FORMAT NO. : HSE-8 REV 0

RADIATION WORK PERMIT

Project :
Name of the work :
Name of site contractor :

Sr. No. :
Date :
Job No. :

Location of work :

Source strength :

Cordoned distance (m) :

Name of Radiography agency :

Approved by Owner/EIL ☐

No. of workers engaged :
(List enclosed with name & gate pass numbers.)

The following items have been checked &compliance shall be ensured during currency of the permit:

S. No.	Item description	Done
	Safety regulations as per BARC/AERB ensured while source in use/in transit & during storage	
	Area cordoned off / safe working platform provided	
	Lighting arrangements for working during nights ensured	
	Warning signs/ flash lights installed	
	Cold work permit taken (if applicable)	
	PPEs like film badges, dosimeters used	

Additional precautions, if any _____

(Radiography Agency's BARC/AERB authorized Supervisor)

Permission is granted.

Permit is valid from _____ AM/PM _____ Date to _____ AM/PM _____ Date

(Signature of permit issuing authority-RCM of contractor)
Name : Designation: Date:

Permit renewal:

Permit extended up to		Additional precautions required, if any	Sign of issuing authority with date (of site contractor)	
Date	Time			

Work completed/ stopped/ area cleared at _____ Hrs of Date _____
(Sign. of permit issuing authority)
Name& Signature of site contractor:

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FORMAT NO. : HSE-9 REV 1

DEMOLISHING/DISMANTLING WORK PERMIT

Project : Sr.No. :
Name of the work : Date :
Name of contractor : Job No. :

Name of sub-contractor : No. of workers to be engaged:
(List enclosed with name & gate pass numbers.)

Line No./ Equipment No./ Structure to be dismantled :

Location details of dismantling/ demolition with sketch : (clearly indicate the area)

The following items have been checked &compliance shall be ensured during currency of the permit:

S. No.	Item description	Done	Not Applicable
	Services like power, gas supply, water, etc. disconnected	☐	☐
	Dismantling/ Demolishing method reviewed & approved	☐	☐
	Usage of appropriate PPEs ensured	☐	☐
	Precautions taken for neighboring structures	☐	☐
	First-Aid arrangements made	☐	☐
	Fire fighting arrangements ensured	☐	☐
	Precautions taken for blasting	☐	☐

Work Permit Receiver
(Contractor's Supervisor/Engineer)

Verification by Contractor
(Contractor's Safety Officer)

Permission is granted.

(Work Permit issuer-Client)

Name :
Date :

Completion report:

Dismantling/ Demolishing is completed on _____ Date at _____ Hrs.

Materials/ debris transported to identified location ☐ Tagging completed (as applicable) ☐

Services like power, gas supply, water, etc. restored ☐

(Permit issuing authority-Client)

CONTRACTOR's NAME

FORMAT NO. : HSE-10 REV 0

DAILY SAFETY CHECKLIST

(To make use of before start of day's work)

Project :
Name of the work :
Name of contractor :

Sr.No. :
Date :
Job No. :

Description of Job decided to perform : -

- **Use of PPE / Safety Gadgets**

Sl. No	PPEs	Compliance (Yes / No)	Sl. No	PPEs	Compliance (Yes / No)
1	Safety Helmets		6	Face Shield	
2	Safety Shoes		7	Full body harness	
3	Hand Gloves		8	Fall Arrest System	
4	Dust Musk		9	Safety net	
5	Safety Goggles		10	Horizontal life-line made of steel wire, (dia not less than 8.0 mm.)	

(Serial No. 1 & 2 are compulsory for everyone. Specify & ensure use of other safety gadgets as required for the job)

- **Identify following important unsafe conditions: -**

Sl. No	Conditions	Yes / No
1	Access to work site / emergency escape clear	
2	Soil / Loose earth kept away from excavated pit / slope / ladder provided	
3	Electrical wire / welding lead lying entangled on ground / welding m/c. booth accessible	
4	Elevated work platform / open ends are protected	
5	Ground area cordoned off before lifting works or erection at height / ground area checked & cordoned-off before start of height works	
6	Structural members / erected pipes / wooden boards/pieces etc. are safely anchored at heights and are not likely to fall down on people when working beneath	
7	Ladders tied-up on tall steel structures, long before are removed to get rid of their use	
8	Any Other	

- **Indicate actions taken, if status of any of the above items is found "No"**
  .....
  .....
- **Specific Safety guidelines / precautions, if any** (communicated thro' TBT)
  .....
  .....
- **Above conditions and PPE compliances are checked by undersigned and correct status are indicated after verification**

Prepared by
Contractor Site Engineer

Verification By
Contractor Safety Officer

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FORMAT NO. : HSE-11 REV 0

(Sheet 1 of 2)

HOUSEKEEPING ASSESSMENT& COMPLIANCE

Project :
Name of the work :
Name of contractor :
Name of contractor : Fortnightly

Sr.No. :
Date :
Job No. :

Sl. No.	Subjects of Review	Satisfactory/ Yes	Non satisfactory/No	Remarks	Action
1.	Cleanliness at the Main entry / access of site				
2.	Ground condition / floor areas free from water-logging / oil spillage				
3.	Ground & elevated floors free from rubbish / wastes / accumulated debris / scraps.				
4.	Manholes / openings are covered / fenced				
5.	Trenches are barricaded / walkways are in place				
6.	Drains are cleaned / not choked / not occupied by dumped materials				
7.	Sufficient CAUTION boards / instructions displayed				
8.	Construction machinery are maintained & parked in orderly manner.				
9.	Movement of site people are not obstructed because of dumping / storing of construction materials				
10.	Access / egress to Electrical Distribution Boards / Panels clear from wires / cables / earth-strips etc.				
11.	Electrical panel rooms / sheds / MCC / Control rooms / Substations etc. are clean & tidy and not used for storing dress / clothes, tiffin-box or bicycles.				
12.	Passage behind Elec. panels are free for access				
13.	Fire extinguishers / fire-buckets are accessible without any difficulty.				
14.	Stair-steps, platforms & landings are clear & tidy				
15.	Sheds / rooms & work areas have got sufficient illumination as well as ventilation				
16.	Cables / Wires / welding leads are routed / hanged appropriately & are not creating unsafe condition.				
17.	Stacking / storing of insulation materials or their packing.				
18.	Removal or cleanliness of left-over sand, concrete, brick-bats, insulation-materials, excess earth, wastes etc.				
19.	Storing / stacking of sand, metal chips, re-bars, steel pipes, valves, fittings etc.				
20.	One escape route at ground & minimum two escape routes at elevation available,				

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FORMAT NO. : HSE-11 REV 0

(Sheet 2 of 2)

Sl. No.	Subjects of Review	Satisfactory/ Yes	Non satisfactory/No	Remarks	Action
21.	Captions / Posters / Slogans on various safety instructions are displayed legibly in local language				
22.	Cable trenches are water-free or regular arrangement for taking out accumulated water exists.				
23.	Windows of rooms / offices are regularly cleaned				
24.	Facilities for cycle sheds, drinking water, washing, rest-rooms etc. are maintained in tidy manner.				
25.	Toilet, Urinals, Canteen / kitchen / pantry etc. are maintained & free from obnoxious smell.				
26.	Construction tools / tackles are stored systematically - the items are tagged / tested / certified by competent third party.				
27.	Sufficient numbers of Dust-bins / Waste-bins found at site and are regularly emptied.				

Additional remarks, if any -

.....

.....

.....

Inspected by
Contractor Engineer

Verification By
Contractor Safety Officer

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FORMAT NO. : HSE-12 REV 0

INSPECTION OF TEMPORARY ELECTRICAL BOOTH / INSTALLATION

Project :
Name of the work :
Name of contractor :
Sub Station No:/Booth No

Sr.No. :
Date :
Job No. :
Location:

SL NO	SUBJECTS	OBSERVATION (YES /NO)	ACTION TAKEN
1	Switchboards installed properly are in order and protected from rain & water-logging.		
2	Adequate illumination provided for switchboard operation during night hours & the lamps are protected from direct human contact.		
3	Voltage ratings, DANGER signs, Shock-Treatment-Chart displayed in the installation / booth		
4	Fire extinguisher (DCP or CO_2) & Sand Bucket kept in close vicinity of Switchboards		
5	Valid License & Competent Electrician / Wireman available & name/ license no. displayed at booth / installation.		
6	General housekeeping in & around booth / installation found in order.		
7	Cable-route-markers for U/G cables provided.		
8	Monthly inspection report of Electrical hand tools available in booth / installation.		
9	Electrical Panel door to be in closed condition and Insulated Mat to be provided in front of panel.		
10	Rubber hand gloves available/ used by Electricians		
11	Availability of CAUTION boards for shutdown & / or repairing works.		
12	All incoming & outgoing feeders have proper MCCB / HRC fuses / Switches.		
13	Switchboards "earthed" at two distinctly isolated locations.		
14	Switchboards have adequate operating space at the front face & at the rear face too.		
15	All connections provided through 30mA ELCB.		
16	Testing records of all ELCBs available at site		
17	Only industrial type plugs & sockets are used.		
18	Temporary connections are 3-core double insulated & free from cuts & joints and 3rd core is earthed at both ends		
19	Socket boards are properly mounted on stand & protected from water ingress.		
20	Electrical equipments operating above 250V have two earthing / double earthing.		
21	All incoming / outgoing cables are properly glanded& terminated with "lugs".		
22	Switch-boards are of industrial variety / type.		
23	Sketch for installation / connection (SLD) made & pasted& other safety labels/display boards		
24	Labeling of incoming / outgoing feeders made.		
25	All hand lamps are protected from direct contact.		
26	All electrical cable / joints are in safe condition		

Inspected by
Contractor Engineer

Verification By
Contractor Safety Officer

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FORMAT NO. : HSE-13 REV 0

(Sheet 1 of 2)

INSPECTION FOR SCAFFOLDING

Project : Sr.No. :
Name of the work : Date :
Name of contractor : Job No. :

Sl. No	Description	Yes	No	N.A.	Actions taken
1	Whether work permit is obtained to take up work at height above 1.5 Mts?				
2	Whether atmospheric condition is "stormy" or "raining" and works at heights have been permitted?				
3	Whether steel pipes scaffoldings are used for units /off-site areas?				
4	Whether scaffolding has been erected on rigid/firm/leveled surfaces / ground? Whether "foot-seals" or "base-plates" are used beneath the up-rights (vertical steel pipes)				
5	Whether scaffold construction is as per IS specification with toe-board and hand-rails (top-rail as well as mid-rail)?				
6	Whether distance between two successive up-rights are less than 2.5 Mts (height of scaffold & load carrying capacity governs the distance between two uprights)				
7	Whether all uprights are extended at least 900 mm above the top most working platform (to enable fitting of handrails)?				
8	Whether vertical distance of two successive ledgers is satisfactory? (*varying between 1.3 Mts. To 2.1 Mts)*				
9	Whether the peripheral areas of working at height are cordoned-off? (for avoiding accident to people arising out of dropped / deflected materials)				
10	Whether platform is provided? Is it safely approachable?				
11	Whether end of scaffold platform / board are extended beyond transoms? (125mm to 150 mm)				
12	Whether CE / IS approved quality and worthy conditioned full-body safety harness (with double lanyard & karabiners) are used while working at heights?				
13	Whether life-line of safety harness is anchored to an independent secured support capable of withstanding load of a falling person?				
14	Whether the area around the scaffold is cordoned off to prohibit the entry of unauthorized person / vehicle?				
15	Whether clamps used are of good condition, of adequate strength and free from defects?				
16	Whether ladder is placed at secured and leveled surface?				
17	Whether water-pass and oil-spills are avoided around the scaffold structure?				
18	Whether ladder is extended 1.5mts. above the landing point at height?				
19	Whether more than one access/egress provided to the scaffold?				
20	Whether ladder used are of adequate length and overlapping of short ladders avoided?				
21	Whether metallic ladders are placed much away from near-by electrical transmission line?				
22	Whether rungs of ladder are inspected and found in good order?				
23	Whether fall-arresters provided on both the access/egress routes?				
24	Whether diagonal (cross) bracings are provided at regular interval on the scaffold?				
25	Whether working platform on the scaffold has been made free from "jolt" or "gap"?				
26	Whether tools or materials are removed after completion of the day's job at heights?				
27	Whether a valid Permit for Work (PFW) is obtained before taking up work over asbestos or fragile roof?				
28	Whether sufficient precaution is taken while working on fragile roof?				

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FORMAT NO. : HSE-13 REV 0

(Sheet 2 of 2)

Sl. No	Description	Yes	No	N. A	Actions taken
29	Whether provision is made to arrange duck ladder, crawling board for working on fragile roof?				
30	Whether scaffold has been inspected by qualified civil engineers prior to their use?				
31	Whether the scaffolding has been designed for the load to be borne by the same?				
32	Whether the erection and dismantling of the scaffolding is being done by trained persons and under adequate supervision?				
33	Whether safety net with proper working arrangement and life-line has been provided?				
34	Whether TAGS (Green for acceptable and Red for incomplete/unsafe scaffolds) are used on scaffolds?				
35	Whether sufficient illumination is provided in and around the scaffold and access?				
36	Whether emergency rescue / response arrangements are made in place				

Inspected by
Contractor Engineer

Verification By
Contractor Safety Officer

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FORMAT NO. : HSE-14 REV 1

(sheet 1 of 2)

PERMIT FOR ERECTION / MODIFICATION & DISMANTLING OFSCAFFOLDING

Project :
Name of the work :
Name of contractor :
Nature of activities :

Sr.No. :
Date :
Job No. :
Duration: From.....To.....

SL. No.	SUBJECTS / ITEMS	DONE	NOT DONE	REMARKS
1	Specific task of Erection / Modification / Dismantling of scaffolds, identified & TAGGED accordingly (before as well as after carrying-out jobs).			
2	People engaged in doing the job are identified & are certified by Job Engineer of Main Contractor as experienced / trained.			Names to be noted
3	Concerned persons are alerted by the Job Engineer of Main Contractor in connection with possible hazards & what the workmen MUST do / MUST not do.			
4	Verification by Job Engineer of Main Contractor made for confirming that all persons permitted to carry-out the jobs are making use of Helmet, Safety Shoes, Goggles, Gloves & Double lanyard safety harness and other relevant PPEs.			
5	Area of work is effectively cordoned-off / barricaded / illuminated.			
6	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 for purpose".			
7	Items / members of scaffold, being lowered are removed from the area & stacked correctly.			
8	Ropes, chains, pulley blocks etc. being used for lifting or lowering scaffold items, are inspected by the Job Engineer & their certifications as well as physical conditions have been found O.K. before signing this PERMIT.			
9	Safety Net / Life-line / Fall Arresters etc. are arranged in position and Job Engineer has found working conditions favorable for activities to start.			
10	Scaffold erection or dismantling tasks are being supervised by Experienced Engineer / Competent person.			
11	Only competent & experienced people have been selected / engaged in Scaffolding erection, modification or dismantling tasks.			
12	Adequate & effective actions for traffic and movement of people around the cordoned-off area taken to avoid inadvertent incident			
13	Working platforms are protected with handrails & toe-boards.			
14	Access & Exit (for reach & escape) are safe for use by people.			
15	Tools, tackles to be used for above jobs are verified by job Engineers of Main contractor as genuinely good and tied-up at height (to prevent their fall).			
16	Site important Telephone Nos. are made known to everyone			
17	SOP (Safe Operating Procedure) for the specific task is made & followed too.			
18	Emergency vehicle has been arranged at work locations.			

- This permit for work shall be available at specific work location all the time.
- After completion of work, permit shall be returned to safety cell of main contractor, without fail.
- This Permit shall be issued maximum upto (Monday to Sunday).
- Additional Precautions, if any

  .....
- **ACCORD OF PERMISSION** (to be ticked) - **YES** ( )/ NO ( )

  Work Permit Receiver Verification By Work Permit issuer Contractor Job Supervisor
  Contractor Safety Officer Contractor Engineer/RCM

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FORMAT NO. : HSE-14 REV 1

(sheet 2of 2)

Everyday Site working conditions & performance of workmen shall be assessed / checked by Contractor Site Engr. and Safety Officer shall verify the same.

	Name / Sign.	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY	SUNDAY
Site Engr.								
Safety Off.								

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FORMAT NO. : HSE-15 REV 1

PERMIT FOR HEAVY LIFT/CRITICAL ERECTION

Project :
Name of the work :
Name of contractor :
Nature of activities :
Location of work :
Equipment/Structure to be erected:

Sr. No. :
Date :
Job No. :
Duration: From.....To.....
Name /Type of crane :
Wt. of equipment/ structure to be erected

SL. NO.	Description of Item	COMPLIANCE STATUS			Remarks
		Yes	No	Not applicable	
1)	Is the crane type suitable for lift or as per erection procedure?				
2)	Is the crane have the correct number of counterweights fitted?				
3)	Availability of Load Certification of crane from authorized agency.				
4)	Is the load chart of crane available in carne cabin/or with Crane operator?				
5)	Is the device to check the Wind speed in crane is working? Is the safety features in crane are working?				
6)	Availability of Load certification of slings and other accessories from authorized agency				
7)	Availability of Licensee/certificate for crane operator from authorized agency.				
8)	Availability of approved HIRAC for the subject activities.				
9)	Availability of approved erection/rigging procedures.				
10)	Availability of temporary gratings/ platforms for critical lifting(as applicable)				
11)	Tool Box conducted before erection?				
12)	Has the area been cordoned off?				
13)	Are the authorized persons during erection are identified?				
14)	Does each person identified for erection understand their roles and responsibilities?				
15)	Is the ground on which crane will rest or outrigger support are correct?				
16)	Is hard stand requirement (if any) complied?				
17)	Is the communication system (viz walkie-talkies, etc. are working properly?				
18)	If more than one crane is lifting the load, is an Intermediate rigger will supervise the lift?				
19)	If there is other obstruction within the operating radius of the crane, have correct precautions been taken to prevent collision?				
20)	All the persons are wearing the requisite PPE?				

Work Permit Receiver Verification By Work Permit issuer Contractor Job Supervisor
Contractor Safety Officer Contractor Engineer/RCM

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FORMAT NO. : HSE-16 REV 1

PERMIT FOR ENERGY ISOLATION & DE-ISOLATION

Project :
Name of the work :
Name of contractor :

Sr.No. :
Date :
Job No. :

ENERGY ISOLATION PERMIT

- Clearance required from:.....Hrs .....Date To .....Hrs ....Date
- Name of equipment/ energy source etc. .....
- Nature of job to be done: .....
- Area.....Location:.....

PERMIT VALIDATION	PERFORMING AUTHORITY
I hereby authorize the .....personnel(performer) to isolate the above equipment/energy source from all sources of power and handover the equipment/energy source for maintenance/repair. Issuing authority Client/Contractor RCM (as applicable) Signature: Date: Name:	The work and precautions will be carried out under my overall responsibility.(Testing/execution engineer) Signature: Date: Name:

SAFETY PRECAUTIONS FOR CLEARANCE	NORMALISING AFTER CLEARANCE
1. Notify workers of intent to de- energize ☐ 2. Obtain lock, tag or locking/tagging devices ☐ 3. Shut down, de-energize, dissipate any residual energies. ☐ 4. Apply lock ,tag and locking and/or tagging devices ☐ 5. *Any other job specific precautions ☐ 6. Verify effectiveness of lockout by attempting to restart. ☐ 7. Proper PPE is ensured ☐ I certify that the energy source mentioned above is isolated from all sources and is safe to start the work. Tag No:..... Lock No:..... Issuing authority Client/Contractor RCM (as applicable) Signature: Date: Name: **(*to be included by contractor in consultation with issuing authority)**	1. Notify workers of intent to re- energize ☐ 2. Conduct visual inspection to confirm that the danger zone is clear of workers ☐ 3. Conduct visual inspection to confirm that tools ,equipment's danger zone is clear of workers ☐ 4. Reposition the safety devices(interlocks, valves, guards, covers ,sensors, as applicable, etc.) ☐ 5. *Any other job specific normalizing details ☐ 6. Remove lock, tag and locking and/or tagging devices. ☐ 7. Re-energize. ☐ 8. Confirm system is operating properly& safely I certify that the energy source mentioned above is isolated from all sources and is safe to start the work. Tag No:..... Lock No:..... Issuing authority Client/Contractor RCM (as applicable) Signature: Date: Name: **(*to be included by contractor in consultation with issuing authority)**

ENERGY DE-ISOLATION PERMIT

PERMIT VALIDATION	PERFORMING AUTHORITY
I hereby authorize the .....personnel(performer) to de- isolate the above equipment/energy source from all sources of power and handover the equipment/energy source for normal operation.. Issuing authority Client/Contractor RCM (as applicable) Signature: Date: Name:	I hereby certify that the equipment/energy source mentioned above has been de-isolated and is ready for normal operation.(Testing/execution engineer) Signature: Date: Name: Countersigned by Issuing authority

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FORMAT NO. : HSE-17 REV 1

PERMIT FOR EXCAVATION (depth 2m and above)

(Sheet 1of 2)

Project :
Name of the work :
Name of contractor :
Job Description :
Size of excavation :

Sr.No. :
Date :
Job No. :
Location:

SL. NO.	Description of Item	COMPLIANCE STATUS			Remarks
		Yes	No	Not applicable	
1)	Suitable and sufficient risk assessments and method statements has been carried to ensure that the work shall be undertaken in accordance with specification and standard.				
2)	Are plans/details of underground services available and the same has been reviewed?				
3)	Has survey done to locate the services/obstacles etc.				
4)	Has the live services (electrical, water line, air line, telephone line, etc)has been disabled for carrying out the job.				
5)	Is adequate barriers/fences to protect the excavation are in place?				
6)	Is Adequate warning signs are in place?				
7)	Is Assessment of ground conditions done and remedial action(if any) taken?				
8)	Safe access / egress (e.g. ramp / steps / ladders etc.) provided for site workmen & supervisors.				
9)	Is the excavation work being undertaken in proximity of structure, etc. ?If Yes, it's effect is considered?				
10)	Availability of competent person for supervising the excavation work?				
11)	Adequate safe arrangement to prevent collapse of edges (e.g. shoring / strutting / benching / sloping etc.) made at site.				
12)	Hard barricades (at least 1.0M away from edge & for excavation near site access roads) with warning signs/caution boards are provided				
13)	Accumulation / passage-ways of water at periphery of excavation / trench stopped/ restricted.				
14)	Is the equipment being used for excavation has been checked for adequacy and is in good working condition having all the safety features?				
15)	Age & fitness of workmen ensured by medical test before engagement in job ?				
16)	Arrangement of Monitoring of possible oxygen deficiency or obnoxious gases done & action taken?				

PERMIT GRANTED - Yes / No

(List enclosed with name & gate pass numbers.)

Name & Signature of Site Engr. Name & Signature of Area – In charge/RCM of Contractor (Receiver) Contractor (Issuer)

Verification by Contractor Safety Officer

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FORMAT NO. : HSE-17 REV 1

PERMIT FOR EXCAVATION

(Sheet 2of 2)

NOTES: -

1. Slopes or benches for excavation beyond 2.0M depth shall be designed & approved by Contractor's site head.
2. Excavated earth to be kept at least 1.5M away from edges
3. Safety helmets, Safety shoes or gum-boots, gloves, goggles, Face shield, Safety Harness shall be essential PPEs.
4. Permit shall be made in **duplicate** and original shall be available at site of work.
5. Permit shall be issued for maximum **one week** only (Monday to Sunday)
6. After completion of works, permit shall be closed & preserved for record purpose

GRANT OF PERMIT AND EXTENSIONS

Sl. No.	Validity period From ____To ____	Working Time From _____To _____	Receiver (site Engr. of Main Contractor)	Issuer(Area In charge/RCM of Main Contractor)	Review by EIL / Owner (Remarks with date
1.					
2.					
3.					
4.					
5.					
6.					
7.					

Additional safety instructions if any: -

1.

2.

3.

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FORMAT NO. : HSE-18 REV 0 **(Sheet 1of 2)**

IDENTIFICATION OF ENVIRONMENTAL ASPECTS, IMPACT ASSESSMENT AND CONTROL MEASURES

S.No	Activity	Environmental Aspect	N/A/E	Environment Impact	Control Measures	Consequences						Risk Level	Significant	Gaps/ Recommendations
						A	B	C	D	E	F	G	Yes/No	

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(Sheet 2 of 2)

INITIAL ENVIRONMENT REVIEW TECHNIQUE

Environmental Impacts	AP = Air Pollution	WP = Water Pollution	LC = Land Contamination	DNR = Depletion of Natural Resources	NP = Noise Pollution

Scale	Quantity (A)	Occurrence (B)	Severity of Impact (C)	Detection (D)	Control (E)	Legal and other requirements (F)
1	Negligible	Very Rare	Negligible visual impact	Immediately	Available & effective at place	In compliance or not applicable
2	Low	Once a month or less	Causes Discomfort or Nuisance	Within 1 hour	Has in-built Secondary control	
3	Moderate	Once a day	Resource Depletion	Within 8 hours	Needs human Intervention	
4	High	Several times a Day	Affects Aquatic Life, flora, fauna or global issue	Within 24 hours	Mechanism in place but not reliable	
5	Excessive	Continuous	Human health effect	More than 24 hours	Absent or no effective control	Not in compliance

Risk Level - G : A x B x C x D x Ex F

Aspects with score of **100 and above** are considered as significant.
Also, Irrespective of the score, all legal noncompliance's to be considered as significant

Condition	
N	NORMAL
A	ABNORMAL
E	EMERGENCY

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FORMAT NO. : HSE-19 REV 0 HIRAC

Risk Identification						Desired Controls & Existing Gaps, If Any		Risk Assessment				Recommended Control Actions To Reduce The Risk Level	Action By	Remarks
SN	Activity	Activity Type (R/NR)	Hazards	Condition(N/AN/E)	Associated Risk	Desired Control Measures	Gaps If Any	Probability(P)	Impact (I)	Risk R= P*I	Risk Classification			

Likelihood – Possibility of occurrence of risks based on present gaps (technological / operational / competence / measurement and monitoring);

UL: Unlikely, **L:** Likely, **VL:** Very Likely, **FR:** Frequent, **C**: Continuous

Impact –

SI: Slight Injury, **MI:** Minor Injury, **MJ:** Major Injury, **SF:** Single Fatality, **MF:** Multiple Fatalities

Level of consequence – Refer Guidance criteria for this i.e. possible degree of damage;

Condition- N: Normal, **AN**: Abnormal, **E**-Emergency

Activity Type: R- Routine, NR- Non Routine

RISK –

L: Low Risk, **M:** Moderate Risk, **H:** High Risk

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FORMAT NO.: **HSE-20 REV 0**

Inspection of Tower Crane

Name of Contractor: **Project:**

Name of Work: **Job No:**

Vehicle Identification/Registration No: **Date:**

Sr. No.	Description	Observation	Remarks & Suggestions
1	Serial number plate &SWL marking		
2	Valid TPI Certificate		
3	Valid Insurance		
4	Safe access and egress are provided to the crane operator.		
5	Front glass of Operator cabin		
6	Operator crane cabin is provided with a locking mechanism so as to prevent unauthorised entry.		
7	A safety bar is fitted across the operator's cabin window where there is likelihood of the operator falling through it.		
8	Manufacturer Operating Manual and Maintenance Manual are made available.		
9	An updated Operation and Maintenance log book is available in the operator cabin.		
10	All mounting bolts are in good condition.		
11	Load chart provided		
12	SLI available		
13	Crane hooks have got smooth surface and no dent		
14	Hook-latch / Dog-clamp in hook is effective		
15	Over hoist limit switch		
16	Double body earthing of Tower Crane		
17	Jib angle indicator is provided (For Luffing Jib Tower Crane).		
18	Emergency stop button, which will terminate the operation of the crane engine, is installed in the operator cabin and correctly identified.		
19	Effective braking mechanisms for Hoisting, Derricking, Slewing, Trolley Travelling maintained:		
20	Trolley Travelling limiter to prevent over-travelling of trolley is functional.		
21	Limit switches to prevent over-derricking and over-lowering of jib (For Luffing Jib Tower Crane) is functional.		
22	Slewing limiter to restrict slewing of crane is functional.		
23	Over load Limiter to prevent overloading of crane is functional.		
24	Load Moment Limiter to prevent over-turning moment is functional.		
25	Anti-collision devices are tested to stop the tower crane's operation such that the crane-to-crane interference must be maintained at not less than 3 m.		
26	Condition of boom		
27	Counter weight placement and pins		
28	Winches, pulleys and wire ropes are in good working condition.		
29	Colour coding		
30	Leakage in hydraulic cylinder		

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31	Fire Extinguisher		
32	Tower crane is adequately grounded or protected against lightning.		
33	Wind anemometer is installed and is in good working condition.		
34	Aviation lamp is functional (Reqd. for 30mt and above)		
35	Pre Medical Check-up& Periodic Medical check-up (every 6 months) including vision test for Operator		
36	Safety Induction for Operator		
37	Others		

Signature & Name of Operator:

Signature and name of Job Engineer

Signature & Name of Contractor's Safety Officer

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FORMAT NO. : HSE-21 REV 0

Crane Inspection Checklist

Name of Contractor: **Project:**

Name of Work: **Job No:**

Vehicle Identification/Registration No: **Date:**

Sr. No.	Description	Observation	Remarks & Suggestions
1	Crane hooks have got smooth surface and no dent		
2	Hook-latch / Dog-clamp in hook is effective		
3	Over hoist limit switch		
4	Over Load Indicator		
5	Over Boom limit switch		
6	Boom angle indicator		
7	Colour coding		
8	Condition of boom		
9	Condition of wire rope		
10	Rope drum / sheaves are in good working condition		
11	Swing break & lock		
12	Swing Alarm		
13	Over hoist break & lock		
14	Boom break & lock (For Telescopic Boom)		
15	Leakage in hydraulic cylinder		
16	Condition of Outrigger (For Tyre Mounted Crane)		
17	Outrigger fully extended Marking (For Tyre Mounted Crane)		
18	Condition of Tyre (For Tyre Mounted Crane)		
19	Wheel chokes are present and are used whenever required (For Tyre mounted)		
20	Battery & lamps		
21	Moving & rotating parts guarded		
22	Load chart provided		
23	Reverse horn (For Tyre Mounted Crane)		
24	Body Condition of crane		
25	Front glass of Operator cabin		
26	Both side Mirror		
27	Number Plate (For Tyre Mounted Crane)		
28	Fire Extinguisher		
29	Horn		
30	Windshield and wipers		
31	Working of light & Indicator		
32	SLI		
33	Spark Arrestor(For Running Refinery/ Petrochemical/Chemical Plant)		

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34	Foot-steps and hand-holds are in good working condition for exit /enter in to cabin		
35	TPI Certificate		
36	RC Document (For Tyre Mounted Crane)		
37	Fitness Certificate of Vehicle by authority		
38	Insurance		
39	PUC		
40	HMV License for Operator		
41	Pre Medical Check-up& Periodic Medical check-up (every 6 months) including vision test for Operator		
42	Safety Induction for Operator		
43	Others		

Signature & Name of Operator:

Signature & Name of Contractor's Concern Engineer

Signature & Name of Contractor's Safety Officer

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FORMAT NO. : HSE-22 REV 0

Hydraulic Mobile Crane- Inspection Checklist

Name of Contractor: **Project:**

Name of Work: **Job No:**

Vehicle Identification/Registration No: **Date:**

Sr. No.	Description	Observation	Remarks & Suggestions
1	Identification number of Hydraulic Mobile crane boldly scribed in front and rear end of machine		
2	Operator has got adequate document in support of his competency (i.e. HMV driving license, knowledge & training)		
3	Marking of SWL on hook position is clearly visible		
4	Test & examination of Hydraulic Mobile crane by statutory / competent authority is carried out & document is valid		
5	Colour Coding		
6	RC Document		
7	Fitness Certificate of Vehicle by authority		
8	Valid Insurance		
9	Valid PUC		
10	Pre Medical Check-up& Periodic Medical check-up (every 6 months) including vision test for Operator		
11	Safety Induction for Operator		
12	Crane hooks have got smooth surface and no dent		
13	Hook-latch / Dog-clamp in hook is effective		
14	Over hoist limit switch		
15	Over Load Indicator		
16	SLI		
17	Condition of boom		
18	Condition of wire rope		
19	Rope drum / sheaves are in good working condition		
20	Leakage in hydraulic cylinder		
21	Tyre condition		

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22	Battery		
23	Moving & rotating parts guarded		
24	Break		
25	Parking Break		
26	Front horn		
27	Reverse horn		
28	Hydraulic Mobile Crane cabin body and frame of machine is in good order		
29	Both side Mirror		
30	Fire Extinguisher		
31	Front glass pane of the Hydraulic Mobile operator's cabin is clean & clear (i.e. not cracked / damaged / broken)		
32	Windshield and wipers condition		
33	Working of front & back lights, turn Indicators, parking lights & fog lamps		
34	Spark Arrestor(For Running Refinery/ Petrochemical/Chemical Plant)		
35	Wheel chokes are present and are used whenever required		
36	Foot-steps and hand-holds are in good working condition for exit /enter in to cabin		
37	Others		

Signature & Name of Operator

Signature & Name of Contractor's Concern Engineer

Signature & Name of Contractor's Safety Officer

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Hydraulic Rig Inspection Checklist

Name of Contractor: **Project:**

Name of Work: **Job No:**

Vehicle Identification/Registration No: **Date:**

Sr. No.	Description	Observation	Remarks & Suggestions
1	Control panel is clean & all buttons/switches are clearly visible (no paint over spray, etc.)		
2	All switch & mechanical guards are in good condition and properly installed		
3	All Safety Indicator lights work		
4	Drive controls function properly & accurately labelled (up, down, right, left, forward, back)		
5	Motion alarms are functional		
6	Safety decals are in place and readable		
7	Any defects such as cracked welds, fuel leaks, hydraulic leaks, damaged control cables or wire harness, etc.		
8	Braking devices are operating properly		
9	Winches, pulleys and wire ropes are in good working condition.		
10	Function of interlocks and limit switch		
11	The manufacturer's operations manual (in all languages of the operators)		
12	Oil level, Hydraulic Oil Level, Fuel Level, Coolant Level		
13	Battery Charge		
14	Outriggers in place or functioning. Associated alarms working		
15	Moving & rotating parts guarded		

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16	Load chart provided		
17	Fire Extinguisher		
18	Spark Arrestor, if operated by using fuel(For Running Refinery/ Petrochemical/Chemical Plant)		
19	Serial number plate		
20	SLI		
21	TPI Certificate		
22	Colour Coding		
23	Insurance		
24	Pre Medical Check-up& Periodic Medical check-up (every 6 months) including vision test for Operator		
25	Safety Induction for Operator		
26	Others		

Signature & Name of Operator:

Signature & Name of Contractor's Concern Engineer

Signature & Name of Contractor's Safety Officer

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Boom Lift Inspection Checklist

Name of Contractor: **Project:**

Name of Work: **Job No:**

Vehicle Identification/Registration No: **Date:**

Sr. No.	Description	Observation	Remarks & Suggestions
1	Operating and emergency controls are in proper working condition, EMO button or Emergency Stop Device		
2	Functional upper drive control interlock (i.e. foot pedal, spring lock, or two hand controls)		
3	Emergency Lowering function operates properly		
4	Lower operating controls successfully override the upper controls		
5	Both upper and lower controls are adequately protected from inadvertent operation.		
6	Control panel is clean & all buttons/switches are clearly visible (no paint over spray, etc.)		
7	All switch & mechanical guards are in good condition and properly installed		
8	All Safety Indicator lights work		
9	Drive controls function properly & accurately labelled (up, down, right, left, forward, back)		
10	Motion alarms are functional		
11	Safety decals are in place and readable		
12	Guardrails and anchor points are in place, and in good condition		
13	Work platform & extension slides are clean, dry, & clear of debris		
14	Work platform extension slides in and out freely with safety locking pins in place to lock setting on models with extension platforms.		
15	Any defects such as cracked welds, fuel leaks, hydraulic leaks, damaged control cables or wire harness, etc.		
16	Braking devices are operating properly		
17	The manufacturer's operations manual is stored on AWP (in all languages of the operators)		
18	Oil level, Hydraulic Oil Level, Fuel Level, Coolant Level		

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19	Battery Charge		
20	Outriggers in place or functioning. Associated alarms working		
21	Tyres and wheels are in good condition, with adequate air pressure if pneumatic		
22	Wheel chokes are present and are used whenever required		
23	Moving & rotating parts guarded		
24	Load chart provided		
25	Fire Extinguisher		
26	Spark Arrestor, if operated by using fuel(For Running Refinery/ Petrochemical/Chemical Plant)		
27	Serial number plate with Load capacity		
28	TPI Certificate		
29	Colour Coding		
30	Insurance		
31	Pre Medical Check-up& Periodic Medical check-up (every 6 months) including vision test for Operator		
32	Safety Induction for Operator		
33	Others		

Signature & Name of Operator:

Signature & Name of Contractor's Concern Engineer

Signature & Name of Contractor's Safety Officer

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CONTRACTOR SAFETY

OISD – GUIDELINES – 207

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Oil Industry Safety Directorate
Government of India
Ministry of Petroleum & Natural Gas
8th Floor, OIDB Bhavan, Plot No. 2, Sector – 73, Noida – 201301 (U.P.)

Website: www.oisd.gov.in

Tele: 0120-2593800, Fax: 0120-2593802

Engineers India Ltd

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Second Edition, April, 2016
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CONTRACTOR SAFETY

Prepared by

FUNCTIONAL COMMITTEE ON CONTRACTOR SAFETY

Engineers India Ltd

OIL INDUSTRY SAFETY DIRECTORATE
8th Floor, OIDB Bhavan, Plot No. 2, Sector – 73, Noida – 201301 (U.P.)
Website: www.oisd.gov.in
Tele: 0120-2593800, Fax: 0120-2593802

Preamble

Indian petroleum industry is the energy lifeline of the nation and its continuous performance is essential for sovereignty and prosperity of the country. As the industry essentially deals with inherently inflammable substances throughout its value chain – upstream, midstream and downstream – Safety is of paramount importance to this industry as only safe performance at all times can ensure optimum ROI of these national assets and resources including sustainability.

While statutory organizations were in place all along to oversee safety aspects of Indian petroleum industry, Oil Industry Safety Directorate (OISD) was set up in 1986 Ministry of Petroleum and Natural Gas, Government of India as a knowledge centre for formulation of constantly updated world-scale standards for design, layout and operation of various equipment, facility and activities involved in this industry. Moreover, OISD was also given responsibility of monitoring implementation status of these standards through safety audits.

In more than 25 years of its existence, OISD has developed a rigorous, multi-layer, iterative and participative process of development of standards – starting with research by in-house experts and iterating through seeking & validating inputs from all stake-holders – operators, designers, national level knowledge authorities and public at large – with a feedback loop of constant updation based on ground level experience obtained through audits, incident analysis and environment scanning.

The participative process followed in standard formulation has resulted in excellent level of compliance by the industry culminating in a safer environment in the industry. OISD – except in the Upstream Petroleum Sector – is still a regulatory (and not a statutory) body but that has not affected implementation of the OISD standards. It also goes to prove the old adage that self-regulation is the best regulation. The quality and relevance of OISD standards had been further endorsed by their adoption in various statutory rules of the land.

Petroleum industry in India is significantly globalized at present in terms of technology content requiring its operation to keep pace with the relevant world scale standards & practices. This matches the OISD philosophy of continuous improvement keeping pace with the global developments in its target environment. To this end, OISD keeps track of changes through participation as member in large number of International and national level Knowledge Organizations – both in the field of standard development and implementation & monitoring in addition to updation of internal knowledge base through continuous research and application surveillance, thereby ensuring that this OISD Standard, along with all other extant ones, remains relevant, updated and effective on a real time basis in the applicable areas.

Together we strive to achieve NIL incidents in the entire Hydrocarbon Value Chain. This, besides other issues, calls for total engagement from all levels of the stake holder organizations, which we, at OISD, fervently look forward to.

Jai Hind!!!

Executive Director
Oil Industry Safety Directorate

Engineers India Ltd

FOREWORD

At the time of development of this document, 113 OISD standards, recommended practices and guidelines are applicable to the Oil and Gas installations of Public sector Oil Companies in India. 11 of these standards have been adopted by Petroleum and Explosives Safety Organisation (PESO) in various rules administered by them and thus the provisions of these standards are mandatory for entire Oil & Gas sector to that extent.

A few serious accidents have occurred in the recent past in India and abroad including vapour cloud explosion and fire at Oil terminal near Jaipur emphasised the need for the industry to review the existing provisions of various guidelines and statutory requirements.

With the above in view the Government of India directed the Oil Industry Safety directorate to develop a comprehensive document covering all the facets of Safety in Design, Operation and Maintenance, of depots and terminals being run by marketing divisions of Oil companies with an objective to strengthen the existing system.

The present guideline on "Contractor Safety" has been prepared by the functional committee based on, existing standards, guidelines & recommended practices of OISD, the recommendations arising out of recent major accidents and their analysis, the accumulated knowledge and experience of industry members in India and updation of National and International codes and practices.

The provisions of this document, if implemented objectively, may go a long way in enhancing overall safety standard and reduce accidents in Oil Installations.

Users are cautioned that no standard can be substitute to the "judgement and experience of Engineers"

This document will be reviewed periodically for improvements based on the new experiences and better understanding. Suggestions are also invited from the users after it is put into practice to improve the document further. Suggestions may be addressed to:

The Coordinator
Committee on "Contractor Safety"
Oil Industry Safety Directorate
8th Floor, OIDB Bhavan, Plot No. 2, Sector – 73, Noida – 201301 (U.P.)

Website: www.oisd.gov.in

Tele: 0120-2593800, Fax: 0120-2593802

This guideline in no way supercedes the statutory regulations of Chief Controller of Explosives (CCE), Factory Inspectorate or any other statutory body, which shall be followed as applicable.

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NOTE

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Though every effort has been made to assure the accuracy and reliability of the data contained in these documents, OISD hereby expressedly disclaims any liability or responsibility for loss or damage resulting from their use.

These documents are intended to supplement rather than replace the prevailing statutory requirements.

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SECOND FUNCTIONAL COMMITTEE ON CONTRACTOR SAFETY

LIST OF MEMBERS

Name	Organization	Status
S/Shri		
Ashok Dashputre	Vice President, RIL	Leader
Dharmvir	Addl. Director, OISD	Member Coordinator
A K Gupta	DGM (HSE), IOCL	Member
P K Agarwal	CM (HSE), IOCL	Member
S Mukharjee	DGM (C), EIL	Member
Udoay Payyadi	Sr. Manager-Maintenance, HPCL	Member
Vijay Mohan	Addl. Director, CHT	Member
Manish Pandey	Sr. Manager (Mech), BORL	Member
B K Rabha	Dy. CE(Instrumentation), OIL	Member
Bimal Raj V L	Manager (F&S), BPCL – KR	Member
Yogesh J Nakhre	Manager-F&S, HPCL.	Member
Upinder Kumar	Petronet LNG	Member
A K Arora	Addl. Director, OISD	Member

In addition to the above, several other experts from Industry contributed in the preparation, review and finalisation of this Guideline.

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FIRST FUNCTIONAL COMMITTEE ON CONTRACTOR SAFETY

LIST OF MEMBERS

Name	Organization	Status
S/Shri		
R N Biswas	Indian Oil Corporation Ltd.	Leader
S K Bag	Indian Oil Corporation Ltd.	Member
K Prakash	Bharat Petroleum Corporation Ltd.	Member
A Tilwankar	Bharat Petroleum Corporation Ltd.	Member
A D Ghorpade	Hindustan Petroleum Corporation Ltd.	Member
Thomas Chacko	Kochi Refineries Ltd.	Member
R Chakravarty	Numaligarh Refineries Ltd.	Member
N R Adsul	Bharat Petroleum Corporation Ltd.	Member
M P Jain	Engineers India Ltd.	Member
C M Sharma	Oil Industry Safety Directorate	Member
A K Ranjan	Oil Industry Safety Directorate	Member Coordinator

In addition to the above, several other experts from Industry contributed in the preparation, review and finalisation of this Guideline.

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CONTRACTOR SAFETY

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CONTRACTOR SAFETY

1.0 INTRODUCTION

Oil and Gas operations like Drilling, Production, Refining, Storage, Transportation and Distribution, etc. are inherently hazardous. A large number of contractor workforce is deployed to carry out construction, maintenance and other jobs. The analysis of the incidents in the Petroleum Sector indicates that a large number of incidents involved contractor workforce and have resulted in either casualty or injury besides leading to property damage and operational interruptions and environmental degradation.

In order to improve the safety levels of hydrocarbon installations, the contractor safety is of utmost importance and there is a need to institute a good contractor safety system.

2.0 SCOPE

This document covers broadly the guidelines on the HSE management system for enhancing the safety levels of the contractor workforce deployed in construction, maintenance and operation activities in the hydrocarbon industry.

The safety precautions to be taken while carrying out different activities during construction / maintenance have separately been covered in OISD-GDN-192 on "Safety Practices during Construction".

3.0 DEFINITIONS

Work station / Work site

A place / unit where the job is carried out by contractor/executing agency in specified manner with safety, during construction phase or in operation phase.

Owner
Any physical or legal person/entity for whom prescribed job is carried out.

It shall also include owner's designated representative / consultant /nominee / agent, authorised from time to time to act for and on its behalf, for supervising / co-ordinating the activities of the contractor/execution agency.

Contractor / Executing Agency

A physical or legal person/entity having contractual obligation with the owner, and who deploys one or more worker on the site.

Contractor Worker

It covers all workmen who are either self-employed or employed through contractor, the casual workers and includes contractor's supervisor, working at a location / site employed directly by Owner or through their contractor.

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Incident

An incident is an unplanned, uncontrolled, unintended or unforeseen event, caused by unsafe acts and / or unsafe conditions, resulting in or having the potential to result in personal injury and/or property damage.

Consultant

Consultant is a physical or legal person/entity engaged by owner to provide the consultancy services to owner for management of the contract on their behalf or as specified.

Designer

Designer is a physical or legal person / entity engaged by owner to provide design services of a work site.

Owner's Representative / Engineer In Charge

The Owner's representative/Engineer-in-charge is the one, who has been designated by the owner to manage the contract.

Owner's Safety Officer

A properly trained person designated by owner who ensures safety at work site.

4.0 DUTIES/ RESPONSIBILITIES

4.1 OWNER

4.1.1 Owner's Management

The commitment to safety has to be emphasized by the owner by practice by its own management and employees at all levels. The duties and responsibilities of owner should include:

i) To institute a mechanism for identification and compliance of all applicable statutory rules & regulations (Refer Annexure I for a list of few important Bureau of Indian Standards & statutory regulations).

ii) To provide specific information to contractors and make workers aware on the hazards associated with job assigned.

iii) To provide information about Risk Mitigation measures available at the place of work.

iv) To provide the contractor with information on Owners Safety Plan & Regulations, Emergency Management Plan, lockout / tag out procedure, confined space entry, work permit system, excavation / trench permit system etc.

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v) To specify rules (e.g. for security including access arrangements) and safety rules such as fire protection, first aid arrangements, Work Permit systems etc.

vi) To provide comprehensive list of statutory regulations / standards and specification, to be complied with during execution of contract, in the tender document itself.

vii) To ensure training of the contractor workforce, medical examination, and proper usage of safety equipment.

viii) To specify the requirements of Health, Safety and Environment (HSE) (commensurate with the nature of job) in Pre- Qualification criteria.

ix) To designate Engineer-in-charge and safety officer.

x) To arrange for a multi-disciplinary safety audit team to conduct surprise / regular safety audits and monitor the implementation of the recommendations.

xi) To introduce suitable schemes for motivation of the contractor worker to adhere to safety guidelines.

xii) To review safety practices & their implementation through periodic surprise visit of the work sites and monthly review meeting.

xiii) To develop the HSE plans and incorporate the same in the tender document.

xiv) To liaise with external agencies like press, public etc and with law enforcement, regulatory, statutory agencies etc.

xv) To report to statutory agencies on safety compliance and accidents, if any.

4.1.2 Owner's Representative/Engineer-in-charge

The duties & responsibilities of engineer-in-charge should include:

i) To ensure that all Contract requirements including Health, Safety, Environment & Security are complied with.

ii) To ensure that contractor workforce deployed is adequately qualified, trained and in state of health to commensurate with the requirements of the job.

iii) To ensure that the Tools / Tackles and Machinery being used are properly tested and are in sound working conditions and necessary resources proposed for providing safe place of work and necessary PPE are being used.

iv) To take the required necessary corrective action immediately upon noticing or receipt of a report on noncompliance or any such condition which poses a threat to health, safety or environment. If during the course of execution of the contract, any situation of non-compliance with the contractor's safety and health plan are noticed / reported, the same will be taken up with the contractor for correction. In the event of repeated non compliance, suitable action to be initiated as per the contract.

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v) To ensure that the incidents are reported to all concerned within stipulated time frame.

vi) To ensure submission of a plan for safe working (Method Statement) from contractor and approval of the same by competent person / department.

vii) To ensure that Work Permit System in line with OISD-STD-105 is adhered to.

viii) To ensure availability of all the documentation needed for the execution of contract.

ix) To ensure that the quality controls have been maintained during fabrication/erection and all jobs required for safe commissioning have been carried out.

x) To ensure safe dismantling of all temporary facilities/connections put up by the contractor, after completion of work.

xi) To compile a report on the safety performance (at the conclusion of each contract or periodically such as annually for renewable and long-term contracts), which is to be considered in future when selecting contractors.

xii) To ensure that the Consultant, contractor and sub-contractor employ / designate qualified & trained Safety Engineer / Officer commensurate with requirement of the job.

xiii) To comply with all applicable safety and health standards, rules, regulations and orders issued by competent authority pertaining to the assigned activities.

4.1.3 Owner's Safety Officer

The duties & responsibilities of the Owner's Safety Officer should include:

i) To assess the hazards associated with jobs in consultation with all concerned and establish safe working procedure including identification of the escape routes.

ii) To establish a written record of factors which can cause injuries and illnesses and maintain statistical information for use in analysing all types of incidents and events involving contract personnel.

iii) To undertake routine/surprise inspections of all work sites and identify unsafe conditions & practices, if any. Check for compliance of the safety practices being followed with approved HSE Plan.

iv) To investigate promptly the incidents (including near-miss) in order to advise corrective and/or preventive action and assist management for its compliance.

v) To ensure periodic internal audits, review meetings, monitor and analyse HSE performance, nonconformities and suggest its corrective & preventive action.

vi) To encourage contractor and contract workers for reporting requirements ~~for~~ of occupational injuries and illnesses.

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vii) To advise whether the proposed working arrangements are safe and satisfactory, particularly at the interface between the contractor's planned work and owner's existing facilities.

viii) To communicate to the Contractor the imposed restrictions which may affect the work/personnel such as the temporary closure of a corridor or electrical isolation of equipment.

ix) To review and monitor the contractor's adherence to approved HSE plan and compliance thereof.

x) To design and conduct either independently or in collaboration with the training department, suitable HSE training programme for the prevention of personal injuries to Consultant, Contractor's Managers, Supervisors and workmen at all levels

xi) To identify areas of operations where specialized training is required to deal with potential dangers.

xii) To document and to bring to the attention of the Owner's Supervisor and Contractor any non-compliance/violation of the safety norms against approved safety and health plan or safety and health requirements and also raise these issues in the Safety Committee Meetings.

xiii) To take part in Tool Box Meetings at random and to ensure maintenance of records.

I. Establish, implement, maintain and review HSE objectives and programs including responsibility, authority, means & time frame at all relevant functions and levels.
II. Apprise the management about HSE status & help formulate appropriate policies for continual improvement.
III. Standardize PPE & Safety Devices, identify and develop approved vendors wherever required.

To organise campaigns, competitions, contests and other activities in association with the concerned departments, which will develop and maintain the interest of the contractor and contractor workers in establishing and maintaining safe conditions of work and procedures;

4.2 CONTRACTOR

4.2.1 Contractor's Management

Duties & responsibilities of the contractor should include the following:

i) To implement safe methods and practices, deploy appropriate machinery, tools & tackles, experienced supervisory personnel and skilled work force etc. required for execution.

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ii) To prepare a comprehensive and documented plan for implementation, monitoring and reporting of Health, Safety and Environment (HSE) and implement the same after its approval.

iii) To nominate qualified & trained Safety Engineers / Officers reporting to the Site in charge, for supervision, co-ordination and, liaison for the implementation of the safety plan.

Similar HSE Plan should be implemented at the sub- contractor's or supplier's site /office. However the compliance with the HSE Plan is to be the sole responsibility of the Contractor.

iv) To arrange facilities at suitable location in liaison with the owner for drinking water, toilets, lighting, canteen, lunch shelter, crèche etc. as applicable as per Laws/ Legislation at site and also arrange for workmen compensation insurance, third party liability insurance, registration under ESI / PF act etc as applicable.

v) To arrange for fire protection equipment as per the advice of owner.

vi) To ensure that its employees have completed appropriate health and safety training as required by the statute / regulation and also as per requirements of the Owner / Consultant. The documentation of such training imparted to all its employees should be maintained and produced for verification as required.

vii) To comply with all the security arrangements of owner.

viii) To ensure that the plant and equipment used on-site by contractor / employees is correctly registered, controlled and maintained in sound working condition.

ix) To ensure availability of First Aid boxes and First Aid trained attendant and other facilities as per requirement of factory Act / Building & Construction Workers Regulation (BOCWR).

x) To ensure that all incidents including near misses are reported immediately. Investigated with corrective and preventive action and learning are shared with all workers and all concerned at the earliest.

xi) To have HSE policy

xii) Maintain HSE performance data on yearly basis and submit to owner for evaluation

In construction projects where sub-contractors are engaged, the contractor should set out the responsibilities, duties and safety measures that are expected of the sub-contractor's workforce. These measures should include the provision and use of specific safety equipment, methods of carrying out specific tasks on safety and the inspection and appropriate use of tools.

The responsibilities indicated separately under contractor's Supervisor, Safety Officer and contract worker are contractually that of the Contractor and legally binding on the

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Contractor only. However the specific detailing as above has been given separately for guidance and operational convenience.

The selection of sub contractors, if employed, should be approved by the owner. Sub-contractor should comply fully with all safety rules and conditions applicable to the main contractor.

4.2.2 Contractor's Supervisor / Safety Officer

Duties & responsibilities of the Contractor's supervisor/Safety Officer should include the following:

i) To ensure strict compliance with work permit system by carrying out work only with appropriate work permits and after ensuring that all safety precautions / conditions in the permit are complied with and closing the same after job completion.

ii) To ensure that required guards and standard personal protective equipment are provided, used, and properly maintained including contingency requirement.

iii) To ensure inspection, tested, certification and maintenance of all tools and ensure removal of defective tools.

iv) To plan the workload and assign workers to jobs in commensuration with their qualification, experience and state of health.

v) To ensure that all the preventive measures for identified hazards (e.g. Job Safety Analysis, Job Hazard Analysis, HIRA, etc.) are in place and communicated to workers

vi) To take immediate corrective action against the violation of safety rules observed or reported.

vii) To ensure that the workers likely to be exposed to hazardous chemicals/materials have access to appropriate Material Safety Data Sheets (MSDS), and provide necessary mitigation measures.

viii) To ensure that appropriate warning signboards or tags are displayed.

ix) To ensure that all workers have proper training for their job assignments, including use of appropriate PPE, first aid and fire fighting equipment.

x) To ensure that only medically fit person shall be engaged in work and also ensure that sick / or injured workers during course of work should receive timely and appropriate first aid and/or medical attention.

xiii) To report each incident and/or injury in accordance with established procedures and assist in investigation.

I. Maintain Daily HSE observation log book at site
II. Conduct Tool Box talks along with Site Engineers/ supervisors.

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Maintain the published HSE literature, HSE regulations, codes and other communications. Advise management of compliance and conditions requiring attention.

A fulltime / dedicated Safety Officer should be assigned, where more than 100 workers are employed at site. For smaller jobs, the supervisor should assume the role of the safety officer also.

4.2.3 Contract workers

The duties & responsibilities of the contractor worker should include the following:

i) To perform work safely as per the job requirement and instructions.

ii) To inform all concerned regarding unsafe conditions / and unsafe acts.

iii) To wear PPE as stipulated and necessary for the job.

iv) To inform promptly to their supervisor regarding all work related incidents resulting in personal injury, illness and/or property damage.

v) To take all necessary and appropriate safety precautions to protect themselves, other personnel and the environment.

4.3 CONSULTANT

The activities and responsibilities covered under the scope of the Owner may be delegated to the consultant in those cases as applicable, based on the respective contract conditions. The primary responsibility of Consultant is to ensure compliance with agreed HSE plan for the contract by the Contractor. However those responsibilities conferred on Owner as Principal employer cannot be delegated to consultant.

Where the consultant's scope involves Engineering and Design, those factors under Designer (Para 4.4) should also be applicable.

In all cases, the Consultant's scope should include submission of latest HSE plans for work under his and Contractor's purview and implementing the same till job completion. It should conform to owner's overall HSE plan. This should include Guidelines and Implementation and Reporting Methodology to be followed with required report formats.

Adequate number of Safety Officers shall be provided by the Consultant with necessary skills required for the work to be performed.

The Consultant shall review the documents submitted by the contractor and advise owner on acceptance as well as advise suitability and number of Contractor's safety officers / supervisors.

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4.4 DESIGNER

The Process Designer should identify all hazards and risks likely to be encountered during fabrication, erection including dismantling, Pre-commissioning, commissioning and Performance run to meet the Guarantees and advise the risk mitigation measures.

All the hazards and safety measures to be adopted while handling Dangerous chemicals and Catalysts should be detailed by the Process Licensor and the same should be again included in the scope of the suppliers. Specific write ups/MSDS should be obtained from Patented single source suppliers also.

Designs should recognize, include and apply safe practice during preparation, construction and subsequent operational use and maintenance after completion of the Project.

All documents including drawings and calculations are to be originated, checked and approved in accordance with latest international codes, standards, specifications and design basis philosophy.

Use of low risk materials, non hazardous substances, use of low noise and dust-suppressed equipment etc. should be encouraged.

5.0 SAFETY MANAGEMENT

5.1 JOB SAFETY ANALYSIS (JSA)

Job safety analysis (JSA) provides a mechanism by which the contractor / owner, safety officer(s) and job supervisor(s) take a detailed look at how an individual task is performed , and its inherent hazards and preventive measures. This procedure helps in integrating accepted safety and health principles and practices into a particular operation. In a JSA, each step of the job is examined to identify potential hazards and to determine the safest way to do the job.

A job safety analysis includes five steps as below:

- Select a job
- Break the job down into a sequence of steps
- Identify the hazards against each of these steps (based on knowledge of accident, causes of injuries and personal experience) and determine the preventive measures to overcome these hazards
- Apply the controls to the hazards
- Evaluate the controls measures and revisit JSA if necessary

5.2 CRITERIA OF SELECTION OF A CONTRACTOR & SAFETY PERFORMANCE REVIEW

“Contractor Safety” can be ensured to a large extent if competent agency for execution of assignment or job, based on HSE system agreed upon by owner, is selected. It is necessary to assess his capabilities and competencies to perform work safely.

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A databank should be developed for all the contractors for their past performance on HSE aspects. An attempt should also be made to get similar data from other similar industries.

The data required will depend upon complexity involved in the job and type / size of resources required. Format needs to be suitably developed depending upon size, nature of the job & hazard associated therein. The format designed should also take care of the skill required to carry out the job.

Performance review is essential for all type of contractors. It helps in recording actual performance/experience with contractors while the contract is in progress. It is essential that resources agreed as per the contract are reviewed at mobilization stage for ensuring compliance from the day one and thorough effective supervision / monitoring system are at place.

This activity also helps in taking timely action in case of unsatisfactory performance to correct the situation and ensure safe work during execution period and deciding about suitability of the contractor for future jobs.

The periodicity of such performance review will depend upon size/type/complexity of contract. However, the performance should be reviewed periodically from mobilisation stage till the demobilization stage. Appropriate corrective action should be ensured.

5.3 SITE PLANNING AND LAYOUT

Before starting the construction/maintenance job at existing workplace in operation or green field locations, following should be ensured: -

i) Details regarding location of workshop/ fabrication yard, site office, stores, laboratory, electrical installations, placement of construction machinery, medical and welfare facilities, lighting underground and above ground piping route, cable route etc. should be decided prior to commencement of the work in consultation with owner / Consultants and implementation should be ensured. Layout should be displayed at strategic locations.

ii) The resources required to meet any emergency situations like fire fighting, first aid etc. should be planned and mobilized as per the job requirement.

iii) The sequence or order in which work to be done and any hazardous operations or processes should be identified.

iv) Free access to site shall be provided with clear roads, passage, gangways, staircases etc. Access to construction site should be leveled, open and free from any obstructions like construction material or scrap/waste, exposure to hazards such as falling materials, material handling equipment and vehicles. Any pit or ditch shall be covered or barricaded.

v) Arrangements should be made to maintain good housekeeping at site. Scrap and debris generated out of construction work should be removed/disposed off at a regular interval as directed. Emergency exit should be provided in case of blockade of primary exit.

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vi) Suitable warning notices and also the routes to and from welfare facilities should be displayed prominently.

vii) Pedestrian pathways and routes for vehicular traffic (light/heavy vehicles including material handling equipment) should be earmarked.

viii) Artificial lighting to be provided at places where work continues or workers pass by after sunset or in case natural light is insufficient like confined spaces.

ix) Keep all equipment /machines under cover to prevent them from dust, rain/flood water, heat etc. and follow storage instructions as applicable for each of them.

5.4 GATE ENTRY PROCEDURE

Gate entry at any site / workplace / unit is to be restricted to ensure entry of only authorised persons / vehicles.

5.4.1 Entry procedure for all contractor workers should be as follows:

A. Issuance of Pass

i) The passes are to be issued after the owner's representative/engineer-in-charge forwards the application of the contractor providing complete details of the workers being engaged. The contractor should be asked to submit Character & Antecedents (C&A) verification of individual worker from concerned authorities.

ii) The actual deployment of the workers at the construction site should be done after imparting the necessary safety induction training.

iii) With regard to issuance of passes for all vehicles including material handling equipment, owner's representative / engineer-in-charge should forward the application only after ensuring that all documents pertaining to the fitness of the vehicle/equipment and valid driving license of the driver, PUC of the vehicle, insurance of vehicle, etc. are available.

iv) The passes should be serially numbered with address, contractor name, identification mark, signature of the worker etc.

v) Special colour code for passes should be used for persons entering different areas like Administrative Block, Unit area, Project Area (wherever applicable).

vi) Contractor workers engaged on routine basis for long periods should be provided with monthly photo pass.

vii) Special permit is required separately for working beyond normal working hours and holidays.

B. Gate Entry

i) Entry of the contractor's employees should be permitted with valid gate passes only.

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ii) Entry of contractor's workers should be allowed in presence of authorized representative of contractor.

iii) Records of persons at the time of entry/exit should be maintained.

iv) At the entry gate of the location, a physical checking for non-carrying of lighter, matchboxes, explosives etc. should be carried out.

v) Gate passes/Identity Cards should be displayed on persons at all the times.

vi) For Mega-projects at existing / operating installations, it is preferable to have a separate gate for entry of contractor workers and also the project areas should be segregated fencing from operational area by fencing / other physical means.

vii) No vehicle should be allowed to enter in an operational area without proper flame arrestor.

viii) Awareness on Safety through training / posters etc. highlighting Do's and Don'ts should be spread within entire contractor workforce. Video/Audio tapes on Safety Topics should be played preferably.

ix) For occasionally engaged workers such as for material handling etc., spot photograph should preferably take with two copies (one for preparing the pass and other for attachment with gate register). Specific advice and recommendation of User Department should be given due cognizance. Relevant details are to be written. The pass should be collected back at the gate after day's work.

5.4.2 Tank Truck Loading (TTL) Operation :

At the loading / unloading location, a large no. of Tank Trucks of petroleum products enter the installation. Crew members are generally not regular entrants. The procedure should be as follows:

i) The gate pass should be issued to the individual crew members on written request of the transporter mentioning TT registration nos., License and certificate of training as per MV rule 9.

ii) Character & Antecedent (C & A) verification of the TTL crew through local police is to be done preferably and record maintained.

iii) For loading/unloading purpose, register entry at security gate is made before allowing entry into the premises with recording of names of crew members, time of entry, pass Sr. No., TT no. etc.

iv) For loading/unloading, crew is allowed entry alongwith TT only, after checking of TT from explosive/security point of view.

v) Out time, invoice no., Destination etc., are recorded while TTs go out of the security gate.

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5.5 TRAINING

Training is to educate contractor workforce on various hazards associated with the job/workplace and on the respective preventive / mitigation measures to avoid untoward incidents.

i) Workers should be adequately and suitably:

(a) informed of potential safety and health hazards to which they may be exposed to at their workplace;

(b) instructed and trained in the measures available for the prevention, control and protection against those hazards.

ii) No person should be employed in any work at a workplace unless that person has received the necessary information, instruction and training so as to be able to do the work competently and safely. The competent authority should, in collaboration with employers, promote training programs to enable all the workers to read and understand the information / instructions related to safety and health matters.

iii) The information, instruction and training should be given in a language understood by the worker and written, Oral, visual and participative approaches should be used to ensure that the worker has assimilated the information.

iv) Every worker should receive instruction and training regarding the general safety and health measures common to the workplace. This should include:

(a) general rights and duties of workers at the workplace;

(b) means of access and egress both during normal working and in an emergency;

(c) measures for good housekeeping;

(d) location and proper use of welfare amenities and first aid facilities provided;

(e) proper use and care of the items of personnel protective equipment and protective clothing provided to the worker;

(f) general measures for personal hygiene and health protection;

(g) fire precautions to be taken;

(h) action to be taken in case of an emergency;

(i) requirements of relevant safety and health rules and regulations.

(j) training on hazards and mitigation measures for specific area where worker is assigned to work shall be given as part of entry procedure

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(k) Job specific training / refresher course shall also be given at regular intervals.

(l) It is also expected that behaviour based safety culture shall be encouraged and all the workers will be involved.

Copies of the relevant safety and health rules, regulations and procedures should be available to workers upon the commencement of and upon any change of employment.

5.5.1 Training Techniques

a) Lectures

This technique should be applied when it is required to transfer information in local language to a large contractor workforce with controlled content and time.

b) Case Study

This is an effective technique based on the presentation of case of real events by Trainer to highlight probable causes like Human Error, ignorance about the job etc.

c) Videos

Videos, an effective technique of communication, should be used to display the right techniques of performing a task in a safe manner and hazards associated with a job.

d) Demonstration at site

Right way to do a job should invariably be demonstrated to workers at the site itself. The right way is also a safe way. Hazards due to wrong procedures, short cuts and their adverse effects etc. should also be highlighted.

5.5.2 Training/Awareness Module and Frequency

A. General Safety Training to all categories of contractor employees should be imparted before induction and annually thereafter. No person should be allowed to enter the installation without undergoing this training. This training program should cover:

i) Mandatory uses of PPE like Cotton clothes, Helmet, Safety Shoes, Full Body Safety harness, dust masks, safety goggles, etc.

ii) Probable Hazards related to industry

iii) Job specific hazards

iv) Important Telephone No / Escape route

v) First Aid

vi) Use of Fire extinguisher

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vii) Location of assembly points

viii) Procedure of calling fire crew in case of any emergency

ix) Wind direction

The contractor workers, if engaged in operation of the plants/facilities, should be trained in line with Clause No. 4.6 of OISD-GDN-206 on "Safety Management System". For other categories of contractor workers, training modules for different category employees are as follows:

B. Contractor Supervisor

Contractor Supervisor should be trained in accordance with the provision of clause no. 5.1.1.2, 5.2.7, 5.3.10, 5.6.12 and 5.7.8 of OISD-STD-154 on 'Safety Aspects in Functional Training'

C. Contractor Worker

Yearly training programme should be carried out for contractor worker and the records should be maintained. The training programme should cover at least the following:

i) Worker responsibility for safety of himself and work area.

ii) Associated hazards with the job and job area including electrical shock hazards.

iii) Importance of First Aid fire fighting equipment, their use & operations

iv) Communication system at the installation

v) Fire / Accident Reporting procedure

vi) General Safety rules

vii) Safety Measures during execution of job such as:

- Welding / Cutting / Grinding
- Working at height
- Confined space entry
- X ray / radiation
- Erection / Dismantling of scaffolding
- Tank construction and repairs
- Handling of chemicals etc.
- Hydrojetting
- Leak testing of pipelines and equipment (hydro and pneumatic testing)
- Grit / other methods of blasting for surface preparation blasting etc.
- Chemical cleaning & pickling
- Catalyst loading & storage
- ELCB

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viii) Importance & use of PPE

ix) Emergency Routes

x) Assembly Points

xi) Job Specific Training

D. Consultant / Contractor

Awareness program should be carried out for demarketed Consultant / Contractor at the time of induction. This program should cover at least the following:

i) Responsibility of contractor for safety of their personnel and work area

ii) Hazardous property of Petroleum products and chemical used

iii) Communication system

iv) Fire / Accident Reporting procedure

v) Medical facility available

vi) Statutory requirements

vii) Importance of First Aid equipment and required at the site

viii) Work Permit system

ix) Direct/ Indirect losses due to accident

x) Safety Measures while executing the jobs such as:

- Welding / Cutting / Grinding
- Working at height
- Confined space entry
- X ray / radiation
- Erection / Dismantling of scaffolding
- Tank construction and repairs
- Handling of chemicals etc.
- electrical jobs
- Hydrojetting
- Leak testing of pipelines and equipment (hydro and pneumatic testing)
- Grit / other methods of blasting for surface preparation blasting etc.
- Chemical cleaning & pickling
- Catalyst loading & storage
- ELCB

xi) Safety training needs of their supervisors and workers

xii) Importance & Use of PPE at the site

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xiii) General Safety rules at the installation –

General points:

Workers should not be allowed to take meals or take rest inside the construction / plant area.

E Security Personnel

Training program should be carried out for Security personnel at the time of induction and annually thereafter and the records should be maintained. The training program should cover at least the following:

i) Layout of Plant and Facilities
ii) Vulnerable locations
iii) Safety regulations (Statutory and in company)
iv) Fire Protection Facilities and Locations
v) Role in case of Fire / Disaster
vi) Emergency Procedure and Drills
vii) Industrial First Aid
viii) Use of Personnel Protective Equipment
ix) Disaster Management Plan

5.6 INSPECTION / AUDIT

Inspection / Audit is a tool to evaluate compliance of all safety requirements. Most of the information could be gathered through site inspection using ready-made check lists to ensure that contractors / agencies abide by the safety rules and norms while working at operating / construction sites.

A checklist, while carrying out different type of jobs, should be developed based on hazards associated with the job being performed and requirements as per OISD-GDN-192 on "Safety Practices during Construction". Typical format is enclosed at Annexure II, which should be modified to suit the requirement of the site / job to be done.

Before starting the work and at regular intervals thereafter, Contractor's Supervisor/safety Officer and Owner's representative / Engineer-in charge/safety Officer should inspect as per the checklist so prepared to ensure that contractor has prepared to start the work with all safety precaution required for safe execution of job.

5.7 FINANCIAL DETERRENTS FOR NON-COMPLIANCE OF SAFETY RULES/ PROCEDURES

Financial or other type of penalties like seizure of gate passes, stoppage of work for a limited period etc. should be levied on the contractors or their workers for non-compliance of safety rules. A provision of suitable accident severity based penalty clause for contractor should be incorporated to ensure adherence of systems and procedures.

The financial deterrent clauses shall be included in the general terms and conditions of the contract. The violators of the clauses shall be suitably punished. Following list shall be taken as a guide while preparing the financial deterrent clauses but need not be limited to these conditions only.

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A few of the usual non-compliance are as follows:

I. Working without valid work permit/ Violation of any of the conditions specified in the permit.

II. Throwing up/down any material from height or not making proper provision to bring down material safely from height

III. Non standard/unsafe platform/ladder, Non standard/unsafe Scaffolding

IV. Non-usage of PPEs like Safety helmet / Safety shoes / Safety goggles / Welding Shield / Respiratory protection etc. by the contractor personnel

V. Non use of ELCB , using poor joints of cable, using naked wire without top plug into the socket, laying wire/cables on the roads without sleeve.

VI. Carrying out electrical jobs by un-authorised person

VII. Non deployment of the licensed electricians for electrical job.

VIII. Unsatisfactory fencing / barricading of excavated areas, Not providing proper shoring /strutting /proper slope and Not keeping the excavated earth at least one meter away from excavated area

IX. Over speeding of vehicles, rash driving, wrong side parking & parking in front of any fire-fighting equipment.

X. Riding on material handling vehicles or trolleys or hydra.

XI. Non-deployment of safety supervisor / supervisor responsible for safety at work site

XII. Failure to maintain safety register and record by Contractor Safety Supervisor or Supervisor responsible for safety.

XIII. Acting in contravention to any of the provision mentioned in Factories Act 1948 and/or the rules framed there under including all amendments thereto.

XIV. Failure to furnish a first information report (FIR) as per prescribed Pro-Forma within 4 hours of the incident.

XV. Keep and maintain proper records of all incidents occurred at work site.

XVI. Working beyond statutory limits by contractor's workers.

XVII. Deployment of child or adolescent labour.

XVIII. Use of untested and uncertified pressure vessel. Use of untested and uncertified lifting tools/tackle.

XIX. Unsafe handling of compressed gas cylinders No trolley or jubilee clips or double gauge regulator or flash back arrestor on both gas lines & both ends or improper storage / handling or cylinders without caps when not in

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use/damaged hoses). Keeping compressed gas cylinders in horizontal position.

XX. Transporting metallic items below overhead lines, without isolation.

XXI. Damage to fire equipment like hydrant & monitors, fire extinguishers including non return of fire equipment

XXII. Horseplay at work site.

XXIII. Non-provision of basic safety requirement such as 24 V lamp for working in confined space, uncertified / non standard lifting tools, earth leakage protection & earthing connections for electrical appliances as per Indian Electricity Rules, emergency isolation switches etc.

XXIV. Keeping gas cylinders inside the confined spaces.

XXV. Non-usage of the full body safety harness and fall back arrester with life line properly anchored by the workers while working at height

XXVI. Violation of Safety Permit conditions like Firefighting equipment.

XXVII. Non-barricading of area while rigging, digging etc.

XXVIII. Working without valid work permit.

XXIX. Un-authorised road closure/blockage.

XXX. Not clearing the work site on regular basis.

XXXI. Leaving contractor owned leftover material at site at the time of demobilization.

5.7.1 REWARDS AND RECOGNITIONS

The contract employees should be suitably rewarded as per a scheme, with monetary benefits/ prizes for timely reporting of the Near miss incidents/ Unsafe conditions/ Unsafe Acts based on the accident potential if it could have occurred.

The compliance to safety procedures by the contractors shall be evaluated annually as per the scheme based on different leading and lagging indicators and shall be awarded during the safety week celebrations.

The best safety conscious worker as recommended by the safety officers of different contractors during short term jobs such as the turnaround maintenance activities shall be suitably rewarded for motivating the workers to comply with safety requirements.

The best safety officer/supervisors of the contractor shall be recognized and shall be suitably rewarded during the safety week celebrations.

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5.8 INCIDENT REPORTING AND INVESTIGATION SYSTEM

All the incidents including near-miss should be reported immediately by contractor's Supervisor to Contractor and owner's Supervisor / Engineer-in-charge, who should inform to Owner's Safety Officer and owner's Management. Owner's Safety Department will be required for onward reporting as per OISD, Statutory requirements.

All accidents regardless of the extent of injury or damage should be investigated in order to find probable causes, lessons learnt thereof and remedial measures required to prevent its recurrence.

The incident investigation should be done as per provision of clause no. 4.12 of OISD-GDN-206 on 'Safety Management System'.

All the recommendations of investigation / Enquiry Report need to be monitored closely for its implementation. A proper record should be maintained to ensure implementation of all the recommendations and same should be reviewed from time to time.

5.9 SAFETY COMMITTEE MEETINGS

Following three type of safety committee meetings should be held aiming at raising the level of safety consciousness at the site:

5.9.1 Toolbox meeting

To maintain awareness, update training and convey important safety and health information, contractor supervisors should conduct tool box meetings at least weekly and also prior to start of any work. All the contractor workers should attend this meeting. The owner's supervisor/Engineer-in-charge and safety officers should also attend these meetings on random basis. Tool box meeting should be conducted more frequently depending upon circumstances. Record of the same can be maintained in the following typical format.

TOOL BOX MEETING FORM

A Toolbox Talk is a safety meeting allowing open environment for discussion with the work force. It focuses on safety topics related to the specific job, such as workplace hazards and safe work practices. It is aimed to refresh workers' knowledge, cover last minute safety checks, to raise workers' awareness of specific problems on site. Toolbox Talks are also intended to facilitate health and safety discussions on the job site and promote safety culture. It also helps to remind workers that health and safety are an important part of the working day.

Toolbox talk should be short in duration and conducted at the job site prior to the commencement of a new job or work shift. Toolbox Talks can be used for post-accident communications / accident case study, re-enforcement of safe work practice and pre-task planning etc.

Contractor supervisors should conduct tool box meetings at least weekly and also prior to start of any work. All the contractor workers should attend this meeting. The owner's supervisor/Engineer-in-charge and safety officers should also attend these meetings on

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random basis. Tool box meeting should be conducted more frequently depending upon circumstances.

A toolbox talk should cover following topics;

- Review of the hazards related to job being done. What safety equipment and PPEs should be used? What procedures should be followed?
- Review and analyse recent safety violations— What was the violation? What hazard did it create? What injury could have occurred?
- Review and analyse recent injuries— What happened? Why did it happen? What should have been done?
- Ergonomics and behaviour related tips.
- Importance of PPEs and proper tool for specific jobs.
- Housekeeping

Records of such talks should be maintained. Following information should be included when completing a Toolbox Talk Form:

- Names and signatures of all persons present,
- Topics discussed,

Any job specific training or instructions that have been given in the meeting and who raised the issue or added to the discussion, to show that there has been active consultation with all persons attending the meeting and that all parties have had a chance to raise issues.

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TOOL BOX TALK RECORD

DATE_____ TIME:_____ LOCATION:_____
DELIVERED BY:_____WITNESSED B Y: _____
JOB DISCRIPTION:_____
NAME OF THE CONTRACTOR:_____

Toolbox Talk – Topics / Issues discussed
Other points or issues raised by attendees

NAME	SIGNATURE	NAME	SIGNATURE

5.9.2 Site Safety Committee Meeting

Primary purpose of this safety committee is to enable owner, contractor and workers to work together to monitor the site safety and health plan so as to prevent accidents and improve working condition on site. Its size and membership will depend on the size and nature of job.

The safety committee should include representatives of owner, consultant, contractor identified as safety officer / supervisor. It should be headed by Engineer-in-charge.

The safety committee should have regular and frequent meetings, atleast fortnightly, to discuss the safety and health program on site and to make suggestions for improvement. The meetings should be documented with a time bound action plan. The functions carried out by safety committee should include:

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i) Review compliance of pending items of last Safety meetings. All critical items should be identified and their compliance ensured.

ii) Consideration of the reports of safety personnel.

iii) Discussion of accident/near-miss and illness reports in order to make appropriate recommendation for prevention.

iv) Examination/evaluation of suggestions made by workers.

v) Dissemination of acquired knowledge through training programs and information sharing sessions.

vi) Discussion & review of Fire Prevention & Disaster Management Plan.

vii) To send recommendation to Apex Body for consideration / approvals.

5.9.3 Safety Review Meeting by Location Head

This meeting should be headed by the Location head and attended by Owner's Supervisor / Engineer-in-charge, owner's safety Officer and all concerned department heads. Prime purpose of this review is to ensure that all the recommendations of various committees are being complied with and to take decisions on critical points raised. This meeting should take place at least once in every quarter. All the investigation reports / audit findings with status of implementation of recommendations should be discussed.

5.10 SAFETY EQUIPMENT / PERSONNEL PROTECTIVE EQUIPMENT

The type of safety equipment to be used is decided based on the job requirement. Selection should be made based on OISD-GDN-192, OISD-STD-155 (Part I & II) and the job requirement. Safety equipment / Personnel Protective Equipment (PPE) shall be of approved make. Contractor shall provide necessary training to each employee regarding proper usage and upkeep of PPE including its limitation.

A register showing stock and issue of PPE should be maintained by the contractor at site and must be available for inspection. 10 to 20 % of PPE in excess of actual requirement to meet contingency requirement should be maintained at site.

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REFERENCES

1) OISD-GDN-206 on “Safety Management System”

2) OISD-GDN-192 on “Safety During Construction”

3) OISD-STD-155 Part (I & II) on “Personnel Protective Equipment”

4) Building & Other Construction workers (Regulation of Employment & Condition of Service) Act 1996 & Rules thereof

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ANNEXURE I

LIST OF SAFETY CODES FOR CIVIL WORKS PUBLISHED BY BUREAU OF INDIAN STANDARDS

Sl.no.	Code No.	Title
1	IS: 818	Code of Practice for Safety and Health Requirements in Electric and Gas Welding and Cutting Operations – First Revision.
2	IS: 875	Code of practice for Structural safety of buildings: Masonry walls
3	IS: 933	Specification for Portable Chemical Fire Extinguisher, Foam Type – Second Revision.
4	IS: 1179	Specification for Equipment for Eye and Face Protection during Welding – First Revision
5	IS: 1904	Code of practice for Structural safety of buildings: Shallow foundations
6	IS: 1905	Code of practice for Structural safety of buildings: Masonry walls
7	IS: 1989 – Part II	Leather Safety Boots and shoes for heavy metal industry
8	IS: 2171	Specification for Portable Fire Extinguishers, Dry Powder Type – Second Revision
9	IS: 2361	Specification of Building Grips – First Revision
10	IS: 2750	Specification for Steel Scaffoldings
11	IS: 2925	Specification for Industrial Safety Helmets – First Revision
12	IS: 3016	Code of Practice for Fires Precautions in Welding and Cutting Operations – First Revision
13	IS: 3521	Industrial Safety Belts and harnesses
14	IS: 3696 – Part I	Safety Code for Scaffolds and Ladders: Part I – Scaffolds
15	IS: 3696 – Part II	Safety Code for Scaffolds and Ladders: Part II – Ladders
16	IS: 3764	Safety Code for Excavation Work
17	IS: 4014 – Part I & II	Code of Practice for Steel Tubular Scaffolding
18	IS: 4081	Safety Code for Blasting and Related Drilling Operations
19	IS: 4082	Recommendations on stacking and storage of construction materials at site

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20	IS: 4130	Safety Code for Demolition of Buildings – First Revision
21	IS: 4138	Safety Code for working in compressed air – First Revision
22	IS: 4756	Safety Code for Tunneling works
23	IS: 4912	Safety requirements for Floor and Wall openings, Railings and toe boards – First Revision
24	IS: 5216 – Part I & II	Recommendations on safety procedures and practices in electrical work
25	IS: 5121	Safety code for piling and other deep foundations
26	IS: 5916	Safety Code for Construction involving use of Hot Bituminous materials
27	IS: 6994 – Part I	Specifications for safety gloves: Part I – Leather and Cotton gloves
28	IS: 5983	Specification for Eye Protectors – First Revision
29	IS: 6922	Criteria for safety and design of structures subject to underground blasts
30	IS: 7155	Code of recommended practices for conveyor safety
31	IS: 7205	Safety Code for Erection on Structural Steel Works
32	IS: 7069	Safety Code for Handling and Storage of Building Materials
33	IS: 7293	Safety Code for Working with Construction Machinery
34	IS: 7323	Guidelines for operation of Reservoirs
35	IS: 7969	Safety Code for handling and storage of building materials
36	IS: 8758	Recommendation for Fire Precautionary Measures in construction of Temporary Structures and Pandals
37	IS: 8989	Safety Code for Erection of Concrete Framed Structures
38	IS: 9706	Code of Practices for construction of Arial ropeways for transportation of material
39	IS: 9759	Guidelines for de-watering during construction
40	IS: 9944	Recommendations on safe working load for natural and manmade fibre rope slings
41	IS: 10667	Guide for selection of industrial safety equipment for protection foot and leg

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42	IS: 10291	Safety Code for dress divers in civil engineering works
43	IS: 10386 – Part I	Safety Code for Construction, Operation and Maintenance for River Valley Projects
44	IS: 10386 – Part II	Safety Code for Construction, Operation and Maintenance for River Valley Projects
45	IS: 11057	Code of Practice for Industrial Safety Nets
46	IS: 13415	Code of Practice on safety for Protective barriers in and around building
47	IS: 13416	Recommendations for preventive measures against hazards at working places

Statutory Regulations

Latest Statutory Acts and Rules, as given below, should be referred:-

1. The Petroleum Acts 1934 and Petroleum Rules 2002
2. The Factory Act, 1948 (As amended by Factory Amendment Act 1987) and concerned Factory Rules
3. The Water (Prevention and Control of Pollution) Act 1974 & Rules 1975
4. The Environment (Protection) Act 1986 and rules thereunder
5. The Manufacturing, Storage and Import of Hazardous Rules 1989
6. The Hazardous Wastes Management (Management & Handling) Rules 1989
7. The Indian Electricity Act 1901 and Rules 1956
8. The Indian Explosive Acts, 1884 & The Indian Explosive Rules 1983
9. The Gas Cylinder Rules 1981and the static & Mobile Pressure Vessels (Unfired) Rules 1981
10. The Indian Boiler Act 1923 and Regulations 1950
11. The Public Liability Act 1991 as amended in 1992
12. The Motor Vehicle act 1988 and Central Motor Vehicle rules 1989
13. Building & Other Construction workers (Regulation of Employment & Condition of Service) Act 1996

In addition to above, various other statutory acts like EPF, ESIS, Minimum wage act and other local statutory requirements shall also be complied with.

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ANNEXURE II

CHECK LIST FOR SAFETY INSPECTION / AUDIT

Job _____ Location _____ Date of Audit_____Frequency _____

Inspected by _____ Contractor (s) _____

Sl.no.	ITEM	YES	NO	NA	REMARKS / ACTION
1.0	**PERSONNEL PROTECTIVE EQUIPMENT (PPE):** Are following PPEs being used as per the job requirements?				
A.	**Minimum mandatory PPEs**				
A1	Safety Helmets (with chin strap)				
A2	Safety Shoes				
A3	Safety Goggles				
A4	Safety hand gloves				
B.	**Job specific PPEs**				
	Whether need of specialised safety PPE identified and documented?				
B1	Full body safety harness with double lanyard				
B2	Fall arrester				
B3	Ear Plug / Ear Muff				
B4	Gum Boots				
B5	Face shield				
B6	Shot/Grit/Slag blasting hood				
B7	Breathing Apparatus				
B8	Gas Filter Mask / Dust Mask				
B9	Hand Gloves (Chemical/ Welding/ Electrical/ anti-vibration/ High temperature/ cold burn etc.)				
B10	Boiler Suit / Fire-retardant suit / Electrical flash fire retardant suit /High pressure water cleaning (Hydrojetting-Turtle) suit /				

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	Chemical suit / Low temperature suit etc.				
B11	Others				
C.	Whether workers are trained / briefed to use the PPEs?				
D.	Whether system of checking the quality / quantity of PPEs provided by contractor exists and in practice?				
E.	Whether as per contract the contractor is obliged to arrange the required PPEs to its workmen and the same is being complied with ?				
2.0	**HOUSE KEEPING**				
2.1	Whether Standards of housekeeping are defined in contract and housekeeping is being maintained accordingly?				
2.2	Whether areas are identified and marked for stacking of material like scrap, pipes, plates, cement, sand, loose excavated material etc.?				
2.3	Whether surplus excavated material, debris and scrap material is being removed and disposed on regular basis as per contract?				
2.4	Whether path ways, roads, stairs etc. in the vicinity of work place are maintained free from obstructions?				
2.5	Whether appropriate actions are taken to avoid the slippery area due to water logging / oil spillage?				
2.6	Whether system for collecting and disposal of small size scraps like welding buds, small size metal pieces, insulation material in place.				
2.7	Whether area is maintained free from vegetation, garbage etc. and the work place is kept clean and free of any hazard?				
2.8	Others				
3.0	**EXCAVATION**				
3.1	Whether detailed plan of excavation including soil stability is made and approved by competent authority?				
3.2	Whether excavation hot work permit is taken?				

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3.3	Whether the workplace is thoroughly inspected before issuance of work permit, as stipulated in OISD-STD-105?				
3.4	Whether special conditions mentioned in the permit are clearly explained to the supervisor and in turn to the contractor workers and documented?				
3.5	Whether proper shoring for the excavation is provided to prevent cave-in for side of slope more than the safe angle of repose (generally around 45 degrees) of the soil being excavated?				
3.6	Whether proper precautions have been taken if the excavation is adjoining to heavy structure like building, street and roadways?				
3.7	While excavating whether proper slope usually 45^0 & suitable benches of 0.5 m width at each 1.5 m depth are provided?				
3.8	Whether barricading of 1m height with glowing caution board is provided for excavation beyond 1.5m depth?				
3.9	Whether excavating earth is placed beyond 1m or depth of the excavation whichever is more, from the edge of the trench?				
3.10	Whether heavy vehicle movement is restricted to come too close (minimum 2 M from the edge of excavation) to the excavating area?				
3.11	Whether adequately anchored stop blocks and barriers are provided to prevent vehicles being driven into the excavation? Heavy vehicles should not be allowed near the excavation unless the support work has been specially designed to permit it.				
3.12	Whether necessary precaution is taken for underground pipes, sewers, cables by contractors?				
3.13	Whether extra precaution is taken for bailing out water properly while excavating?				
3.14	During rains whether the excavation is				

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	done with extra precaution to prevent caving in?				
3.15	Whether two separate entry/ exit points with necessary ladders / steps, as per requirement, have been provided?				
3.16	Whether required no. of persons are available (as per OISD-STD-105) at all the time to communicate any hazards noticed with workers working in deep trenches or excavation?				
3.17	Whether necessary precautions like regular gas testing are being taken in areas having hydrocarbons and toxic gases so that no gas accumulation takes place in the trenches.				
3.18	Whether IS: 4081-1986 & Indian Explosive act & rules for storage, handling & carrying of explosive material and execution of blasting operation is followed?				
3.19	Whether in case of mechanised excavation, caution board is provided for do's and don'ts like 'Nobody to enter' within one meter of the extreme reach?				
3.20	Whether the following observations are being documented during excavation work and corrective actions taken :- a) Boulder formation encountered b) Collapsing / development of cracks of sides c) Marked damage to support d) Unexpected fall of ground e) Inspection of site after each blast. f) Water logging g) Unexpected utility/cabling				
3.21	Others				
4.0	**PERMITS**				
4.1	Whether valid work permit is issued in compliance to OISD-STD-105 to start any work?				
4.2	Whether before issuing the permit, JSA carried out and mitigation measures made				

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	part of work permit?				
4.3	Whether personnel working at site were given tool box talk about the hazards and emergency procedure with important do's and don'ts and record maintained?				
4.4	Whether all conditions of the permit are fulfilled before starting the job?				
4.5	As noted in the permit, whether compliance of all the recommendations are ensured during entire duration of the job?				
4.6	Whether permits are available at work site all the times?				
4.7	Whether hot work permit registered in fire station / designated safety officer?				
4.8	Whether permits are being closed after the completion of job?				
4.9	Others				
5.0	**SAFETY IN CUTTING / WELDING/GRINDING**				
5.1	Whether LPG / Oxygen / Acetylene/ Gas cylinders are kept outside only while working in confined space?				
5.2	Are Acetylene/ O_2 / LPG cylinders kept in upright position with required valve cap and secured at designated places under shed – wet fire retardant clothes ~~gunny bags~~ wrapped around it if the same is under sun at designated place?				
5.3	Check cylinder and cylinder valves for approved quality & any kind of damage?				
5.4	Whether protective valve ~~s~~ caps are kept on cylinders while not in use?				
5.5	Whether proper means and method for transportation of cylinders to avoid dropping and rolling are being adopted / followed?				
5.6	Whether gas cylinders, regulators are				

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	kept away from combustible materials and free from oil and grease?				
5.7	Whether all hoses are of approved quality and found to be free of any damage or crack?				
5.8	Whether oxygen and acetylene cylinders are stored separately at a distance of at least 5 feet from each other and kept under shade as per Gas Cylinder rules 2002?				
5.9	Whether gas cylinders are kept at safe location particularly in case job is being done at different elevations while in use?				
5.10	Whether color coding is being used for easy identification of different type of cylinders and hoses?				
5.11	Whether cylinder keys are available near the cylinder?				
5.12	Whether gas torches with flash back arrestors of approved make are only being used?				
5.13	Whether pressure gauges are in working condition and checked from time to time?				
5.14	Whether welding shields are used while welding?				
5.15	Whether proper earthing for welding machines are provided?				
5.16	Whether power is taken from approved sources (welding receptacles)?				
5.17	Whether welding receptacles are properly grounded?				
5.18	Whether welding cables are maintained in good condition and without any joints/ cuts?				
5.19	Whether to avoid short circuit, welding machines are protected against rain?				
5.20	Whether earth connectors are securely connected to the job and not to the				

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	adjoining pipeline or structure?				
5.21	Whether flame arrestor of DG set is of approved make and quality?				
5.22	Whether 30mA rating ELCB is provided on power supply.				
5.23	Whether separate power supply arrangement is provided for portable oven?				
5.24	Others				
6.0	**ABRASIVE (SHOT/GRIT/SLAG) BLASTING**				
6.1	Whether abrasive blasting is used only after getting approval from competent authority / work permit?				
6.2	Whether air compressor used for abrasive blasting are positioned away from work place?				
6.3	Whether exhaust of the prime mover is directed away from the work place?				
6.4	Whether in case of motor driven compressor, the body of the motor as well as the compressor is properly earthed?				
6.5	Whether line operator of abrasive blasting wear suitable PPEs including mask?				
6.6	Whether adequate measures are adopted to confine dust / flying particles?				
6.7	Whether adequate measures are taken for proper ventilation while the work is done in confined space?				
6.8	Whether the Air receiver vessel of the compressor is pressure tested.				
6.9	Others				
7.0	**SAFETY WHILE WORKING AT HEIGHTS / SCAFFOLDING / LADDERS**				
7.1	Whether work permit is obtained to take up work at height above 2.2 meters?				
7.2	Whether steel pipes scaffoldings are used in unit/off site areas?				

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7.3	Whether provision for suitable platform with all scaffoldings are made? Whether its construction is as per specification with toe board and railing?				
7.4	Whether the area below working at height is cordoned?				
7.5	Whether ISI approved quality and good condition full body safety harness with shock absorber are used while working at heights?				
7.6	Whether life line of full body safety harness with shock absorber is anchored to an independent secured support capable of withstanding load of a falling person?				
7.7	Whether the area around the scaffold is cordoned off to prohibit the entry of unauthorized person?				
7.8	Whether lifeline ropes used are of good condition and adequate strength free of defects?				
7.9	Whether ladder is placed at secured and leveled surface?				
7.10	Whether it is extended 1.0 Meters above the landing point?				
7.11	Whether ladder used are of adequate length and tying short ladder is avoided?				
7.12	Whether metallic ladders are placed away from electrical system?				
7.13	Whether tools or materials are removed after completion of the day's job at heights?				
7.14	Whether a valid permit is obtained before taking up work on asbestos or fragile roof?				
7.15	Whether sufficient precaution like roof ladders, nets, lifeline, full body harness, etc. is taken while working on fragile roof?				

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7.16	Whether provision is made to arrange duck ladder, crawling board for working at fragile roof?				
7.17	Whether scaffolding has been erected on rigid / firm / leveled surfaces only?				
7.18	Whether scaffold has been inspected by competent person & tagged accordingly prior to being put in use?				
7.19	Whether the scaffolding has been designed for the load to be borne?				
7.20	Whether the erection and dismantling of the scaffolding is being done only by trained persons and under competent supervision?				
7.21	Whether safety net with proper working arrangement and life line has been provided?				
7.22	Others				
8.0	**SAFETY IN CONFINED SPACE**				
8.1	Whether positive isolation is done as per approved blind list and crossed checked by competent person?				
8.2	Whether a permit is obtained to enter a confined space?				
8.3	Whether gas test for hydrocarbon, toxic gas, oxygen level is checked for acceptable limits before entering any confined space and recorded? If levels are beyond permissible limit, whether required PPE like BA, Gas Mask are used.				
8.4	Whether adequate oxygen level is ensured in confined space before entering? If not, whether all precaution like using of Breathing Apparatus set is ensured?				
8.5	In case of chance of ingress of hydrocarbon gases / toxic gases, whether Personnel Monitoring System (PMS) is used ?				

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8.6	Whether only in presence of a supervisor, worker enters in confined space?				
8.7	Whether provision of sufficient means of entry and exit is available?				
8.8	Whether provision of ventilation to remove welding fumes, dust, exhaust gases are made?				
8.9	Whether provision of 24V (Hand lamps with cage as per OISD-STD-155) light for working inside space is made?				
8.10	Is it strictly ensured that stand-by trained persons (2 nos.) are standing outside before a person enters a confined space and communication is being maintained all the time with workers working inside?				
8.11	Whether life belt with one end under control of stand-by person outside is kept while working in confined space?				
8.12	Whether Personnel protective Equipment as specified in the permit are in good condition?				
8.13	Whether boxing up is done only as per the approved procedures and under the supervision of competent persons?				
8.14	Whether all the safety precautions listed in OISD-GDN-192 are taken while working in sewers, OWS etc.?				
8.15	Whether proper house keeping is being maintained inside the confined space?				
8.16	Whether training has been provided to workers working in the confined space and the workers only of sound health are being asked to work in the confined space?				
8.17	Others				
9.0	**SAFETY IN MATERIAL HANDLING**				
9.1	Whether all lifting tools, tackles, machines, chains, ropes etc. are of sound construction, made of sound material and				

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	maintained in good condition?				
9.2	Whether lifting tools & tackles are tested as per norms and safe working load, date of testing visibly marked/painted on the equipment?				
9.3	Whether lifting tools, tackles are of adequate strength for the load to be handled?				
9.4	Whether all parts including the working gears fixed or movable of every lifting machine, chain, rope, tackles specify the following condition: a) Thoroughly examined by competent person at least once a year or such interval as required by statutory authority. b) Document of such examination are maintained and produced to owner supervisor before use of particular equipment?				
9.5	Whether chain blocks and cables are inspected before each use to assure their sound condition?				
9.6	Whether hoist and lift, if used are: a) Properly maintained and thoroughly examined by competent authority at least once in every year. b) A register to be maintained to record particulars of such examination in prescribed forms and shall be produced to the owner supervisor before use.				
9.7	Whether area below the movement of boom of crane is cleared to avoid injury from falling objects?				
9.8	In crane handling area whether it is ensured that crew of truck, leave the truck before starting loading / unloading?				
9.9	Whether transporting material from one place to another is done by suitable				

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	means?				
9.10	Whether carrier with sufficient capacity without projecting parts is used for transporting materials?				
9.11	Whether riggers engaged are well trained and conversant with signaling procedures including night signaling if required?				
9.12	Whether permission of authorized person is obtained before working on or near an overhead crane?				
9.13	Whether trained riggers are available all the time along with crane?				
9.14	Whether barricading has been done to ensure no unauthorised person enters in the working area of the crane?				
9.15	Whether lifting (rigging) plan has been prepared and approved before start of the work?				
9.16	Whether route of crane movement has been planned before the crane moves out of the garage?				
9.17	Whether it has been ensured that no electrical cable comes within 3 meters or safe distance from the boom of the crane?				
9.18	Whether boom is being kept in the horizontal position or locked while idling?				
9.19	Whether material is being stacked / destacked in trucks with the help of wedges to ensure no slippage while loading / unloading takes place?				
9.20	Whether the forklift / crane is being operated only by trained / authorized person?				
9.21	Others				
10.0	**ELECTRICAL SAFETY**				
10.1	Has the Electrical Line Clearance				

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	procedure been followed involving electrical and other concerned Dept. and filling of formats?				
	Whether the "LOTO" system is defined properly and all personnel are aware with the procedure?				
	Whether "LOTO" system is being used in all electrical isolation jobs, by all departments?				
10.2	Have Danger Signs with Voltage rating/ Men at work signboards been displayed at both Sub Station as well as the work site?				
10.3	Has the contractor worker understood the electrical circuit on which he is going to work with probable electrical hazards and mitigation measures to be adopted?				
10.4	Whether contractor has engaged electrician (s) having valid electrical license in line with provisions in Indian Electricity Rules?				
10.5	Have all checks prior to switching operation been carried out and authorisation of owner/ user section obtained subsequently?				
10.6	Have all earthing links on electrical conductors removed before charging the line/ apparatus?				
10.7	Are PPE as prescribed under Indian Electricity Rules available, kept healthy and being used?				
10.8	Are earthing and bonding arrangement of non-current carrying metallic parts in line with provisions of Indian Electricity Rules – 1956 amended time to time as IS: 3043?				
10.9	Have electrical part of OISD-GDN-192 and Clause No. 9.0 for Temporary installations in OISD-STD-173 been understood and followed wherever applicable?				
10.10	Are flexible wires having voltage of 240 volts above earth potential taken through				

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	PVC conduits?				
10.11	Whether portable hand lamps with a voltage rating of not more than 24 volts used with flameproof enclosures in confined spaces within columns, vessels etc?				
10.12	Have the Switches, MCBs, fuses etc. been inspected for proper ratings?				
10.13	Has Earth Leakage Circuit Breaker (ELCB) been used on the incoming side to protect against leakage of current? Is the device tested every time the work is started?				
10.14	Whether all portable appliances are provided with insulated Three pin plugs and socket arrangement?				
10.15	Whether industrial type extension boards and plug sockets are used?				
10.16	Has the electrical equipment brought to site by contractor been inspected by owner's supervisor/ safety officer for damage/cuts/abrasion etc? Is record of Insulation Resistance, wherever required being kept?				
10.17	Have standard practices for termination of conductors/ cables been followed (e.g. use of proper lugs, crimping tool, cable glands etc)? Is cable armour in continuity from feeding point to load?				
10.18	Are the Contractor supervisor and workmen well acquainted with first aid for electrical shock?				
10.19	Are the wires/ cables identifiable along their route towards the load by using colour coding and/or markers?				
10.20	Others				
11.0	**ROAD WORK**				
11.1	Whether site is barricaded and provided with warning signs including night warning lamps/ self glowing markers at appropriate location for diversion of traffic?				

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11.2	Whether mixing aggregates with bitumen is done with the help of batch mixing plants? If no, whether adequate precautions have been taken?				
11.3	Whether road rollers, bitumen sprayers, pavement finishers are driven by experienced drivers with valid driving licenses?				
11.4	Whether the worker handling hot bitumen sprayers or spreading bitumen aggregate mix or mixing bitumen with aggregate are provided with PVC hood, hand gloves rubber shoes (gum boot) with pegging upto knee joints?				
11.5	Others				
12.0	**FORM WORK, REINFORCEMENT**				
12.1	Whether form work, shuttering, shoring etc. are adequately designed and provided to erect the structure and to support the expected load?				
12.2	Whether staging (support) for shuttering is designed for loads like worker movement, impact load and other incidental loads during construction?				
12.3	Whether workers use PPEs at work site like safety shoes, gloves, helmet with chin strap, goggles and dust masks etc.?				
12.4	Whether all safety procedures are adopted while cutting rod?				
12.5	Whether proper staging and bundling is provided for supplying rods at height?				
12.6	Whether sufficient cross bracings are provided for high staging works as per design requirement?				
12.7	Others				
13.0	**CONCRETING**				
13.1	Whether the concreting area is barricaded?				

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13.2	Whether vibrator hoses, pumping concrete accessories are in healthy condition and mechanically strong?				
13.3	Whether it is ensured that no pipe line in concrete pumping system is attached to any temporary strut such as scaffolds etc.?				
13.4	Whether it is checked that safety guards around moving parts are provided in concrete mixer/ machines?				
13.5	Whether earthing of electrical mixers, vibrator etc. are provided?				
13.6	Whether entry of unauthorised person in the concreting area is restricted?				
13.7	Whether adequate lighting arrangement is made in the concreting area if working during night?				
13.8	Whether PPEs like gum boots, gloves, helmet with chin strap, goggles and dust masks etc. are being used?				
13.9	For overhead or underground work, whether form work and shuttering have been checked with respect to design?				
13.10	Whether boom placers are properly secured?				
13.11	Others				
14.0	**DEMOLISHING (DEMOLISHING BY BLAST NOT CONSIDERED)**				
14.1	Whether an initial survey carried out to identify any structural problems and risks associated with flammable substances and substances hazardous to health?				
14.2	Whether sequence of demolition is formulated and approved by competent person after the survey and recorded in a method statement having taken all the various considerations into account and identifying the problems and their solutions?				
14.3	Are non-sparking tools being used, if required?				

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14.4	Is intermittent clearing operation being done to keep the area reasonably tidy and clean?				
14.5	Whether effective barricading has been provided?				
14.6	Whether Electrical and other facilities like water, oil, gas pipelines, etc. have been isolated / protected?				
14.7	Whether required PPEs like helmet with chin strap, goggles, ear plug/muff, hand gloves, safety shoes, dust mask, etc. used?				
14.8	Others				
15.0	**RADIOGRAPHY**				
15.1	Are safety precautions for handling of source as per guidelines of BARC being followed?				
15.2	Is the potency of the source being used within acceptable limits as per the BARC regulations?				
15.3	Is the area being cordoned with proper signs during radiography as per guidelines of BARC?				
15.4	Does proper place exist as per BARC regulations for storage of source / Personnel safety equipment?				
15.5	Does the radiographer have valid certificate of radiography from competent authority (BARC)?				
15.6	Is radiographer using Exposure Meter / Dosi Meter?				
15.7	Whether minimum occupancy of the premises / workplace is being ensured while radiography is in progress?				
15.8	Is permit system being followed?				
15.9	Whether Radiation Safety Officer is				

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	available at site?				
15.10	Others				
16.0	**ADDITIONAL SAFETY PRECAUTION FOR UNITS WITH HYDROCARBONS**				
16.1	Are jobs being carried out with a valid work permit only as per OISD-STD-105 "Work Permit System".				
16.2	Is smoking prohibited in all places containing combustible or flammable materials and "No Smoking" notices prominently displayed?				
16.3	Are only approved type electrical installations and equipment, including portable lamps, being used?				
16.4	Are oily rags, waste, wooden materials and clothes or other substances liable to spontaneous ignition being removed?				
16.5	Are the combustible materials properly shielded in case same cannot be removed from the area?				
16.6	Has welding screens (like metal/ fire retardant cloth/ water curtain) been put up to protect other equipment / facilities/ OWS cement ceiling/ drains in adjoining areas against flying sparks, as may be required?				
16.7	Is Gas-testing being done with the means of a calibrated Gas detection Meter prior to start of Hot work and being done subsequently at regular intervals as per the requirement and recorded?				
16.8	Are regular inspections being done of places where there are fire risks like in the vicinity of heating appliances, electrical installations and conductors, stores of flammable and combustible materials, welding and cutting operations?				
16.9	Are fire-extinguishing equipment being placed at strategic locations and are kept well maintained and inspected at suitable intervals by a competent person?				

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16.10	Are accesses to fire - extinguishing equipment such as hydrants, portable extinguishers and connections for hoses kept clear at all times?				
16.11	Are all supervisors and a sufficient number of workers trained in the use of fire-extinguishing equipment?				
16.12	Are audio means, to give warning in case of fire provided, audible in all parts of the site where persons are liable to work?				
16.13	Is there an effective evacuation plan in place so that all persons are evacuated speedily without panic?				
16.14	Others				
17.0	**EMERGENCY PROCEDURES**				
17.1	Is signaling / siren system effective?				
17.2	Is arrangement for rescuing affected person adequate?				
17.3	Are signs showing emergency exit route installed?				
17.4	Is emergency exit route clear of obstacles?				
17.5	Is communication system adequate?				
17.6	Whether emergency vehicle with driver has been provided to meet any emergency situation?				
17.7	Does any tie-up with hospitals or local doctors exist?				
17.8	Has the assembly point for workers in case of emergency been identified and earmarked?				
17.9	Has training been provided to a few workers for First Aid?				
17.10	Emergency procedure and telephone numbers are known to all and same are prominently displayed at site? (Sample				

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	compliance check)				
17.11	Whether emergency mock drills are being regularly done?				
17.12	Others				
18.0	**WELFARE FACILITIES**				
18.1	Are hygienic conditions prevailing at labour camps?				
18.2	Are First Aid facilities available?				
18.3	Does proper sanitation exist at site office and labour camps?				
18.4	Does any arrangement of medical facilities like tie ups with nearby hospital exist?				
18.5	Is proper drinking water facility available for workmen & staff?				
18.6	Are crèches provided for children (if applicable)?				
18.7	Is any proper place/canteen/restroom provided for eating food and taking rest?				
18.8	Is any place earmarked for storing / keeping clothing?				
18.9	Is adequate washing facility available?				
18.10	Does proper ventilation at working place exist?				
18.11	Others				
19.0	**GENERAL**				
19.1	Are illumination levels at workplace and passages adequate?				
19.2	Is communication system adequate?				
19.3	Are display and caution boards provided at strategic locations?				
19.4	Are road barriers being used for blocking any roads/passage?				

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19.5	Has the structure been adequately secured against storm/high winds during construction/ erection?				
19.6	Are the equipment properly earthed?				
19.7	Are vehicles being checked like brakes, oil, lights etc. on regular basis?				
19.8	Is compressed air being used only for its intended purpose and not for any other purpose?				
19.9	Are only proper clothes and not loose clothes being used while working around machinery?				
19.10	Are nails or other sharp objects being removed or bent?				
19.11	Are machine guards over moving parts of machinery such as coupling, pulley, wheel etc. installed?				
19.12	Whether after maintenance of machinery the guards are securely fitted before putting into operation?				
19.13	Are working platforms / gangways provided with hand rails & toe guards?				
19.14	Are swing platforms provided with chains & secured adequately when not in use?				
19.15	Are the approaches to work sites being maintained & kept clear of obstacles?				
19.16	Whether engines of equipment entering into the operating area have exhaust and muffler system with approved spark arrestor?				
19.17	Whether vehicles/engine driven equipment, electrical equipment and tools used are certified?				
19.18	Whether contractors inform his workers about hazards and safe procedures?				

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19.19	Whether sufficient care is taken so that spark do not go outside working enclosure & falls below?				
19.20	Whether contractor's qualified / trained supervisor is present?				
19.21	Whether all exhausts of engines are provided with approved type of flame arrestors and exhaust is not facing toward the place where the workers are working?				
19.22	Others				

Signature of the Auditor

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SAFETY PRACTICES DURING CONSTRUCTION

Engineers India Ltd

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First Edition, July, 2000



Oil Industry Safety Directorate

Government of India
Ministry of Petroleum & Natural Gas
8th Floor, OIDB Bhavan, Plot No. 2, Sector – 73, Noida – 201301 (U.P.)

Website: www.oisd.gov.in

Tele: 0120-2593800, Fax: 0120-2593802

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SAFETY PRACTICES DURING CONSTRUCTION

Prepared by

COMMITTEE ON
SAFETY PRACTICES DURING CONSTRUCTION

Oil Industry Safety Directorate

Government of India
Ministry of Petroleum & Natural Gas
8th Floor, OIDB Bhavan, Plot No. 2, Sector – 73, Noida – 201301 (U.P.)

Website: www.oisd.gov.in

Tele: 0120-2593800, Fax: 0120-2593802

Preamble

Indian petroleum industry is the energy lifeline of the nation and its continuous performance is essential for sovereignty and prosperity of the country. As the industry essentially deals with inherently inflammable substances throughout its value chain – upstream, midstream and downstream – Safety is of paramount importance to this industry as only safe performance at all times can ensure optimum ROI of these national assets and resources including sustainability.

While statutory organizations were in place all along to oversee safety aspects of Indian petroleum industry, Oil Industry Safety Directorate (OISD) was set up in 1986 Ministry of Petroleum and Natural Gas, Government of India as a knowledge centre for formulation of constantly updated world-scale standards for design, layout and operation of various equipment, facility and activities involved in this industry. Moreover, OISD was also given responsibility of monitoring implementation status of these standards through safety audits.

In more than 25 years of its existence, OISD has developed a rigorous, multi-layer, iterative and participative process of development of standards – starting with research by in-house experts and iterating through seeking & validating inputs from all stake-holders – operators, designers, national level knowledge authorities and public at large – with a feedback loop of constant updation based on ground level experience obtained through audits, incident analysis and environment scanning.

The participative process followed in standard formulation has resulted in excellent level of compliance by the industry culminating in a safer environment in the industry. OISD – except in the Upstream Petroleum Sector – is still a regulatory (and not a statutory) body but that has not affected implementation of the OISD standards. It also goes to prove the old adage that self-regulation is the best regulation. The quality and relevance of OISD standards had been further endorsed by their adoption in various statutory rules of the land.

Petroleum industry in India is significantly globalized at present in terms of technology content requiring its operation to keep pace with the relevant world scale standards & practices. This matches the OISD philosophy of continuous improvement keeping pace with the global developments in its target environment. To this end, OISD keeps track of changes through participation as member in large number of International and national level Knowledge Organizations – both in the field of standard development and implementation & monitoring in addition to updation of internal knowledge base through continuous research and application surveillance, thereby ensuring that this OISD Standard, along with all other extant ones, remains relevant, updated and effective on a real time basis in the applicable areas.

Together we strive to achieve NIL incidents in the entire Hydrocarbon Value Chain. This, besides other issues, calls for total engagement from all levels of the stake holder organizations, which we, at OISD, fervently look forward to.

Jai Hind!!!

Executive Director
Oil Industry Safety Directorate

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FOREWORD

At the time of development of this document, 113 OISD standards, recommended practices and guidelines are applicable to the Oil and Gas installations of Public sector Oil Companies in India. 11 of these standards have been adopted by Petroleum and Explosives Safety Organisation (PESO) in various rules administered by them and thus the provisions of these standards are mandatory for entire Oil & Gas sector to that extent.

A few serious accidents have occurred in the recent past in India and abroad including vapour cloud explosion and fire at Oil terminal near Jaipur emphasised the need for the industry to review the existing provisions of various guidelines and statutory requirements.

With the above in view the Government of India directed the Oil Industry Safety directorate to develop a comprehensive document covering all the facets of Safety in Design, Operation and Maintenance, of depots and terminals being run by marketing divisions of Oil companies with an objective to strengthen the existing system.

The present guideline on "Safety Practices During Construction" has been prepared by the functional committee based on, existing standards, guidelines & recommended practices of OISD, the recommendations arising out of recent major accidents and their analysis, the accumulated knowledge and experience of industry members in India and updation of National and International codes and practices.

The provisions of this document, if implemented objectively, may go a long way in enhancing overall safety standard and reduce accidents in Oil Installations.

Users are cautioned that no standard can be substitute to the "judgment and experience of Engineers"

This document will be reviewed periodically for improvements based on the new experiences and better understanding. Suggestions are also invited from the users after it is put into practice to improve the document further. Suggestions may be addressed to:

The Co-ordinator
Committee on "Safety Practices during Construction"

Oil Industry Safety Directorate

Government of India
Ministry of Petroleum & Natural Gas
8th Floor, OIDB Bhavan, Plot No. 2, Sector – 73, Noida – 201301 (U.P.)

Website: www.oisd.gov.in

Tele: 0120-2593800, Fax: 0120-2593802

This document in no way supersedes the statutory regulations of Chief Controller of Explosives (CCE), Factory Inspectorate or any other statutory body, which must be followed as applicable.

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Though every effort has been made to assure the accuracy and reliability of the data contained in these documents, OISD hereby expressly disclaims any liability or responsibility for loss or damage resulting from their use.

These documents are intended to supplement rather than replace the prevailing statutory requirements.

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SECOND FUNCTIONAL COMMITTEE ON CONTRACTOR SAFETY

LIST OF MEMBERS

Name	Organization	Status
S/Shri		
A K Gupta	DGM (HSE), IOCL	Leader
Dharmvir	Addl. Director, OISD	Member Coordinator
Ashok Dashputre	Vice President, RIL	Member
P K Agarwal	CM (HSE), IOCL	Member
D Jana	AGM-Construction, EIL	Member
Udoay Payyadi	Sr. Manager-Maintenance, HPCL	Member
Vijay Mohan	Addl. Director, CHT	Member
B K Rabha	Dy. CE(Instrumentation), OIL	Member
Sankar Raman V	CM-E&C, BPCL - Kochi Refineries Ltd.	Member
Yogesh J Nakhare	Manager-F&S, HPCL.	Member
Pushp Khetarpal	Sr. Vice President (O&M), Petronet LNG	Member
Upinder Kumar	Petronet LNG	Member
A K Arora	Addl. Director, OISD	Member

In addition to the above, several other experts from Industry contributed in the preparation, review and finalisation of this Guideline.

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FIRST FUNCTIONAL COMMITTEE ON SAFETY PRACTICES DURING CONSTRUCTION

	NAME	ORGANISATION
LEADER		
	Shri A.K. Tandon	EIL, New Delhi.
MEMBERS		
1.	Shri U.M. Rao	GAIL, Noida.
2.	Shri K.N. Ravindran	CRL, Cochin
3.	Shri P.K. Anand	ONGC, Mumbai.
4.	Shri H.N. Das	ONGCL, Nazaria.
5.	Shri Jagnandan Tyagi	IOC(PL) Nodia.
6.	Shri M.C Lohar	IBP Co. Ltd., Calcutta.
7.	Shri J.C. Agrawal	IOC, Mktg, New Delhi.
8.	Shri S.M. Ghotavadekar	HPCL, Mumbai.
9.	Shri Sanjoy Ghose	BPCL, Mumbai.
10.	Shri H. C Jha “Hari”	IOC-Panipat Refinery.
11.	Shri Suhas Kate	HPCL, Visakh.
Member-Coordinator		
	Shri A.K. Ranjan	OISD, New Delhi

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SAFETY PRACTICES DURING CONSTRUCTION

1.0 INTRODUCTION

Safety in Construction Management deserves utmost attention especially in the hydrocarbon industry, such as Exploration, Refineries, Pipelines and Marketing installations, Gas Processing units etc. Construction is widely recognised as one of the accident prone activities. Most of the accidents are caused by inadequate planning, failure during the construction process and/or because of design deficiencies. Besides property loss, accidents also result in injuries and fatalities to the personnel, damage to environment which needs to be prevented.

The reasons for accidents during construction activities are related to unique nature of the industry, human behaviour, difficult work-site conditions, extended odd duty hours, lack of training & awareness and inadequate safety management. Unsafe working methods, lack of proper JSA (Job Safety Analysis) and use of improper / inadequate PPEs, equipment failure and improper housekeeping also tend to increase the accident rate in construction.

Ensuring good quality of materials, equipment and competent supervision along with compliance of standard engineering practices shall go a long way to in built safety into the system.

The objective of this document is to provide practical guidance on technical and educational framework for health, safety and environment in construction with a view to:

(a) prevent accidents and harmful effects on the health of workers arising from employment in construction;
(b) ensure appropriate safety during implementation of construction;
(c) provide safety practice guidelines for appropriate measures of planning, control and enforcement.
(d) protect environment.

2.0 SCOPE

This document specifies broad guidelines on HEALTH, SAFETY AND ENVIRONMENT practices to be adhered to during construction activities including green field projects in oil industry. However, before commencing any job, specific hazards and its effects should be assessed and necessary corrective/preventive actions should be taken by all concerned. The document is intended only to supplement and not to replace or supersede the prevailing statutory requirements, which shall also be followed as applicable. For Personal Protective Equipment, OISD-STD-155 (Part I&II) shall be referred to. The scope of this document does not include the design aspects and quality checks during construction.

3.0 DEFINITIONS

Definitions of various terminology are given below:

- **Adequate, appropriate or suitable** are used to describe qualitatively or quantitatively the means or method used to protect the men, machinery, material, property and enviroment.

- **By hand:** The work is done without the help of a mechanised tool.

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- **Competent Authority:** A stautory agency having the power to issue regulations, orders or other instructions having the force of law.

- **Competent person:** A person possessing adequate qualifications, such as suitable training and sufficient knowledge, experience and skill for the safe performance of the specific work. The competent authorities may define appropriate criteria for the designation of such persons and may determine the duties to be assigned to them.

- **Construction site:**

  A worksite involving new construction, modification or maintenance of existing facility, shutdown related activity, demolition, housekeeping etc.

- **Environment:**

  Environment includes water, air and land and the interrelationship which exists among and between water, air and land and human beings, other living creatures, plants, microorganisms and property.

- **Execution agency:**

  Any entity / person, having contractual obligation with the owner and who employs one or more workers on a construction site.

- **Hazard:** A condition or a set of conditions which has potential of causing injury to person, damage to property or environment.
- **Health:** Soundness of body covering Physical, Emotional, Psychological and Intellectual conditions of a worker which assists the attainment of the objectives.
- **Means of access or egress:** Passageways, corridors, stairs, platforms, ladders and any other means for entering or leaving the workplace or for escaping in case of danger.

- **Owner:** Any entity / person for whom construction job is carried out.

  It shall also include owner's designated representative/ consultant/ nominee/ agent, authorised from time to time to act for and on its behalf for supervising/ coordinating the activities of the execution agency.

- **Scaffold:** Any fixed, suspended or mobile temporary structure supporting workers and material or to gain access to any such structure and which is not a lifting appliance.
- **Safety :** Prevention & protection from exposure to Hazard.

- **Worker:** Any person engaged in construction activity.

- **Workplace:** Owner's designated premises where workers need to be present by virtue of their involvement in the construction activity**.**

4.0 GENERAL DUTIES

4.1 GENERAL DUTIES OF EXECUTION AGENCIES

4.1.1 Execution agency should:

i) provide means and organisation to comply with the Health, safety and environment protection measures required at the workplace.

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ii) provide and maintain workplaces, plant, equipment, tools and machinery and organise construction work so that, there is no risk of accident or injury to health of workers. In particular, construction work should be planned, prepared and undertaken so that:

(a) dangers liable to arise at the workplace, are prevented;
(b) excessively or unnecessarily strenuous work positions and movements are avoided;

- organisation of work takes into account the safety and health of workers and also environment protection;
- materials and products used are suitable from Health safety and environment protection point of view;

(c) working methods are adopted to safeguard workers against the harmful effects of chemical, physical and biological agents.

iii) establish committees with representatives of workers and management or make other arrangement for the participation of workers in ensuring safe working conditions.

iv) arrange for periodic safety inspections by competent persons of all buildings, plant, equipment, tools, machinery, workplaces and review of systems of work, regulations, standards or codes of practice. The competent person should examine and ascertain the safety of construction machinery and equipment.

v) provide such supervision to ensure that workers perform their work with due regard to safety and health of theirs as well as that of others.

vi) employ only those workers who are qualified, trained and suited by their age, physique, state of health and skill.

vii) satisfy themselves that all workers are informed and instructed in the hazards connected with their work and environment and trained in the precautions necessary to avoid accidents and injury to health.

viii) ensure that buildings, plant, equipment, tools, machinery or workplaces in which a dangerous defect has been found should not be used until the defect has been rectified.

ix) organise for and remain always prepared to take immediate steps to stop the operation and evacuate workers as appropriate, where there is an imminent danger to the safety of workers.

x) establish a checking system by which it can be ascertained that all the members of a shift, including operators of mobile equipment, have returned to the camp or base at the close of work on dispersed sites and where small groups of workers operate in isolation.

- provide appropriate first aid, training and welfare facilities to workers as per various statutes like the Factories Act 1948, Building & Construction Workers Regulation (BOCWR), etc. and, whenever collective measures are not feasible or are insufficient, provide and maintain personal protective equipment and clothing in line with the requirement as per OISD-STD-155 (Part I & II) on Personnel Protective

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Equipment. They should also provide access to workers to occupational health services.

- educate workers about their right and the duty at any workplace to participate in ensuring safe working conditions to the extent of their control over the equipment and methods of work and to express views on working procedures adopted as may affect health, safety and environment.

xi) ensure that except in an emergency, workers unless duly authorised, should not interfere with, remove, alter or displace any safety device or other appliance furnished for their protection or the protection of others, or interfere with any method or process adopted with a view to avoiding accidents and injury to health.

xii) ensure that workers do not operate or interfere with plant and equipment that they have not been duly authorised to operate, maintain or use.

xiii) ensure that workers do not sleep, rest or cook etc in dangerous places such as scaffolds, railway tracks, garages, confined spaces or in the vicinity of fires, dangerous or toxic substances, machines or vehicles and heavy equipment etc.

xiv) obtain the necessary clearance/permits as required and specified by owner.

Arrangement for drinking water, toilet facilities, a creche and transport arrangement etc. to be provided as per statutory requirement.

xv) deploy a safety officer at site as per the requirement of Factory Act 1948/ Building & Construction Workers Regulation (BOCWR)/ Criticality of the job.

xvi) ensure that all employees/workmen undergo medical examination as required under the law or under the contract provision and keep a record of the same.

xvii) obtain the police verification of the workers/ supervisors arranged by him and the same is to be submitted to the owner.

xviii) not permit any employee/workmen/visitor to enter the work area under the influence of alcohol or any drugs.

4.2 GENERAL DUTIES OF OWNERS

4.2.1 Owners should:

i) co-ordinate or nominate a competent person to co-ordinate all activities relating to HEALTH, SAFETY AND ENVIRONMENT on their construction projects;

ii) inform all contractors on the work site / project of special risks to HEALTH, SAFETY AND ENVIRONMENT;

iii) ensure that executing agency is aware of the owner's requirements and the executing agency's responsibilities with respect to HEALTH, SAFETY AND ENVIRONMENT practices before starting the job.

5.0 SAFETY PRACTICES AT WORK PLACES

5.1. GENERAL PROVISIONS

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5.1.1 All openings and other areas likely to pose danger to workers should be clearly indicated and accident prevention measures taken as required. The working area should be clearly de-marketed to keep the workers in that area only.

5.1.2 Workers & Supervisors should use the safety helmet and other requisite Personal Protective Equipment according to job & site requirement as per OISD-STD-155 (Part I & II). They should be trained to use personal protective equipment including their limitations.

5.1.3 Never use solvents, alkalis and other oils to clean the skin.

5.1.4 Lift the load with back straight and knees bent. The contractor shall ensure at his construction site, no worker lifts by hand or carries overhead or over his back or shoulders any material, article, tool or pipelines exceeding in weight as per The Factory Act 1948 / Rule 38 of Building & Construction Workers Regulation (BOCWR), unless aided by another worker or device.

5.1.5 Ensure the usage of correct and tested tools and tackles. Don't allow the make shift tools and tackles. Also the tools should be suitable for a particular job and rated accordingly.

5.1.6 No loose clothing should be allowed while at construction site.

5.1.7 Start work only after proper authorization viz Work permit etc.

5.1.8 Job safety analysis to be done for all critical works.

5.1.9 Hydra should not be used for transportation of hook loaded materials.

5.1.10 Rope ladders should not be used at construction sites.

5.2 MEANS OF ACCESS AND EGRESS

Adequate and safe means of access (atleast two, differently located) to and egress from all workplaces should be provided. Same should be displayed and maintained. Escape routes should be marked prominently in workers friendly language. The escape routes should not be blocked at any point of time and same to be made understand to the workers.

5.3 HOUSEKEEPING

5.3.1 General Housekeeping shall be carried out by the contractor and he will ensure;

i) proper storage of materials and equipment;

ii) removal of scrap, inflammable material, waste and debris at appropriate intervals including slippery materials. (construction sand on road, oil/ lubricants, resins, etc.).

iii) to provide containers for segregation of disposal of debris at required places and regular cleaning of the same.

5.3.2 Removal of loose materials, which are not required for use, to be ensured. Accumulation of these at the site can obstruct means of access to and egress from workplaces and passageways.

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5.3.3 Workplaces and passageways, that are slippery owing to oil, grease or other causes, should be cleaned up or strewn with sand, sawdust, ash etc.

5.3.4 All surplus earth and debris are removed/disposed off from the working areas to officially designated dumpsites. The debris like plastics, packing material, rubber items should not be allowed to burn. Trucks carrying sand, earth and any pulverized materials etc. in order to avoid dust or odour impact, shall be covered while moving.

5.4 PRECAUTIONS AGAINST THE FALL OF MATERIALS & PERSONS AND COLLAPSE OF STRUCTURES

5.4.1 Precautions should be taken such as the provision of fencing, look-out men or barriers to protect any person against injury by the fall of materials, or tools or equipment being raised or lowered.

5.4.2 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.

5.4.3 All openings through which workers are liable to fall should be kept effectively covered or fenced and displayed prominently.

5.4.4 SOP of crane operation should be adhered to. The crane jacks/legs should be parked on compacted surface to avoid tilting.

5.5 PREVENTION OF UNAUTHORISED ENTRY

5.5.1 Construction sites located in built-up areas and alongside vehicular and pedestrian traffic routes should be fenced to prevent the entry of unauthorised persons.

5.5.2 Visitors should not be allowed access to site(s) unless accompanied by or authorised by a competent person. All authorized visitors should report at the site office. Contractor shall provide visitor's helmet (helmet with visitor sticker) and other PPEs like Safety Shoe, reflective jacket, respiratory protection etc. as per requirement of the site. All the workers to have photo IDs including the staff of vehicles used in the job.

5.6 FIRE PREVENTION AND FIRE FIGHTING

5.6.1 All necessary measures should be taken by the executing agency and owner to:

i) avoid the risk of fire;
ii) control quickly and efficiently any outbreak of fire;
iii) bring out a quick and safe evacuation of persons.
iv) Inform unit/fire station control room, where construction work is carried out within existing operating area.
v) DMP should be in place for the same.

5.6.2 Combustible materials such as packing materials, sawdust, greasy/oily waste and scrap wood or plastics should not be allowed to accumulate in workplaces but should be kept in closed metal containers in a safe place. To be disposed periodically away from site at designated place and assigned manner.

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5.6.3 Places where workers are employed on works prone to danger of fire should be provided with:

i) suitable and sufficient fire-extinguishing equipment, which should be easily visible and accessible;
ii) an adequate water supply at sufficient pressure meeting the requirements of various OISD standards.
iii) required PPEs.

5.6.4 To guard against danger at places having combustible material, workers should be trained in the action to be taken in the event of fire, including the use of means of escape.

5.6.5 At sites having combustible material, suitable visual sign boards should be provided to indicate clearly the direction of escape in case of fire.

5.6.6 Means of escape should be kept clear at all times. Escape routes should be frequently inspected and if possible marked in fluorescent colours particularly in high structures and where access is restricted.

5.7 LIGHTING

5.7.1 Where natural lighting is not adequate, working light fittings or portable hand-lamps should be provided at workplace on the construction site where a worker will do a job.

5.7.2 Emergency lighting should be provided for personnel safety during night time to facilitate standby lighting source, if normal system fails.

5.7.2 Artificial lighting should not produce glare or disturbing shadows.

5.7.3 Lamps should be protected by guards against accidental breakage.

5.7.4 The cables of portable electrical lighting equipment should be of adequate size & characteristics for the power requirements and of adequate mechanical strength to withstand severe conditions in construction operations.

5.7.5 For temporary lighting connection, mostly neutral and phases are connected and insulation tapes are provided. It is better to stagger the neutral and phase connection so that even if the tape gets removed from the joints, there will be no short circuit/ spark between neutral and phase due to staggering of neutral and phase.

5.7.6 All the temporary lighting/ machine connections are to be provided from a three core cable for better safety.

5.8 PLANT, MACHINERY, EQUIPMENT AND HAND TOOLS

5.8.1 General Provisions

i) Plant, machinery and equipment including hand tools, both manual and power driven, should:
   a) be of proper design and construction, taking into account health, Safety and ergonomic principles.
   b) be maintained in good working order;
   c) be used only for work for which they have been designed.
   d) be operated only by workers who have been authorised and given appropriate training.

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e) be provided with protective guards, shields or other devices as required.

ii) Adequate instructions for safe use should be provided.

iii) Standard operating procedures should be established and used for all plant, machinery and equipment.

iv) Operators of plant, machinery and equipment should not be distracted while work is in progress.

v) Plant, machinery and equipment should be switched off when not in use and isolated before any adjustment, clearing or maintenance is done.

vi) Where trailing cables or hose pipes are used they should be kept as short as practicable and not allowed to create a hazard.

vii) All moving parts of machinery and equipment should be enclosed or adequately guarded.

viii) Every power-driven machine and equipment should be provided with adequate means, immediately accessible and readily identifiable to the operator, of stopping it quickly and preventing it from being started again inadvertently.

ix) Operators of plant, machinery, equipment and tools should be provided with PPEs, including where necessary, suitable ear protection.

5.8.2 Hand tools

i) Hand tools should be repaired by competent persons.

ii) Heads of hammers and other shock tools should be dressed or ground to a suitable radius on the edge as soon as they begin to mushroom or crack.

iii) When not in use and while being carried or transported, sharp tools should be kept in sheaths, shields, chests or other suitable containers.

iv) Only insulated or non-conducting tools should be used on or near live electrical installations.

v) Only non-sparking tools should be used near or in the presence of flammable or explosive dusts or vapours.

5.8.3 Pneumatic Tools

i) Operating triggers on portable pneumatic tools should be:
   a) so placed as to minimise the risk of accidental starting of the machine.
   b) so arranged as to close the air inlet valve automatically when the pressure of the operator's hand is removed.

ii) Hose and hose connections for compressed air supply to portable pneumatic tools should be:

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a) designed and tested for the pressure and service for which they are intended;
b) fastened securely on the pipe outlet and equipped with the safety chain, as appropriate.

iii) Pneumatic shock tools should be equipped with safety clips or retainers to prevent dies and tools from being accidentally expelled from the barrel.

iv) Pneumatic tools should be disconnected from power and the pressure in hose lines released before any adjustment or repair is made.

5.8.4 Electrical Tools

i) Low voltage portable electrical tools should generally be used.

ii) All electrical tools should be earthed, unless they are "all insulated" or "double insulated" tools which do not require earthing.

iii) All electrical tools should get inspected and maintained on a regular basis by a competent electrician and complete records kept.

iv) No temporary connected appliance shoud be left connected in the socket. Its plug should be immediately removed after use.

5.8.5 Engines

i) Engines should:

a) be installed so that they can be started safely and the maximum safe speed cannot be exceeded.
b) have controls for limiting speed.
c) have devices to stop them from a safe place in an emergency.
d) have their batteries top covered with insulating material.
e) have radiator fan covers in place.

ii) IC engines should not be run in confined spaces unless adequate exhaust ventilation is provided or the exhaust should be installed outside the confined place at suitable height.

iii) When IC engines are being fuelled:

a) the engine should be shut off.
b) care should be taken to avoid spilling fuel.
c) no person should smoke or have an naked light in the vicinity.
d) a fire extinguisher should be kept readily available.

iv) Secondary fuel reservoir should be placed outside the engine room.

6.0 CONSTRUCTION ACTIVITIES

The various common activities in construction are as under:

- Excavation
- Scaffolding, Platforms & Ladders
- Structural Work, Laying of Reinforcement & Concreting
- Road Work (Laying of roads)
- Cutting /Welding
- Working in Confined Space

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- Proof/Pressure Testing
- Working at Heights
- Handling & Lifting Equipment
- Vehicle Movement
- Electrical
- Offshore
- Demolition
- Radiography
- Shot blasting/ spray painting
- Work above water

Work permit system as per requirement of OISD-STD-105 shall be followed for various construction activities. As regards the activities at work places including grass root project sites if not covered under OISD-STD-105, owner shall develop a suitable methodology for execution of various construction activities under work permit system for safe execution of the works.

The safe practices to be followed during the implementation of above construction activities are given below:

6.1 EXCAVATION

6.1.1 All excavation work should be planned and the method of excavation and the type of support work required should be decided considering the following:

i) the stability of the ground including the chances of seepage of water;
ii) the excavation will not affect adjoining buildings, structures or roadways;
iii) to prevent hazard, the Hydrocarbon lines, water, electrical and other above ground & underground public utilities should be shut off, re-routed or disconnected, if necessary; If such a presence is envisaged, clearance to be taken from respective competent authority/ person.
iv) the position of culvert/bridges, temporary roads and spoil heaps should be determined;
v) a signed rough sketch of the excavation site to be prepared and made the workers understand

6.1.2 Before digging begins on site, all excavation work should be planned and the method of excavation and the type of support work required should be decided based on good engineering practices and recorded.

6.1.3 All excavation work should be supervised by a competent person.

6.1.4 Sites of excavations should be thoroughly inspected:

i) daily, prior to each shift and after interruption in work of more than one day;
ii) after every blasting operation;
iii) after an unexpected fall of ground;
iv) after substantial damage to supports;
v) after a heavy rain, frost or snow;
vi) when boulder formations are encountered.
vii) for cracks in the nearby buildings or area as the excavation progresses and the same to be reviewed.

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6.1.5 Safe angle of repose while excavating trenches exceeding 1.5m depth upto 3.0m should be maintained. Based on site conditions, provide proper slope, usually 45^0,and suitable bench of 0.5m width at every 1.5m depth of excavation in all soils except hard rock or provide proper shoring and strutting to prevent cave-in or slides.

6.1.6 As far as possible, excavated earth should not be placed within one meter of the edge of the trench or depth of trench whichever is greater.

6.1.7 Don't allow vehicles to operate too close to excavated area. Maintain atleast 2m distance from edge of excavation or depth of trench whichever is greater. No load, plant or equipment should be placed or moved near the edge of any excavation where it is likely to cause its collapse and thereby endanger any person unless precautions such as the provision of shoring or piling are taken to prevent the sides from collapsing.

6.1.8 Adequately anchored stop blocks and barriers should be provided to prevent vehicles being driven into the excavation. Heavy vehicles should not be allowed near the excavation unless the support work has been specially designed to permit it.

6.1.9 If an excavation is likely to affect the stability of a structure on which persons are working, precautions should be taken to protect the structure from collapse.

6.1.10 Barricade at 1m height (with red & white band/self glowing caution board) should be provided for excavations beyond 1.0 m depth. Provide two entries/exits for such excavation through proper means. Lighting arrangements to be made to avoid any accidental fall in the excavated portion even when work is not in progress.

6.1.11 Necessary precautions should be taken for underground utility lines like cables, sewers etc. and necessary approvals/clearances from the concerned authorities shall be obtained before commencement of the excavation job.

6.1.12 Water shall be pumped/ bailed out, if any accumulates in the trench. Necessary precautions should be taken to prevent entry of surface water in trenches.

6.1.13 During / after rains, the soil becomes loose. Take additional precaution against collapse of side wall. During rains excavation should be avoided.

6.1.14 In hazardous areas, air should be tested to ascertain its quality. No one should be allowed entry till it is suitable for breathing.

6.1.15 In case of mechanised excavation, precaution shall be taken to not to allow anybody to come within one meter of extreme reach of the mechanical shovel. This area of reach of mechanical shovel should be marked / barricaded suitably. The mechanised excavator shall be operated by a well-trained experienced operator. When not in operation, the machine shall be kept on firm leveled ground with mechanical shovel resting on ground. Wheel or belt shall be suitably jammed to prevent any accidental movement of the machine. Suitable precautions as per manufacturer guidelines should be taken for dozers, graders and other heavy machines.

6.1.16 In case of blasting, follow strictly IS:4081-1986 & Indian Explosive Act and rules for storage, handling and carrying of explosive materials and execution of blasting operation.

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6.2 SCAFFOLDING, PLATFORMS & LADDERS

System of tagging shall be followed to indicate status of `Fit-for-Purpose' certification by a competent person for the scaffoldings. Green Tag shall indicate `Fit-for-Purpose' whereas Red Tag shall indicate `Unfit-for-purpose'. Accordingly only Red Tag shall be displayed during Erection & Dismantling.

All personnel engaged in erecting, using, dismantling scaffolds shall use full body safety harness with double lanyard with shock absorber connected with personal fall arrestor which should be secured to a properly designed anchor.

6.2.1 Scaffold related guidelines

General Requirements

Categories and Classification

Most scaffolds fall into one of the four primary categories:

- Tube and coupler scaffold
- System scaffolds e.g. Cup lock, Ring lock, H frame scaffold
- Suspension(or Suspended) scaffold
- Mobile scaffold
- Special scaffold

Scaffolds are classified according to their intended use as:

- Light duty
- Medium duty (General Purpose)
- Heavy duty

Type of Scaffolding	Load duty	Light		Medium	Heavy/Special		
	Maximum Safe load in Kg/m^2	75	150	225	300	450	600
Tubular with clamps	Max. bay length (distance between two verticals) in Meter	2.7	2.2	1.8	1.4	1.0	0.8
Cup / Ring lock		2.5	2.0	1.5	1.25	1.0	NA

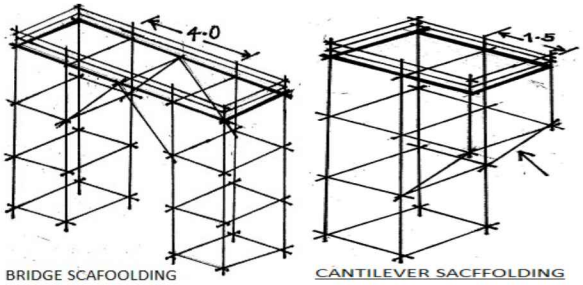
Conditions where special scaffolding procedure is required:

1. Height of the scaffolding is more than 30 meters.

2. Scaffolding is special in nature/ type: cantilever more than 1 .5 meters, bridge more than 4 meters, scaffolding for machine/ equipment maintenance requiring frequent modifications, offshore scaffold, hanging scaffold; wooden scaffold (for specific use e.g. cooling tower), etc.

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For all such cases, but not limited to, in addition to checklist, a plant specific procedure cum checklist based on additional risk is to be prepared & validated by a competent person (example: procedure for erection/ dismantling shall be prepared and followed. If need felt, help from Engineering Cell/Third Party may be taken for checking proposed scaffold in respect of design and load carrying capacity etc.).

Specifications of Scaffolds

Applicable to all Scaffolds

1. All elevated structures/ working platform areas should be guarded on all sides.

2. Railings and toe boards should be provided on the platform.

3. Scaffolds shall be designed to support at least 4 times the anticipated weight of Men, material and wind force.

4. Make certain that all scaffolds are in plumb and level at all times.

5. Scaffolds shall be secured from tipping when the scaffold height exceeds four times its minimum base dimension.

6. Scaffolds must be constructed at least **3** planks wide unless location makes this physically impossible.

7. Landing platform should be provided at every 9 meter of height or less.

8. The members of scaffolds should extend at least 6" on either ends but not more than 12". They should be fastened on both ends and laid tight by clamps.

9. All scaffoldings having height to base ratio more than 4 shall be secured firmly with permanent structure in X and Y direction at least every 6 meters.

10. Scaffold which spread to 20 meter or more should have two accesses preferably opposite side.

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11. Plastic Checklist holder with red marked to be used as a “Not Fit-for-Purpose” warning signboard and Green colour combined checklist to be used as “Fit-for-Purpose” signboard.

12. Keep distance of at least 150mm between high temp Pipelines or equipment and scaffolding.

13. Safe distance from overhead electrical lines to be maintained as per Site electrical safety procedures.

Applicable to Tube-and-coupler scaffold

1. Tube and coupler scaffolds over 30 meter in height must be Designed by a competent professional engineer (who by extensive knowledge, training, and experience have successfully demonstrated his ability to carry out scaffold design and load calculations).
2. Maximum height of first horizontal member (Ledger) of scaffolds from the Ground shall be 2.2 meters. Lower lift can be considered for heavy loads depending upon the scaffold design. When scaffold is more than 6 meter height for carrying heavy load, kicker lift should be provided at a height of 150mm from ground.

3. The top rail shall be at height of 900-1200 mm and Mid rails must be installed approximately halfway between the top rail and the platform surface. Toe boards (150mm) should be securely attached to the working platform. Toe boards are generally applicable to working platform and not for landing platforms.

4. The bay length & width depends on the height and the load to be carried by the scaffold.

5. Bracings shall be fitted up to full height of scaffold.

6. Standards should be joined having overlap of min 600 mm using three equally spaced swivel clamps or end to end using sleeve/pin type coupler.

7. Ledgers should be joined having overlap of min 600 mm using three equally spaced swivel clamps or end to end using sleeve coupler.

8. Base plate 150 x 150 x 6mm shall be used to support all vertical pipes of Scaffolds.

9. Sole plate shall be used at all unpaved area to support base late.

10. Scaffolding platform Grating shall be tied with clamp at both ends, and scaffolding platform Grating shall not overhang more than 150 mm and shall be at least 150 mm away from hot surface.

11. Every scaffold shall be provided with certified ladder and extending its free end shall be above platform by 1000 mm/ four rungs.

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Applicable to Mobile scaffolds

1. Attach castors with plain stems to the panel or adjustment screw by pins or other suitable means.
2. Apply castor brakes/lock at all times when scaffolding is not being moved.
3. Do not ride rolling scaffoldings.
4. Remove all material and equipment from platform before moving scaffolding.
5. Do not try to move rolling scaffolding without sufficient help. Watch out for holes protrusions in the floor and for overhead obstructions.
6. Do not use brackets on rolling scaffoldings without first considering the overturning effect.

Design Criteria

- All types of scaffolds shall be strong enough of carrying and transmitting all types of loads to the ground. All scaffolds shall be adequately secured, stiffened, both longitudinally and transversely.
- Scaffolding determines as per the requirement and use of scaffold such as:
    - Purpose of scaffolding
    - Loading on scaffold platform
    - Required height
    - Sufficient work place
    - Surrounding environment

Storage and inspection of materials

- All scaffolding material shall be stored at designated location to protect them from adverse environment conditions such as corrosion, weather.
- Storage racks/ Locations/ areas shall be clearly identified.
- Storage facility of scaffold material shall be properly constructed for its stability and load bearing capability.
- Steel pipes and scaffolding platform Grating shall be stacked horizontally according to length. Fittings, Couplers shall be stored in separate bins.

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- Defective material shall be removed from site.
- Scaffolding material such as tubular, planks, clamps etc. shall be inspected annually for contractor owned material by contractor. The visual inspection shall cover 100% scaffold materials.

Transportation and handling of scaffolding material

- Make sure that scaffold pipe shifting done in vehicle of appropriate length.
- Special safety care to be taken while shifting or lifting pipes manually.
- Rope and pulley should be used to lift pipe from height.

Safety requirements

A risk assessment to access scaffold hazards through inspection and work method statement for relevant work activities shall be made before erecting, dismantling, moving, or modifying scaffold. Examples of hazards to be considered include the following:

- Working at/from heights.
- The presence of nearby electrical lines or process equipment (e.g. hot line, vents, drains, etc.). Necessary safety distances shall be maintained as specified in site level electrical safety procedure.
- Possible emergency scenario, escape routes and responses.
- The condition and loading of working surfaces /platform /scaffold pipes and other components or loose material such as clamps/ bolts on the working platforms.
- The presence and activity of other people and equipment in the vicinity of the work.
- The weather (Heavy rain, high wind velocity-more than 20 knots, etc).
- Erection during dark hours.
- Scaffold collapse.
- Manual task (Manual Material Handling).
- Access and egress during normal and emergency condition.
- The effect of heavy equipment movement in close vicinity such as within 4 meters to be considered for direct hit and sagging of land in case of unpaved area.

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This assessment is a part of the work permit process but should also be extended to the specific job planning of the crew performing the work. Appropriate actions shall be taken to mitigate the hazards identified during the assessment.

Fall protection when erecting, dismantling, and modifying scaffolds shall be under the direction of a competent person (Scaffold Supervisor). Scaffold erectors (Scaffolder) shall use personal fall-protection systems that provide continuous fall protection while erecting, dismantling or modifying scaffolds unless the determination is made by a competent person that fall protection is not feasible or it creates a greater hazard. Fall protection can be accomplished through the use of adequate anchorages that are independent of the scaffold or by using scaffold systems and components that are approved by the manufacturer as adequate anchorages. Employees/workmen shall use appropriate fall-arrest equipment.

The footing for supported scaffolds shall be sound, rigid, and capable of supporting the maximum intended load, including the weight of the scaffold.

Scaffold platform grating shall be fastened on both ends and laid tight by scaffold clamps/couplers.

Manufacturer's guidelines for proprietary scaffolds (e.g. Cup lock, ring lock, H frame, Insulating modular scaffolds) shall be followed unless a competent person approves the variance and provided the variance complies with applicable regulations and generally accepted scaffold engineering practices.

Proprietary/special scaffold manufacturer's guidelines for erection and inspection should be available with users, and with plant maintenance engineer for reference.

The following safe practices with respect to scaffolds shall be followed:

- There shall be firm foundation for all scaffoldings. All scaffolding shall be made of sound material. Scaffolding material shall be inspected and used, only if found in good condition. Avoid using equipment whose strength is not known.

- Provide adequate Base for scaffolding posts. Metal base plate is used under all upright or standard scaffoldings. Correct type of couplers shall be used for all connections. Use right angle couplers for joining vertical to horizontal members and swivel type couplers for joining bracing with ledgers. For joining vertical load bearing members (standards), "joint pin" type couplers can also be used. The couplers shall be of a structural metal, such as drop-forged steel, malleable iron, or structural grade aluminum (use of gray cast iron is prohibited).

- Plumb and level scaffoldings as erection proceeds, so that braces will fit without forcing. Fasten all braces securely.

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- Where scaffoldings are erected above walkways or work areas, the space between toe board and railing should be screened (e.g. Safety net, Metal sheets).

- Whenever work is being done over men who are working on scaffolding, overhead protection should be provided on the scaffolding.

- Restrain free-standing scaffolding towers from tipping by guying or other means.

- A safe and convenient means of access shall be provided to the platform level. Means of access may be a portable ladder, fixed ladder, ramp or runway or stairway. The ladder shall be so installed that there supporting member (pipe) is just below ladder rung. This is to avoid tripping hazard, especially while using the ladder.

- During erection, the ladder shall be installed as early as practicable, but not later than first two horizontal members (Ledgers). This is to facilitate Scaffolder while erecting the scaffold.

- During erection/ dismantling, scaffolder shall use 'T' steps to minimize risk of accidental fall/ slip.

- Ladder should be provided with tie rods/studs at top and bottom rungs and secured to scaffolding with ladder clamps, at least 2 locations for a ladder of length up to 4 m & at 3 locations for more than 4 m long ladder.

- The horizontal member/ ledger on which ladder is to be fixed, must be clamped to two subsequent standard using fixed clamps.

- Do not cantilever or extend putlogs / trusses as side brackets, without thoroughly considering the loads to be applied.

- Do not climb scaffold using cross braces.

- Do not use ladders or makeshift devices on top of scaffoldings to increase the height.

- Have at least 12" overlap and 6" extension beyond centerline of support or cleat at both ends to prevent sliding.

- Do not allow unsupported ends of planking to extend an unsafe distance beyond supports.

- Planks shall be non-greasy and free from defects.

- Access to working platform shall be suitably protected against inadvertent fall by providing swing members/ swing gate or chains.

- When scaffolding is no longer required, request for dismantling of scaffold shall be sent to scaffolding supervisor through work permit.

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- Scaffold shall be removed from top bracings. Ties, rackers etc. should not be removed from section lower than the one which is being dismantled.
- Do not throw or allow falling to ground any scaffold member, board or fittings.
- Dismantled scaffold material shall be neatly stacked, away from the site until whole of scaffold has been dismantled.

6.2.2 Metal as material of construction

i) A scaffold should be provided and maintained or other equally safe and suitable provision should be made where work cannot safely be done on or from the ground or from part of a building or other permanent structure.

ii) Scaffolds should be provided with safe means of access, such as stairs, ladders or ramps. Ladders should be secured against inadvertent movement.

iii) Every scaffold should be constructed, erected, properly secured/ tied and maintained so as to prevent collapse or accidental displacement during erection, while in use, in idle state or dismantling.

iv) Every scaffold and part thereof should be constructed :

(a) in such a way so as not to cause hazards for workers during erection and dismantling;
(b) in such a way so as guard rails and other protective devices, platforms, ladders, stairs or ramps can be easily put together;
(c) with sound material and of requisite size and strength for the purpose for which it is to be used and maintained in a proper condition.

v) Boards and planks used for scaffolds should be protected against splitting.

vi) Materials used in the construction of scaffolds should be stored under good conditions and apart from any material unsuitable for scaffolds.

vii) Couplers should not cause deformation in tubes. Couplers should be made of drop forged steel or equivalent material.

viii) Tubes should be free from cracks, splits and excessive corrosion and be straight to the eye, and tube ends cut cleanly square with the tube axis.

ix) Scaffolds should be designed for their maximum load as per relevant codes.

x) Scaffolds should be adequately braced.

xi) Scaffolds which are not designed to be independent should be rigidly connected to the building at designated vertical and horizontal places.

xii) A scaffold should never extend above the highest anchorage to an extent which might endanger its stability and strength.

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xiii) Loose bricks, drainpipes, chimney-pots or other unsuitable material should not be used for the construction or support of any part of a scaffold.

xiv) Scaffolds should be inspected and certified:

(a) before being taken into use;
(b) at periodic intervals thereafter as prescribed for different types of scaffolds;
(c) after any alteration, interruption in use, exposure to weather or seismic conditions or any other occurrence likely to have affected their strength or stability.

xv) Inspection should more particularly ascertain that:

(a) the scaffold is of suitable type and adequate for the job;
(b) materials used in its construction are sound and of sufficient strength;
(c) it is of sound construction and stable;
(d) that the required safeguards are in position.

xvi) A scaffold should not be erected, substantially altered or dismantled except by or under the supervision.

xvii) If out-rigger scaffolding is to be used, it should be specifically designed and inspected before putting in use.

6.2.3 Lifting appliances on scaffolds (CHAIN PULLEY BLOCKS, PULLERS)

i) When a lifting appliance is to be used on a scaffold:

(a) the parts of the scaffold should be carefully inspected to determine the additional strengthening and other safety measures required;
(b) any movement of the scaffold members should be prevented;
(c) if practicable, the uprights should be rigidly connected to a solid part of the building at the place where the lifting appliance is erected.

6.2.4 Prefabricated scaffolds

i) In the case of prefabricated scaffold systems, the instructions provided by the manufacturers or suppliers should be strictly adhered to. Prefabricated scaffolds should have adequate arrangements for fixing bracing.

ii) Frames of different types should not be intermingled in a single scaffold.

iii) Scaffolding shall be erected on firm and level ground. In case of loose or uneven terrain, care should be taken to see that the scaffolding is on firm footing by leveling / compacting or other means.

iv) All members of metal scaffolding shall be checked periodically to screen out defective / rusted members. All joints should be properly lubricated for easy tightening.

v) Entry to scaffolding should be restricted.

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Signature Not Verified
Digitally signed by MD MAZHER ALI
Date: 2026.04.09 19:46:00 IST
Location: eProcure-EPROC

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