lancet
(xv)	1 (30gms) bottle of potassium permanganate crystals.
(xvi)	1 pair scissors
(xvii)	1 copy of the First aid leaflet issued by the Director General, Factory Advice Service and Labour Institutes, Government of India.
(xviii)	A bottle containing 100 tablets (each of 5 grains) of aspirin
(xix)	Ointment for burns
(xx)	A bottle of suitable surgical anti-septic solution

<b>(B)</b>	<b>For establishment in which the number of contract labour exceeds 50 nos (fifty) each first aid box shall contain the following equipment:</b>
(i)	12 small sterilized dressings
(ii)	6 medium size sterilized dressings
(iii)	6 large size sterilized dressings.
(iv)	6 large size sterilized burn dressings
(v)	6 (15 grams) packets sterilized cotton wool
(vi)	12 pieces of sterilized eye pads in separate sealed packets.
(vii)	12 roller bandages 10 cm wide.
(viii)	12 roller bandages 5 cm wide.
(ix)	One tourniquet.
(x)	A supply of suitable splints.
(xi)	Three packets of safety pins.
(xii)	Kidney tray.
(xiii)	Sufficient number of eye washes bottles filled with distilled water or suitable liquid clearly indicated by a distinctive sign which shall be visible at all times.
(xiv)	4 per cent Xylocaine eye drops, and boric acid eye drops and soda by carbonate eye drops.
(xv)	1 (60ml) bottle containing a two percent alcoholic solution of iodine
(xvi)	One (two hundred ml) bottle of mercurochrome (2 per cent) solution in water.



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(xvii)	1 (120ml) bottle containing Sal volatile having the dose and mode of administration indicated on the label.
(xviii)	1 roll of adhesive plaster (6 cmX1 meter)
(xix)	2 rolls of adhesive plaster (2 cmX1 meter)
(xx)	A snake bite lancet.
(xxi)	1 (30 grams) bottle of potassium permanganate crystals.
(xxii)	1 pair scissors
(xxiii)	1 copy of the First aid leaflet issued by the Director-General, Factory Advice service and labour Institutes, Government of India.
(xxiv)	a bottle containing 100 tablets (each of 5 grains) of aspirin
(xxv)	Ointment for burns
(xxvi)	A bottle of a suitable surgical anti septic solution.
(2)	Adequate arrangement shall be made for immediate recoupment of the equipment when necessary.



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### ANNEXURE - 3

#### List of HSE Procedures

S No	Procedure No.	Procedure Name
1	HSEP:01	HSE Procedure for Register of OHS Hazards & Risks
2	HSEP:02	HSE Procedure for Register of Environmental Aspects & Impacts
3	HSEP:03	HSE Procedure for Register of Regulations
4	HSEP:04	HSE Procedure for Training & Awareness
5	HSEP:05	HSE Procedure for Control of Documents
6	HSEP:06	HSE Procedure for Emergency Preparedness & Response
7	HSEP:07	HSE Procedure for HSE Performance Measurement, Monitoring & Review
8	HSEP:08	HSE Procedure for Incident Investigation, Reporting & Corrective Action
9	HSEP:09	HSE Procedure for Non-conformity Handling & Corrective Action
10	HSEP:10	HSE Procedure for Control of Records
11	HSEP:11	HSE Procedure for Internal Audit
12	HSEP:12	HSE Procedure for Permit to Work
13	HSEP:15	HSE Procedure for Operational Control





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#### ANNEXURE - 4

Sl. No	Type of Fire Risk (Class of Fire)	Extinguishing Medium & Relevant INDIAN STANDARD	Scale of Equipment (Minimum recommended)
1.	<b>CLASS 'A'</b> Fires involving ordinary combustible materials like wood, paper, textiles, rubber etc. (Ordinary hazard or low fire load)	WATER Soda acid type, water type (gas pressure) and water type (constant air pressure) IS: 934 -1976; IS: 940 -1976; IS: 6234 -1971	For every 600 square meter floor area or part, one 9-litre capacity. Minimum 4 numbers per floor or room; should not be required to travel more than 15 meter to reach any extinguisher.
2.	<b>CLASS 'A'</b>  (Extra hazard & high fire load)	-do	-do – (Also, consult local fire authority).
3.	<b>CLASS 'A'</b>  (Special hazards)	-do	-do – Extra provision For every 100 square meter floor area or part, one 4.5 Kg. CO <sub>2</sub> ; minimum 2 numbers per room; should not be required to travel more than 10 meter to reach any extinguisher.
4.	<b>CLASS 'B'</b> (Fires in flammable liquids like oils, solvents, petroleum, products, varnishes, paints, etc. where blanketing effect is essential) (Storage and handling in small quantities)	FOAM / CARBON DIOXIDE / DRY CHEMICAL POWDER IS: 933 -1976; IS: 2878 1976; IS: 2171 1976; IS: 4308 -1982	For every 50 square meter floor area or part, 2 numbers 9 -liters foam or 5 kg dry powder; should not be required to travel more than 10 m in the area of storage to reach any extinguisher.
5.	<b>CLASS 'B'</b> (Bulk storage other than in tank form))	-do -	-do- (but minimum 3 numbers per room)
6.	<b>CLASS 'C'</b> (Fires involving gaseous substances under pressure where it is necessary to dilute the burning gas at a very fast rate with an inert gas or powder) (storage and handling of gas cylinders)	CARBON DIOXIDE / DRY CHEM. POWDER. The best way to extinguish such fire is by stopping the flow of fuel gas to the fire. Container is kept cool with water spray. IS: 2878 -1976; IS: 2171 -1976; IS: 4308 -1982	For every 100 square meter floor area or part; 2 numbers, 10 kg powder extinguisher or 6 kg CO <sub>2</sub> ; minimum 3 nos. per room; should not be required to travel more than 10 meter to reach any extinguisher.



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7.	<b>CLASS'D'</b> Fires involving metals like magnesium, aluminum, zinc, potassium etc. where the burning metal is reactive to water and which require special extinguishing media or technique	SPECIAL DAY POWDER IS: 2171 -1976 IS: 4861 -1968	For every 50 square meter floor area or part, 2 nos. 5 kg special dry powder; minimum 3 nos. per room; should not be required to travel more than 10 meter to reach any extinguisher.
8.	<b>MIXED OCCUPANCY</b> (electrical); Generators; Transformers; etc.	CARBON DIOXIDE DRY POWDER, IS: 2878 1976; IS: 2171 -1976	For every 100 square meter floor area or part one 10 kg CO2. Minimum 2 numbers for every location should not be required to travel more than 10 meter to reach an extinguisher.

Note: Due to peculiarities of the power plant construction sites, there would be locations in the construction areas of Boiler, Turbine, Generator, Transformer, etc. where different types of fire risk (classes of fire) may co-exist. Special care shall be taken while selecting and installing portable fire extinguishers for such locations so that all types of fire risk that may co-exist, are adequately covered. Similar special care shall be taken for storage areas.

Note :- Following Must be Ensure at all Construction Activity:-

1. All Electrical welding booths shall be equipped with appropriate Fire extinguisher.
2. Appropriate Fire Extinguishers shall be made within easy reach of all welding operations.
3. Fire extinguishers shall be regularly tested and last checked date to be indicated on each. Master list shall be prepared with location and details.
4. Providing appropriate fire-fighting equipment at designated workplace and nominate a fire officer/warden adequately trained for his job.
5. Subcontractor shall provide enough fire protecting equipment of the types and numbers at his office, stores, temporary structure in Labour colony etc. Such fire protection equipment shall be easy and kept open at all times.
6. The fire extinguishers shall be properly refilled and kept ready which should be certified at periodic intervals. The date of changing should be marked on the Cylinders.
7. All other fire safety measures as laid down in the "codes for fire safety at construction site" issued by safety coordinator of BHEL shall be followed.
8. Non-compliance of the above requirement under fire protection shall in no way relieve the subcontractor of any of his responsibility and liabilities to fire incident occurring either to his materials or equipment or those of other.
9. Emergency contacts nos. must be displayed at prominent locations.
10. Tarpaulin being inflammable should not be used (instead, only non-inflamable covering materials shall be used) as protective cover while preheating, welding, stress relieving etc. at site.



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#### ANNEXURE - 5

##### HSE Requirements for Adverse Weather & Climate Conditions, Epidemics/ Pandemics

##### 1. Summer

- a** The Working Time and Lunch Hour will be as per instruction of Statutory Authorities (no work between 11am to 3:30pm). However, in case temp comes down due to rain/cloudy weather work will continue as per normal routine.
- b** During long lunch break, worker will be allowed to go back home for rest. Those who will like to stay back will avail at the facility of rest shed or other designed area.
- c** They will be allowed to take small break during work as per their need.
- d** Water sprinkling will be done on roads to reduce **dust** concentration.
- e** Workers will be provided with adequate cold drinking water and Butter milk/Lemon water etc.
- f** Adequate ORS stock will be made available at the work location in the First aid Box available at construction activity location for use as needed and at Medical Centre for emergency need.
- g** Fire prevention shall be on high alert, with removal of dry grass and bushes, etc, inside and outside the surrounding work areas. No smoking, and control of open flame/sparks shall be maintained and monitored.
- h** Worker will be informed about the Do's and Don'ts to be followed during summer in the Pre Job Brief.

##### 1.1 Dos & Don'ts

- a** Drink plenty of cool water and other non-alcoholic fluid and keep body well Hydrated.
- b** Eat salt in food to replenish loss of salt through sweating.
- c** Avoid over physical exercise.
- d** Have adequate sleep at night.
- e** Eat light and less spicy food
- f** Avoid eating food which was cooked long time ago.
- g** Nobody should use small water bodies such as pits, running rain water through crevices etc. for drinking and cleaning purpose as it may be unhygienic.

##### 1.2 Emergency Handling

In case of emergency due to heat disorder:

- a** Rescue the victim from workplace and place under shed.
- b** If to be rescued from height, use stoke basket or rescue kit.
- c** Inform Ambulance immediately.
- d** If nearby any air conditioned room/shed is available, place him inside the room/shed.
- e** Administer First aid by trained First aider for Heat Disorder
- f** If conscious, give him ORS solution to drink.
- g** If required send the victim hospital immediately.

##### 2. Monsoon

This is the procedure to be followed during monsoon period in the entire project with respect:

- a** To give clear guidance as to other action that must be implemented
- b** To inform employees what to do in an Emergency Scenario
- c** To establish an emergency response and communication procedure
- d** Ensure that all height work platforms are barricaded and avoid any highly hazardous height work.
- e** Height work.
- f** Ensure that all personnel have good quality and intact safety shoes
- g** Stop all dangerous height work during rain
- h** Explain Do's and Don'ts to workers during Tool Box Meetings
- i** Ensure that there are no weak structures, boards etc. that can fall during high winds
- j** Do not permit anyone to ride up or comedown scaffolds framework during heavy wind or rain.
- k** Provide "anchor" of adequate strength to scaffolds and other high-rise structures.



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<b>l</b>	All rest sheds and GI sheds will be anchored into the round and wall and roof panels will be secured with J hook to prevent shed from blowing over or parts/pieces becoming airborne. Proper earthing per IS standard is also to be installed.
<b>m</b>	Do not go alone nor permit anyone to stay at tower-tops, roof-tops, high structures or on electrical poles during the course of stormy weather or heavy rain.
<b>n</b>	Electrical:
<b>o</b>	All electrical connections / loads have to be routed through ELCB / RCCB (residual current circuit breaker) whose rating should be 30mA.
<b>p</b>	RCCB operational checks need to be done DAILY / WEEKLY during monsoon season.
<b>q</b>	All electrical distribution board shall be properly covered at top and sides to protect from rainwater. Extension boards shall be protected from rainwater.
<b>r</b>	Ensure proper "earthing" for each and every electrical appliance.
<b>s</b>	Double earthing need to be provided for 3-phase power supply and for voltage more than 220V.
<b>2.1 During monsoon the following will be implemented:</b>	
<b>a</b>	Do not allow any loose material (e.g. GI sheet, Ply board, empty cement bag, aluminum foil, foam sheets etc.) on roof sheds or top of structures.
<b>b</b>	Avoid joints on power cables which need to be laid over-head or under-ground, better not to have any joint at all. In case joints become essential, such cables must be housed rigidly

	and insulation must be provided as per approved standard. The joint shall be suitable for outdoor use.
<b>c</b>	Maintain smooth flow on open drains. i.e. no obstruction or blockade shall be made on storm water drains. If required, make temporary drains.
<b>d</b>	Arrange back-filling of excavated pits on war-footing basis.
<b>e</b>	Arrange bringing down booms of all cranes, Hydraulic machines during stormy weather (wind speed 40-50 kmph)
<b>f</b>	Confirm that all gantry cranes are effectively choked to prevent rolling and toppling.
<b>g</b>	Do not forget to deep ready a dew battery operated lights at site-offices during rainy season.
<b>h</b>	Do not go alone nor permit anyone to stay at tower-tops, roof-tops, high structures or on electrical poles during the course of stormy weather or heavy rain.
<b>i</b>	Avoid using wet damp clothes.
<b>j</b>	Barricade excavated zone filled with water.
<b>k</b>	Engage diesel operated water pump to dewater work area. For electrically operated water pump, the starter shall be protected from rain water. All rotating parts shall be guarded. Ensure availability of sufficient water pumps.
<b>l</b>	Spread sand/dry soil over slippery area.
<b>m</b>	Avoid movement of vehicles as minimum as possible.
<b>n</b>	Avoid self-medication – consult doctors/physicians if feeling sneezy or cold.
<b>o</b>	All electrical connections / loads have to be routed through ELCB/RCCB (residual current circuit breaker) whose rating should be 30mA. ELCB/RCCB operational checks need to be done monthly during monsoon season.
<b>p</b>	Provide lightning arrestors at the top of Boiler, Chimney, Cooling tower (NDCT) etc. and rest sheds which are not covered by existing lightning arrestor of other installation.
<b>q</b>	All electrical distribution board shall be properly covered at top and sides to protect from rain water. Extension boards shall be protected from rain water.
<b>r</b>	Do not permit any one to ride up or come down scaffolds frame work during heavy wind or rain.
<b>s</b>	Provide "anchor" of adequate strength to scaffolds and other high-rise structures.



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<b>t</b>	All rest sheds and GI sheds will be anchored into the round and wall and roof panels will be secured with J hook to prevent shed from blowing over or parts/pieces becoming airborne. Proper earthing per IS standard is also to be installed.
<b>u</b>	Ensure proper "earthing" for each and every electrical appliance.
<b>2.2 Health and hygiene</b>	
Monsoon reduces the immunity of our body and makes us vulnerable to many diseases which are commonly associated with this season. It is time for us to keep our body challenging against disease by boosting our immunity and taking safety measures against these diseases.	
The diseases associated with monsoon are Malaria, Jaundice, Gastrointestinal infections, like typhoid, cholera etc. apart from these viral infections like cold and cough also make their presence felt. Majority of above said diseases are on account of:	
<b>A</b>	Puddle of water formed due to rain become breeding grounds for mosquitoes which spread disease like, malaria and dengue fever. As a precautionary measure against mosquito-bite disease one can use mosquito net around the end which is better choice to mosquito repellent like mats and coils.
<b>B</b>	Pollution of drinking water during monsoon is very common. It is very necessary to drink clean and pure water when water-borne monsoon diseases like diarrhea and gastro-intestinal infections threaten us.
<b>C</b>	Walking in dirty water during rainy season leads of numerous fungal infection which affect toes and nails. Diabetic patients have to take a special care about their feet. Keeping feet always dry and clean is very necessary. Avoid walking in dirty water. Keep shoes socks and raincoats dry and clean.

<b>2.3 Workmen will be made aware of following Do's and Don'ts:</b>	
<b>a</b>	Do not sleep in daytime.
<b>b</b>	Avoid over physical exertion.
<b>c</b>	During lightning and thunder storm, do not take shelter under tree. Take shelter inside rest shed or store room.
<b>d</b>	No bare conductors or bare current-carrying parts of equipment be permitted to be installed unless adequate precautions are taken to prevent direct or indirect contact.
<b>e</b>	Only flame-proof equipment and conductors shall be installed at places where explosives or inflammable substances are stored, handled or used or where explosive atmosphere exists.
<b>f</b>	Persons competent and authorized only shall attend to electrical breakdowns and other operational faults and give or restore power to an equipment and such persons shall be easily identifiable by their dress or special helmet worn.
<b>g</b>	It will constitute a standard practice to switch off portable tools while shifting from one place to another or while leaving them behind unattended;
<b>h</b>	The contractor shall ensure that a system is in place to always keep tools well maintained.
<b>i</b>	Wash vegetables with clean water and steam them well to kill germs.
<b>j</b>	Avoid eating un-cooked foods and salads should be washed properly before consumption.
<b>k</b>	Drink plenty of water and keep body well Hydrated.
<b>l</b>	Always keep the surrounding area dry and clean. Don't allow to get water accumulated around.
<b>m</b>	Keep body warm as viruses attack immediately when body temperature goes down.
<b>n</b>	Do not enter air conditioned room with wet hair and damp cloths.
<b>o</b>	Dry your feet and webs with soft dry cloth whenever they are wet.
<b>p</b>	Eat light and less spicy food.
<b>q</b>	Avoid eating food which was cooked long time ago.
<b>r</b>	Eat salt in food to replenish loss of salt through sweating.





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<b>3</b>	<b>Emergency Weather Conditions</b>
	<b>Cyclone/Severe thunder storm</b>
	In the event of Cyclone/Severe thunder storm, alert will be issued by BHEL site manager based on notification received by Govt. authorities/Metrological departments or Customer.
<b>i</b>	<b>The actions required during cyclone/rough weather:</b>
<b>a</b>	Check and advise contractors to cleanup work area. Pick up all loose and unused material of respective supervisor's area.
<b>b</b>	Tie to secure all gas cylinders to avoid displacement and unsafe conditions which could be due to wind pressure.
<b>c</b>	Secure portable electricity generating sets and other equipment, pumps, hoses etc.
<b>d</b>	Make preparation for removal of water logging.
<b>e</b>	Take review of work activity and make preparation for removal of equipment and material from vulnerable areas.
<b>f</b>	Isolate/turn off all electrical power from the main panel/switches. Secure and anchor panels properly.
<b>g</b>	Recheck anchorage/tie of all temporary structures/sheds, tall objects, cranes, rigs, scaffolds etc. to avoid toppling due to wind force.
<b>h</b>	Cranes boom shall be secured, either locked or lowered the booms as reasonably and practicably possible and rigs to safe position for the safety point of view.
<b>i</b>	Group up all trash barrels, wooden pallets, forms; wooden decks etc. and anchor properly.
<b>j</b>	Welding machines, air compressors and such equipment are to be grouped together and secured to the stable objects. Welding leads, electrical cables, hoses are to be rolled up and secured properly.
<b>k</b>	Set on site vehicles on high ground in the site area with brakes set firmly.
<b>l</b>	Anchor all tanks, vessels, gas cylinders that may be moved by high wind and water.
<b>m</b>	Evacuate job site.
<b>ii</b>	<b>Personnel Evacuation:</b>
<b>a</b>	Personnel Evacuation will be required if predicted wind speed and storm surge heights are beyond acceptable limits as per the instructions from Govt. Authorities/ Metrological departments or Customer.
<b>b</b>	Once the warning is received for personnel evacuation, an emergency response team shall be formed. The team will work with local authorities and other agencies formed/deployed to evacuate and transport all personnel involved in the project to the cyclone shelter.
<b>c</b>	Cyclone may be followed by the calm "EYE", be aware of it. If the wind suddenly drops, don't assume the cyclone is over. Violent wind may resume from the opposite side direction. Wait for the official "All clear Signal".
<b>d</b>	After the cyclone, do not go outside until officially communicated about safe situation outside. Use recommended routes for returning. Do not panic or rush while returning
<b>e</b>	Checking of gas leaks and wellbeing of electrical appliances is essential before leaving the site.
<b>f</b>	Follow local communications for official warning and advice. The construction Manager shall also obtain updates from customer/metrological departments and communicate to the personnel on project site.
<b>D</b>	<b>Preparedness for Other Adverse Climates and Weather Conditions</b>
	Preventive steps for ensuring health and safety of workers in all possible adverse weather and climatic conditions to be ensured as per requirement
<b>E</b>	<b>Preparedness for Epidemics &amp; Pandemics</b>
	All necessary precautions and actions as per guidelines of Govt, authorities and regulatory bodies and BHEL procedures, shall be ensured so as to ensure health, safety and prevention of infection during any epidemic/ pandemic/ medical emergency.





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#### ANNEXURE - 6

##### Indicative List of Indian Standard Codes for Safety

S No	CODE NAME	TITLE
<b>PERSONAL PROTECTIVE EQUIPMENT</b>		
(1)	IS : 818-1968 (Reaffirmed 2003)	Code of Practice for safety and health requirements in Electric and Gas Welding and Cutting operations.
(2)	IS: 1179-1967 (Reaffirmed 2003)	Specification for Equipment for Eye & Face protection during welding.
(3)	IS : 1989 (Part 2):1986 (Reaffirmed 1997) IS: 5557-1969	Specification for Leather Safety Boots & Shoes Industrial & Safety Rubber Knee Boot
(4)	IS: 4770 : 1991 (Reaffirmed 2006)	Rubber Gloves – Electricals purposes-Specification
(5)	IS:8519 – 1977 (Reaffirmed 1983)	Guide for Selection of Industrial Safety Equipment for Body Protection.
(6)	IS:8520 – 1977 (Reaffirmed 2002)	Guide for Selection of Industrial Safety Equipment for Eye, Face and Ear Protection.
(7)	IS: 8807-1978	Code of practice for maintenance and care of industrialsafety equipment eye and face protection
(8)	IS: 1224-1985	Safety shoes
(9)	IS: 8940-1978	Code of practice for maintenance and care of industrial safety equipment eye and face protection
(10)	IS: 8990-1978	Code of practice for maintenance and care of industrial safety clothing
(11)	IS: 10667-1983	Guide for selection of industrial safety for protection of foot and leg
(12)	IS: 816-1969	Code of practice for safety and health requirements in electric and gas welding and cutting operations
(13)	IS: 7194-1994	Assessment of noise exposure during work for hearing conservation purposes
(14)	IS: 2925 – 1984 (Reaffirmed 2010)	Specification for Industrial Safety Helmets
(15)	IS: 3521 : 1999 (Reaffirmed 2002)	Industrial Safety Belts & Harnesses-Specification
(16)	IS: 14166:1994 (Reaffirmed 2002)	Respiratory Protective Devices-Full Face Masks Specification
(17)	IS: 14746 : 1999 (Reaffirmed 2003)	Respiratory Protective Devices-Half Masks and Quarter Masks - Specification
<b>CIVIL ENGINEERING OR CONSTRUCTION WORK</b>		
(18)	IS: 2750- 1967(Part II)	Steel scaffolds
(19)	IS: 875-1987	Structural safety of building: loading standards
(20)	IS: 4014-1967	Code of practice for steel tubular scaffolding
(21)	IS: 3646(Part II) – 1966(Reaffirmed 2003)	Code of Practice for Interior Illumination
(22)	IS:3696 (Part I) – 1987 (Reaffirmed 2002)	Safety Code for Scaffolds and Ladders
(23)	IS: 4138-1977	Safety code for working in compressed air



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(24)	IS: 7293-1974	Safety code for working with construction machinery
(25)	IS: 9944-1992	Recommendations on safe working load for natural and man-made rope slings
(26)	IS: 3696(Part 2) : 1991 (Reaffirmed 2002 )	Scaffolds and Ladders-Code of Safety
(27)	IS:3786 – 1983 (Reaffirmed 2002)	Method for Computation of Frequency and Severity Rates for Industrial Injuries and Classification of Industrial Incidents
(28)	IS: 4912 : 1978 (Reaffirmed 2002)	Safety Requirements for Floor and Wall Openings, Railings and Toe Boards
(29)	IS: 5983 – 1980 (Reaffirmed 2002)	Specification for Eye-Protectors
(30)	IS:6519 – 1971 (Reaffirmed 1997)	Code of Practice for Selection, Care and Repair of Safety Footwear
(31)	IS:9167:1979	Specification for Ear-Protectors
(32)	IS:6994(Part I)-1973 (Re affirmed 1996)	Specification for Industrial Safety Gloves Leather and Cotton Gloves
(33)	IS 11006 : 2011	Flash Back(Flame Arrestor) Specification
(34)	IS:9473:2002	Respiratory Protective Devices-Filtering Half Masks to protect Against Particles-Specification.
(35)	IS: 9944:1992 (Reaffirmed 2003)	Natural and Man-made Fiber Rope Slings- Recommendations On Safe working loads.
(36)	IS:11057 – 1884 (Reaffirmed 2001)	Specification for Industrial Safety Nets
(37)	IS: 12254:1993 (Reaffirmed 2002)	Polyvinyl Chloride (PVC) Industrial Boots-Specification
(38)	BS:1129	Portable timber ladders, steps, Trestles & lightweight staging
(39)	BS:1139	Metal scaffolds
(40)	BS:5973	Code of practice for access & working scaffolds
(41)	BS:5974	Code of practice for temporary installed scaffolds and access equipment
(42)	BS:5975	Code of practice for false work
<b>FIRE PROTECTION</b>		
(43)	IS: 2193-1992	Code of practice for selection, installation and maintenance of portable first aid fire extinguishers
(44)	IS: 5896	Code of practice for selection, operation and maintenance of fire-fighting appliances
(45)	IS: 8433-1984	Code of practice for dissolved acetylene cylinders
(46)	IS : 15397 :2003 (Reaffirmed 2008)	Portable Extinguisher Mechanical Foam Type(Stored Pressure)-Specification
<b>ELECTRICAL</b>		
(47)	IS: 3043-1987	Code of practice for earthing
(48)	IS: 5424-1969	Rubber mats for electrical purposes
(49)	IS: 3646 (Part II)	Artificial lightings
(50)	IS: 2148 & IS: 2206	Flame proof electrical fittings Machinery
<b>MACHINERY</b>		
(51)	IS:13367(Part 1):1992 (Reaffirmed 20030)	Safe Use of Cranes-Code of Practice
(52)	IS: 1860-1980	Code of practice for installation, operation and maintenance of electric passenger and goods lifts
(53)	IS: 1991-1987	Safety requirements for the use, care and protection of abrasive grinding wheels



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(54)	IS: 5903-1970	Safety devices for gas cylinders
(55)	IS: 8216-1976	Guide for inspection of lift wire ropes
(56)	IS: 8964-978	Recommendations for safety conditions for woodworking machines
(57)	IS: 9474-1980	Principles of mechanical guarding of machinery
(58)	IS: 11461- 1985	Code of practice for compressors safety
(59)	IS: 19311:2002	Guidelines for Quality and/or Environmental Management Systems Auditing
(60)	IS: 13367-1992	Code of practice for safe use of cranes
(61)	IS:1641	Code of practice for fire safety of buildings – General principles of fire grading and classification.
(62)	IS:1642	Code of practice for fire safety of buildings - Details of construction.
(63)	IS:4081	IS:4081 Safety code for blasting and related drilling operations.
(64)	IS:4130	Demolition of buildings - code of safety.
(65)	IS:5121	Safety code for piling and other deep foundations.
(66)	IS:5916	Safety code for construction involving use of hot bituminous materials
(67)	IS:7205	Safety code for erection of structural steel work.
(68)	IS:7969 (Indian Explosives Act 1940)	Safety code for handling and storage of building materials. (As updated)
(69)	IS:11769	Guidelines for safe use of products containing asbestos

#### CODES & STANDARDS

In addition to the codes and standards specifically mentioned in the relevant technical specifications for the equipment / plant / system, all equipment parts, systems and works covered under this specification shall comply with all currently applicable statutory regulations and safety codes of the Republic of India as well as of the locality where they will be installed, including the following:

A	Indian Electricity Act
B	Indian Electricity Rules
C	Indian Explosives Act
D	Indian Factories Act and State Factories Act
E	Indian Boiler Regulations (IBR)
F	Regulations of the Central Pollution Control Board, India
G	Regulations of the Ministry of Environment & Forest (MoEF), Government of India
H	Pollution Control Regulations of Department of Environment, Government of India
I	State Pollution Control Board.
J	Rules for Electrical installation by Tariff Advisory Committee (TAC).
K	Building and other construction workers (Regulation of Employment and Conditions of services) Act, 1996
L	Building and other construction workers (Regulation of Employment and Conditions of services) Central Rules, 1998
M	Explosive Rules, 1983
N	Petroleum Act, 1984



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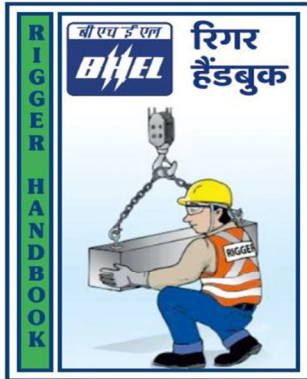
O	Petroleum Rules, 1976
P	Gas Cylinder Rules, 1981
Q	Static and Mobile Pressure Vessels (Unified) Rules, 1981
R	Workmen's Compensation Act, 1923
S	Workmen's Compensation Rules, 1924
T	Any other statutory codes / standards / regulations, as may be applicable.
U	Employer's Safety Rules for Construction and Erection
V	Employer's Safety Policy
W	CERC (Indian Electricity Grid Code) Regulations, 2023
X	CEA (Flexible Operation of Coal Based Thermal Power Generating Units) Regulations, 2023
Y	Any other statutory codes / standards / regulations, as may be applicable.



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### ANNEXURE - 7



#### एक रिगर क्या है?

• भारोत्थान गियर के चयन या निरीक्षण सहित, किसी भार को सुरक्षित रूप से उठाने के लिए तकनीकों का उपयोग करने वाले व्यक्तियों को रिगर कहते हैं।

#### एक योग्य रिगर को पता होना चाहिए कि कैसे...

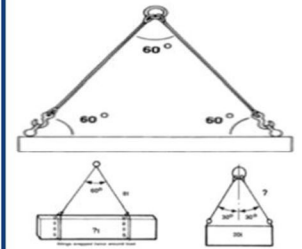
- विभिन्न प्रकार की रस्सियों, स्लिंक्स, जंजीरों और सहायक उपकरणों का उपयोग करें।
- उठाने के लिए उपयोग की जाने वाली किसी भी रस्सी, स्लिंग या चैन के सुरक्षित कार्य भार (एसडब्ल्यूएल) की गणना करें।
- भार उठाने के लिए भार का आकलन करें।
- उपयुक्त सुरक्षित स्लिंगिंग तकनीकों का चयन करें और उनका उपयोग करें।
- विभिन्न भारों और आकारों के सुरक्षित रूप से स्लिंग लोड का चयन करें।
- जब लोड (सामान) ऑपरेटर की दृष्टि से बाहर होता है तो क्रेन या होइस्ट ऑपरेटर को लोड की गति में निर्देशित करें।
- भार को निर्देशित करने के लिए हाथों और सीटी से संकेत दें।
- संभाले जाने वाले कुछ भारों का भार-वितरण डीकॉट पर मुद्रित किया जा सकता है या किस प्रकार से भार पर अंकित किया जा सकता है।

#### फ्लैट वेबिंग और राउंड सिंथेटिक स्लिंग्स (Flat webbing and round synthetic slings)

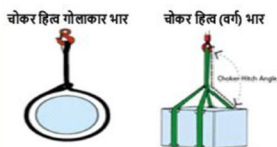
फ्लैट वेबिंग और राउंड सिंथेटिक स्लिंग्स को SWL के साथ लेबल किया जाता है। अगर लेबल गायब है तो भार न उठाए। मूल्यांकन और पुनः लेबलिंग के लिए निर्माता को स्लिंग लोटाए। सिंथेटिक स्लिंग्स रंग कोडित होते हैं।



लोड या डिलीवरी डॉक पर अंकित भार से सावधान रहें। उदाहरण के लिए इमारती लकड़ी, गीली होने पर 50 प्रतिशत भारी हो सकती है। फर्शजूम में, जब बड़े दलवाई को एक साथ से उठाया जाता है, तो रेत द्वारा निर्मित खूण (Suction) क्रेन में काफी वृद्धि कर सकता है। पाइप और टेक अक्सर तलतल पदार्थ, कीचड़ या अन्य सामग्री द्वारा भाँस होते हैं।



#### स्लिंग के विभिन्न प्रकार



#### सामान्य नियम (Thumb Rule)

स्लिंग का सेफ वर्किंग लोड (एसडब्ल्यूएल) अधिकतम भार है जिसे स्लिंग सामग्री के एसडब्ल्यूएल, रीवेइंग व्यवस्था और स्लिंग टर्मिनेशन की विधि पर विचार करने के बाद ठोठाया जा सकता है।

अ) सबीला इस्पात तार रस्सी (FSWR) स्लिंग के लिए SWL नीचे दिये गये सूत्र द्वारा दिया जाता है:-

$$\text{सूत्र: } \text{SWL (kg)} = D^2 (\text{mm}) \times 8$$

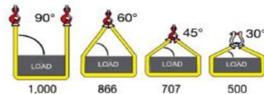
$$D (\text{mm}) = \sqrt{\text{SWL (kg)} / 8}$$

जहाँ, SWL = सुरक्षित कार्य भार और D = रस्सी व्यास

ब) श्रृंखला (Chain) का SWL ग्रेड (G) द्वारा नीचे दिये गये सूत्र द्वारा दिया जाता है:-

$$\text{सूत्र: } \text{SWL (किलो)} = D^2 (\text{मिमी}) \times G \times 0.4$$

जहाँ (i.e.), ग्रेड (G) 80 श्रृंखला, 0.4 का उपयोग करें।



#### WORKING LOAD LIMIT (WLL) IN TONNES UNDER GENERAL CONDITIONS OF USE

Chain Size (mm)	Grade	Slings of 2, 3 or 4 Leg Slings			
		Straight Sling	Adjustable Sling*	Reeved Sling	Basket Sling Max 60°
6	80	1.1	1.3	0.8	1.5
8	80	2.0	2.0	1.5	2.6
10	80	3.2	3.2	2.4	4.1
13	80	5.3	5.3	4.0	6.9
16	80	8.0	8.0	6.0	10.4
20	80	12.5	12.5	9.4	16.3
22	80	15.0	15.0	11.3	19.5
26	80	21.2	21.2	15.9	27.6
32	80	31.5	31.5	23.6	41.0
6	100	1.4	1.4	0.8	1.8
8	100	2.5	2.5	1.4	3.3
10	100	4.0	4.0	2.3	5.2
13	100	6.7	6.7	3.8	8.7
16	100	10.0	10.0	5.6	13.0
20	100	16.0	16.0	9.0	20.8
22	100	19.0	19.0	10.7	24.7
26	100	26.5	26.5	14.9	34.5
32	100	40.0	40.0	22.5	52.0
8	120	3.0	3.0	2.3	3.9
10	120	5.0	5.0	4.0	6.5
13	120	8.0	8.0	6.3	10.8
16	120	12.0	12.0	9.0	16.0
20	120	19.0	19.0	14.0	26.0
22	120	22.0	22.0	16.0	30.0
26	120	30.0	30.0	22.0	42.0
32	120	45.0	45.0	33.0	63.0
8	150	5.0	5.0	3.0	5.0
10	150	8.0	8.0	5.0	8.0
13	150	13.0	13.0	8.0	13.0
16	150	20.0	20.0	12.0	20.0
20	150	32.0	32.0	19.0	32.0
22	150	38.0	38.0	22.0	38.0
26	150	52.0	52.0	30.0	52.0
32	150	78.0	78.0	45.0	78.0

\* On adjustable slings, some grab shortening hooks may reduce the WLL by 25%. Advice should be sought from the mfg.

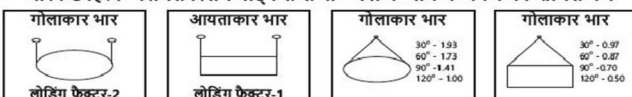
नोट - ऊपर दिये गये सभी कारक मानक के अनुसार हैं और यह कारक पर्वस्थिति के अनुसार बदल सकते हैं।

चित्र :- उपयोग की सामान्य परिस्थितियों में टन (1000 किलो) में कार्य भार सीमा

#### सिंगल स्लिंग



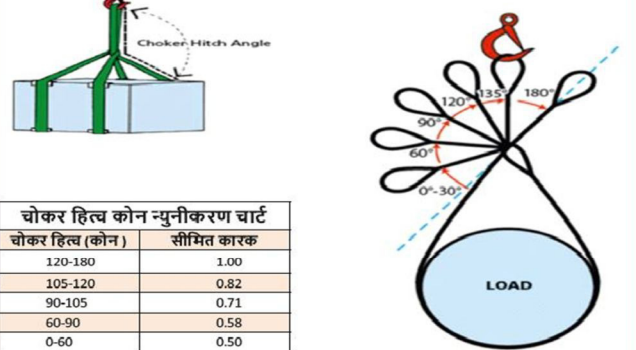
बास्केट हिल्ट - सिंगल स्लिंग वदिकल लेग्स - पैरों के बीच के कोण को शामिल करें



#### अंतहीन स्लिंग



#### वायर रोप स्लिंग चोकर हिल्ट के साथ

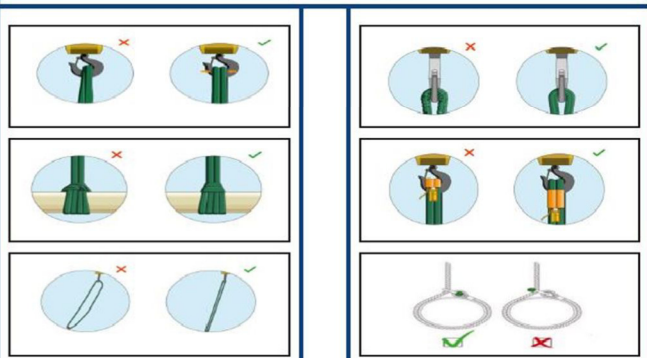


#### रिगर के हाथों के संकेत

क्रेन की गतिविधियों को निर्देशित करने के लिए रिगर को क्रेन ड्राइवरों को स्पष्ट भौतिक संकेत देना चाहिए। रिगर स्पष्ट रूप से बोले और क्रेन के उस हिस्से का नाम बताएं जिसे पहले ले जाना है - फिर चलने / घूमने की दिशा।

MOTION	HAND SIGNAL	WHISTLE, BELL OR BUZZER SIGNAL
Hoisting		2 short **
Luffing boom up		3 short ***
Swinging right		1 long, 2 short --**
Hoisting (or) lowering boom extend		1 long, 3 short ---**
Travel and traverse		Not applicable
MOTION	HAND SIGNAL	WHISTLE, BELL OR BUZZER SIGNAL
Hoisting		1 long
Luffing boom down		4 short ----
Swinging left		1 long, 1 short -*
Hoisting (or) lowering boom retract		1 long, 4 short ----**
Stop		1 short *

#### क्या करें और क्या न करें

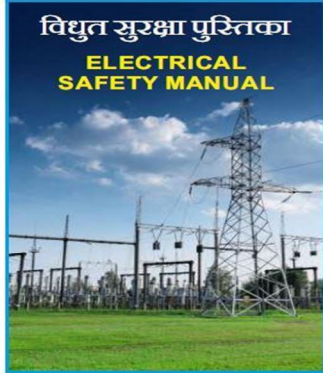




## HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATIONS BY CONTRACTORS

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### ANNEXURE-8



#### विजली क्या है :

विजली एक किस्म की ऊर्जा है, जो कि संवाहक (कंडक्टर) में लगातम व क्रमात्मक बिन्दुओं से इलेक्ट्रॉनों के आंतरण से उत्पन्न होती है। विजली के आवेज के दौरान को विद्युत धारा कहा जाता है, जिसकी तीव्रता सामान्यतः एम्पीयर में मापी जाती है। विद्युत धारा या तो डिरेक्ट धारा (Direct Current) होती है या फिर प्रत्यावर्ती धारा (Alternate Current) वोल्टेज विद्युतीय जलिका (विभव जलिका धारिता युक्ति धारा) होती है, जिसके कारण सर्किट में धारा प्रवाहित होती है। इसे धारिता कुलंब जूलस (वोल्टस) में मापा जाता है।

#### विजली के खतरों :-

- 1) **विजली का झटका** एक खतरनाक स्थिति होती है, जिसमें विजली की लगी धारा / धारिता के संपर्क से, ऊर्जा का संभावित उत्सर्जन होता है।
- 2) **शॉर्ट सर्किट** विजली के किसी सर्किट के अलग-अलग वोल्टेज के दो बिन्दुओं के बीच असामान्य संपर्क के कारण होता है।
- 3) **ज्वलन (फ्लैश)** का खतरा एक ऐसी स्थिति

होती है, जो विद्युत धारा (आर्क) के कारण ऊर्जा के उत्सर्जन से उत्पन्न होती है।

4) **ओवरवोल्टेज** एक ऐसी स्थिति होती है, जिसमें विजली की धारा या सर्किट पर उसकी क्षमता से ज्यादा एम्पीयर लोड डाला जाता है।

5) **असुरक्षित वोल्टेज** तब होती है, जब किसी सर्किट या उसके पुर्जों में वोल्टता, उसकी अधिकतम डिजाइन सीमा को लांघ लेती है।

6) **ऊपरी लाईन के खतरों** से तात्पर्य है जमीन से ऊपर स्थित दवा में लटकती विजली की ट्रांसमिशन लाइन।



**खतरा**  
**उच्च वोल्टेज**

#### विजली के झटके (शॉक) को रोकने के लिए सावधानियां :-

1) **इन्सुलेशन निरीक्षण** :- विजली के उपकरण, झटके (शॉक) से बचाने के लिए इन्सुलेट बनाते हैं। कमजोर इन्सुलेशन से झटके (शॉक) को रोकने के लिए, रोजमर्रा के उपयोग में विजली के तार और कनेक्शन का ठीक से निरीक्षण करें। सुनिश्चित करें कि प्रत्येक विद्युत कनेक्शन में संपर्क प्रदान किया गया हो।

2) **फेज-टू-ग्राउंड (फाल्ट) आरम्भिकीय का उपयोग करें** :- विजली के झटके से संबंधित घटने को कम करने के लिए यह सुनिश्चित करें कि फेज-टू-ग्राउंड (फाल्ट) आरम्भिकीय का मुख्य जंक्शन बॉक्स में उपयोग किया जाता है और ओवरलैपिंग विद्युत मानक के अनुसार आवश्यक है कि, उपरोक्त आउटलेट के लिए या तो माउंट फॉल्ट सर्किट इंटरप्टर (जीएफसीआई) प्रदान करें या एक सुनिश्चित उपकरण आउटलेट कंडक्टर उपलब्ध कराएं।

3) **व्यक्तिगत सुरक्षा उपकरण (पीपीई)** :- इस उपकरण में स्वर इन्सुलेशन दस्ताने, आरती, चट्टाई, कबल, लाइन नली, और गैर-प्रवाहक फलोर टोपी (कैप) शामिल हैं। उचित पीपीई को पहनने के अलावा

कर्मचारियों को, पीपीई उपयोग करने से पहले उसकी धारिता की जांच करें। यदि उपकरण सेवा योग्य नहीं है तो, उसे त्याग दें या उसकी मरम्मत करें।

4) **ताला और टैग** :- विजली के झटके को कम करने के लिए, तालाबंदी और टैग आउट उपकरण का उपयोग सबसे प्रभावी तरीकों में से एक है। स्वरभाव करने समय आकस्मिक ऊर्जा को रोकने के लिए, तालाबंदी टैग आउट का उपयोग करने के लिए कर्मचारियों को शक्ति के स्रोत पर या तो एक टैग या ताला लगाया होगा।

5) **धारा लाइन सुरक्षा** :- विजली की लाइनों सबसे बड़ा विद्युत धारा संकुचित करती है, इसलिए एडवर्टिसात अनिवार्य सुरक्षा लेना महत्वपूर्ण है। सिर के ऊपर विजली लाइनों के पास काम करते समय यह सुनिश्चित करने की आवश्यकता है कि वे केवल लकड़ी या फाइबरग्लास सीढ़ी का उपयोग करें। सुनिश्चित करें कि पदों, स्थानीय उपयोगिता कंपनी से ली हुई विजली लाइनों के संपर्क को रोकने के लिए जानकारी ले कर सुनिश्चित करें।




**घरेलू उपयोग - क्या करें**

- मानक आईएसई विनिर्देशन उपकरण और सामान का उपयोग करें।
- रेफ्रिजरेटर, वाशिंग मशीन, ओवन, मिक्सर ग्रेडर को विजली से कनेक्ट करने के लिये विशेष उपयुक्त रूप से अभिन की हुई तीन पिनो वाली प्लग का उपयोग करें।
- मानव संरक्षण हेतु विजली के सर्किट में 30mA संवेदनशीलता वाला आरम्भिकीय (रेसिड्युअल करंट सर्किट ब्रेकर) लगाएं।
- उपकरणों में लोडिंग पर विजली की आपूर्ति बंद कर दें।
- विजली की धारा को गर्म / नीले उपकरणों से दूर रखें।
- स्विचबोर्ड ऐसी जगह लगाये जहाँ आसानी से पहुँचा जा सके।
- उपकरणों को साफ और सुख से सुख रखें।
- विजली से चलनेवाले औजार प्रचलित करने समय स्वर के सोल वाले जुते पहनें।
- साफ करने से पहले, दमेश विजली की वस्तुओं के प्लग निकाल दें।



- यह सुनिश्चित करें कि सभी किस्म की धारा को फेजवर लाइनें-समर्थी विद्युतकर्मी ही स्थापित एवं / या सर्विस / मरम्मत करें।
- सर्किट ब्रेकर और फ्यूज उपलब्ध कराएं, जिनसे शॉर्ट सर्किट / ओवरवोल्टेज होने पर मुख्य पैनल से सर्किट अपने-आप बंद हो जाएँ और कोई दुर्घटना नहीं होगी।





**घरेलू उपयोग - क्या न करें**

- नीचे दिये विजली के उपकरण प्रचलित न करें।
- कई उपकरणों से जोड़कर धारा को ओवरलोड न करें।
- फ्यूज की जगह तार न लगाएं।
- विजली तालु होने पर फ्यूज बॉक्स / सीएफएल न बदलें।
- लंबी तारे डालकर, विजली आपूर्ति की निकासी न करें।
- प्लग को सर्किट से निकालने के लिए तार को न खींचें।
- धारा को बीच से न जोड़ें और अगर जोड़ना ही पड़े तो ऊपर आवरण लगाएं।
- धारा को कालीन ग्रेडर के नीचे न डालें।
- विजली की लंबी धारा को सर्किट में प्लग के बने न डालें।
- विजली की धारा को कभी न मोड़ें और न ही मोड़ें या फिर उपकरणों को तार के सटार न उठाएं।



**औद्योगिक उपयोग - क्या करें**

- सभी स्विचों / स्विचबोर्डों की पढ़ावा लिखित करें और उनपर लिखल लगाएं।
- सभी स्विचों / स्विचबोर्डों / पैनलों को पहुंचने योग्य स्थानों पर लगाएं।
- विजली के पैनलों के सामने स्वर / आवरण गैट का उपयोग करें।
- काम करते समय, दमेश आईएसआई निशान वाले मानक वैद्युतिक संरक्षण उपकरणों (पीपीई) का उपयोग करें।
- पृथक्करण हेतु और विजली की प्रणाली पर काम करने के लिये कार्य अनुमति / लोटे (LOTO) प्रणाली अपनाने।
- मानक / आईएसआई निशान वाली सामग्री / वस्तुओं का उपयोग करें।
- विजली के सभी उपकरणों / मशीनों की दोहरी अभिन करना सुनिश्चित करें।
- कार्यस्थल पर अग्नीशमन यंत्रों / शत की बाल्टियों का उपलब्ध होना सुनिश्चित करें।
- जहाँ कहीं जरूरत हो, खतरों के बोर्ड और अन्य

चेतावनी संकेतों का उपयोग करें।

- विजली के उपकरणों एवं धारा के कटने-फटने या आवरण क्षतिग्रस्त होने की जांच जरूर करें।
- जब तक साफ न हो जाए, तब तक डेस्क सर्किट को बिजलीयुक्त न करें।
- ज्वलन संरक्षण वाले उपयुक्त रूप से निर्मित उपकरण का उपयोग करें। संरक्षण हेतु, आर्क रोधी कपड़ों और पीपीई का इस्तेमाल करें।
- सुनिश्चित करें कि काम शुरू करने से पहले फेडरों और श्रमिकों ने काम को समझ लिया है।
- विजली प्रणाली पर काम करने के लिए लिखित प्रक्रिया पत्रिका लिखें।
- जहाँ तक संभव हो, विजली की ऊपरी धारा को दूर रखें, आवरणयुक्त करें या उचित प्रणाली पर काम करने से पहले, गैर-संपर्क किस्म के वोल्टेज संयुक्त द्वारा वोल्टेज की गैर-गैर-जुड़ती जांच करें।
- अनायास संपर्क से बचने के लिए, विजली की धारा को आवरणयुक्त या स्वरयुक्त बनाएं।
- उपकरण के सिरे पर निशान की जांच धारा या

संबंधित व्यक्ति से संपर्क करके सर्विस के वोल्टेज का पता लगाएं।

- अगर सामग्री को विजली की धारा के नीचे रखना पड़े, तो श्रमिकों को खतरों की जानकारी देने हेतु, चेतावनी पत्रिकाएं और संकेत लटकाएं तथा सामान रखने से पहले लिखित प्रक्रियाएं ठासिल करें।
- कार्य के अनुकूल, मॉडिफिकेशन / मापन यंत्रों का चयन करें।



**खतरा इलेक्ट्रिक शॉक जोखिम**

**औद्योगिक उपयोग - क्या न करें**

- अस्थायी कनेक्शन न लगाएं।
- विशेषकर सुवादा उपकरणों हेतु प्रयुक्त धारा को बीच से न जोड़ें।
- स्विच / पैनल आवरणों को खुला न छोड़ें।
- सर्किट के विद्युत - प्रवाहित पुर्जों खुले न छोड़ें।






**आपातकालीन कॉल करें**

**महत्वपूर्ण संकेतों की जाँच करें**

**बाईं विन की साँसें चेक करें**


**बचाव के लिए साँसें दें**

**सीपीआर दें**

**मदद के लिए प्रतीक्षा करें**




**पीपीई सुरक्षा उपकरण**





**ANNEXURE 9**

**HSE INSPECTION FORM ATS**

	<b>POWER SECTOR</b>	<b>FORMAT NO: HSEP:14-F01</b> <b>REV NO.: 01</b> <b>PAGE NO. 01 OF 1</b>
	Inspection of First Aid Box	

<b>Name of Site</b>	
<b>Name of Sub-Contractor</b>	
<b>Inspected by</b>	
<b>Date &amp; Time of Inspection</b>	

**Number of employees on the site: - \_\_\_\_\_ Number of Workers on the site: - \_\_\_\_\_**


S. No.	Item	No. Available	Remarks
1	No. of small sterilized dressings		
2	No of medium sized sterilized dressings		
3	No of large sized sterilized dressings.		
4	No. of large sized sterilized burn dressings		
5	No of (15 grams) packets sterilized cotton wool		
6	No of pieces of sterilized eye pads in separate sealed packets.		
7	No of roller bandages 10 cm wide.		
8	No of roller bandages 5 cm wide.		
9	Whether tourniquet available		
10	Whether supply of suitable splints available.		
11	No of packets of safety pins.		
12	Whether kidney tray available		
13	Whether sufficient number of eye wash bottles, filled with distilled water or suitable liquid, clearly indicated by a distinctive sign which shall be visible at all times, available.		
14	Whether 4%-xylocaine eye drops, and boric acid eye drops and soda bicarbonate eye drops available.		
15	Whether (60ml) bottle containing a two percent alcoholic solution of iodine available		
16	Whether (two hundred ml) bottle of mercurochrome (2 per cent) solution in water available.		
17	Whether 120ml bottle containing Sal volatile having the dose and mode of administration indicated on the label,		
18	Whether roll of adhesive plaster (6 cm X 1 meter) available		
19	No of rolls of adhesive plaster (2 cmX1meter)		
20	Whether snake bite lancet available.		
21	Whether (30 grams) bottle of potassium permanganate crystals available.		
22	Whether a pair scissors available		
23	Whether copy of the First-Aid leaflet issued by the Director-General, Factory Advice service and labor Institutes, Government of India available.		
24	Whether bottle containing 100 tablets(each of 5 grains) of aspirin available		
25	Whether Ointment for burns available		
26	Whether bottle of a suitable surgical anti-septic solution available		
27	Whether List of Contents pasted on First Aid Box along with respective expiry dates		

**Signature of Inspecting Official**

**Date:**

**Signature of Contractor Site I/ C**

**Date:**

	<b>POWER SECTOR</b>	FORMAT NO: <b>HSEP:14-F02</b> REV NO.: 01 PAGE NO. 01 OF 2
	Health Check-Up	

<b>Name of Site</b>	
<b>Name of Sub-Contractor</b>	
<b>Name of Employee</b>	
<b>Age</b>	

History Of Past Illness	H/O Epilepsy:	
	H/O Drug Allergy:	
	H/O Diabetics/ Hypertension:	
	H/O Unconsciousness:	
Personal History		

EXAMINATION		OBSERVATION	
<b>General Physical Examination</b>			
Height			
Weight			
BMI			
Built And nourishment			
Pallor			
Temperature			
Chest Expansion	Inspiration	Expansion	
Lymph Node Enlargement			
Upper Limbs Strength & Function			
Lower Limbs Strength & function			
Spine Adequately flexible for the job concerned (Yes/ No)			
Mental alertness and stability with good eye, hand and foot co-ordination.			
<b>Ear, Nose, Throat</b>			
Ear / Hearing			
Nose			
Throat			
<b>Vision</b>			
Left Eye		Right Eye	

EXAMINATION		OBSERVATION	
<b>Cardiovascular System Examination</b>			
Inspection			
Palpation	Pulse	BP	
Auscultation (Heart Sounds)			



## POWER SECTOR

## Health Check-Up

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<u>Respiratory System</u>		
Inspection	Respiratory Rate	
Palpation:		
Percussion		
Auscultation (Breath Sounds)		
<u>Examination of Abdomen</u>		
Inspection		
Palpation		
Auscultation (Bowel Sounds)		
<b>Any Other</b>		
<b>Clinical Impression</b>		

**Signature of the Examining doctor**

**Date:**

**POWER SECTOR****HSE Induction Training**FORMAT NO: **HSEP:14-F03**

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<b>Name of Site</b>	
<b>Name of Sub-Contractor</b>	
<b>Date</b>	
<b>Name of Training Coordinator</b>	

Sl. No.	Name	Designation	Organization	Signature

**Signature of Training Coordinator****Date:**

**POWER SECTOR****Toolbox Talk**FORMAT NO: **HSEP:14-F04**

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<b>Name of Site</b>	
<b>Sub-Contractors Name</b>	
<b>Date</b>	

<b>Topic</b>	<b>Name of person delivered Tool Box Talk</b>	<b>No. of Participants attended</b>	<b>Remarks</b>

**Signature of Site I/ C of Contractor****Date:**



	<b>POWER SECTOR</b>	<b>FORMAT NO: HSEP:14-F05</b> <b>REV NO.: 01</b> <b>Page 01 of 4</b>
	Monthly Site HSE Report	

<b>Name of Contractor:</b>	<b>Report Month &amp; Date:</b>

**A. Accidents/ Incidents Details: -**

a	Lost time in Accidents	No. of incidents	Man Hours Lost	No. of People Involved	No. of persons reported to Govt.		
	For the Month						
	Cumulative						
b	Minor Injuries						
	For the Month						
	Cumulative						
c	Fires	No. of Near-Misses	No. of First- Aid cases	No. of persons injured	No. of equipment damaged	No. of Fire reported Outside	
	For the Month						
	Cumulative						
d	Other mishaps not covered in a, b, c.	No. of Near-Misses	No. of First- Aid cases	No. of persons injured	No. of equipment damaged	Total near misses and First-Aid	
	For the Month						
	Cumulative						

**B. Data for Man-hours worked:**

Details	Value	Remarks if any
No. of people		
Man Hours worked		
O.T. Hours		
Total Man Hours		
Grand Total of man hours worked during the month(A+B)		
Cumulative man-hours(from _____ to _____): ( Since commencing of operations)		

**C. Status of Deployment of Work force, Safety Officers/ Supervisors & Construction Medical Officer(s) & Electricians:**

Description	Names	Qualification & Experience
Safety Officers		
Safety Supervisors		
First aider staff detail		
Electricians		
Scaffolding Inspectors		
T&P Inspectors		

Signature of Contractor Site In-charge

Signature of Contractor HSE Officer

**POWER SECTOR****Monthly Site HSE Report**

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**D. Lifting Tools, Tackles, Equipment and Pressure Vessels:**

Item	Nos. Deployed	Nos. Tested by competent person	Serial Number and Test validity (one per line)
Winches			
Chain Blocks			
Wire Rope Slings			
Man Cages			
D-Shackles			
Air Compressors			
Crawler Cranes			
Mobile Cranes			
Hydra Cranes			
Others			

**E. Reverse Horns in Construction Vehicles:**

Item	Serial numbers, last testing dates and status of reverse horns (OK/ No OK) – one per line
Transit Mixers	
Hydra Cranes	
Dumpers/ Trippers	
Backhoes	
Other Vehicles	

**F. ELCBs:**

Serial numbers, locations, last testing dates, status (OK/ Not OK) – one per line

**G. Electrical Earthing:**

Serial numbers, locations and locations of electrical earth points – one per line

**H. Fire Extinguishers:**

Name & designation of person responsible for maintenance of Extinguishers at different locations : ( Individual Contractor's Safety Officers).

**FIRE EXTINGUISHERS AT ERECTION SITE:**

Type	Serial numbers, sizes, Locations, last testing dates and status (OK/ Not OK) (one per line)
FOAM TYPE	
SODA TYPE	
DRY TYPE (DCP)	
CO2 TYPE	

Signature of Contractor Site In-charge

Signature of Contractor HSE Officer

**POWER SECTOR****Monthly Site HSE Report**

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**FIRE EXTINGUISHERS AT SITE OFFICES & STORES:**

Type	Serial numbers, sizes, Locations, last testing dates and status (OK/ Not OK) (one per line)
FOAM TYPE	
SODA TYPE	
DRY TYPE (DCP)	
CO2 TYPE	

**I. Implementation of checklist, Work Permits:**

Item	Numbers During the Month	Major Deviations

**Note:-** Please attach photocopies of all filled Checklists & Work permits for that month.

**J. Personal Protective Equipment Issued (Extend table for each Contractor):**

Item	Issued this Month	Nos. Issued up to the Month	Percentage of usage at Site (as per physical verification)
<b>Name of Contractor:</b>			
Safety Helmet			
Safety Shoes			
Full Body Harness			
Fall Arrestor			
Safety Nets			
Other PPEs.			

**K. Safety Observations by Contractor Executives- Observations package wise:**

No. of Observations received in the month	No of points complied	Cumulative no. of non-complied points

**L. Training programs on safety during the month:****1. Refresher/ On the Job Trainings Conducted: -**


Topic	Date Of Programme	No. Of Participants	Level Of Participants

**2. Tool-Box talks/ Pep-talks on Safety:**

Date	Tool Box Talk - No of Participants	Topic	Remarks

Signature of Contractor Site In-charge

Signature of Contractor HSE Officer

	<b>POWER SECTOR</b>	<b>FORMAT NO: HSEP:14-F05</b> <b>REV NO.: 01</b> <b>Page 04 of 4</b>
	Monthly Site HSE Report	

**3. Induction Trainings:**

Date	Safety Induction No. of Participants	Topic	Remarks

**M. Progress of Management Programmes at Site**

SL	Description Of MPs	Annual Plan	Achievement In This Month	Cumulative Achievement
<b>A. Environment Improvement Programme</b>				
1	Plantation of Trees			
2	Installation of Scrap Bins			
3	Chemical Storage & Handling System			
<b>B. Improvement of Working Environment</b>				
4	Increasing LTI free days			
5	Air Quality Monitoring			
6	Water Quality Monitoring			
7	Illumination level Monitoring			

**N. HR Information:**

Designation	Total No. Inducted	Total no. of Induction Balance	Total no. of Gate Pass Issued	Total no. of Gate Pass Balance	Total no. of Gate Pass Cancelled	Medical Check-up Completed	Medical Check-up Balance

**O. Rewards on Account of Good Safety Performance**

Serial Number	Reward Issued to	Details of Reward Issued (Amount etc.)	Brief Reason

**Note:** Photos of Reward Functions to be attached

**P. Other Safety initiatives / Safety Activities conducted (with photos, if any):**

Signature of Contractor Site In-charge

Signature of Contractor HSE Officer

Date:

Date:

**POWER SECTOR****Personal Protective Equipment**

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<b>Name of Site</b>	
<b>Name of Sub-Contractor</b>	
<b>Date &amp; Time of Inspection</b>	


Item	Issued this Month	Nos. Issued up to the Month	Percentage of usage at site
Safety Helmet			
Safety Shoes			
Full Body Harness			
Fall Arrestor			
Safety Nets			
Other PPEs.			

Signature of Inspecting Official:

Date:

Signature of Site I/ Cof Contractor:

Date:

	<b>POWER SECTOR</b>	<b>FORMAT NO: HSEP:14-F07</b> <b>REV NO.: 00</b> <b>PAGE NO. 01 OF 1</b>
	<b>Inspection Of T&amp;Ps</b>	

<b>Name of Site</b>	
<b>Name of Sub-Contractor</b>	
<b>Date &amp; Time of Inspection</b>	

Sl.No.	Description	Remarks
1.0	Name of equipment	
2.0	Basic Information of equipment	
2.1	Specification	
2.2	Sr. No. of equipment	
2.3	Make	
2.4	Year of manufacture	
3.0	Major repairs / overhauls(Furnish details of work carried out)	Date(s) of major repair/overhaul
3.1		
3.2		
3.3	Repairs carried out at site	
4.0	Any performance test conducted	Yes/ No
5.0	Document Submitted	Yes/ No
6.0	Manufacturer's test / guarantee certificate	Available/ Not available
7.0	Performance test	Done/ Not Done
8.0	Acceptance Norms	
9.0	Committee Observations	
10.0	Date of next review (if accepted)	
<b>Signature-Contractor HSE Officer</b>		<b>Signature-Contractor Site In-charge</b>



**POWER SECTOR****Status Of T&Ps**FORMAT NO: **HSEP:14-F08**

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<b>Name of Site</b>	
<b>Name of Sub-Contractor</b>	
<b>Date &amp; Time of Inspection</b>	

<b>Item</b>	<b>Nos. Deployed</b>	<b>Identification Numbers (1 on each line)</b>	<b>Whether Tested by competent person</b>	<b>Validity of Test Certificates</b>	<b>Whether internal testing using Color Coding or similar system done</b>
<b>Winches</b>					
<b>Chain Blocks</b>					
<b>Wire Rope Slings</b>					
<b>Man Cages</b>					
<b>D-Shackles</b>					
<b>Air Compressors</b>					
<b>Crawler Cranes</b>					
<b>Mobile Cranes</b>					
<b>Hydra Cranes</b>					
<b>Others</b>					

Signature of Inspecting Official

Date

Signature of Site I/ Cof Contractor

Date

**POWER SECTOR****Inspection Of Cranes**FORMAT NO: **HSEP:14-F09A**

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<b>Name of Site</b>	
<b>Name of Sub-Contractor</b>	
<b>Inspected by</b>	
<b>Date &amp; Time of Inspection</b>	


Crane Reg. No (Make/ Model) \_\_\_\_\_

Name of Driver/ Operator \_\_\_\_\_

Sl.no.	Description	Observation	Measures
1	Valid Driving license		
2	Hook & Hook Latch		
3	Over Hoist limit switch		
4	Boom limit switch		
5	Boom Angle Indicator		
6	Boom limit cutoff switch		
7	Condition of Boom		
8	Condition of ropes		
9	Number of load lines		
10	Size and condition of the slings		
11	Stability of the cranes		
12	Soil Condition		
13	Swing Break And Lock		
14	Proper Break And Lock		
15	Hoist Break And Lock		
16	Boom Break And Lock		
17	Main Clutch		
18	Leakage in Hydraulic Cylinders		
19	Out riggers fully extendable		
20	Tyre pressure		
21	Condition of Battery And Lamps		
22	Guards of moving and rotating parts		
23	Load chart provided		
24	Number and position of pedant ropes		
25	Reverse Horn		
26	Load Test Details		
27	Operator's fitness		
28	Pollution under control certificate		
29	Fire extinguisher of appropriate type.		
30	Training of the operator		

Signature of Site I/ C of Contractor:

Date:

	<b>POWER SECTOR</b>	FORMAT NO: HSEP:14-F09B REV NO.: 00 PAGE NO. 01 OF 1
	<b>Inspection Of Winches</b>	

<b>Name of Site</b>	
<b>Name of Sub-Contractor</b>	
<b>Inspected by</b>	
<b>Date &amp; Time of Inspection</b>	

Winch Reg. No. (Make/ Model) \_\_\_\_\_

Name of Operator \_\_\_\_\_

S.N o.	Description	YES	NO	NA	Remarks
1	Has the copy of Third Party Inspection certificate been provided in winch machine shed?				
2	Is winch machine operator experienced enough to operate the winch machine?				
3	Is the winch machine operated by someone other than the winch machine operator?				
4	Is there guard provided in all moving parts like wheel and motor's shaft?				
5	Will it protect against unforeseen operational contingencies?				
6	Are brakes, clutch and locking arrangement working properly?				
7	Has it been ensured that the guard does not constitute a hazard by itself?				
8	Are the cranks and the connecting rods protected by guardrails?				
9	Is there provision for fully covered shed with wooden plank roof?				
10	Is wire rope free from any kind of damage or wear and tear?				
11	Is split pin provided for the protection of clutch and brake locking arrangement?				
12	Is pulley inspected by competent person and certified before use?				
13	Is pulley free from any wear and tear visually?				
14	Is winch rope barricaded with clipsheet for the protection of rope and person?				
15	Is the wire rope lubricated by cardium oil?				
16	Is there any friction in wire rope which may damage the wire rope rather than the rolling parts?				
17	Is there any oil leakage in the hydraulic system of the winch machine?				
18	Has it been ensured that the guard will not cause discomfort or inconvenience to operator?				
<b>Total NO</b>				<b>% Compliance</b>	
<b>Total NA</b>					

Signature of Inspecting Official:

Date:

Signature of Site I/ Cof Contractor:

Date:

**POWER SECTOR****Inspection of Height Working**FORMAT NO: **HSEP:14-F10**

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<b>Name of Site</b>	
<b>Name of Sub-Contractor</b>	
<b>Area/ Location</b>	
<b>Inspected by</b>	
<b>Date &amp; Time of Inspection</b>	

Sl. No.	Descriptions	Observation (OK/ Not OK)	Remarks
<b>A. Working Platforms</b>			
1	Adequate illumination has been ensured.		
2	Work area inspected prior to the start of the work.		
3	Is the work area barricaded to prevent fall and platforms are of adequate strength (bamboo, jute / plastic ropes not to be used).		
4	The temporary work platforms & structures for height work including those used in Boiler structures, water walls, ESP, Powerhouse are fully barricaded with railings (as per <b>IS 3696</b> )		
5	Fabricated makeshift arrangements are checked for quality and type of material welding, anchoring etc.		
6	Are floor gaps, permanently covered and barricaded		
7	Area below the work place barricaded, particularly below hot work.		
8	All work platforms ensured to be of adequate strength and ergonomically suitable.		
9	Work at more than one elevation at the same segment is restricted.		
10	In case work platform is hanging/ non-rigid, lifeline connected to independent & rigid structure		
11.	Scaffolds are certified by certified scaffolding inspector and provided with green tag		
<b>B. PPE And Safety Devices</b>			
1	Use of safety helmet, safety belts ensured for all workers		
2	Anchoring points provided at all places of work.		
3	Common lifeline provided wherever linear movement at height is required.		
4	Lifeline is installed on rigid & independent structure		
5	Safety nets are use wherever required.		
6	Proper fall arrest system is deployed at critical workplaces.		
7	Crawler boards/ Safety system for works on fragile roof are used.		
8	Minimum three lines of fall protection eg. Safe platform, Safety nets and double lanyard Safety harness with lifelines provided		
<b>C. Training, Awareness/ Medical</b>			
1	All the workers have been explained safe work method?		
2	All height workers have undergone vertigo test and height specific training		
3	Workers provided with bags / box to carry bolts, nuts and hand tools		
4	Arrangement for fastening hand tools made.		
5	An established communication system has been established and explained to the workers.		

**POWER SECTOR****Inspection of Height Working**FORMAT NO: **HSEP:14-F10**

REV NO.: 01

PAGE NO. 02 OF 2

**D. Access/ Egress**

1	Walkways provided with handrail, mid-rail and toe guard?		
2	All checkered plates, gratings properly welded/ bolted?		
3	Are ladders inspected and they are in good condition?		
4	Are ladders spliced?		
5	Are ladders properly secured to prevent slipping, sliding or falling?		
6	Do side rails extend 36" above top landing?		
7	Are built up ladders constructed of sound materials?		
8	Are rugs and cleats not over 12" on center?		
9	Metal ladders not used around electrical hazards.		
10	Proper maintenance and storage.		
11	Ladders placed at right slope.		
12	Ladders / staircases welded/ bolted properly.		
13	Any obstruction in the stairs.		
14	Are landing provided with handrails, knee rails, toe-boards etc.?		
15	Whether ramp is provided with proper slope.		
16	Proper hand rails / guards provided in ramps.		

**E. Housekeeping**

1	Walkways, aisles & all overhead workplaces cleared of loose material.		
2	Flammable materials, if any, are cleared.		
3	All the de shuttering materials are removed after de-shuttering is done.		
4	Platforms and walkways free from oil/ grease or other slippery material.		
5	Collected scrap are brought down or lowered down and not dropped from height.		

**F. Other Observations**

--

**Signature of Inspecting Official****Date:****Signature of Site I/ C of Contractor:****Date:**

**POWER SECTOR****Inspection of Welding and Gas Cutting**FORMAT NO: **HSEP:14-F11**

REV NO.: 00

PAGE NO. 01 OF 1

<b>Name of Site</b>	
<b>Name of Sub-Contractor</b>	
<b>Area/ Location</b>	
<b>Inspected by</b>	
<b>Date &amp; Time of Inspection</b>	

<b>Electric Welding</b>				
<b>S No</b>	<b>Description</b>	<b>Yes</b>	<b>No</b>	<b>Remarks</b>
1	Is electric connection given through 30 mA ELCB/ RCCB to welding m/ c?			
2	Is electric cable fitted properly in junction box on m/ c?			
3	Is electrical cable free from joints?			
4	Are the joints attached firmly & insulated with tape?			
5	Is double earthing given to body of m/ c?			
6	Is the physical condition of the m/ c good?			
7	Is ON/ OFF switch connected to the m/ c working and in good condition?			
8	Are indication lamps on m/ c working?			
9	Is the electrode holder in good condition?			
10	Are the cables of the welding m/ c lugged & tight properly?			
11	Are return lead connected properly (Rod, Angle, Channels not to be used)			
	Total No of NO			
	Total No of YES			
	<b>% Compliance</b>			

<b>Gas Welding &amp; Cutting</b>				
<b>S No</b>	<b>Description</b>	<b>Yes</b>	<b>No</b>	<b>Remarks</b>
1	Are Cylinders kept on trolleys?			
2	Physical condition of Gas cylinders good?			
3	Is there Oil/ Grease on valve of the cylinder?			
4	Are pressure regulators and gauges in good condition?			
5	Condition of hose pipe OK?			
6	Are hose pipe clamped with hose clip?			
7	Is flash back arrestor & NRV fitted on both torch & cylinder ends			
8	Is nozzle of the torch cleaned?			
9	Are cylinders protected from falling weld splatters?			
10	Are Fire blankets used to prevent weld splatters falling on the ground?			
	Total Number of NO			
	Total No of YES			
	<b>% Compliance</b>			

**Signature of Inspecting Official****Date:****Signature of Site I/ C of Contractor:****Date:**





# POWER SECTOR

## Inspection Of Electrical Installation

FORMAT NO: HSEP:14-F12

REV NO.: 00

PAGE NO. 01 OF 1

Name of Site	
Name of Sub-Contractor	
Area/ Location	
Inspected by	
Date & Time of Inspection	

SNo	Description	Yes/ No	Remarks
<b>A</b>	<b>Cables</b>		
1	Whether the condition of cable is checked?		
2	Are cables received from other sites checked for insulation resistance before putting them into use?		
3	Are all main cables taken either underground / overhead?		
4	Are welding cables routed properly above the ground?		
5	Are welding and electrical cables overlapping?		
6	Is any improper joining of cables/wires prevailing at site?		
<b>B</b>	<b>DBs/ SDBs</b>		
1.	Is earth conductor continued up to DB / SDB?		
2.	Whether DBs and extension boards are protected from rain / water?		
3.	Is there any overloading of DBs / SDBs?		
4.	Are correct / proper fuses & CBs provided at mainboards and sub-boards?		
5.	Is energized wiring in junction boxes, CB panels & similar places covered all times?		
<b>C</b>	<b>ELCB</b>		
1.	Whether the connections are routed through ELCB/ RCCB?		
2.	Is ELCB sensitivity maintained at 30 mA?		
3.	Are the ELCB numbered and tested periodically & test results recorded in a logbook countersigned by a competent person?		
<b>D</b>	<b>Grounding</b>		
1.	Is natural earthing ensured at the source of power (main DB at Generator or Transformer)?		
2.	Whether the continuity and tightness of the earth conductor are checked?		
3.	Mention the gauge of the earth conductor used at the site.		
4.	Mention the value of Earth Resistance.		
<b>E</b>	<b>Electrically operated Machines or Accessories</b>		
1.	Whether the plug top is provided everywhere.		
2.	Are all metal parts of electrical equipment and light fittings / accessories grounded?		
3.	Is there any shed or cover for welding machines?		
4.	Are halogen lamps fixed at proper places?		
5.	Are portable power tools maintained as per norms?		
6.	Any other observations:		

Signature of Inspecting Official

Date:

Signature of Site I/ C of Contractor:

Date:



## POWER SECTOR

### Inspection of Elevator

FORMAT NO: HSEP:14-F13  
REV NO.: 00  
PAGE NO. 01 OF 1

<b>Name of Site</b>	
<b>Name of Sub-Contractor</b>	
<b>Area/ Location</b>	
<b>Inspected by</b>	
<b>Date &amp; Time of Inspection</b>	

Sr. No.	Description	Remarks
1.0	Name of equipment	
2.0	Basic Information of equipment	
2.1	Specification	
2.2	Sr. No. of equipment	
2.3	Make	
2.4	Year of manufacture	
3.0	Major repairs/overhauls(Furnish details of work carried out)	Date(s) of major repair/overhaul
3.1		
3.2		
3.3	Repairs carried out at site	
4.0	Any performance test conducted	Yes/ No
5.0	Document Submitted	Yes/ No
6.0	Manufacturer's test / guarantee certificate	Available/ Not available
7.0	Performance test	Done/ Not Done
8.0	Acceptance Norms	
9.0	Committee Observations	
10.0	Date of next review (if accepted)	

**Signature of Inspecting Official**

**Date:**

**Signature of Site I/ C of Contractor:**

**Date:**

**POWER SECTOR****Inspection of Excavation**

FORMAT NO: HSEP:14-F13E

REV NO.: 00

PAGE NO. 01 OF 1

<b>Name of Site</b>	
<b>Name of Sub-Contractor</b>	
<b>Area/ Location</b>	
<b>Inspected by</b>	
<b>Date &amp; Time of Inspection</b>	

Sl.no	Description	Yes	No	Remarks
1	Precautions taken for Underground Electrical Cable			
2	Precautions taken for Under / Above ground sewer/ Drinking Water Line			
3	Precautions taken for Underground Telecommunication Line			
4	Precautions taken for Underground Product/Utility Line			
5	Precautions taken for Underground Fire Water Line			
6	Shoring / Shuttering / Sheet piling done to prevent collapse of excavation walls. Strength of Excavation wall ensured at all times			
7	Slope Cutting / Angle Maintained			
8	Hard Barricading & Edge Protection provided			
9	Separate Safe Access for Man and Vehicle			
10	Lighting arrangement			
11	Banksman Provided			
12	Required basic PPEs provided			
13	Excavated soil / Construction Material / equipment kept away from the edge.			
14	First aid in attendance.			
15	Other:			
	Total No of YES			

Signature of Inspecting Official

Date:

Signature of Site I/ C of Contractor:

Date:

**POWER SECTOR****HSE Penalty Format**

FORMAT NO:

**HSEP:14-F14**

REV NO.: 01

PAGE NO. 01 OF 1

- 1) Nonconformities of safety rules and safety appliances will be viewed seriously and BHEL has right to impose penalty/ fines on the contractor/ subcontractor for every instance of violation noticed.
- 2) As per contractual provision HSE penalties shall be imposed on contractor/ subcontractor for noncompliance on HSE requirements as per following format.
- 3) Following are the applicable penalties for various safety violations: -

Sub: MEMO for Penalty for non-compliances in Safety

- 4) Following lapse (tick marked) was observed and penalty (in Rs.) is imposed as stated at the bottom of this memo. It is requested that such occurrences be please avoided in future.

Sl. No.	Nature of Non - Compliance	Penalty (in INR)	Remarks
<b>A. System Violations</b>			
1	Working without valid Work Permit/ HIRA/ Method Statement / JSA	2000	Per case
2	Controls as per Work Permit/ HIRA/MS/JSA not ensured	2000	Per case
3	Reported Safety Violations Not Closed within Stipulated Time	1000-10000	Per case
4	Absence of required Subcontractor Officials (Site Head, HS Head) in Safety Reviews/Meetings	5000	Per case
5	Not providing required PPEs (Safety Harness, Lifeline, Safety Net, Fall arrestor, Safety Helmet, Gloves, Shoes etc.) for the work by subcontractor	2000	Per case
<b>B. Competency/ Training/ Induction Violations</b>			
1	Incompetent personnel deployed for specialized jobs like height work, hot work, rigging, vehicle operation etc. (without valid license/ certificate etc.)	3000	Per case
2	Work without induction training & medical check	2000	Per case
3	Height Work without Vertigo Test and height work training	2000	Per case
<b>C. PPE Violations - Height Work</b>			
1	Not wearing/ hooking Double Lanyard Safety Harness while working at height (> 1.2 meters) or not anchoring to lifeline at unguarded or open area while working at height.	1000	Per case
2	Not Providing Lifeline for height work	3000	
3	Unsafe platforms - without Top, Mid Rails and Toe-Guards for Height Work	3000	
4	Not providing secondary means of fall protection for height work (Safety Nets, Retractable Fall Arrestors etc.)	3000	Per case
<b>D. PPE Violations - General</b>			
1	Not wearing safety helmet	1000	Per case

**POWER SECTOR****HSE Penalty Format**

FORMAT NO:

**HSEP:14-F14**

REV NO.: 01

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2	Wearing of helmets without chinstraps	1000	Per case
3	Not Wearing safety shoes	500	Per case
4	Not wearing gloves	500	Per case
5	Not using grinding goggles/ face shield during grinding/ cutting	2000	Per case

**E. Electrical Safety Violations**

1	Broken/ exposed wires/ cables	2000	Per case per day
2	Electrical plug not used for connection/ hand machines	1000	Per case per day
3	Not using proper ELCBs for electrical equipment	2000	Per case per day
4	Improper earthing of welding & Other electrical machines (Lack of double earthing, improper/ untested earth pit etc.)	2000	Per case per day
5	Not using 24 V supply for lighting in confined spaces	2000	Per case
6	Cables haphazard/ blocking way/ not organized properly	1000	Per case per day

**F. Lifting & Rigging Violations**

1	Using Sling/ Chain Pulley Block and other Small T&Ps without proper, traceable Tag and Test Certificate	2000	Per T&P per day
2	Using damaged slings or not slinging properly	2000	Per T&P per day
3	Use of lifting equipment without having valid Test certificate	5000	Per equipment per seven days
4	Lifting hooks used without latches	2000	Per hook per day
5	Not effectively barricading area below lifting activity	5000	Per case
6	Using untrained/ unqualified rigger	5000	Per case

**G. Housekeeping**

1	Non-removal of scrap from platforms	5000	Per Event Per location per 7 days
2	Not conducting scheduled housekeeping drives	5000	Per drive

**H. Hot Work Safety Violations**

1	Gas cutting without flashback arrestor at both ends	5000	Per machine per incidence
2	Gas cutting at height without fire blanket	2000	Per event
3	Not keeping gas cylinders vertically	2000	Per event
4	Lifting cylinders without cage or rolling of cylinders	2000	Per incidence
5	Leakage in gas cylinder	2000	Per incidence

**I. Vehicle Safety/ Operation**

1	Not having valid driving license for the type of vehicle/ T&P	2000	Per driver per incidence
2	Two-wheeler entry in construction area	2000	Per vehicle

**POWER SECTOR****HSE Penalty Format**

FORMAT NO:

**HSEP:14-F14**

REV NO.: 01

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3	Using Hydra for material movement at site in unsafe manner	2000	Per case
4	Using Two Hydra in Tandem for material movement without proper precautions as per OCP	2000	Per case
5	Vehicles, Hydras, Cranes, Dumpers and Earth Movers not having automatic back horns linked to gear	2000	Per equipment per day
6	Not providing proper hard barricades around excavations/ unpermitted areas	5000	Per location per day
7	Not using guide rope while transporting material using Hydra or Cranes	2000	Per event
8	Over speeding	5000	Per case
9	Using Conventional Hydra crane	50000	Per day /crane
<b>J. Accidents/ Incidents/ Near Misses</b>			
1	Non-reporting of Near Miss/ Incident	20000	Per case
2	Major Accident - Worker unable to resume work with in 48 hrs	20000	Per incident
3	<b>Major Accident</b> - Major injury or accident causing 25% or more permanent disablement to workmen or employees in that three-month period. Permanent disablement shall have the same meaning as indicated in The Workmen's Compensation Act' 1923 or IS 3786.	400000	Per incident
4	Fatal Accident	1000000	Per incident
<b>K. Miscellaneous</b>			
1	Not providing the facility (drinking water, rest shed, labor colony etc. as per the specifications/ requirement)	5000	Per month per violation
2	Not nominating the required number of workers for training as per plan	5000	Per incidence
3	Lack of proper arrangement for disposal of sewage/ waste water/ effluents etc.	10000	Per incidence

**Details (if any) related to non- compliance (Name of persons, Nature of deficiency, etc.)****Penalty imposed:**

1. Rate as per above chart \_\_\_\_\_

2. No. of Persons/ machine/ event/ labor

Total Penalty = 1. X 2. =

**Witnessed by:**

(Sub- Contractor representative)

(BHEL representative) Signature

Signature \_\_\_\_\_

Name \_\_\_\_\_

**Distribution:**

- 1 Copy: to Sub- Contractor Site In-charge,
- 1 Copy to Site Construction Manager (BHEL)
- 1 Copy to Site Finance



**POWER SECTOR****HSE Penalty Format**

FORMAT NO:


**HSEP:14-F14**

REV NO.: 01

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**Note:- HSE Penalty :-**

Sl. No.	Description for HSE penalty
1	In case the amount of penalty imposed by BHEL's Client/ customer on BHEL for Safety violation/ incident due to or in the area of the subcontractor is more than those indicated above, same shall be imposed back-to-back on the contractor/ subcontractor. However, in case such an amount is less than the specified above, penalty amount indicated above shall be imposed on the subcontractor.
2	For same violation only one penalty (higher of the two mentioned below) shall be applicable <ul style="list-style-type: none"> <li>a. Penalty imposed by BHEL's Customer over BHEL.</li> <li>b. Penalty as indicated in current document.</li> </ul>
3	For repeated violation for the same equipment/ location, the penalty would be double of the previous penalty. Date of "Repeated Violation" will be counted from subsequent days.
4	For repeated fatal incident in the same Unit incremental penalty shall be imposed by BHEL.
5	Penalty amount not limited to above mention table, in case customer penalties more than above mention penalty or any other penalty imposed by customer, then same penalty will be deducted from Contractor RA Bill.
6	Any others non-conformity noticed not listed above will also be fined as deemed fit by BHEL the decision of BHEL engineer is final on the above.
7	If principal customer/statutory and regulatory bodies impose some penalty on HSE due to the non-compliance of the subcontractor the same shall be passed on to them.
8	The penalty amount shall be recovered by BHEL Finance department from subcontractors from the RA/Final bill.

	<b>POWER SECTOR- HQ</b>	<b>FORMAT NO: HSEP:14-F15</b>
	<b>Incident Report</b> To be submitted within 24 hours of time of incident (Immediate information through message to be sent)	REV NO.: 00 PAGE NO. 01 OF 01

**Type of incident: Fatal/Major/ Minor/Fire/Property Damage/Near-miss**

1	NAME OF SITE		3	ACTIVITY AREA	
2	SCOPE OF WORK		4	NAME OF CONTRACTOR	
			5	NAME & DESIGNATION OF BHEL ACTIVITY I/C	
6	DATE & TIME OF ACCIDENT		7	DATE RESUMED	
8	NO. OF WORK-DAYS LOST BY VICTIM (If duty not resumed, give estimated figure)				
9	NO. OF MANHOURS LOST BY OTHERS				
10	PERSONAL DETAILS OF INJURED AND / OR DETAILS OF MATERIALS / EQUIPMENT / PROPERTY DAMAGED				
NAME				NAME OF MATERIAL / EQUIPMENT / PROPERTY	
PERIOD OF EMPLOYMENT					
AGE	YRS	SEX	MALE/ FEMALE	ESTIMATED COST	ACTUAL COST
MARITAL STATUS		SINGLE / MARRIED			
OCCUPATION		NATURE OF DAMAGE			
PART OF BODY INJURED					
NATURE OF INJURY					
AGENCY ( OBJECT / EQUIPMENT / SUBSTANCE ) MOST RESPONSIBLE FOR CAUSING ACCIDENT / INJURY / DAMAGE					
12	PERSON (NAME & DESIGNATION) WITH MOST CONTROL OVER AGENCY (OBJECT / EQUIPMENT / SUBSTANCE ) CAUSING ACCIDENT INJURY / DAMAGE				
13	DESCRIBE CLEARLY HOW THE ACCIDENT OCCURRED (USE ADDITIONAL SHEET, IF REQUIRED)				
<b>ANALYSIS</b>					
14	WHAT ACTS AND / OR CONDITIONS CONTRIBUTED MOST DIRECTLY TO THIS ACCIDENT				
15	WHAT ARE THE BASIC REASON FOR THE EXISTENCE OF THESE ACTS AND / OR CONDITION?				
16	WHAT CORRECTIVE ACTIONS HAVE BEEN TAKEN TO PREVENT ACCIDENT RECURRENCE?				
	DATE :		SIGNATURE OF SITE HSE COORDINATOR		
17	COMMENTS OF HEAD / SOX				
	DATE:		SIGNATURE OF HEAD/SOX		

**POWER SECTOR****Format for Inspection of Labor Colony**FORMAT NO: **HSEP:14-F16**

REV NO.: 00

PAGE NO. 01 OF 1

<b>Name of Site</b>	
<b>Name of Sub-Contractor</b>	
<b>Area/ Location</b>	
<b>Inspected by</b>	
<b>Date &amp; Time of Inspection</b>	


S. No	Particulars	No	Yes	Comments
1	Sufficient living space ensured for each occupant with Kitchen area			
2	Area cleanliness ensured through regular cleaning			
3	Toilet facility sufficient for all occupants available, in order with adequate lighting, cleaned regularly and in hygienic condition			
4	Washing facilities available with adequate water supply			
5	Availability of sufficient drinking water in protected tanks with weekly tank cleaning and source tested annually as per IS10500 ensured			
6	Adequate drainage to remove waste and rain water, no flooding			
7	"Unsafe for Drinking" posted near accessible non-potable water and sources; posted in language of occupants or universal symbol			
8	Prevention of mosquitoes, flies, and rodents in immediate housing area through insecticide sprays if required			
9	Electricity provided& electrical connections safety ensured			
10	Fans, Coolers / Quilts, Heaters provided as required to cater to weather conditions along with adequate electricity supply			
11	Houses Walls and roof tight and solid; floors rigid and durable, with smooth, cleanable finish in good repair			
12	Availability of nominal rate ration / common use items shop within / nearby the colony			
13	Emergency medical plan developed: (A) Potential injuries determined (B) Local EMS response determined (C) Qualified first-aid person on site, if required			
14	Emergency plans posted where employees gather			
15	Transportation to nearest suitable facility			

**Any other checks:**

--	--	--	--	--

**Remarks:**

**Name & Sign. Of  
Contractor HSE Officer**

	<b>POWER SECTOR</b>	FORMAT NO: <b>HSEP:14-F17</b>
	Format for Maintaining Records of E-waste Handled / Generated	REV NO.: 00 PAGE NO. 01 OF 1

(Generated Quantity in Metric Tons (MT) per year)

Site		
Contractor		
Date		
Types & Quantity of e-waste handled/generated**	Category	Quantity
	Item Description	
Types & Quantity of e-waste stored	Category	Quantity
	Item Description	
Types & Quantity of e-waste sent to collection center authorized by producer/dismantler/recycler/refurbisher or authorized dismantler/ recycler or refurbisher **	Category	Quantity
	Item Description	
Types & Quantity of e-waste transported*	Category	Quantity
	Item Description	
Name, address and contact details of the destination		
Types & Quantity of e-waste refurbished*	Category	Quantity
	Item Description	
Name, address and contact details of the destination of refurbished materials		
Types & Quantity of e-waste dismantled*	Category	Quantity
	Item Description	
Types & Quantity of e-waste recycled*	Category	Quantity
	Item Description	
Types & Quantity of materials recovered	Category	Quantity
	Item Description	
Name, address and contact details of the destination		
Types & Quantity of e-waste sent to recyclers by dismantlers	Category	Quantity
	Item Description	
Name, address and contact details of the destination		
Types and Quantity of other waste sent to respective recyclers by dismantlers/ recyclers of e-waste	Category	Quantity
	Item Description	
Types and Quantity of e-waste treated & disposed	Category	Quantity
	Item Description	
Name, address and contact details of the destination		

Signature of Contractor Site In-charge:

Date

**POWER SECTOR**

Format for Maintaining Records of Hazardous Waste at the Facility

FORMAT NO: HSEP:14-F18

REV NO.: 00

PAGE NO. 01 OF 1

1. Name of Site:
2. Name of the Contractor:
3. Date:
4. Description of hazardous waste:

Physical form with description	Chemical form	Total volume and weight (in kg.)

5. Description of storage and treatment of hazardous waste:

Date	Method of storage of hazardous wastes	Date	Method of treatment of hazardous wastes

6. Details of transportation of hazardous waste:

Name & address of consignee of package	Mode of packing/ of the waste for transportation	Mode of transportation to site of disposal	Date of transportation

7. Details of disposal of hazardous waste:

Date of disposal	Concentration of hazardous material in the final waste form	Site of disposal (identify the location on the relevant layout drawing for reference)	Method of disposal	Persons involved in disposal

8. Data of environmental surveillance:

Date of measurement	Analysis of ground water			Analysis of soil samples			Analysis of air sampling			Analysis of any other samples (give details)
	Location of sampling	Depth of sampling	Data	Location of sampling	Depth of sampling	Data	Location of sampling	Data		

9. Details of the hazardous wastes reused and recycled:

Date	Total quantity of hazardous waste generated	Details of hazardous waste minimization activity	Material received	Final quantity of waste generated	Net reduction in waste generation quantity and percentage

Signature of Contractor Site In-charge:

Date:

**POWER SECTOR****Inspection of Illumination**

FORMAT NO: HSEP-14-F19

REV NO.: 00

PAGE NO. 01 OF

<b>Name of Site</b>	
<b>Name of Sub-Contractor</b>	
<b>Area/ Location</b>	
<b>Inspected by</b>	
<b>Date &amp; Time of Inspection</b>	

S. No	Date/ Time	Area	Reqd Lux Value	Actual Lux Value	HSE Agency Sign	HSE BHEL Sign	Remarks
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
11							
12							


Signature of Inspecting Official

Date:

Signature of Site I/ C of Contractor:


Date:



	<b>POWER SECTOR</b>	FORMAT NO: HSEP:14-F30 REV NO.: 00 PAGENO. 01 OF 3
	<b>Format for Monthly HSE Planning &amp; Review</b>	

**Note: This is a template and can be modified in consultation with BHEL**

<b>Name of the Site</b>		<b>Name of the Contractor</b>	
<b>Scope of Work</b>		<b>Date</b>	
<b>PART- A: PLAN OF HSE ACTIVITIES FOR THE MONTH OF.....</b>		<b>PART-B: REVIEW ON .....</b>	
<b>SN.</b>	<b>Description of HSE Activity &amp; Formats</b>	<b>Plan &amp; Targets for the month</b>	<b>Review</b>
1	Availability of First Aid Box at Required Places and Inspection thereof as per Format : F01	Areas 1. ... ...	
2	Health check-up as per Format : F02	Health check-up for Nos 1. New inductees 2. Drivers & Operators 3. Workers in following high risk areas: a. ...	
3	Induction training of newly joined workers as per Format : F03	Minimum No. of workers:	
4	Toolbox talks (TBT) conducted before start of work as per Format : F04	Locations of TBTs & No. of workers 1. ...	
5	PPE usage and issue as per Format : F06		
6	Inspection of T&Ps as per Format : F07	List of T&Ps to be inspected 1.	
7	Identification & Inspection Status of T&Ps as per Format : F08		
8	Inspection of Cranes & Winches as per Format : F09 (A & B)	List of Cranes & Winches & Nos. 1. ...	
9	Inspection of Height Working as per Format : F10	Areas: 1. ...	
10	Inspection of Welding & Gas Cutting operations as per Format : F11	Areas: 1. ...	
11	Inspection of Electrical Installations as per Format : F12	Locations: 1. ...	
12	Inspection of Elevators (as applicable) as per Format : F13	Locations: 1. ...	
13	Inspection of Excavation as per Format : F13E	<b>Locations:</b> 1. ...	

	<b>POWER SECTOR</b>	FORMAT NO: <b>HSEP:14-F30</b> REV NO.: 00 PAGE NO. 02 OF 3
	<b>Format for Monthly HSE Planning &amp; Review</b>	

SN.	Description of HSE Activity & Formats	Plan & Targets for the month	Review
14	Job Safety Analysis	Activities: 1. ...	
15	Regular Job Specific Training (Re-training) for workers involved in hazardous activities	Topics/ Hazards & No. of workers 1. ...	
16	Mass housekeeping (HK) drive in work areas	Areas 1. ...	
17	Vertigo Test of Height workers	Minimum No. of workers:	
18	Deployment of qualified HSE Officers as per contract	Location(s) & Nos. 1. ...	
19	Deployment of qualified HSE Stewards as per contract	Location(s) & Nos. 1. ...	
20	Deployment of Safety tools & Equipment (Safety Nets, Lifelines, Fall arrestors, Man-cages, flashback arrestors, scaffolding etc.)	Tool/ Equipment & Location 1. ...	
21	Safety Walks by site in charge of agency (4 -Weekly once)	Dates:	
22	Safety walks by departmental head (8-Weekly twice)	Dates:	
23	Availability/ deployment of Safety posters/ placards/ signage at strategic locations	Locations: Nos. 1. ...	
24	Provision of clean drinking water sources for workers	Locations: Nos. 1. ...	
25	Provision of toilets for workers (separate for male & female workers)	Locations: Nos. 1. ...	
26	Rest sheds for workers during lunchtime, rain, dust storm etc.	Locations: Nos. 1. ...	
27	Availability of following in Labor colony	1. <b>Clean drinking water</b> 2. <b>Toilets</b> 3. <b>Cleanliness &amp; Hygiene</b> 4. <b>Grass cutting,</b> 5. <b>Fogging</b> 6. <b>Electrical Inspection ...</b>	

**POWER SECTOR****Format for Monthly HSE Planning & Review**

FORMAT NO: HSEP:14-F30  
REV NO.: 00  
PAGE NO. 03 OF 3

SN.	Description of HSE Activity & Formats	Plan & Targets for the month	Review
28	Availability of dust/ waste bins at various locations	Locations: 1. ...	
29	Availability of First Aider in each shift	Details of first aider	
30	Emergency vehicle/ Ambulance as required (Centrally arrange by BHEL) in each shift	1.	
31	Deployment/ Availability of tested Fire Extinguishers	Locations & Nos. 1. ...	
32	Tree plantation	Locations & Nos. 1. ...	
33	Waste disposal & Scrap Bins	Locations 1. ...	
34	Illumination checks	Locations 1. ...	
35	Safety award function: 1. Display of good practices Award presentation	Minimum 1 per month	
36	Submission of Daily Reports as per Format No.F31A	Daily Reports (Night & Day Shifts)	

PLAN		REVIEW	
<b>Agency</b> Name:	<b>BHEL</b> Name:	<b>Agency</b> Name:	<b>BHEL</b> Name:
Sign:	Sign:	Sign:	Sign:
Date:	Date:	Date:	Date:



	N i g h t	D A Y	Shift
			Submitted By
			Work Area(s)
			Staff
			Man-Power
			Safety Officers
			Safety Stewards
			Tool Box Inspected
			Induction Training Inspected
			Vertigo Test Inspected
			On-the-Job Training Given/ Inspected
			Work Permits Issued
			Job Safety Analyses Approved
			Height Work Inspection Conducted (Areas)
			Other Hazardous Activities Inspection (Areas)
			T&P Inspection (Names & Nos. Inspected)
			Safety Walk (Designation, Areas)
			HSE Meeting
			Safety Reward (Details)
			Housekeeping/ Dust Suppression/ Tree Plantation Activities (Locations/ Details)
			Lost time Accident
			Restricted Work Case
			Medical Treatment Case
			First Aid Case
			Near miss
			Property Damage/ Fire
			Any other remains /input



## Format for Daily HSE Reporting

PAGE NO. 01 OF 1

**Note: Following format to be submitted (preferably) in excel/ soft copy by Contractor daily at the end of each shift. Any photographs/ records to be attached**



## Power Sector Headquarters

Rev. 00

Year

Agency

**5. Format to be preferably used in soft copy only and submitted by e-mail**

NCs

1

11

111



## Format for Weekly HSE Reporting



## Health, Safety & Environment

## Power Sector Headquarters

Day

Month

Year

## Project

Agency

**Important:**

### 1. N-Night Shift

**2. Photographs of inspection of height work, hazardous activities, T&Ps, Toolbox Talks, Training, Reward Function, Housekeeping/ Plantation drives etc. to be attached**

**4. Report to be compiled daily at day end and submitted to BHEL-PSWR Nagpur HQ**

**5. Format to be preferably used in soft copy only and submitted by e-mail**

[illegible]



**POWER SECTOR- HQ****Checklist for Evaluation of HSE Performance**

FORMAT NO: HSEP:14-F3

REV NO.: 00

PAGE NO. 01 OF 3

SL	Parameter for Measurement	M/O	Wt	Supporting Documents
1a	Induction training for new workers conducted through audio-visual medium & documented?	M	1	Induction Training Records
1b	Tool box talk conducted regularly as per plan, and documented?	M	1	Toolbox Talk Records
1c	Contractor in charge and safety in charge attended safety meetings?	M	2	Minutes of Meeting
1d	Whether observations in safety meetings are compiled before next meeting?	M	2	-do-
1e	Preparation and submission of Monthly HSE report within stipulated time	M	1	Report submission date
1f	Preparation and submission of Incident/near-miss report and RCA Report (as applicable) within stipulated time	M	1	Incident/ Near Miss Records
1g	Carrying out Inspections and submission of Inspection reports within stipulated time	M	1	Inspection Records
1h	Regular Job Specific Training ensured for High Risk Workers (through audio-visual medium) as per plan	M	1	Training & Attendance Records
2a	Whether the contractor is registered under BOCW	M	2	BOCW Registration Certificate
2b	Availability of Qualified safety officer (1 for every 500 labor)	M	2	Safety Officer qualification & experience records
2c	Availability of Qualified safety supervisor (1 for every 100 labor )	M	2	Safety Officer qualification & experience records
2d	All the workers are provided and using safety helmets and safety shoes/gum boots	M	2	PPE Issue Records, Inspection/ non-conformity records
2e	Housekeeping done on regular basis and scrap removal at site	M	1	Housekeeping records, Inspection/ non-conformity records
2f	Usage of Goggles/Face shields and Hand gloves for gas cutter and grinders		1	PPE Issue Records, Inspection/ non-conformity records
2g	Wall openings & floor openings are guarded?		1	Inspection/ non-conformity records
2h	Adequate illumination provided in all working area?		1	Inspection/ non-conformity records
2i	Safety posters, sign boards and emergency contact numbers in all prominent location are displayed?		1	Inspection/ non-conformity records
2j	Availability of automatic reverse horns, Main horn, hook latches for Vehicles, mobile cranes, Hydraulic Mobile Cranes		1	Inspection/ non-conformity records
2k	Ban of carrying mobile phones to work place is implemented for workers		1	Inspection/ non-conformity records
2l	Availability of Tags & Inspection Certificates for Cranes of all capacities		1	Master T&P List with internal & external test details
2l.2	Availability of Tags & Inspection Certificates for Winches of all capacities		1	Master T&P List with internal & external test details
2l.3	Availability of Tags & Inspection Certificates, color coding for Chain pulley blocks		1	Master T&P List with internal & external test details
2l.4	Availability of Tags & Inspection Certificates for Vehicles - Trailers, Dozers, Dumpers, Excavators. Mixers etc.		1	Master T&P List with internal & external test details
2l.5	Availability of Tags & Inspection Certificates for Welding machines, grinders, Drilling machines, etc.		1	Master T&P List with internal & external test

				details
21.6	Availability of Tags & Inspection Certificates, colour coding for Wire rope slings etc.		1	Master T&P List with internal & external test details
21.7	Availability of Tags & Inspection Certificates for Batching plants		1	Master T&P List with internal & external test details
2m.1	Use of Lifting Permit as per requirement		1	Permit Records
2m.2	Use of Height Permit as per requirement		1	Permit Records
2m.3	Use of Hot Work Permit as per requirement		1	Permit Records
2m.4	Use of Excavation permit as per requirement		1	Permit Records
2m.5	Use of Confined space work permit as per requirement		1	Permit Records
2m.6	Use of Grating removal and safety net removal permit as per requirement		1	Permit Records
2m.7	Use of Lockout-Tag out permit as per requirement		1	Permit Records
2m.8	Use of Radiography permit as per requirement		1	Permit Records
2m.9	Use of Night/ Holiday Work Permit as per requirement		1	Permit Records
2m.10	Use of Any other Applicable Permit as per requirement		1	Permit Records
3a	Material safety data sheet(MSDS) available for all chemicals and displayed in usage and storage area?		1	Inspection/ non-conformity records
3b	Spillages of oil/concrete and other chemical is controlled and cleaned by proper method in case of spill?		1	Inspection/ non-conformity records
3c	Availability of adequate number of urinals in workplace and in elevations and maintained	M	1	
3d	Availability of rest rooms for workers at site	M	1	
3e	Availability of Drinking water facility at work spot		1	
3f	Hygienic Labor colony is provided for workers.		1	
4a	Is heavy/complex critical lifting permit obtained for heavy, complex materials before handling/erection activity?		1	Work Permit records
4b	Whether area below lifting activities barricaded		1	Inspection/ non-conformity records
4c	Availability of experienced rigging foreman		1	Experience details of rigging foreman
4d	Is agency is following proper storage and handling procedure as per manufacturer standard for all hazardous material?		1	Procedure for storage & handling
4e	Are oxygen and acetylene cylinders are transported to work place from storage area in trolleys		1	
5a	Whether all deep excavation has been protected by barrier		1	Inspection/ non-conformity records
5b	Sloping/benching & shoring provided for excavation as per requirement?		1	-do-
5c	Proper access and egress provided for excavations?		1	-do-
5d	Blasting is done in controlled manner?		2	-do-
6a	Whether Electrical booth is equipped with Co <sub>2</sub> fire extinguishers and fire buckets filled with sand?		2	Inspection/ non-conformity records
6b	Availability of Illumination lamp in electric booth?		1	-do-
6c	whether Caution Boards have been displayed?		1	-do-
6d	Usage of Metal Plug top for all hand power tools?		1	-do-
6e	Usage of Insulated welding cables.		1	-do-
6f	Electrical Booth/Distribution Board to be covered by proper Canopy.		1	-do-
6g	Availability of functional & individual 30ma ELCB / RCCB and MCB for protection and conducting periodical check-up?		1	-do-
6h	Double earthing for panel boards and all machinery & proper earth pit with regular inspection available?		1	-do-
6i	Whether Electrician is qualified and experienced		1	Qualification & Experience records of electrician
6j	Availability and usage of Rubber hand gloves by electrician?		1	Inspection/ non-conformity records
7a	Whether Scaffolding pipes made with steel or aluminum, are being used and checked periodically by experienced/ certified scaffolder?		2	Inspection/ non-conformity records

7b	8mm Stainless Steel wire rope with plastic cladding is provided for life line (Vertical / Horizontal) during height work?		2	-do-
7c	Availability of emergency lighting in case of power failure		1	-do-
7d	Whether all the openings are covered with Safety Nets made of fire proof Nylon?		1	-do-
7e	Whether MS pipe rails around staircases & platforms in usage are provided with top, middle rails and toe guard?		1	-do-
7f	Whether Ladder with vertical life line /Fall arrestor is available to climb?		1	-do-
7g	Whether all workers deployed for working at height have been issued height pass after undergoing vertigo test?		1	Height Pass records
7h	Whether all workers deployed for height work / climbing ladder are provided and using Double lanyard safety belt?		1	PPE Issue records, inspection/ non-conformity reports
7i	Is all hand tools/Small material used by height workers is tied firmly to prevent fall?		1	-do-
8a	Flash back arrestors for all gas cutting sets is available on Torch side and cylinder side		1	Inspection/ non-conformity records
8b	Oxygen/Acetylene/LPG cylinders not in use have caps in place and stored separately?		1	-do-
8c	Availability of Face screen, Hand gloves, and Apron, for welders		1	-do-
8d	Protection from falling hot molten metal during metal cutting / welding at height by providing GI sheet below the cutting area especially in fire prone areas		1	-do-
9a	Pre-employment medical check-up done for all workers and submitted?		1	Medical check records
9b	Availability of first aid center & first aider at work place	M	2	Attendance records
9c	Ambulance facility as required - 24 hours (Centrally arranged by BHEL)	M	2	-do-
9d	Is First aid trained personnel's are available and their names are displayed at site?	M	1	-do-
9e	Availability of Emergency vehicle at site		1	
9f	Periodical medical check-up is conducted for all the workers and submitted?		1	Medical check records
9g	Availability of sufficient number of first aid box as per standard list and maintaining record		1	Inspection records
10a	Availability of Fire extinguishers, buckets at all vulnerable points		2	Fire extinguisher records
10b	Periodic fire mock drill conducted?		1	Fire, Mock drill records
10c	Are all flammable materials are stored separately?		1	
10d	Periodic grass cutting is done in material storage area?		1	
10e	Availability of 24V DC lighting in confined space work area		1	
10f	Availability of exhaust fan in confined space work area		1	

**Note:**

- **M: Mandatory; O: Optional.** Points other than mandatory can be excluded with appropriate justification (scope etc.) by BHEL
- Additionally: 30 Marks for each Fatal Accident and 10 mark for each major accident shall be deducted.

# **ANNEXURE 10**

## **WORK PERMITS**



HSEP:12-F01

<b>GENERAL WORK PERMIT</b>		Permit No. & Date
Project & Unit:		Emergency Contact Nos
Agency:		

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	<b>Job Specific Permit Required :</b>		
	Height Work <input type="checkbox"/> Hot Work <input type="checkbox"/>		
	Confined Space Work <input type="checkbox"/> Excavation Work <input type="checkbox"/>		
	Radiation Work <input type="checkbox"/> Heavy / Complex / Critical Lifting Activity <input type="checkbox"/>		
	Night Work / Holiday Work <input type="checkbox"/> Loading / Unloading <input type="checkbox"/>		
	Grating / Safety Net / Safety Facility Removal <input type="checkbox"/> Lockout / Tag out Request <input type="checkbox"/>		
	Beam/Truss/Duct/ Structure fit-up & Alignment <input type="checkbox"/> Drilling & Blasting <input type="checkbox"/>		
	Other Permit required. Pl specify :		
2.	All Tools & Plants are TPI tested and inspected		
3.	Proper access available for workplace		
4.	All workmen to be engaged are having Gate Pass and attended Induction Training		
5.	All workmen are provided basic PPEs		
6.	All Drivers and Operators are authorized and having required valid licenses.		
7.	Proper control measures are established against possible hazards		
8.	Proper housekeeping is done and Emergency response system established.		
9.	Availability of licensed electrician ensured		
10.	Electrical equipment's to be used are in good condition (Give Details)		
11.	<b>Specific PPEs for the Activity (List Attached):</b>		
	Dust Mask/ other respiratory equipment required. List details:		
	Welding and/or Grinding Shield required.		
	Gloves: Leather ( ) / PVC ( ) / Welding ( )		
	Other PPE, List (attached):		
12.	<b>Procedure Required :</b>		
	OCP No. Ref :		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

#### A. Permit Requester/ Receiver (Agency):

Site Engineer:	
Signature:	
Name:	Designation:

Site HSE Officer:	
Signature:	
Name:	Designation:

#### B. Permit Issuer (BHEL):

Site Engineer/ Authorized Representative:	
Signature:	
Name:	Designation:

Site HSE Officer/ Authorized Representative:	
Signature:	
Name:	Designation:

#### C. Package-in-charge (BHEL):

Signature:	
Name:	Designation:

(\* Permit valid for 7 days only)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HOS3<sup>rd</sup> Copy: BHEL Site HSE

### Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.	
Reason for Closure:      Job complete <input type="text"/>	Permit Validity Over <input type="text"/>
<b>Agency</b>	
<b>Site Engineer</b>	<b>Site HSE Officer</b>
Signature:	Signature:
Name:	Name:
<b>BHEL</b>	
Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:	
<b>Site HSE Officer*</b>	<b>Site Engineer*</b>
Signature:	Signature:
Name:	Name:

(\* or authorized representative duly concurred by Region HSE)





HSEP:12-F02

**HEIGHT WORK PERMIT**

Permit No. &amp; Date

Project &amp; Unit:

Emergency Contact Nos

Agency:

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	All workers on job are competent and medically fit (No Height Phobia) for working at height		
2.	Horizontal life lines are provided to cater to design specification of 2300 kg per person and are installed on a rigid & independent structure		
3.	Safety harness with life line support/ fall arrester are checked and available in working condition		
4.	Scaffolding soundness inspected is available for use with valid tag		
5.	Work platform is not made of bamboo or weak material. Barricading is available with Top, Mid Rails and Toe Guard.		
6.	Working platform is clean without any unwanted material. Floor openings are covered.		
7.	Access and exit to workplace are safe, marked and without obstruction.		
8.	Adequate lighting provided (for dark hours) as per applicable lux standards (Refer HSEP:13)		
9.	Safety nets are provided below working area as secondary line of fall protection		
10.	Area below the working platform has been cleared of all activity		
11.	Ladders have been secured, inspected and provided as per BHEL standard/contract.		
12.	Safety shoes (non-slip), Helmet with chin strip available with employees		
13.	Visible Signboards provided on working platforms in workers' understandable language		
14.	All lifting / tightening tools, hand tools/equipment checked and in good condition		
15.	ELCB provided for Electrical connections individually. Electrical cable, welding Hose/Compressed air hose properly secured and laid down without obstruction. Earth resistance is OK.		
16.	Crane / Winch / Hydra operator and Rigger is qualified and experienced		
17.	Emergency response team & Medical Facilities available.		
18.	Work hazards are identified, controlled and communicated to the worker in daily Safety Pep talk.		
19.	Minimum two levels of fall protection have been ensured		
20.	Method Statements/ Job Safety Analyses attached:		
21.	Other:		
22.	List of Other Permits Required for the Activity (Attached):		
23.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

**A. Permit Requester/ Receiver (Agency):**

<b>Site Engineer:</b>
Signature:
Name: _____ Designation: _____

<b>Site HSE Officer:</b>
Signature:
Name: _____ Designation: _____

**B. Permit Issuer (BHEL):**

<b>Site Engineer/ Authorized Representative:</b>
Signature:
Name: _____ Designation: _____

<b>Site HSE Officer/ Authorized Representative:</b>
Signature:
Name: _____ Designation: _____

**C. Package-in-charge (BHEL):**

Signature:
Name: _____ Designation: _____

(\* Permit valid for 7 days as per overleaf format)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HOS3<sup>rd</sup> Copy: BHEL Site HSE

All parameters from S.No. 1 to 23 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started



## Daily Work Area Condition Endorsement

Day	Date	Remarks (if any) & Signature with Date & Time				
		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer *	Remarks
2						
3						
4						
5						
6						
7						

## Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From..... (Date, Time)	To..... (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer*
1							
2							
3							
4							
5							
6							
7							

## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.	
Reason for Closure:      Job complete 	Permit Validity Over 
<b>Agency</b>	
<b>Site Engineer</b>	<b>Site HSE Officer</b>
Signature:	Signature:
Name:	Name:
<b>BHEL</b>	
Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:	
<b>Site HSE Officer*</b>	<b>Site Engineer*</b>
Signature:	Signature:
Name:	Name:

(\* or authorized representative duly concurred by Region HSE)



HSEP:12-F03

<b>BURNING/ WELDING/ HOT WORK PERMIT</b>		Permit No. & Date
Project & Unit:		Emergency Contact Nos
Agency:		

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	Welding area ensured safe and free from all hazards (explosives etc.) with barricading and safe inlet / exit		
2.	Proper ventilation and /or lighting provided (in case of dark hours).		
3.	Welding platform ensured safe and strong. Not built of bamboo or similar material		
4.	For enclosed / confined spaces, the integrity of the structure and supports are ensured, Gas Testing done		
5.	Gas hoses, Welding machine input/output cables, welding holder and weld return clamp (Holder) are in good condition, routed and insulated as required		
6.	Emergency STOP buttons are in working condition. Welder /Helper knows how to operate it.		
7.	Welder & Fitter trained to connect ground/work return clamps (Holder) to work place prior to energization of welding machine.		
8.	Gas cylinders are stacked vertically and not below the welding / cutting area. Regulator key is available with cylinder. Gas cylinders covered with shields to prevent falling splinters.		
9.	Pressure gauges/Flash back arrestor (at both ends) provided and in working condition.		
10.	Personal Protective equipment Minimum applicable: safety helmet, safety goggles, welding helmet, safety shoes, leather gloves, long sleeve and nose mask -provided		
11.	In case of pits, water removed from the pit and wood/rubber insulation provided.		
12.	Safety signboards / cautions are in place.		
13.	Adequate and Suitable nos. of firefighting extinguisher provided. Sufficient water for firefighting available.		
14.	Nearby combustible material removed. Housekeeping done.		
15.	Emergency response team & Medical Facilities available.		
16.	Work hazards are identified, controlled and communicated to the worker.		
17.	Method Statements/ Job Safety Analyses attached:		
18.	Other:		
19.	List of Other Permits Required for the Activity (Attached):		
20.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

**A. Permit Requester/ Receiver (Agency):**

<b>Site Engineer:</b>	
Signature:	
Name:	Designation:

<b>Site HSE Officer:</b>	
Signature:	
Name:	Designation:

**B. Permit Issuer (BHEL):**

<b>Site Engineer/ Authorized Representative:</b>	
Signature:	
Name:	Designation:

<b>Site HSE Officer/ Authorized Representative:</b>	
Signature:	
Name:	Designation:

<b>C. Package-in-charge (BHEL):</b>	
Signature:	
Name:	Designation:

(\* Permit valid for 7 days as per overleaf format)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HOS3<sup>rd</sup> Copy: BHEL Site HSE

All parameters from S.No. 1 to 20 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started



## Daily Work Area Condition Endorsement

Day	Date	Remarks (if any) & Signature with Date & Time				
		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer *	Remarks
2						
3						
4						
5						
6						
7						

## Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From..... (Date, Time)	To..... (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer*
1							
2							
3							
4							
5							
6							
7							

## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.	
Reason for Closure:      Job complete 	Permit Validity Over 
<b>Agency</b>	
<b>Site Engineer</b>	<b>Site HSE Officer</b>
Signature:	Signature:
Name:	Name:
<b>BHEL</b>	
Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:	
<b>Site HSE Officer*</b>	<b>Site Engineer*</b>
Signature:	Signature:
Name:	Name:

(\* or authorized representative duly concurred by Region HSE)



HSEP:12-F04

**CONFINED AREA WORK PERMIT**

Permit No. &amp; Date

Project &amp; Unit:

Emergency Contact Nos

Agency:

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	Has the equipment been Isolated from Power/Steam/Air?		
2.	Has the equipment been Isolated from liquid or gasses?		
3.	Has the equipment been de-pressurized &/or drained?		
4.	Has the equipment been Blanked/blinded or disconnected?		
5.	Has the equipment been water flushed &/or steamed?		
6.	Whether man ways open and ventilated?		
7.	Whether constant Inert gas flow arranged?		
8.	Whether mechanically ventilated and adequately cooled?		
9.	Whether 24 V lighting provided inside the confined space?		
10.	Whether Radiation sources removed?		
11.	Whether training on confined space provided to the group?		
12.	Whether required PPEs used?		
13.	Whether Dust/Gas/Air Line mask used?		
14.	Whether attendant with SCBA/Air mask available?		
15.	Whether grounded air Exhaust/Blower/ AC provided?		
16.	Whether Personal Gas alarm provided?		
17.	Whether communication Equipment Provided?		
18.	Whether rescue equipment/team available?		
19.	Whether firefighting arrangement done		
20.	Emergency response team & Medical Facilities available.		
21.	Work hazards are identified, controlled and communicated to the worker.		
22.	Method Statements/ Job Safety Analyses attached:		
23.	Other:		
24.	List of Other Permits Required for the Activity (Attached):		
25.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

**A. Permit Requester/ Receiver (Agency):**

Site Engineer:  
Signature: \_\_\_\_\_  
Name: \_\_\_\_\_ Designation: \_\_\_\_\_

Site HSE Officer:  
Signature: \_\_\_\_\_  
Name: \_\_\_\_\_ Designation: \_\_\_\_\_

**B. Permit Issuer (BHEL):**

Site Engineer/ Authorized Representative:  
Signature: \_\_\_\_\_  
Name: \_\_\_\_\_ Designation: \_\_\_\_\_

Site HSE Officer/ Authorized Representative:  
Signature: \_\_\_\_\_  
Name: \_\_\_\_\_ Designation: \_\_\_\_\_

**C. Package-in-charge (BHEL):**

Signature: \_\_\_\_\_  
Name: \_\_\_\_\_ Designation: \_\_\_\_\_

(\* Permit valid for 7 days as per overleaf format)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HDS3<sup>rd</sup> Copy: BHEL Site HSE

All parameters from S.No. 1 to 25 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started

## Daily Work Area Condition Endorsement

Day	Date	Remarks (if any) & Signature with Date & Time				
		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer *	Remarks
2						
3						
4						
5						
6						
7						

## Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From..... (Date, Time)	To..... (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer*
1							
2							
3							
4							
5							
6							
7							

## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.

Reason for Closure: Job complete  Permit Validity Over 

## Agency

Site Engineer	Site HSE Officer
Signature:	Signature:
Name:	Name:

## BHEL

Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:

Site HSE Officer*	Site Engineer*
Signature:	Signature:
Name:	Name:

(\* or authorized representative duly concurred by Region HSE)





HSEP:12-F05

**EXCAVATION WORK PERMIT**

Permit No. &amp; Date

Project &amp; Unit:

Emergency Contact Nos

Agency:

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	Precautions taken for Underground Electrical Cable		
2.	Precautions taken for Under / Above ground sewer/Drinking Water Line		
3.	Precautions taken for Underground Telecommunication Line		
4.	Precautions taken for Underground Product/Utility Line		
5.	Precautions taken for Underground Fire Water Line		
6.	Shoring / Shuttering / Sheet piling done to prevent collapse of excavation walls. Strength of Excavation wall ensured at all times		
7.	Hard Barricading & Edge Protection provided		
8.	Separate Safe Access for Man and Vehicle		
9.	Lighting arrangement		
10.	Banks Man Provided		
11.	Required basic PPEs provided		
12.	Slope Cutting/Benching Maintained		
13.	Excavated soil / Construction Material / equipment kept away from the edge.		
14.	Emergency response team & Medical Facilities available.		
15.	Work hazards are identified, controlled and communicated to the worker.		
16.	Method Statements/ Job Safety Analyses attached:		
17.	Other:		
18.	List of Other Permits Required for the Activity (Attached):		
19.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

**A. Permit Requester/ Receiver (Agency):**

<b>Site Engineer:</b>
Signature:
Name: _____ Designation: _____

<b>Site HSE Officer:</b>
Signature:
Name: _____ Designation: _____

**B. Permit Issuer (BHEL):**

<b>Site Engineer/ Authorized Representative:</b>
Signature:
Name: _____ Designation: _____

<b>Site HSE Officer/ Authorized Representative:</b>
Signature:
Name: _____ Designation: _____

**C. Package-in-charge (BHEL):**

Signature:
Name: _____ Designation: _____

(\* Permit valid for 7 days as per overleaf format)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HDS3<sup>rd</sup> Copy: BHEL Site HSE

All parameters from S.No. 1 to 19 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started



## Daily Work Area Condition Endorsement

Day	Date	Remarks (if any) & Signature with Date & Time				
		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer *	Remarks
2						
3						
4						
5						
6						
7						

## Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From..... (Date, Time)	To..... (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer*
1							
2							
3							
4							
5							
6							
7							

## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.	
Reason for Closure:      Job complete 	Permit Validity Over 
<b>Agency</b>	
<b>Site Engineer</b>	<b>Site HSE Officer</b>
Signature:	Signature:
Name:	Name:
<b>BHEL</b>	
Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:	
<b>Site HSE Officer*</b>	<b>Site Engineer*</b>
Signature:	Signature:
Name:	Name:

(\* or authorized representative duly concurred by Region HSE)



HSEP:12-F06

**RADIATION WORK PERMIT**

Permit No. &amp; Date

Project &amp; Unit:

Emergency Contact Nos

Agency:

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	All the persons at the site informed/removed from the area.		
2.	Area around the source of radiation cordoned off with the rope/chord.		
3.	Radiation warning symbol/boards displayed around radiography work on rope/chord.		
4.	Radiographer worn radiation badges during testing and is within safe limits.		
5.	Radiography camera and carrying case box having radiation symbol.		
6.	Radiation Survey Meter is in working condition, calibrated & within validity period.		
7.	Radiographer has valid certificate from BARC.		
8.	Blinking light provided on road during radiography (in dark hours).		
9.	Proper required Illumination provided		
10.	Safe access and working platform provided to conduct RT work		
11.	All the persons involved in Radiography work are aware of the hazard of radiation		
12.	Emergency response team & Medical Facilities available.		
13.	Work hazards are identified, controlled and communicated to the worker in daily Safety Pep talk.		
14.	Method Statements/ Job Safety Analyses attached:		
15.	Other:		
16.	List of Other Permits Required for the Activity (Attached):		
17.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

**A. Permit Requester/ Receiver (Agency):**

<b>Site Engineer:</b>
Signature:
Name: _____ Designation: _____

<b>Site HSE Officer:</b>
Signature:
Name: _____ Designation: _____

**B. Permit Issuer (BHEL):**

<b>Site Engineer/ Authorized Representative:</b>
Signature:
Name: _____ Designation: _____

<b>Site HSE Officer/ Authorized Representative:</b>
Signature:
Name: _____ Designation: _____

**C. Package-in-charge (BHEL):**

Signature:
Name: _____ Designation: _____

(\* Permit valid for 7 days as per overleaf format)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HDS3<sup>rd</sup> Copy: BHEL Site HSE

**Permit No. & Date:**  
**All parameters from S.No. 1 to 17 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started**



## Daily Work Area Condition Endorsement

Day	Date	Remarks (if any) & Signature with Date & Time				Remarks
		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer *	
2						
3						
4						
5						
6						
7						

## Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From..... (Date, Time)	To..... (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer*
1							
2							
3							
4							
5							
6							
7							

## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.	
Reason for Closure:      Job complete 	Permit Validity Over 
<b>Agency</b>	
<b>Site Engineer</b>	<b>Site HSE Officer</b>
Signature:	Signature:
Name:	Name:
<b>BHEL</b>	
Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:	
<b>Site HSE Officer*</b>	<b>Site Engineer*</b>
Signature:	Signature:
Name:	Name:

(\* or authorized representative duly concurred by Region HSE)



HSEP:12-F07

<b>LIFTING ACTIVITY PERMIT</b>		<b>Permit No. &amp; Date</b>
<b>Type (Refer Pg 2) (Tick Applicable):</b> Critical <input type="checkbox"/> Non-Critical <input type="checkbox"/>		<b>Emergency Contact Nos</b>
<b>Project &amp; Unit:</b>		
<b>Agency:</b>		

Exact Location of Work: \_\_\_\_\_ Maximum Lifted Weight (T) \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	Crane used for lifting activity TPI tested, certified and approved for rated lifting. SWL indicator(s) in working condition.		
2.	All lifting tackles, gears/appliances (chain pulley blocks, wire rope slings etc.) are tested and certified for lifting works with valid Serial numbers traceable to certificates.		
3.	Chain Pulley Blocks are exclusively used for alignment, not loading		
4.	Crane operator is trained and competent for lifting operation and experienced rigger is available.		
5.	Lifting sling/ belt is protected against sharp edge of the jobs to be lifted.		
6.	Lifting hook is properly latched to prevent material falling over		
7.	Access and exit marked and without obstruction.		
8.	In case of lifting multiple materials at once, same are tied up with strong rope / material		
9.	Area below lifting activity barricaded to prevent movement		
10.	Minimum 2 guidelines have been provided for balancing and guiding jobs to be lifted.		
11.	Periphery area of crane booms as well as lifting job is barricaded and unauthorized/no-entry sign board posted.		
12.	Rigger and signal man are trained and competent for lifting work.		
13.	No lifting activity to be carried out during lightening, heavy wind/rain.		
14.	If scaffolding to be used during lift, scaffolding with valid tag available for use.		
15.	Emergency response team & Medical Facilities available.		
16.	Work hazards are identified, controlled and communicated to the worker.		
17.	Critical Lift Assessment and Plan (as Annexure) attached for Critical Lift.		
18.	Walkie-Talkie is ensured for communication especially in case of long distance or absence of direct line of sight		
19.	Method Statements/ Job Safety Analyses/ Lifting Plan attached:		
20.	Other:		
21.	List of Other Permits Required for the Activity (Attached):		
22.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

#### A. Permit Requester/ Receiver (Agency):

<b>Site Engineer:</b>
Signature:
Name: _____ Designation: _____

<b>Site HSE Officer:</b>
Signature:
Name: _____ Designation: _____

#### B. Permit Issuer (BHEL):

<b>Site Engineer/ Authorized Representative:</b>
Signature:
Name: _____ Designation: _____

<b>Site HSE Officer/ Authorized Representative:</b>
Signature:
Name: _____ Designation: _____

#### C. Package-in-charge (BHEL):

Signature:
Name: _____ Designation: _____

(\* Permit valid for 14 days as per overleaf format)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HDS3<sup>rd</sup> Copy: BHEL Site HSE

**Permit No. & Date:**  
**All parameters from S.No. 1 to 22 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started**

## Daily Work Area Condition Endorsement

Day	Date	Remarks (if any) & Signature with Date & Time				
		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer *	Remarks
2						
3						
4						
5						
6						
7						

## Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From..... (Date, Time)	To..... (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer*
1							
2							
3							
4							
5							
6							
7							

## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.

Reason for Closure: Job complete  Permit Validity Over 

## Agency

Site Engineer

Site HSE Officer

Signature:

Signature:

Name:

Name:

## BHEL

Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:

Site HSE Officer\*

Site Engineer\*

Signature:

Signature:

Name:

Name:

(\* or authorized representative duly concurred by Region HSE)

**A Lift shall be considered Critical Lift and Require Critical Lift Plan in any of the Following Cases**

- Lifting more than safe working load of the Lifting equipment
- Tandem Lifting using multiple cranes
- Total load exceeding 75% of capacity of crane
- Lift of unusual difficulty or geometry
- Rigging or Lift over operating units
- Any other lift as decided by site HSE / Erection
- Transfer of load from one arrangement to another (eg. From Winch to Chain Pulley Blocks)
- Complex Lifting operation involving:
  - multiple machines / materials
  - complicated routing of slings
  - Lifting of high value items (as decided by Site HSE / PS-Region)
- Any other lift as decided by site HSE / Erection





# Critical Lift Assessment & Plan

Time / Trial / Control / Certificate No. / Shift / PC / KRW / PILING

Form No.:

HSEP12:CLF

Annexure of Lifting Activity Work Permit Number: .....

Page 1 of 2

**This form shall be completed prior to performing Critical Lifts**

Answer the following questions and complete the required sections of the Lift Assessment & Plan.

If the answer is "yes", follow the instructions. If the answer is "no", continue to the next question.

1) Will personnel be hoisted? If "yes", complete sections A, B, D.	Y	N	<b>Section A</b>	<b>Lift Details</b>
			Type of Lift (Tick one): Critical <input type="radio"/> Personnel <input type="radio"/>	
2) Will more than one crane be used? If "yes", complete sections A, B, C.	Y	N	Project / Company Name	
3) Will the lift be more than 3 Meter from the ground and exceed 75% of the cranes/ T&Ps capacity? If "yes", complete sections A, B, C.	Y	N	Lift Location	
			Pre-lift Meeting Date	
			Lift Date	
			Rigging Supervisor	
4) Will the lift meet any of the conditions listed as stated in the Note on Pg 2 of this document? If "yes", complete sections A, B, C.	Y	N	Rigger Signature	
			Operator Signature	
			Signal Person Signature	

## Section B

## Lift Plan

1) **Numbers of T&Ps Used:**      Cranes.....      Winches.....      Chain Pulley Blocks.....      Other (Mention).....

2) **Sketch the plan and include the following** (Draw for all applicable configurations; Use additional pages if necessary)

- Weight and location of center of gravity of load & other necessary dimensions
- Rigging Setup & positions of T&Ps used with labels of their Serial Numbers

3) **Mention the Following (Attach additional papers if required):**

- Lifting Steps including load transfer from one arrangement to another & any obstructions to be avoided
- List ratings of the rigging T&Ps used to include number of sling legs, angle of the slings from horizontal, etc.
- Attach TPI Certificates and Internal Inspection records of T&Ps used
- List of Riggers, Foremen, Operators used in the activity

Agency Supervisor/Engineer [Signature with Date]:



# Critical Lift Assessment & Plan

Annexure of Lifting Activity Work Permit Number: .....

Format No.:  
HSEPI2:CLF  
Page 2 of 2

<b>Section C</b>		<b>Critical Lift Authorization</b> (For all used cranes; Use additional pages (if necessary):			
Crane Manufacturer		Crane Model #		Crane Serial/Unit #	
Crane Model #		Crane Serial/Unit #		Total Boom Length	
Maximum Radius	Swing Direction and Degrees	Boom Angle Pick Set	Lift Elevation	Jib or Boom Ext.? <b>Y</b> <b>N</b> Length:	
<b>(A) Crane Component Weights:</b>		<b>(B) Rated Crane Capacity</b>	Electrical Hazards?	<b>Y</b> <b>N</b>	
Jib/Boom Extension:		<b>(C) Load Weight</b>	Explain:		
Aux. Boom Head:			Overhead Hazards?	<b>Y</b> <b>N</b>	
Block/Headache Ball:			Explain:		
Cable:		<b>(D) Total Lift Weight(A+C)</b>	Underground Hazards?	<b>Y</b> <b>N</b>	
Rigging:			Explain:		
Allowance for Unknown:		% of Crane Capacity(D÷B)	Soil Conditions		
Total Deductions:					
Critical Lift Coordinator Sign & Date		Authorized Contactor Manager Sign & Date			
<b>Section D</b>		<b>Personnel Lift Authorization</b> (For all used cranes; Use additional pages if necessary):			
Crane Manufacturer		Crane Model #		Crane Serial/Unit #	
Platform ID#		Maximum Radius		Number of Occupants	
Platform Rating		<b>(A) Crane Rated Load at Max Radius</b>	<b>(C) Weight of Tools &amp; Occupants</b>		Occupants
<b>(B) Platform Weight</b>			Total Lift Weight(B+C)		
Platform Type (tick one) pinned on      suspended		<b>(D) Maximum Allowable Lift (50% of A)</b>		*must be less than D	
<b>*Answering "no" to any of the following questions prohibits the lift from being performed.</b>					
1) Does the crane have documentation of the current yearly inspection?					<b>Y</b> <b>N</b>
2) Is the personnel platform designed by an engineer and is the maximum load capacity documented?					<b>Y</b> <b>N</b>
3) Is the crane equipped with a positive lock means between the platform and crane?					<b>Y</b> <b>N</b>
4) Does the weather meet all acceptable conditions? (wind speed <=40 kmph and no rain or approaching thunderstorms)					<b>Y</b> <b>N</b>
<b>The following apply only to suspended personnel platforms.</b>					
5) Does the personnel platform have documentation of current yearly inspection?					<b>Y</b> <b>N</b>
6) Has a load test of 125% of the capacity of the personnel platform and crane been performed?					<b>Y</b> <b>N</b>
7) Is the guardrail (minimum from mid-rail to floor) screened to prevent material/tools from falling out?					<b>Y</b> <b>N</b>
8) Is the crane equipped with a working anti-two-block device?					<b>Y</b> <b>N</b>
		<b>Name</b>		<b>Signature</b>	
<b>Agency Site Engineer</b>					
<b>Agency Site HSE Officer</b>					
<b>BHEL Site Engineer</b>					
<b>BHEL Site HSE Officer</b>					
<b>Note: A Lift shall be considered Critical Lift and Require Critical Lift Plan in any of the Following Cases</b>					
<ul style="list-style-type: none"> <li>Lifting more than safe working load of the Lifting equipment</li> <li>Tandem Lifting using multiple cranes</li> <li>Total load exceeding 75% of capacity of crane</li> <li>Lift of unusual difficulty or geometry</li> <li>Rigging or Lift over operating units</li> <li>Transfer of load from one arrangement to another (eg. From Winch to Chain Pulley Blocks)</li> </ul>			<ul style="list-style-type: none"> <li><b>Complex Lifting operation involving:</b> <ul style="list-style-type: none"> <li>many machines / materials</li> <li>complicated routing of slings</li> <li>Lifting of high value items (as defined by Site HSE / PS-Region)</li> </ul> </li> <li>Any other lift as decided by site HSE / Erection</li> </ul>		



Annexure-IV to Corrigendum-4  
METHOD STATEMENT & JOB SAFETY ANALYSIS FORMAT  
Region: Site: JSA No.

Tender No. BHEL/CPC / KRW/ PILING HSE/001 :JSA  
Rev. 00  
Sep 21, 2024

Agency			
Activity Title			
Team Members			
Exact Location of Work			
Reference Erection Drawing No. (if any)			

JOB SAFETY ANALYSIS (JSA)					
S. No.	Job Plan Steps; Attach sketch/ drawing if required	Hazards	Control Measures	Residual Risk (High/ Medium/ Low)	Person responsible for control measure
Additional Precautions/ Control Measures (if any)					

It is certified that all possible steps and hazards in the activity are covered above, which will be carried out by competent personnel under strict supervision and following all contractual and regulatory requirements. All necessary equipment, tools & tackles, safety devices shall be ensured.								
(Name)	Submitted by Agency Execution		Reviewed by Agency HSE		Reviewed by BHEL Execution		Reviewed & Approved by BHEL HSE	
(Sign)								
(Date)								



HSEP:12-F08

**NIGHT WORK PERMIT**

Permit No. &amp; Date

Project &amp; Unit:

Emergency Contact Nos

Agency:

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	No heavy complex work is being carried out involving heavy, moving machinery etc. during night work		
2.	Proper illumination (lux value) as per prescribed standards has been provided		
3.	All required safety precautions / Permits / PPEs have been taken		
4.	Work area certified safe (with barricading, w/o hazards, proper access / ingress).		
5.	Workers are trained for the task		
6.	Adequate supervision is in order during the course of work		
7.	Emergency response team & Medical Facilities available.		
8.	Work hazards are identified, controlled and communicated to the worker.		
9.	Method Statements/ Job Safety Analyses attached:		
10.	Other:		
11.	List of Other Permits Required for the Activity (Attached):		
12.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

**A. Permit Requester/ Receiver (Agency):**

Site Engineer:	
Signature:	
Name:	Designation:

Site HSE Officer:	
Signature:	
Name:	Designation:

**B. Permit Issuer (BHEL):**

Site Engineer/ Authorized Representative:	
Signature:	
Name:	Designation:

Site HSE Officer/ Authorized Representative:	
Signature:	
Name:	Designation:

**C. Package-in-charge (BHEL):**

Signature:	
Name:	Designation:

(\* Permit valid for 7 days as per overleaf format)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HDS3<sup>rd</sup> Copy: BHEL Site HSE

All parameters from S.No. 1 to 12 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started

## Daily Work Area Condition Endorsement

Day	Date	Remarks (if any) & Signature with Date & Time				
		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer *	Remarks
2						
3						
4						
5						
6						
7						

## Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From..... (Date, Time)	To..... (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer*
1							
2							
3							
4							
5							
6							
7							

## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.

Reason for Closure: Job complete

Permit Validity Over

## Agency

Site Engineer

Site HSE Officer

Signature:

Signature:

Name:

Name:

## BHEL

Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:

Site HSE Officer\*

Site Engineer\*

Signature:

Signature:

Name:

Name:

(\* or authorized representative duly concurred by Region HSE)



HSEP:12-F09

<b>MATERIAL LOADING/UNLOADING/SHIFTING PERMIT</b> Type (Refer Pg 2) (Tick Applicable): Critical <input type="checkbox"/> Non-Critical <input type="checkbox"/>		Permit No. & Date
Project & Unit:		Emergency Contact Nos
Agency:		

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	Sufficient Area has been provided for material unloading		
2.	Loaded material carefully inspected and proper plan is made for unloading to avoid toppling/ falling		
3.	Loading / Unloading Cranes, T&Ps are in order with valid TPI certificate.		
4.	Ground is Level		
5.	Crane operator is authorized and experienced Rigger is available on the spot		
6.	Latches are available on Crane Hooks & Slings are tested and have valid Tag		
7.	Sufficient personnel with stabilizing ropes are available during shift		
8.	Speed of vehicle is Low while movement		
9.	Communication methodology between different gangs is in place. Communication gear (walkie-talkie sets etc.) provided where required		
10.	Walkie-Talkie is ensured for communication especially in case of long distance or absence of direct line of sight		
11.	Adequate supervision is in order on the spot		
12.	Area barricaded for every possible movement of crane.		
13.	Emergency response team & Medical Facilities are available during activity.		
14.	Workers involved are properly trained and sensitized to the dangers		
15.	Work hazards are identified, controlled and communicated to the worker in Toolbox Talk before start of activity.		
16.	List of skilled & unskilled workers along with Supervisor involved in the Activity (Attached)		
17.	Critical Lift assessment and Plan (Annexure) attached for Critical Loading/ Unloading/ Shifting		
18.	Method Statements/ Job Safety Analyses specific to the hazards in this particular activity enclosed:		
19.	Other:		
20.	Any Other Permits Required for the Activity (Attached):		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

#### A. Permit Requester/ Receiver (Agency):

Site Engineer:
Signature:
Name: _____ Designation: _____

Site HSE Officer:
Signature:
Name: _____ Designation: _____

#### B. Permit Issuer (BHEL):

Site Engineer/ Authorized Representative:
Signature:
Name: _____ Designation: _____

Site HSE Officer/ Authorized Representative:
Signature:
Name: _____ Designation: _____

#### C. Package-in-charge (BHEL):

Signature:
Name: _____ Designation: _____

(\* Permit valid for 7 days as per overleaf format)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HDS3<sup>rd</sup> Copy: BHEL Site HSE



All parameters from S.No. 1 to 16 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started

## Daily Work Area Condition Endorsement

Day	Date	Remarks (if any) & Signature with Date & Time				
		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer *	Remarks
2						
3						
4						
5						
6						
7						

## Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From..... (Date, Time)	To..... (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer*
1							
2							
3							
4							
5							
6							
7							

## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.	
Reason for Closure: Job complete	Permit Validity Over
<b>Agency</b>	
<b>Site Engineer</b>	<b>Site HSE Officer</b>
Signature:	Signature:
Name:	Name:
<b>BHEL</b>	
Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:	
<b>Site HSE Officer*</b>	<b>Site Engineer*</b>
Signature:	Signature:
Name:	Name:

(\* or authorized representative duly concurred by Region HSE)

**A Loading/ Unloading/ Shifting shall be considered Critical and Require Critical Lift Plan in any of the Following Cases**

- Lifting more than safe working load of the Lifting equipment
- Tandem Lifting using multiple cranes
- Total load exceeding 75% of capacity of crane
- Lift of unusual difficulty or geometry
- Lifting involving transfer of load from Winch to Chain Pulley blocks
- Rigging or Lift over operating units
- Transfer of load from one arrangement to another (eg. From Winch to Chain Pulley Blocks)
- **Complex Lifting operation involving:**
  - many machines / materials
  - complicated routing of slings
  - Lifting of high value items (as defined by Site HSE / PS-Region)
- Any other lift as decided by site HSE / Erection



# Critical Lift Assessment & Plan

Time / Trial / Control / Certificate No. / Shift / PC / KRW / PILING

Form No.:

HSEP12:CLF

Annexure of Lifting Activity Work Permit Number: .....

Page 1 of 2

**This form shall be completed prior to performing Critical Lifts**

Answer the following questions and complete the required sections of the Lift Assessment & Plan.

If the answer is "yes", follow the instructions. If the answer is "no", continue to the next question.

1) Will personnel be hoisted? If "yes", complete sections A, B, D.	Y	N	<b>Section A</b>	<b>Lift Details</b>
			Type of Lift (Tick one): Critical <input type="radio"/> Personnel <input type="radio"/>	
2) Will more than one crane be used? If "yes", complete sections A, B, C.	Y	N	Project / Company Name	
3) Will the lift be more than 3 Meter from the ground and exceed 75% of the cranes/ T&Ps capacity? If "yes", complete sections A, B, C.	Y	N	Lift Location	
			Pre-lift Meeting Date	
			Lift Date	
			Rigging Supervisor	
4) Will the lift meet any of the conditions listed as stated in the Note on Pg 2 of this document? If "yes", complete sections A, B, C.	Y	N	Rigger Signature	
			Operator Signature	
			Signal Person Signature	

## Section B

## Lift Plan

1) **Numbers of T&Ps Used:**      Cranes.....      Winches.....      Chain Pulley Blocks.....      Other (Mention).....

2) **Sketch the plan and include the following** (Draw for all applicable configurations; Use additional pages if necessary)

- Weight and location of center of gravity of load & other necessary dimensions
- Rigging Setup & positions of T&Ps used with labels of their Serial Numbers

3) **Mention the Following (Attach additional papers if required):**

- Lifting Steps including load transfer from one arrangement to another & any obstructions to be avoided
- List ratings of the rigging T&Ps used to include number of sling legs, angle of the slings from horizontal, etc.
- Attach TPI Certificates and Internal Inspection records of T&Ps used
- List of Riggers, Foremen, Operators used in the activity

Agency Supervisor/Engineer [Signature with Date]:



# Critical Lift Assessment & Plan

Annexure of Lifting Activity Work Permit Number: .....

Format No.:  
HSEPI2:CLF  
Page 2 of 2

<b>Section C</b>		<b>Critical Lift Authorization</b> (For all used cranes; Use additional pages (if necessary):			
Crane Manufacturer		Crane Model #		Crane Serial/Unit #	
Crane Model #		Crane Serial/Unit #		Total Boom Length	
Maximum Radius	Swing Direction and Degrees	Boom Angle Pick      Set	Lift Elevation	Jib or Boom Ext.? <b>Y</b> <b>N</b> Length:	
<b>(A) Crane Component Weights:</b>		<b>(B) Rated Crane Capacity</b>		Electrical Hazards? <b>Y</b> <b>N</b> Explain:	
Jib/Boom Extension:					
Aux. Boom Head:					
Block/Headache Ball:					
Cable:					
Rigging:					
Allowance for Unknown:					
Total Deductions:					
Critical Lift Coordinator Sign & Date		Authorized Contactor Manager Sign & Date			
<b>Section D</b>		<b>Personnel Lift Authorization</b> (For all used cranes; Use additional pages if necessary):			
Crane Manufacturer		Crane Model #		Crane Serial/Unit #	
Platform ID#		Maximum Radius		Number of Occupants	
Platform Rating		<b>(A) Crane Rated Load at Max Radius</b>		<b>(C) Weight of Tools &amp; Occupants</b>	
<b>(B) Platform Weight</b>					
Platform Type (tick one)		<b>(D) Maximum Allowable Lift (50% of A)</b>		Total Lift Weight(B+C)	
pinned on      suspended				*must be less than D	
<b>*Answering "no" to any of the following questions prohibits the lift from being performed.</b>					
1) Does the crane have documentation of the current yearly inspection?				<b>Y</b> <b>N</b>	
2) Is the personnel platform designed by an engineer and is the maximum load capacity documented?				<b>Y</b> <b>N</b>	
3) Is the crane equipped with a positive lock means between the platform and crane?				<b>Y</b> <b>N</b>	
4) Does the weather meet all acceptable conditions? (wind speed <=40 kmph and no rain or approaching thunderstorms)				<b>Y</b> <b>N</b>	
<b>The following apply only to suspended personnel platforms.</b>					
5) Does the personnel platform have documentation of current yearly inspection?				<b>Y</b> <b>N</b>	
6) Has a load test of 125% of the capacity of the personnel platform and crane been performed?				<b>Y</b> <b>N</b>	
7) Is the guardrail (minimum from mid-rail to floor) screened to prevent material/tools from falling out?				<b>Y</b> <b>N</b>	
8) Is the crane equipped with a working anti-two-block device?				<b>Y</b> <b>N</b>	
		<b>Name</b>		<b>Signature</b>	
<b>Agency Site Engineer</b>					
<b>Agency Site HSE Officer</b>					
<b>BHEL Site Engineer</b>					
<b>BHEL Site HSE Officer</b>					
<b>Note: A Lift shall be considered Critical Lift and Require Critical Lift Plan in any of the Following Cases</b>					
<ul style="list-style-type: none"> <li>Lifting more than safe working load of the Lifting equipment</li> <li>Tandem Lifting using multiple cranes</li> <li>Total load exceeding 75% of capacity of crane</li> <li>Lift of unusual difficulty or geometry</li> <li>Rigging or Lift over operating units</li> <li>Transfer of load from one arrangement to another (eg. From Winch to Chain Pulley Blocks)</li> </ul>			<ul style="list-style-type: none"> <li><b>Complex Lifting operation involving:</b> <ul style="list-style-type: none"> <li>many machines / materials</li> <li>complicated routing of slings</li> <li>Lifting of high value items (as defined by Site HSE / PS-Region)</li> </ul> </li> <li>Any other lift as decided by site HSE / Erection</li> </ul>		



Annexure-IV to Corrigendum-4  
METHOD STATEMENT & JOB SAFETY ANALYSIS FORMAT  
Region: Site: JSA No.

Tender No. BHEL/CPC / KRW/ PILING HSE/001 :JSA  
Rev. 00  
Sep 21, 2024

Agency			
Activity Title			
Team Members			
Exact Location of Work			
Reference Erection Drawing No. (if any)			

JOB SAFETY ANALYSIS (JSA)					
S. No.	Job Plan Steps; Attach sketch/ drawing if required	Hazards	Control Measures	Residual Risk (High/ Medium/ Low)	Person responsible for control measure
Additional Precautions/ Control Measures (if any)					

It is certified that all possible steps and hazards in the activity are covered above, which will be carried out by competent personnel under strict supervision and following all contractual and regulatory requirements. All necessary equipment, tools & tackles, safety devices shall be ensured.								
(Name)	Submitted by Agency Execution		Reviewed by Agency HSE		Reviewed by BHEL Execution		Reviewed & Approved by BHEL HSE	
(Sign)								
(Date)								



HSEP:12-F10

**SAFETY FACILITY REMOVAL PERMIT**

Permit No. &amp; Date

Project &amp; Unit:

Emergency Contact Nos

Agency:

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	Has the area been hard barricaded (tape/rope not to be used), to cordoned off area		
2.	Has signage been displayed to caution others of the hazard		
3.	Has proper illumination been arranged to ensure area is well lit as required		
4.	Are personal fall arrest systems being used around hole-opening as required?		
5.	Is a structurally solid hole-cover, marked with do not remove notice being used		
6.	Has the grating been properly installed with clamp/ nut & bolt/ welded		
7.	Emergency response team & Medical Facilities available.		
8.	Work hazards are identified, controlled and communicated to the worker.		
9.	Method Statements/ Job Safety Analyses attached:		
10.	Other:		
11.	List of Other Permits Required for the Activity (Attached):		
12.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

**A. Permit Requester/ Receiver (Agency):**

Site Engineer:
Signature:
Name: _____ Designation: _____

Site HSE Officer:
Signature:
Name: _____ Designation: _____

**B. Permit Issuer (BHEL):**

Site Engineer/ Authorized Representative:
Signature:
Name: _____ Designation: _____

Site HSE Officer/ Authorized Representative:
Signature:
Name: _____ Designation: _____

**C. Package-in-charge (BHEL):**

Signature:
Name: _____ Designation: _____

(\* Permit valid for 7 days as per overleaf format)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HDS3<sup>rd</sup> Copy: BHEL Site HSE

All parameters from S.No. 1 to 12 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started

## Daily Work Area Condition Endorsement

Day	Date	Remarks (if any) & Signature with Date & Time				
		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer *	Remarks
2						
3						
4						
5						
6						
7						

## Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From..... (Date, Time)	To..... (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer*
1							
2							
3							
4							
5							
6							
7							

## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.

Reason for Closure: Job complete

Permit Validity Over

## Agency

Site Engineer

Site HSE Officer

Signature:

Signature:

Name:

Name:

## BHEL

Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:

Site HSE Officer\*

Site Engineer\*

Signature:

Signature:

Name:

Name:

(\* or authorized representative duly concurred by Region HSE)



HSEP:12-F11

**LOCKOUT TAGOUT WORK PERMIT**

Permit No. &amp; Date

Project &amp; Unit:

Emergency Contact Nos

Agency:

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

Tag No.	Device to be Tagged / Locked I.D. No.	Device Location	Device Position OPEN / CLOSED - ON/OFF	Lock No.	Tag Lock Placed by Name/Sign - Date/Time	Tag Lock Removed by Name/Sign - Date/Time

No.	Item	Yes	Not required / Remarks
1.	Emergency response team & Medical Facilities available.		
2.	Work hazards are identified, controlled and communicated to the worker.		
3.	Method Statements/ Job Safety Analyses attached:		
4.	Other:		
5.	List of Other Permits Required for the Activity (Attached):		
6.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

**A. Permit Requester/ Receiver (Agency):**

Site Engineer:
Signature:
Name: _____ Designation: _____

Site HSE Officer:
Signature:
Name: _____ Designation: _____

**B. Permit Issuer (BHEL):**

Site Engineer/ Authorized Representative:
Signature:
Name: _____ Designation: _____

Site HSE Officer/ Authorized Representative:
Signature:
Name: _____ Designation: _____

**C. Package-in-charge (BHEL):**

Signature:
Name: _____ Designation: _____

(\* Permit valid for 7 days as per overleaf format)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HDS3<sup>rd</sup> Copy: BHEL Site HSE



All parameters from S.No. 1 to 6 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started

## Daily Work Area Condition Endorsement

Day	Date	Remarks (if any) & Signature with Date & Time				
		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer *	Remarks
2						
3						
4						
5						
6						
7						

## Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From..... (Date, Time)	To..... (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer*
1							
2							
3							
4							
5							
6							
7							

## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.

Reason for Closure: Job complete

Permit Validity Over

## Agency

Site Engineer

Site HSE Officer

Signature:

Signature:

Name:

Name:

## BHEL

Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:

Site HSE Officer\*

Site Engineer\*

Signature:

Signature:

Name:

Name:

(\* or authorized representative duly concurred by Region HSE)



HSEP:12-F12

# BEAM / TRUSS/ DUCT/ STRUCTURE FIT-UP & ALIGNMENT PERMIT

Permit No. &amp; Date

Project &amp; Unit:

Emergency Contact Nos

Agency:

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	Is the alignment procedure & Plan submitted, checked and verified safe (Please attach plan along with drawing, location & capacities of lifting tools & tackles)		
2.	Are all lifting tools & tackles, equipment tested and with valid serial numbers traceable to valid certificates		
3.	Ensured that (for load above 5 Ton) chain pulley blocks will not be used to bear full load of the hanging structure and will only be used for lateral movement. Either Winches, Leashing, Structural supports or similar arrangement will be used for hanging the load		
4.	Ensure that area below is cordoned off and barricaded		
5.	Ensured that all the workers working on the load (if any): (check whichever is applicable) a. have double lanyard safety harnesses which are hooked to a lifeline anchored with rigid structure independent of the hanging load have retractable fall arrestors, which are hooked to a lifeline anchored with rigid structure independent of the hanging load		
6.	Other Permits (Height Work, Hot Work etc. are ensured)		
7.	All necessary PPEs to be ensured		
8.	List of associated workers attached		
9.	Emergency response team & Medical Facilities available.		
10.	Work hazards are identified, controlled and communicated to the worker in daily Safety pep talk.		
11.	Method Statements/ Job Safety Analyses attached:		
12.	Other:		
13.	List of Other Permits Required for the Activity (Attached):		
14.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

## A. Permit Requester/ Receiver (Agency):

Site Engineer:	
Signature:	
Name:	Designation:

Site HSE Officer:	
Signature:	
Name:	Designation:

## B. Permit Issuer (BHEL):

Site Engineer/ Authorized Representative:	
Signature:	
Name:	Designation:

Site HSE Officer/ Authorized Representative:	
Signature:	
Name:	Designation:

## C. Package-in-charge (BHEL):

Signature:	
Name:	Designation:

(\* Permit valid for 7 days as per overleaf format)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HOS3<sup>rd</sup> Copy: BHEL Site HSE

All parameters from S.No. 1 to 14 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started

## Daily Work Area Condition Endorsement

Day	Date	Remarks (if any) & Signature with Date & Time				
		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer *	Remarks
2						
3						
4						
5						
6						
7						

## Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From..... (Date, Time)	To..... (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer*
1							
2							
3							
4							
5							
6							
7							

## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.

Reason for Closure: Job complete

Permit Validity Over

## Agency

Site Engineer

Site HSE Officer

Signature:

Signature:

Name:

Name:

## BHEL

Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:

Site HSE Officer\*

Site Engineer\*

Signature:

Signature:

Name:

Name:

(\* or authorized representative duly concurred by Region HSE)



HSEP:12-F13

**DRILLING & BLASTING PERMIT**

Permit No. &amp; Date

Project &amp; Unit:

Emergency Contact Nos

Agency:

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	Agency has taken proper approval from Chief controller of explosive as per Explosive act 1884.		
2.	Are made arrangement of safety precaution as per IS 4081 during blasting.		
3.	Are all the workers are trained and proper gate pass with WC policy Document submitted to BHEL.		
4.	Permission have been taken from Local/competent authority/customer		
5.	Blasting carried out with the permission of the engineer-in-charge and by competent and experienced supervisors/ workers who are thoroughly acquainted with the details of handling explosives and blasting operations.		
6.	Are Signboards reading " DANGER-HIGH EXPLOSIVES ", " PROTECTED AREA ", " NO SMOKING ", etc., prominently displayed in front of the magazine.		
7.	Poster of " Blasting Zone " and "Entry restricted" are displayed		
8.	Drilling and Blasting plan including (No of Bore, Nos of detonator and total weight of explosive, area cover during blasting has been approved by BHEL engineer in charge.		
9.	Arrangements in place: Sufficient warning shall be given to enable the people working in the blasting area to get off the danger zone. All persons, other than blaster, shall leave the danger area at least 10 minutes before the blasting starts. The danger zone shall be suitably cordoned off and flagmen posted at important points.		
10.	Barriers at a distance of not less than 400 m, 10 minutes shall close all approaches to the project site, before firing		
11.	Arrangement for Loud wailing note of not less than 1-minute duration shall be sounded on sirens to warn the public before commencement of firing.		
12.	The Indian Explosives Act will be abided for storage of explosives and relevant provisions.		
13.	The position of all holes to be drilled shall be marked out with white paint.		
14.	Loading and drilling shall not be carried out at the same time in the same area.		
15.	Hard Barricading & Edge Protection provided		
16.	Record of explosive shall be maintained(Gate entry, Used, Record should be verified & signed)		
17.	Lighting arrangement, fire Extinguisher deployed		
18.	All holes loaded on a shift shall be fired on the same shift.		
19.	Required basic PPEs (Safety shoes, helmet, Nose mask etc) provided		
20.	Loading and drilling shall not be carried out at the same time in the same area.		
21.	Excavated soil / Construction Material / equipment kept away from the edge.		
22.	First aid in attendance.		
23.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

**A. Permit Requester/ Receiver (Agency):**

Site Engineer:	
Signature:	
Name:	Designation:

Site HSE Officer:	
Signature:	
Name:	Designation:

**B. Permit Issuer (BHEL):**

Site Engineer/ Authorized Representative:	
Signature:	
Name:	Designation:

Site HSE Officer/ Authorized Representative:	
Signature:	
Name:	Designation:

**C. Package-in-charge (BHEL):**

Signature:	
Name:	Designation:

(\* Permit valid for 1 day as per overleaf format)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HDS3<sup>rd</sup> Copy: BHEL Site HSE

**All parameters from S.No. 1 to 23 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started**

### **Permit Extension Beyond Initially Requested Hours**

[illegible]

(\* or authorized representative duly concurred by Region HSE)

## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area. Reason for Closure:      Job complete <input type="text"/> Permit Validity Over <input type="text"/>	
<b>Agency</b>	
<b>Site Engineer</b>	<b>Site HSE Officer</b>
Signature:	Signature:
Name:	Name:
<b>BHEL</b>	
<b>Verified as above and Permit is Closed</b> <b>In case job not complete, New Permit No. Issued:</b>	
<b>Site HSE Officer*</b>	<b>Site Engineer*</b>
Signature:	Signature:
Name:	Name:



HSEP:12-WOP

**WINCH OPERATION PERMIT**Type (Refer Pg 2) (Tick Applicable): Critical ☐ Non-Critical ☐

Project &amp; Unit:

Agency:

Permit No. &amp; Date

Emergency Contact Nos

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	All workers on job are competent and medically fit. Do's Don'ts are explained in TBT		
2.	Winch Operator is competent, has good Eye-sight and hearing and dedicated & authorized to Operate the Winch;		
3.	Rigger & Signaller are competent and aware of Signals		
4.	Walkie-Talkie Sets are available for Communication		
5.	List of authorizes operators is displayed near Winch		
6.	TPI Certificate of Winch is available		
7.	Lifting Drawing/ Plan is available in case of complex lift arrangement involving more than 2 pulleys		
8.	Proper & Safe Access to Winch is available and operator seating is conformable		
9.	Adequate lighting provided (for dark hours) as per applicable lux standards		
10.	Winch operator, Signaller and lifting gang understand each other's language		
11.	Area below the hanging load is barricaded and cleared of all activity		
12.	Necessary PPEs are ensured. Height work gang is wearing Safety Harness; Lifeline is available for movement		
13.	Supervisor and Safety Officer are available during lifting activity		
14.	Daily Inspection carried out: Winch brakes are functioning - No slippage; Gears are impacting speed in expected manner; Pulleys are in good condition and rotating freely		
15.	Path of the Winch Rope is clear of any obstructions		
16.	Method Statements/ Job Safety Analyses attached:		
17.	Other:		
18.	List of Other Permits Required for the Activity (Attached):		
19.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

**A. Permit Requester/ Receiver (Agency):**

<b>Site Engineer:</b>	
Signature: _____	
Name: _____	Designation: _____

<b>Site HSE Officer:</b>	
Signature: _____	
Name: _____	Designation: _____

**B. Permit Issuer (BHEL):**

<b>Site Engineer/ Authorized Representative:</b>	
Signature: _____	
Name: _____	Designation: _____

<b>Site HSE Officer/ Authorized Representative:</b>	
Signature: _____	
Name: _____	Designation: _____

**C. Package-in-charge (BHEL):**

Signature: _____	
Name: _____	Designation: _____

(\* Permit valid for 7 days and to be endorsed daily before start of work as per overleaf format)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HDS3<sup>rd</sup> Copy: BHEL Site HSE

All parameters from S. No. 1 to 19 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started

## Daily Work Area Condition Endorsement

Day	Date	Remarks (if any) & Signature with Date & Time				
		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer *	Remarks
2						
3						
4						
5						
6						
7						

## Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From..... (Date, Time)	To..... (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer*
1							
2							
3							
4							
5							
6							
7							

## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.	
Reason for Closure: Job complete	Permit Validity Over
<b>Agency</b>	
<b>Site Engineer</b>	<b>Site HSE Officer</b>
Signature:	Signature:
Name:	Name:
<b>BHEL</b>	
Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:	
<b>Site HSE Officer*</b>	<b>Site Engineer*</b>
Signature:	Signature:
Name:	Name:

(\* or authorized representative duly concurred by Region HSE)

**A Lift shall be considered Critical Lift and Require Critical Lift Plan in any of the Following Cases**

- Lifting more than safe working load of the Lifting equipment
- Tandem Lifting using multiple cranes
- Total load exceeding 75% of capacity of crane
- Lift of unusual difficulty or geometry
- Rigging or Lift over operating units
- Any other lift as decided by site HSE / Erection
- Transfer of load from one arrangement to another (eg. From Winch to Chain Pulley Blocks)
- Complex Lifting operation involving:
  - multiple machines / materials
  - complicated routing of slings
  - Lifting of high value items (as decided by Site HSE / PS-Region)
- Any other lift as decided by site HSE / Erection





# Critical Lift Assessment & Plan

Time / Trial / Control / Certificate No. / Shift / PC / KRW / PILING

Form No.:  
HSEP12:CLF

Annexure of Lifting Activity Work Permit Number: .....

Page 1 of 2

**This form shall be completed prior to performing Critical Lifts**

Answer the following questions and complete the required sections of the Lift Assessment & Plan.

If the answer is "yes", follow the instructions. If the answer is "no", continue to the next question.

	Y	N	Section A	Lift Details
1) Will personnel be hoisted? If "yes", complete sections A, B, D.				Type of Lift (Tick one): Critical <input type="radio"/> Personnel <input type="radio"/>
2) Will more than one crane be used? If "yes", complete sections A, B, C.				Project / Company Name
3) Will the lift be more than 3 Meter from the ground and exceed 75% of the cranes/ T&Ps capacity? If "yes", complete sections A, B, C.				Lift Location
				Pre-lift Meeting Date
				Lift Date
				Rigging Supervisor
4) Will the lift meet any of the conditions listed as stated in the Note on Pg 2 of this document? If "yes", complete sections A, B, C.				Rigger Signature
				Operator Signature
				Signal Person Signature

Section B	Lift Plan
-----------	-----------

1) **Numbers of T&Ps Used:**      Cranes.....      Winches.....      Chain Pulley Blocks.....      Other (Mention).....

2) **Sketch the plan and include the following** (Draw for all applicable configurations; Use additional pages if necessary)

- Weight and location of center of gravity of load & other necessary dimensions
- Rigging Setup & positions of T&Ps used with labels of their Serial Numbers

3) **Mention the Following (Attach additional papers if required):**

- Lifting Steps including load transfer from one arrangement to another & any obstructions to be avoided
- List ratings of the rigging T&Ps used to include number of sling legs, angle of the slings from horizontal, etc.
- Attach TPI Certificates and Internal Inspection records of T&Ps used
- List of Riggers, Foremen, Operators used in the activity

Agency Supervisor/Engineer [Signature with Date]:



# Critical Lift Assessment & Plan

Annexure of Lifting Activity Work Permit Number: .....

Format No.:  
HSEPI2:CLF  
Page 2 of 2

<b>Section C</b>		<b>Critical Lift Authorization</b> (For all used cranes; Use additional pages (if necessary):			
Crane Manufacturer		Crane Model #		Crane Serial/Unit #	
Crane Model #		Crane Serial/Unit #		Total Boom Length	
Maximum Radius	Swing Direction and Degrees	Boom Angle Pick      Set	Lift Elevation	Jib or Boom Ext.? <b>Y</b> <b>N</b> Length:	
<b>(A) Crane Component Weights:</b>		<b>(B) Rated Crane Capacity</b>	Electrical Hazards?	<b>Y</b> <b>N</b>	
Jib/Boom Extension:		<b>(C) Load Weight</b>	Explain:		
Aux. Boom Head:			Overhead Hazards?	<b>Y</b> <b>N</b>	
Block/Headache Ball:			Explain:		
Cable:		<b>(D) Total Lift Weight(A+C)</b>	Underground Hazards?	<b>Y</b> <b>N</b>	
Rigging:			Explain:		
Allowance for Unknown:		% of Crane Capacity(D÷B)	Soil Conditions		
Total Deductions:					
Critical Lift Coordinator Sign & Date		Authorized Contactor Manager Sign & Date			
<b>Section D</b>		<b>Personnel Lift Authorization</b> (For all used cranes; Use additional pages if necessary):			
Crane Manufacturer		Crane Model #		Crane Serial/Unit #	
Platform ID#		Maximum Radius		Number of Occupants	
Platform Rating		<b>(A) Crane Rated Load at Max Radius</b>	<b>(C) Weight of Tools &amp; Occupants</b>		Occupants
<b>(B) Platform Weight</b>			Total Lift Weight(B+C)		
Platform Type (tick one) pinned on      suspended		<b>(D) Maximum Allowable Lift (50% of A)</b>			
				*must be less than D	
<b>*Answering "no" to any of the following questions prohibits the lift from being performed.</b>					
1) Does the crane have documentation of the current yearly inspection?				<b>Y</b>	<b>N</b>
2) Is the personnel platform designed by an engineer and is the maximum load capacity documented?				<b>Y</b>	<b>N</b>
3) Is the crane equipped with a positive lock means between the platform and crane?				<b>Y</b>	<b>N</b>
4) Does the weather meet all acceptable conditions? (wind speed <=40 kmph and no rain or approaching thunderstorms)				<b>Y</b>	<b>N</b>
<b>The following apply only to suspended personnel platforms.</b>					
5) Does the personnel platform have documentation of current yearly inspection?				<b>Y</b>	<b>N</b>
6) Has a load test of 125% of the capacity of the personnel platform and crane been performed?				<b>Y</b>	<b>N</b>
7) Is the guardrail (minimum from mid-rail to floor) screened to prevent material/tools from falling out?				<b>Y</b>	<b>N</b>
8) Is the crane equipped with a working anti-two-block device?				<b>Y</b>	<b>N</b>
		<b>Name</b>	<b>Signature</b>	<b>Date</b>	
<b>Agency Site Engineer</b>					
<b>Agency Site HSE Officer</b>					
<b>BHEL Site Engineer</b>					
<b>BHEL Site HSE Officer</b>					
<b>Note: A Lift shall be considered Critical Lift and Require Critical Lift Plan in any of the Following Cases</b>					
<ul style="list-style-type: none"> <li>Lifting more than safe working load of the Lifting equipment</li> <li>Tandem Lifting using multiple cranes</li> <li>Total load exceeding 75% of capacity of crane</li> <li>Lift of unusual difficulty or geometry</li> <li>Rigging or Lift over operating units</li> <li>Transfer of load from one arrangement to another (eg. From Winch to Chain Pulley Blocks)</li> </ul>			<ul style="list-style-type: none"> <li><b>Complex Lifting operation involving:</b> <ul style="list-style-type: none"> <li>many machines / materials</li> <li>complicated routing of slings</li> <li>Lifting of high value items (as defined by Site HSE / PS-Region)</li> </ul> </li> <li>Any other lift as decided by site HSE / Erection</li> </ul>		



Annexure-IV to Corrigendum-4  
METHOD STATEMENT & JOB SAFETY ANALYSIS FORMAT  
Region: Site: JSA No.

Tender No. BHEL/CPC / KRW/ PILING HSE/001 :JSA  
Rev. 00  
Sep 21, 2024

Agency			
Activity Title			
Team Members			
Exact Location of Work			
Reference Erection Drawing No. (if any)			

JOB SAFETY ANALYSIS (JSA)					
S. No.	Job Plan Steps; Attach sketch/ drawing if required	Hazards	Control Measures	Residual Risk (High/ Medium/ Low)	Person responsible for control measure
Additional Precautions/ Control Measures (if any)					

It is certified that all possible steps and hazards in the activity are covered above, which will be carried out by competent personnel under strict supervision and following all contractual and regulatory requirements. All necessary equipment, tools & tackles, safety devices shall be ensured.								
(Name)	Submitted by Agency Execution		Reviewed by Agency HSE		Reviewed by BHEL Execution		Reviewed & Approved by BHEL HSE	
(Sign)								
(Date)								



HSEP:12-CBPO&amp;MP

# CONCRETE BATCHING PLANT OPERATION & MAINTANANCE PERMIT

Permit No. &amp; Date

Project &amp; Unit:

Emergency Contact Nos

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	All workers on job are competent and medically fit (No Height Phobia) for working at height		
2.	Batching plant operator is trained and having adequate experience and displayed		
3.	Emergency stop buttons available, effective and clearly labelled?		
4.	All the conveyors are adequately guarded and pull-guard switch provided if applicable		
5.	All the chain block/lifting machines, compressors, chains, ropes of conveyor or bucket elevator inspected by competent third party? Test certificate with identity No. available		
6.	Work platforms protected by adequate hand rails (minimum height 1.0 meter)		
7.	Valid PV Test certificate of compressor is available & displayed.		
8.	Elect Compressor MOTOR is powered through RCCB.		
9.	Proper Housekeeping practices are followed at the work area		
10.	Limit switch is provided (and in working condition) for cleaning and maintenance work		
11.	Are the openings where there is free fall hazard covered or fenced securely by railing, toe guards etc?		
12.	Are the moving parts and point of operation of concrete pump, compressor adequately guarded?		
13.	Fire Extinguisher is available		
14.	Additional holding arrangements for mixing compartment opening lid provided (other than single chain block)		
15.	Competent Supervisor and Safety Officer are available during operation		
16.	Emergency response team & Medical Facilities available.		
17.	Work hazards are identified, controlled and communicated to the worker in daily Safety Pep talk.		
18.	Hazardous chemicals (admixtures) stored at isolated location, with proper warning signs, , MSDS displayed		
19.	Method Statements/ Job Safety Analyses attached: SOP/DCP available and displayed		
20.	Inspection of Batching Plant done frequently as per BHEL INSPECTION CHECKLIST		
21.	List of Other Permits Required for the Activity (Attached):		
22.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

## A. Permit Requester/ Receiver (Agency):

Site Engineer:  
Signature: \_\_\_\_\_  
Name: \_\_\_\_\_ Designation: \_\_\_\_\_

Site HSE Officer:  
Signature: \_\_\_\_\_  
Name: \_\_\_\_\_ Designation: \_\_\_\_\_

## B. Permit Issuer (BHEL):

Site Engineer/ Authorized Representative:  
Signature: \_\_\_\_\_  
Name: \_\_\_\_\_ Designation: \_\_\_\_\_

Site HSE Officer/ Authorized Representative:  
Signature: \_\_\_\_\_  
Name: \_\_\_\_\_ Designation: \_\_\_\_\_

## C. Package-in-charge (BHEL):

Signature: \_\_\_\_\_  
Name: \_\_\_\_\_ Designation: \_\_\_\_\_

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HOS3<sup>rd</sup> Copy: BHEL Site HSE

(\* Permit valid for 14 days as per overleaf format)

Page 1 of 2

P.T.O.

All parameters from S.No. 1 to 23 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started



## Daily Work Area Condition Endorsement

Day	Date	Remarks (if any) & Signature with Date & Time				
		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer *	Remarks
2						
3						
4						
5						
6						
7						

## Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From..... (Date, Time)	To..... (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer*
1							
2							
3							
4							
5							
6							
7							

## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.	
Reason for Closure:      Job complete 	Permit Validity Over 
<b>Agency</b>	
<b>Site Engineer</b>	<b>Site HSE Officer</b>
Signature:	Signature:
Name:	Name:
<b>BHEL</b>	
Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:	
<b>Site HSE Officer*</b>	<b>Site Engineer*</b>
Signature:	Signature:
Name:	Name:

(\* or authorized representative duly concurred by Region HSE)



HSEP:12-EMSCOP

<b>ELECT MOTOR SKY CLIMBER OPERATION PERMIT</b>		Permit No. & Date
Project & Unit:		Emergency Contact Nos
Agency:		

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	All workers on job are competent and medically fit (No Height Phobia) for working at height		
2.	Operator is competent, has good Eye-sight and hearing and dedicated & authorized to Operate the SKY CLIMBER		
3.	Walkie-Talkie Sets are available for Communication		
4.	Ensure MANUAL OPERATION of motor is functional.		
5.	Ensure REMOTE of SKY CLIMBER is in working condition & secured		
6.	MAN BASKET structure is in good condition & HANDRAILS are provided as per standard .		
7.	VALID TPI Certificate of SKY CLIMBER is available. SWL is MARKED on SKY CLIMBER.		
8.	MOTOR is powered through RCCB		
9.	Ensure all the ON/OFF & UP/DOWN switches are working .		
10.	Check all lifting tools & tackle, Wire rope are in good condition & free from cut., damage ,rust. etc		
11.	Daily Inspection of SKY CLIMBER carried out as per daily inspection checklist		
12.	Necessary PPEs are ensured. Height work gang is wearing Safety Harness.		
13.	Fire Extinguisher is available in the basket		
14.	All lifting / tightening tools, hand tools/equipment checked and in good condition		
15.	Competent Supervisor and Safety Officer are available during operation		
16.	Wind speed checked within specified limit using calibrated Anemometer		
17.	Emergency response team & Medical Facilities available.		
18.	Work hazards are identified, controlled and communicated to the worker in daily Safety Pep talk.		
19.	Minimum two levels of fall protection have been ensured to the workmen using SKY CLIMBER		
20.	Method Statements/ Job Safety Analyses attached:		
21.	Other:		
22.	List of Other Permits Required for the Activity (Attached):		
23.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

#### A. Permit Requester/ Receiver (Agency):

Site Engineer:	
Signature:	
Name:	Designation:

Site HSE Officer:	
Signature:	
Name:	Designation:

#### B. Permit Issuer (BHEL):

Site Engineer/ Authorized Representative:	
Signature:	
Name:	Designation:

Site HSE Officer/ Authorized Representative:	
Signature:	
Name:	Designation:

#### C. Package-in-charge (BHEL):

Signature:	
Name:	Designation:

(\* Permit valid for 14 days as per overleaf format)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HOS3<sup>rd</sup> Copy: BHEL Site HSE

P.T.O.

Page 1 of 2

P.T.O.

**Permit No. & Date:** \_\_\_\_\_

**All parameters from S.No. 1 to 23 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started**

## Daily Work Area Condition Endorsement

Day	Date	Remarks (if any) & Signature with Date & Time				
		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer *	Remarks
2						
3						
4						
5						
6						
7						

## Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From..... (Date, Time)	To..... (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer*
1							
2							
3							
4							
5							
6							
7							

## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.

Reason for Closure: Job complete

Permit Validity Over

## Agency

Site Engineer

Site HSE Officer

Signature:

Signature:

Name:

Name:

## BHEL

Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:

Site HSE Officer\*

Site Engineer\*

Signature:

Signature:

Name:

Name:

(\* or authorized representative duly concurred by Region HSE)





HSEP:12-ASBWP

**ABRASIVE SHOT BLASTING WORK PERMIT**

Permit No. &amp; Date

Project &amp; Unit:

Emergency Contact Nos

Agency:

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	All workers on job are competent and medically fit (No Height Phobia) for working at height		
2.	Authorized & Trained blaster available		
3.	Blasting area is covered from all side and top to avoid release of slag/dust/hazardous particle in the air.		
4.	Blasting area is isolated or cordoned off?		
5.	Hood & Other Necessary PPEs are ensured		
6.	Hose pipes connected with clamped and provision of whip arrestor ensured ?		
7.	Valid Test certificate of compressor is available & displayed		
8.	Elect Compressor MOTOR is powered through RCCB		
9.	Pressure gauge attached to compressor & working properly & have valid calibration certificate available		
10.	Grit material stored in bags and at dry place to avoid contamination		
11.	Emergency Relief Valve is working		
12.	Warning sign boards are deployed around the blasting shed		
13.	Fire Extinguisher is available i		
14.	All hand tools/equipment checked and in good condition		
15.	Competent Supervisor and Safety Officer are available during operation		
16.	Emergency response team & Medical Facilities available.		
17.	Work hazards are identified, controlled and communicated to the worker in daily Safety Pep talk.		
18.	Hopper condition is good		
19.	Method Statements/ Job Safety Analyses attached:		
20.	Other:		
21.	List of Other Permits Required for the Activity (Attached):		
22.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

**A. Permit Requester/ Receiver (Agency):**

<b>Site Engineer:</b>
Signature: _____
Name: _____ Designation: _____

<b>Site HSE Officer:</b>
Signature: _____
Name: _____ Designation: _____

**B. Permit Issuer (BHEL):**

<b>Site Engineer/ Authorized Representative:</b>
Signature: _____
Name: _____ Designation: _____

<b>Site HSE Officer/ Authorized Representative:</b>
Signature: _____
Name: _____ Designation: _____

**C. Package-in-charge (BHEL):**

Signature: _____
Name: _____ Designation: _____

(\* Permit valid for 14 days as per overleaf format)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HOS3<sup>rd</sup> Copy: BHEL Site HSE

P.T.O.

Page 1 of 2

P.T.O.

All parameters from S.No. 1 to 23 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started

## Daily Work Area Condition Endorsement

Day	Date	Remarks (if any) & Signature with Date & Time				
		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer *	Remarks
2						
3						
4						
5						
6						
7						

## Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
	From..... (Date, Time)	To..... (Date, Time)		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer*
1							
2							
3							
4							
5							
6							
7							

## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.

Reason for Closure: Job complete

Permit Validity Over

## Agency

Site Engineer

Site HSE Officer

Signature:

Signature:

Name:

Name:

## BHEL

Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:

Site HSE Officer\*

Site Engineer\*

Signature:

Signature:

Name:

Name:

(\* or authorized representative duly concurred by Region HSE)



HSEP:12-EM&amp;DSP

<b>ERECTION / MODIFICATION &amp; DISMANTLING SCAFFOLDING PERMIT</b>		Permit No. & Date
Project & Unit:		Emergency Contact Nos
Agency:		

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	All workers on job are competent and medically fit (No Height Phobia) for working at height		
2.	Only competent & experienced people have been selected / engaged in Scaffolding erection, modification or dismantling tasks.		
3.	Area of work is effectively cordoned-off / barricaded / illuminated.		
4.	For taking-up / lowering down Scaffolding members / clamps / couplings etc. appropriate ropes / pulleys/ chains etc. have been arranged for use (not to throw any item) & the same have been verified as "fit".		
5.	Scaffold erection or dismantling tasks are being supervised by Experienced Engineer / Competent person.		
6.	Working platforms are protected with handrails & toe-boards.		
7.	Access & Exit (for reach & escape) are safe for use by people.		
8.	Items / members of scaffold. being lowered are removed from the area & stacked correctly		
9.	Proper Housekeeping practices are followed at the work area		
10.	Inspection done frequently as per BHEL INSPECTION CHECKLIST		
11.	Sole board, Base Plate & Base Lift provided		
12.	Free length of the planks should not be more than 150mm on both the sides.		
13.	Bracings Connected at node point Covered all the four sides up to the full height		
14.	All ledger connected to inside the standards & Joints occurred in same bay		
15.	Are all the Pipes / Clamps / platforms / Ladders are of EN & IS standard		
16.	TAGS (RED/YELLOW/GREEN) are provided by competent scaffolding supervisor		
17.	Required PPE's / FBH/RFA & other safety equipment's provided		
18.	Emergency response team & Medical Facilities available.		
19.	Method Statements/ Job Safety Analyses attached: SOP/DCP available and displayed		
20.	Work hazards are identified, controlled and communicated to the worker in daily Safety Pep talk.		
21.	List of Other Permits Required for the Activity (Attached):-		
22.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.*

#### A. Permit Requester/ Receiver (Agency):

<b>Site Engineer:</b>
Signature: _____
Name: _____ Designation: _____

<b>Site HSE Officer:</b>
Signature: _____
Name: _____ Designation: _____

#### B. Permit Issuer (BHEL):

<b>Site Engineer/ Authorized Representative:</b>
Signature: _____
Name: _____ Designation: _____

<b>Site HSE Officer/ Authorized Representative:</b>
Signature: _____
Name: _____ Designation: _____

#### C. Package-in-charge (BHEL):

Signature: _____
Name: _____ Designation: _____

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HOS3<sup>rd</sup> Copy: BHEL Site HSE

(\* Permit valid for 14 days as per overleaf format)

All parameters from S.No. 1 to 23 on Page 1 of this Permit are to be checked physically. In case any deviation is observed, same is to be rectified, only then work is to be started

## Daily Work Area Condition Endorsement

Day	Date	Remarks (if any) & Signature with Date & Time				
		Agency Site Engineer	Agency HSE Officer	BHEL Site Engineer *	BHEL HSE Officer *	Remarks
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7						

## Permit Extension Beyond Initially Requested Hours

Sl. No.	Extension Period		Remarks	Signature with Date & Time			
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## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.

Reason for Closure: Job complete

Permit Validity Over

## Agency

Site Engineer

Site HSE Officer

Signature:

Signature:

Name:

Name:

## BHEL

Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:

Site HSE Officer\*

Site Engineer\*

Signature:

Signature:

Name:

Name:

(\* or authorized representative duly concurred by Region HSE)



HSEP:12-CDBIWP

**CONSTRUCTION DB INSTALLATION WORK PERMIT**

Permit No. &amp; Date

Project &amp; Unit:

Emergency Contact Nos

Agency:

Exact Location of Work: \_\_\_\_\_

Nature / Description of Work: \_\_\_\_\_

Duration of Work Execution \*: From Date: \_\_\_\_\_ to Date: \_\_\_\_\_ Daily from \_\_\_\_\_ hrs. to \_\_\_\_\_ hrs.

Name of Agency Performing the Work: \_\_\_\_\_

Name of Agency's Site Engineer (Permit Requesting Authority): \_\_\_\_\_ Sign: \_\_\_\_\_

Name of Agency's Package In-charge: \_\_\_\_\_ Sign: \_\_\_\_\_ Date: \_\_\_\_\_

*The above described work will be done under all the safety precautions mentioned on this permit to work as under during the currency of the Permit.*

No.	Item	Yes	Not required / Remarks
1.	All workers on job are competent and medically fit (No Height Phobia) for working at height		
2.	MAIN DB/PDB are INDUSTRIAL TYPE & protected from RAIN & WATER LOGGING		
3.	Voltage rating, DANGER SIGN, Shock-Treatment chart displayed in the installation. Booth		
4.	Competent & valid license holder Electrician deployed for installation		
5.	Ensure MAIN/PDB DOOR lock is in working condition & Insulated MAT is provided/available		
6.	Rubber Hand Gloves available/used by Electrician		
7.	All incoming & outgoing FEEDER have adequate rating of MCCB/RCCB./RCBO.		
8.	DOUBLE EARTH PIT (FOR MAIN DB 440V ) available and connected with MAIN DB./PDB		
9.	RCCB/RCBO installed in MAIN DB/PDB is tested and record checked		
10.	All Incomings & Outgoing Cables are properly glanded & terminated with LUGS		
11.	Cables route marker for U/G cable provided and are double insulated , free from CUTS & JOINTS.		
12.	Sketch for installation/connection (SLD) available & pasted.		
13.	Fire Extinguisher (DCP or CO2) & Sand Bucket is available		
14.	General Housekeeping in & around booth/installation found in order		
15.	Competent Supervisor and Safety Officer are available during installation		
16.	Only Industrial type PLUGS & SOCKET are used		
17.	Illumination arrangement available inside BOOTH/INSTALLATION ROOM		
18.	Work hazards are identified, controlled and communicated to the worker in Safety Pep talk.		
19.	MAIN DB/PDB installed have adequate space at FRONT & REAR		
20.	Labelling of incoming & outgoing feeders made		
21.	Job Safety Analyses attached:		
22.	List of Other Permits Required for the Activity (Attached):		
23.	Toolbox Talk Records with (preferably) list of workers involved in the Permit Activity (to be attached)		

*The conditions mentioned in the above checklist are sufficient for safe completion of this activity. These have been checked and found complied before issuing the Permit, and shall be monitored and ensured throughout the currency of this Permit.***A. Permit Requester/ Receiver (Agency):**

<b>Site Engineer:</b>
Signature: _____
Name: _____ Designation: _____

<b>Site HSE Officer:</b>
Signature: _____
Name: _____ Designation: _____

**B. Permit Issuer (BHEL):**

<b>Site Engineer/ Authorized Representative:</b>
Signature: _____
Name: _____ Designation: _____

<b>Site HSE Officer/ Authorized Representative:</b>
Signature: _____
Name: _____ Designation: _____

**C. Package-in-charge (BHEL):**

Signature: _____
Name: _____ Designation: _____

(\* Permit valid for 14 days as per overleaf format)

Original: Permittee

2<sup>nd</sup> Copy: Agency Deptt. HOS3<sup>rd</sup> Copy: BHEL Site HSE

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## Permit Extension Beyond Initially Requested Hours

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## Permit Closure After Work Completion

Permit is here by returned after completing the job, ensuring safe removal of men and material and proper housekeeping of the Area.

Reason for Closure: Job complete

Permit Validity Over

## Agency

Site Engineer

Site HSE Officer

Signature:

Signature:

Name:

Name:

## BHEL

Verified as above and Permit is Closed In case job not complete, New Permit No. Issued:

Site HSE Officer\*

Site Engineer\*

Signature:

Signature:

Name:

Name:

(\* or authorized representative duly concurred by Region HSE)



**BHARAT HEAVY ELECTRICALS LIMITED  
POWER SECTOR WESTERN REGION**