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

xi) Safety training needs of their supervisors and workers

xii) Importance & Use of PPE at the site

xiii) General Safety rules at the installation

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 PENALTIES FOR NON-COMPLIANCE

Financial or other type of penalties like seizure of gate passes, stoppage of work for a limited period etc. may 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 may be incorporated to ensure adherence of systems and procedures. A few of the usual non-compliance are as follows:

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

-- Non-usage of the safety belt and life line by the workers while working at height

-- 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.

-- Violation of Safety Permit conditions like Fire fighting equipment

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

-- Working without valid work permit

-- Unauthorised road closure/blockage

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 needs to 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.

TOOLBOX MEETING FORM

SUBJECT :
PRESENTER :
DATE :
TIME : From….. To…..
CONTENT IN BRIEF :

Participant's Name	Signature
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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:

i) Review compliance of pending items of last Safety meetings.

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.

6.0 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

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
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
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, may 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
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.

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?				
1.1	Safety Helmets				
1.2	Safety Shoes				
1.3	Gum Boots				
1.4	Safety Belts with life line				
1.5	Gloves				
1.6	Ear Plug				
1.7	Goggles				
1.8	Shield Glass				
1.9	Face Protection				
1.10	Breathing Apparatus				
1.11	Canister Mask				
1.12	Hand wash / Eye wash/ Respirating filter / cloth				
1.13	Boiler Suit				
1.14	Others				
2.0	**HOUSE KEEPING**				
2.1	Whether Waste Bins are provided / used				
2.2	Are Passageways / Walkways clear?				
2.3	Is General neatness O.K.?				
2.4	Is the Ground free from oil, grease etc. and is not found to be slippery?				
2.5	Others				

3.0	**EXCAVATION**				
3.1	Whether soil stability is checked?				
3.2	Whether proper shoring for the excavation is provided to prevent cave-in for side of slope >45 Degree?				
3.3	Whether proper precautions have been taken if the excavation is adjoining to heavy structure like building, street and roadways?				
3.4	While excavating whether proper slope usually 45^0 & suitable benches of 0.5 m width at each 1.5 m depth are provided?				
3.5	Whether barricading of 1m height with glowing caution board is provided for excavation beyond 1.5m depth?				
3.6	Whether excavating earth is placed beyond 1m of the edge of the trench?				
3.7	Whether heavy vehicle movement is restricted to come too close to the excavating area?				
3.8	Whether necessary precaution is taken for underground pipes, sewers, cables by contractors?				
3.9	Whether excavation hot work permit is taken?				
3.10	Whether extra precaution is taken for bailing out water properly while excavating?				
3.11	During rains whether the excavation is done with extra precaution to prevent caving in?				
3.12	Whether two separate entry/ exit points with necessary ladders / steps, as per requirement, have been provided?				
3.13	Whether one person is available at all the time to communicate any hazards noticed with workers working in deep trenches or excavation?				
3.14	Whether necessary precautions like				

	regular gas testing are being taken in areas having hydrocarbons and LPG so that no gas accumulation takes place in the trenches.				
3.15	Whether IS: 4081-1986 & Indian Explosive act & rules for storage, handling & carrying of explosive material and execution of blasting operation is followed?				
3.16	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?				
3.17	Whether the following are inspected during excavation work :- 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.				
3.18	Others				
4.0	**PERMITS**				
4.1	Whether valid work permit is issued to start any work?				
4.2	Whether all conditions of the permit are fulfilled before starting the job?				
4.3	As noted in the permit, whether compliance of all the recommendations are ensured?				
4.4	Whether permits are available at work site all the times?				
4.5	Whether hot work permit registered in fire station?				
4.6	Whether permits are being closed after the completion of job?				
4.7	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 /LPG cylinders kept in upright position and secured at designated places under shed – wet gunny bags wrapped around it if the same is under sun at designated place?				
5.3	Check cylinder and cylinder valves for any kind of damage?				
5.4	Whether protective valves are kept on cylinder 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 kept away/free from oil and grease?				
5.7	Whether all hoses were found to be free of any damage or crack?				
5.8	Whether oxygen and acetylene cylinders are stored separately?				
5.9	Whether color coding is being used for easy identification of different type of cylinders and hoses?				
5.10	Whether cylinder keys are available near the cylinder?				
5.11	Whether gas torches with NRV with flash back arrestor of approved make are only being used?				
5.12	Whether pressure gauges are in working condition and checked from time to time?				
5.13	Whether welding shields are used while welding?				
5.14	Whether proper earthing for welding machines are provided?				
5.15	Whether power is taken from approved sources (welding receptacles)?				
5.16	Whether welding receptacles are properly grounded?				

5.17	Whether welding cables are maintained in good condition and without any joints/ cuts?				
5.18	Whether to avoid short circuit, welding machines are protected against rain?				
5.19	Whether earth connectors are securely connected to the job and not to the adjoining pipeline or structure?				
5.20	Whether flame arrestor of DG set is of approved make and quality?				
5.21	Others				
6.0	**SAND / SHOT BLASTING**				
6.1	Whether sand blasting is used only after getting approval from competent authority?				
6.2	Whether air compressor used for sand / shot 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 sand/shot blasting wear suitable PPEs including mask?				
6.6	Whether adequate measures are adopted to confine dust/spray particles?				
6.7	Whether adequate measures are taken for proper ventilation while the work is done in confined space?				
6.8	Others				
7.0	**SAFETY WHILE WORKING AT HEIGHTS / SCAFFOLDING / LADDERS**				
7.1	Whether work permit is obtained to take up work at height above 3 mts?				
7.2	Whether steel pipes scaffoldings are used in unit/off site areas?				

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 suitable platform is provided?				
7.6	Whether ISI approved quality and good condition safety belts are used while working at heights?				
7.7	Whether life line of safety belt is Anchored to an independent secured support capable of withstanding load of a falling person?				
7.8	Whether the area around the scaffold is cordoned off to prohibit the entry of unauthorized person?				
7.9	Whether ropes used are of good condition and adequate strength free of defects?				
7.10	Whether ladder is placed at secured and leveled surface?				
7.11	Whether it is extended 1.5 Mts. Above the landing point?				
7.12	Whether ladder used are of adequate length and tying short ladder is avoided?				
7.13	Whether metallic ladders are placed away from electrical system?				
7.14	Whether tools or materials are removed after completion of the day's job at heights?				
7.15	Whether a valid permit is obtained before taking up work on asbestos or fragile roof?				
7.16	Whether sufficient precaution is taken while working on fragile roof?				
7.17	Whether provision is made to arrange duck ladder, crawling board for working at fragile roof?				
7.18	Whether scaffolding has been erected on rigid / firm / levelled surfaces only?				

7.19	Whether scaffold has been inspected by competent person prior to being put in use?				
7.20	Whether the scaffolding has been designed for the load to be borne?				
7.21	Whether the erection and dismantling of the scaffolding is being done only by trained persons and under supervision?				
7.22	Whether safety net with proper working arrangement and life line has been provided?				
7.23	Others				
8.0	**SAFETY IN CONFINED SPACE**				
8.1	Whether a permit is obtained to enter a confined space?				
8.2	Whether gas test for hydrocarbon, toxic gas, oxygen level is obtained before entering any confined space?				
8.3	Whether adequate oxygen level is ensured in confined space before entering? If not, whether all precaution like using of Breathing Apparatus set is ensured?				
8.4	Whether, in case of chance of ingress of hydrocarbon gases / toxic gases, Personnel Monitoring System (PMS) is used or not?				
8.5	Whether only in presence of a supervisor, worker enters in confined space?				
8.6	Whether provision of sufficient means of entry and exit is available?				
8.7	Whether provision of ventilation to remove welding fumes, dust, exhaust gases are made?				
8.8	Whether provision of 24V (Hand lamps with cage as per OISD-STD-155) light for working inside space is made?				

8.9	Is it strictly ensured that a stand-by trained person is standing outside before a person enters a confined space and communication is being maintained all the time with workers working inside?				
8.10	Whether life belt with one end under control of stand-by person outside is kept while working in confined space?				
8.11	Whether Personnel protective Equipment are in good condition as specified in the permit?				
8.12	Whether absence of Hydrogen Sulfide, CO or other toxic gas is ensured before entering into a confined space? If yes, whether proper required PPE like BA, Gas Mask are used.				
8.13	Whether boxing up is being done only as per the approved procedures and by 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 maintained in good condition?				
9.2	Whether 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	Whether it is ensured that crew of truck leave the truck in crane handling area before starting loading / unloading, if not involved in rigging operation?				
9.9	Whether transporting material from one place to another is done by suitable 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 signalling 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 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 come within 3 metres 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 person?				
9.21	Others				
10.0	**ELECTRICAL SAFETY**				
10.1	Has the Electrical Line Clearance procedure been followed involving electrical and other concerned Dept. and filling of formats?				
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 licence 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	Have PPE as prescribed under Indian Electricity Rules been in place, kept healthy and 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-173 been understood and followed wherever applicable?				
10.10	Are flexible wires having voltage of 240 volts above earth potential taken through 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?				
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 hand gloves rubber shoes 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?				
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 at vulnerable points?				
12.7	Others				
13.0	**CONCRETING**				
13.1	Whether the concreting area is barricaded?				
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 checked?				
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 and dust masks etc. are being used?				
13.9	For overhead or underground work, whether form work and shuttering have been checked so that the same do not collapse during concreting?				

13.10	Others				
14.0	**DEMOLISHING (DEMOLISHING BY BLAST NOT CONSIDERED)**				
14.1	Has the stability of structure been examined by competent person and found OK?				
14.2	Are non-sparking tools being used, if required?				
14.3	Is intermittent clearing operation being done to keep the area reasonably tidy and clean?				
14.4	Whether effective barricading has been provided?				
14.5	Whether Electrical and other facilities like water, oil, gas pipelines have been isolated/protected?				
14.6	Whether the plan of demolition (including sequence of activities) has been prepared and approved prior to start of the work?				
14.7	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?				
15.4	Does proper place exist as per BARC regulations for storage of source / Personnel safety equipment?				
15.5	Does the radiographer has 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	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/asbestos/ water curtain) been put up to protect other equipment / facilities/ OWS/ 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?				
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.				
16.10	Are access 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	Others				
18.0	**WELFARE FACILITIES**				
18.1	Is 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?				
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?				
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

CONSTRUCTION SAFETY AUDIT CHECK-LIST FOR REFINERIES & PETROCHEMICAL PLANTS

Oil Industry Safety Directorate

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Section 1: Introduction

The safety Checklist is a tool to help identify the tasks, hazards, and controls, based upon contractor's scope of work, and to properly align them with Oil Industry Safety Directorate's applicable standard, guidelines, and recommended practises.

The safety checklist is intended to be filled out by internal auditors of owner and later verified by OISD auditor. Filling out the Safety Checklist helps determine if owner, main contractor, and its subcontractor(s) is considering expected hazards and controls based upon the scope of work.

This checklist will be applicable to auditing the construction areas of petroleum refineries, petrochemical plants, and oil /gas processing plants.

1.1 Audit Facility details

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
1.1.1.	Name of the Project:	
1.1.2.	Plant Location:	
1.1.3.	Name of PMC/EPCM/LSTK Contractor (Unit wise):	
1.1.4.	Licensed/Design Capacity: unitwise (Annual & Hourly):	
1.1.5.	Type of Feed/ feed mix	
1.1.6.	Provide brief description of the unit/facility	
1.1.7.	Land area- L x B (In meters):	
1.1.8.	Max. No. of Persons deployed on any particular day	
1.1.9.	Present overall progress of work completion in percentage	

1.2 Contractors Competent & Qualified Person(s):

Provide the name(s) of those persons onsite who by possession of a recognized degree, certification, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems relating to the subject matter, the work, or the project. The contractor shall confirm that each qualified and competent person listed has been trained in the following areas as applicable:

1.2.1	Overall site In-charge of contractor for the facility	
1.2.2	Site supervisor of contractor	
1.2.3	Crane Competent Person of Contractor:	
1.2.4	Confined Space Entry Supervisor of Contractor:	
1.2.5	Electrical Qualified Person(s) of Contractor:	
1.2.6	Excavation & Trenching Competent Person of Contractor:	
1.2.7	Scaffold Competent Person of Contractor:	

Section 2: Leadership and Commitment by Owners for contractor safety

As we embark on this critical evaluation of contractor safety practices, we begin by focusing on the pivotal role that owners play in fostering a safe work environment. In this section, we examine the leadership and commitment demonstrated by owners towards the safety of all personnel involved in their projects. The extent to which owners embrace safety as a core value and actively support contractors in their pursuit of a hazard-free workplace is fundamental to the success of any safety program. This section will audit into the actions, policies, and culture established by owners to confirm that safety is paramount in every aspect of their operations.

Sl. No.	Description	Observations by the team
2.1	In the HSE policy, what are the components relevant to construction sites?	
2.2	Are HSE related issues reviewed by company management, during project reviews? Provide MoM of last project review meeting.	
2.3	What is the system for safety aud t of construction sites in line with OISD-GDN-192 and checklist of OISD-GDN-207? Who reviews the construction safety audit report? When was the last audit conducted?	
2.4	Is there a company nominated HSE executive for each construction site? To whom does the HSE executive report? Are the role, responsibility, accountability and authority of the HSE executive defined and communicated?	
2.5	What is the qualification & experience of contractor HSE officer? How many contractor HSE officers are there in the site and what is basis for this number?	
2.6	Are HSE personnel deployed by contractor in ratio as specified in contract condition?	
2.7	What is the system for review & approval of CVs of HSE personnel of PMC & executing agencies before their deployment at site?	
2.8	Are the HSE officer aware of related OISD standards like OISD-STD-105, OISD-STD-155, OISD-GDN-206, OISD-GDN-192, OISD-GDN-207 etc.	
2.9	What is the system for giving induction safety training to all workmen? What is the periodicity of training imparted to workmen? Who reviews and approves the contents & matter of induction safety training?	
2.10	What is the system for rewarding the workmen performing excellently in the field of HSE?	
2.11	What system is there to confirm competency of contract workmen (specialized job like welder, electrical technician, instrument technician, scaffolders, crane operator etc)?	

2.12	Who imparts toolbox talk to contract workmen, before start of job? Is record available for same? Are applicable recommendations of OISD safety alerts/case studies being discussed during TBT?	
2.13	What is the system and frequency for regular health check-up of working personnel?	
2.14	Is Doctor or Paramedic available at site?	
2.15	Does "Basic Life Support Ambulance" is available at site?	
2.16	Does the system exist for tie-up with nearby hospital for attending to emergency cases on round the clock basis?	
2.17	Does the system exist to Confirm that children & unhealthy adults are not engaged for the job.	
2.18	Has Asset Integrity Management (AIM) been considered during design stage i.e. inherent safety, built in reliability.	
2.19	Is there any procedure to Confirm safety aspects such as safe access, approach, escape etc., operability and maintenance aspects such as ergonomics etc. w.r.t. equipment?	
2.20	What is the procedure to Confirm Calibration/ standardization of equipment and instrumentation used for construction/ fabrication/ erection/ inspection etc?	
2.21	What system is followed to Confirm proper inspection of materials at various stage of procurement at vendor shop? What is the role of owner in this inspection process?	
2.22	Is the installation procedure available for all type of equipment?	
2.23	What system exist to confirm use of appropriate gaskets, packing, bolts, valves, lubricants and welding rods etc? Is it documented?	
2.24	(a) What is the frequency of safety review meeting by contractor/ PMC/ Owner? (b) Produce the agenda, MOM and compliance status of these meetings for verification.	

Section 3: Pre-Project Safety Planning and Statutory Approval

Pre-project safety planning and obtaining statutory approvals are critical aspects of ensuring safety and compliance, especially in construction and hazardous operations. Here's a combined checklist that addresses both pre-project safety planning and the necessary statutory approvals:

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
3.1	Are the conditions stipulated in the PESO (CCOE) approval for construction of facilities complied? Provide Ref no and Date of approval of PESO approval along with plot plan, equipment layout and Hazardous area classification.	
3.2	OISD standard	
3.3	Is storage license for hydrocarbon and gas cylinder available?	
3.4	Are the conditions stipulated in the MOEF Clearance (EC) is compiled?	
3.5	Is the Change of Land Use (CLU) approval being applicable and available?	
3.6	Are the conditions stipulated in the consent to establish from State Pollution control Board complied? Issue date? List pending issues if any.	
3.7	Are the Consent to Establish under Factories Act taken.	
3.8	Are Registration of establishment from Central / State Govt. Labour Commissioner under Contract Labour (Regulation and Abolition) Act 1970 available?	
3.9	Whether water supply/ Electricity supply agreement is available?	
3.10	Whether construction approval for IBR equipment and piping is available from IBR authority?	
3.11	Whether PNGRB consent/ approval for pipe line is applicable and taken?	
3.12	Whether fire NOC is available?	

3.13	Confirm the existence of a comprehensive project-specific safety plan. Confirm that the safety plan addresses potential hazards and risks associated with the project.	
3.14	Whether Risk Analysis (QRA/ RRA) has been carried out and recommendations implemented?	
3.15	Provide the list of risk reduction measures implemented.	
3.16	Whether Environment impact assessment has been carried out and recommendations implemented?	
3.17	Whether consent under hazardous waste/ construction waste or plastic waste management taken?	
3.18	Whether HAZOP study has been carried out and its recommendations addresses and updated in as-built P&ID? Specify total recommendations.	
3.19	Any other approval like ground water, forest clearance CRZ etc.	

Section 4: Site Assessment and Preparation

Meticulous evaluation and readiness Confirm the safety and effectiveness of contractor safety in the oil and gas industry. This section focuses on key considerations for identifying hazards, implementing safeguards, and setting the foundation for a secure project site.

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
4.1	Confirm that the site is properly cleared of any debris, vegetation, or potential obstructions.	
4.2	Confirm the establishment of safe access routes and pathways for personnel and equipment.	
4.3	Confirm that safety barriers are installed to prevent unauthorized access to hazardous areas, construction area evacuated area.	

4.4	Check for the presence of safety barriers, warning signage, and access control. Confirm that warning signs are clearly visible and appropriately placed to alert personnel to potential dangers.	
4.5	Confirm that fully equippec first-aid stations are strategically located throughout the site. Confirm that personnel are aware of the location of first-aid facilities and how to access them in case of emergencies.	
4.6	Confirm that essential safety equipment, such as fire extinguishers and safety showers are readily accessible and well-maintained. Confirm that personnel are trained in the proper use of safety equipment.	
4.7	Confirm that access points, walkways, stairs, and platforms are in good condition and free from tripping hazards.	
4.8	Confirm that adequate lighting is available for safe movement, especially in areas with 24/7 operations.	

Section 5: Incident Reporting and Investigation

This Section focuses on ensuring that inc dents are promptly reported, thoroughly investigated, and corrective actions are implemented:

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
5.1	Existence of a clear and documented incident reporting process at the construction site. Confirm that all personnel including contractors, are aware of the reporting process.	
5.2	Confirm that incidents are reported promptly, including unsafe act, unsafe condition, near misses and minor injuries.	
5.3	Confirm that incident repors contain essential information, including date, time, location, individuals involvec, and a detailed description of the incident.	
5.4	Confirm that all incidents, regardless of severity, are reported and documented, and that there are no instances of unreported incidents.	
5.5	Whether consumption of first a d items are being evaluated to analysed the type of incident.	

Section 6: Safety Equipment and PPE

This comprehensive evaluation Confirms that personnel, including contractors, are adequately equipped to mitigate refinery-specific hazards and adhere to safety protocols, ultimately fostering a secure working environment. The checklist encompasses various aspects, including PPE selection, proper usage, maintenance, and compliance with industry safety standards.

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
6.1	What is the PPE policy and the system to confirm the use of mandatory PPEs at all the construction sites? What are the mandatory PPEs used?	
6.2	What is the system for selecting and ensuring the quality of PPEs & safety gadgets? Please give details of system.	
6.3	Confirm that personnel, including contractors and sub-contractors are trained on the proper use, care, and maintenance of PPE.	
6.4	Evaluate the availability and condition of essential PPE items, including: - • Hard he met • Safety glasses or face shields • Hearing protection (e.g., earplugs or earmuffs) • Gloves (variety of types for different tasks • Safety footwear with slip-resistant soles • High-visibility vests or clothing (if required)	
6.5	Confirm the availability and functionality of emergency safety equipment, including: - • Eyewash stations and safety showers • Fire extinguishers • Emergency escape respirators (if needed) • First-aid kits and medical supplies	

Section 7: Emergency Response and Evacuation

Audit checklist is a vital tool to assess the contractor's preparedness and capability to respond swiftly and effectively to various potential emergencies, including fires, chemical spills, and other critical incidents. This comprehensive evaluation Confirms that emergency plans, equipment, personnel training, and evacuation procedures are meticulously reviewed, promoting the safety of all individuals.

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
7.1	Existence of a comprehensive emergency response plan specific to project site.	
7.2	Confirm that the plan is well-documented, up-to-date, and accessible to all personnel, including sub-contractors	
7.3	Confirm that the emergency response plan addresses a wide range of potential construction incidents, including fire, Slip, Trip, and Fall, Electrical Accident, Trench and Excavation Hazard, Caught-in or Caught-between Accidents, Confined space Incidents, explosions, releases of hazardous materials, natural calamity and handling heavy equipment.	
7.4	Confirm the clarity and specificity of roles and responsibilities assigned to personnel, including emergency response teams and sub-contractors.	
7.5	Confirm that emergency contact information is prominently displayed throughout the project site, including: Phone numbers for local emergency services (fire, medical, police). Contacts for management and designated emergency responders.	
7.6	Confirm the availability and functionality of emergency response equipment, including: • Fire extinguishers, hoses, and suppression systems • Gas detectors and alarms. • Spill control kits and containment materials.	
7.7	Confirm that all personnel, including contractors, receive emergency response training: • Confirm that training includes procedures for evacuations, fire response, spill containment, and first aid. • Confirm that personnel are trained in the proper use of emergency equipment.	

7.7.1	Review training records to confirm compliance with training requirements.	
7.8	Is arrangement for rescuing affected person adequate?	
7.9	Are signs showing emergency exit route installed?	
7.10	Is emergency exit route clear of obstacles?	
7.11	Is communication system adequate?	
7.12	Whether emergency vehicle with driver has been provided to meet any emergency situation?	
7.13	Does any tie-up with hospitals or local doctors exist?	
7.14	Has the assembly point for workers in case of emergency been identified and earmarked?	
7.15	Has training been provided to a few workers for First Aid?	
7.16	Emergency procedure and telephone numbers are known to all and same are prominently displayed at site? (Sample compliance check)	
7.17	Whether emergency mock drills are being regularly done?	
7.18	Specify frequency, coverage and effectiveness of mock drill	

Section 8: Safety while working at Height/ Scaffolding /ladders.

Safety while working at height, particularly on scaffolding and ladders, is paramount in preventing falls and injuries. It involves thorough risk assessments, proper training, and the use of fall protection equipment to Confirm workers' safety. Adherence to safety protocols and equipment maintenance is vital to minimize risks in elevated work environments.

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
8.1	Confirm for issuance of "Height Work Permit" before start of for any work at height (> 1.8 Mtrs).	
8.2	Confirm that a comprehensive Job safety assessment has been conducted for all tasks involving working at height at project site taking into account specific work areas, types of tasks. and potential hazards associated with working at height. Confirm that control measures are in place to mitigate identified hazards.	
	Scaffolding	
8.3	Confirm that scaffolding is erected, inspected, and maintained by competent personnel.	
8.4	Confirm that scaffold structures are designed to support the intended loads and are stable and secure.	
8.5	Confirm that guardrails, toe boards, and access points are installed correctly.	
8.6	Check that scaffolding platforms are fully planked and free from defects.	
8.7	Confirm that only authorized personnel are allowed to erect, modify, or dismantle scaffolding.	
	Fall Protection	
8.8	Confirm that fall protection measures are in place when working at height.	
8.9	Confirm the use of personal fall protection equipment (harnesses, lanyards, lifelines, fall arrestor) where necessary.	

8.10	Confirm the presence of anchorage points or anchor systems for connecting fall protection equipment.	
8.11	Confirm that workers are trained in the proper use of fall protection equipment.	
	Training and Competency	
8.12	Confirm the training and competency of contractors and sub-contractors involved in working at height tasks:	
8.13	Confirm that personnel are trained in identifying fall hazards and using fall protection equipment.	
8.14	Confirm that workers are competent in scaffold erection, ladder use, and fall prevention measures.	
8.15	Whether vertigo test is mandatory for the workers working at height.	
8.16	Review training records to Confirm compliance with training requirements.	
	Inspection	
8.17	Confirm the system exist for certification of scaffolds (and green tagging), by competent person. What is the frequency of inspection/ recertification	
8.18	Does the system exist for periodic visit to all height locations by a competent person, and identification of dangerous openings, for necessary corrective actions. Are the records available. Furnish list of deviations observed.	
	Supervision and Monitoring	
8.19	Confirm that competent supervisors oversee activities	
8.20	Confirm that regular inspections and audits are conducted to monitor compliance with safety measures.	
8.21	Confirm that hazard communication includes proper signage and barricades to warn of working at height activities.	

Section 9: Safety while excavation and trenching

Excavation and trenching activities are paramount for various maintenance, construction, and projects. These processes involve digging into the earth's surface to create cavities or trenches for purposes such as installing pipelines, repairing underground structures, or conducting maintenance on critical infrastructure. Safety is of utmost concern in these operations due to the risk of trench collapses, utility strikes, and exposure to hazardous gases. Stringent safety protocols, including comprehensive excavation plans, proper protective systems, and continuous training, are imperative to mitigate risks and Confirm the well-being of workers, the integrity of the refinery's infrastructure. and the prevention of environmental incidents.

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
9.1	Confirm that a comprehensive excavation and trenching plan is in place and approved by competent authority.	
9.2	Verify that a thorough site inspection of excavation and trenching activities as per clause 6.1.4 of OISD-GDN-192 is followed.	
	Protective Systems:	
9.3	Inspect the use of appropriate protective systems such as trench boxes, shoring, or sloping based on soil conditions and depth	
9.4	Is it Confirmed that excavated earth is not dumped by the side of excavated pit.	
9.5	Are the escape stairs/ ladders available in every excavated pit (of more than 1.2 mts depth)	
9.6	Whether barricading of 1 Mtr. Height with glowing caution boards provided for excavations beyond 1.5 mtr. Depth.	
9.7	Whether one person is available outside at all times to communicate any hazards noticed with workers working in deep trenched or excavations.	

Section 10: Safety while reinforcement/ shuttering & concreting

A comprehensive safety checklist for these activities includes Confirming the structural integrity of formwork and shuttering, ensuring proper bracing and support systems are in place to prevent collapses, and confirming the correct placement of reinforcement materials. Additionally, rigorous checks for the availability and use of personal protective equipment, fall protection measures, and adequate ventilation are essential to safeguard workers from potential hazards associated with concrete work in this high-risk environment.

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
	Pre-Work Planning:	
10.1	Confirm the presence of detailed reinforcement and concreting plans and designs. Confirm that plans are reviewed and approved by qualified structural engineers and complied with national building codes.	
	Structural Stability	
10.2	Inspect formwork, shuttering, and bracing systems to Confirm they are structurally sound and properly installed.	
10.3	Confirm that adequate supports are in place to prevent collapses during concreting.	
	Safety:	
10.4	The safety of workers on erection and dismantling of steel and prefab structure should be Confirmed by provision mentioned in OISD-GDN-192 clause no 6.3.2	
10.5	All lifting appliances should be suitable for the operations and approved and tested as per statutory requirement.,	
10.6	Inspect the proper storage and handling of reinforcement bars, concrete, and related materials to prevent accidents and material degradation.	

Section 11: safety while working in confined space area.

Safety is paramount when working in confined spaces. These spaces can pose numerous hazards, including toxic atmospheres, limited entry and exit points, and the potential for engulfment or entrapment. To Confirm worker safety, strict adherence to confined space entry procedures, including proper ventilation, continuous atmospheric monitoring, and the use of appropriate personal protective equipment, is essential. Comprehensive training, frequent drills, and clear communication among the team are vital elements in mitigating risks and responding effectively to emergencies within confined spaces, ultimately safeguarding the lives of refinery personnel.

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
	General	
11.1	Whether entry inside the vessel to carry out any job shall be done after issuance of valid permit only in line with the requirement of OISD-STD-105?	
11.2	Shut down, pos tively isolate, depressurise and purge the confined area as per laid down procedures.	
	Entry Procedures	
11.3	Confirm proper and accessible means of exit before entry inside a confined space.	
11.4	Whether systems exist for registering the number of workmen entering & leaving the confined space.	
11.5	What type of ladder/ safety harness are in use for working in confined space?	
	Atmospheric Testing	
11.6	Whether system exists for gas test of confined spaces in order to Confirm adequate oxygen level & absence of Hydrocarbon, H2S, CO or other toxic gases before entry of workmen into the confined spaces.	
11.7	Confirm that gas detectors are calibrated and functioning correctly.	
	Communication	

11.8	When the work is going on in the confined space, there should always be two men standby at the nearby manway / manhole equipped with communication arrangement to contact seniors and to evacuate the worker inside confined space in case of emergency.	
	Lighting and Equipment	
11.9	Use 24V flameproof lamp fittings only for illumination.	
11.10	Use tools with air motors or electric tools with maximum voltage of 24V.	
11.11	The cutting torches should also be kept outside the vessel immediately after the cutting and the gas cylinders used for cutting/welding shall be kept outside.	
	Emergency Response	
11.12	Confirm the availability and condition of rescue equipment, such as hoists, tripods, and self-contained breathing apparatus (SCBA).Also Confirm that a well-documented rescue plan s in place, and rescue personnel are trained and ready to respond.	

Section 12: Safety during material handling and lifting equipment safety.

Ensuring safety while handling and lifting equipment is of paramount importance in the industrial setting of an oil refinery. It involves meticulous equipment inspection, rigorous operator training, and strict adherence to safety procedures to prevent accidents, protect personnel, and safeguard critical infrastructure.

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
12.1	Does the system exist for load testing & certification of all lifting tools and tackles like wire ropes slings, chain blocks etc. at regular intervals as per the provisions of factories act. Is register maintained to record particulars of such tests. Please mention the periodicity of such tests. Furnish list of deviations/ failures of such tests.	
12.2	Does the systems exist for load test & certification of equipment (Cranes, Hoists, Hydra etc.) by competent persons before deployment at site and thereafter at regular intervals.	
12.3	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? c) Whether safe working load, date of testing & next test due date visibly marked/ painted on all equipment.	
12.4	Whether chain blocks and cables are inspected before each use to assure their sound condition?	
12.5	Whether area below the movement of boom of crane is cleared to avoid injury from falling objects?	
12.6	In crane handling area whether it is confirmed that crew of truck, leave the truck before starting loading / unloading?	
12.7	Whether transporting material from one place to another is done by suitable means?	
12.8	Whether carrier with sufficient capacity without projecting parts is used for transporting materials?	

12.9	Whether riggers engaged are well trained and conversant with signalling procedures including night signalling if required?	
12.10	Whether permission of authorized person is obtained before working on or near an overhead crane?	
12.11	Whether trained riggers are available all the time along with crane?	
12.12	Whether barricading has been done to confirm no unauthorised person enters in the working area of the crane?	
12.13	Whether lifting (rigging) plan has been prepared and approved before start of the work?	
12.14	Whether route of crane movement has been planned before the crane moves out of the garage?	
12.15	Whether it has been confirmed that no electrical cable comes within 3 meters or safe distance from the boom of the crane?	
12.16	Whether boom is be ng kept in the horizontal position or locked while idling?	
12.17	Whether material is being stacked / de-stacked in trucks with the help of wedges to Confirm no slippage whi e loading / unloading takes place?	
12.18	Whether the forklift / crane is being operated only by trained / authorized person?	
12.19	Whether permission of authorized person is obtained before working on or near an overhead crane?	
12.20	Whether trainec riggers are available all the time along with crane?	
12.21	Whether barricading has been done to Confirm no unauthorised person enters in the working area of the crane?	
12.22	Whether lifting (rigging) plan has been prepared and approved before start of the work?	
12.23	What system is available to Confirm that all Heavy equipment operators are experienced for operating the relevant equipment.	
12.24	Does the system exist for general check-up of cranes, hydra etc. like tyre pressure, reverse horn etc. on daily basis.	
12.25	Does the system exist for approval of erection scheme of heavy lifts & critical lifts. Who is the approving authority?	
12.26	Does the system exist for keeping record of equipment, tools & tackles and manpower involved in heavy lifts & critical lifts.	

12.27	Does the system exist to restrict the boom loaded hydras for movement/ transshipment of loads?	
12.28	Does the system exist to Confirm adequate hard stand before deployment of crane?	

Section 13: Safety while gas cutting, grinding & welding.

Safely during gas cutting, grinding, and welding is paramount in industrial operations, particularly in environments like an oil refinery. These processes involve high temperatures, flammable materials, and potentially hazardous fumes, making strict adherence to safety protocols, proper training, and the use of appropriate personal protective equipment critical to prevent accidents, fires, and exposure to harmful substances.

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
13.1	Whether LPG / Oxygen / Acetylene/ Gas cylinders are kept outside only while working in confined space	
13.2	Are Acetylene/ O2 / 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?	
13.3	Check cylinder and cylinder valves for approved quality & any kind of damage?	
13.4	Whether protective valves caps are kept on cylinders while not in use?	
13.5	Whether proper means and method for transportation of cylinders to avoid dropping and rolling are being adopted / followed?	
13.6	Whether gas cylinders, regulators are kept away from combustible materials and / free from oil and grease?	
13.7	Check cylinder and cylinder valves for approved quality & any kind of damage?	
13.8	Are the electric connection cables & welding cables, cutting hoses laid in non-haphazard manner.	
13.9	Whether all hoses are of approved quality and found to be free of any damage or crack?	
13.10	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 2016?	
13.11	Whether gas cylinders are kept at safe location particularly in case job is being done at different elevations while in use?	

13.12	Whether color coding is being used for easy identification of different type of cylinders and hoses?	
13.13	Whether cylinder keys are available near the cylinder?	
13.14	Whether gas torches with flash back arrestors of approved make are only being used?	
13.15	Whether pressure gauges are in working condition and checked from time to time?	
13.16	Whether welding shields are used while welding?	
13.17	Whether proper earthing for welding machines are provided?	
13.18	Whether power is taken from approved sources (welding receptacles)?	
13.19	Whether welding receptacles are properly grounded?	
13.20	Whether welding cables are maintained in good condition and without any joints/ cuts?	
13.21	Whether to avoid short circuit, welding machines are protected against rain?	
13.22	Whether earth connectors are securely connected to the job and not to the adjoining pipeline or structure?	

Section 14: Safety in electrical jobs.

Safety during gas cutting, grinding, and welding is paramount in industrial operations, particularly in environments like an oil refinery. These processes involve high temperatures, flammable materials, and potentially hazardous fumes, making strict adherence to safety protocols, proper training, and the use of appropriate personal protective equipment critical to prevent accidents, fires, and exposure to harmful substances.

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
14.1	Whether the provisions for temporary installations as per clause 09 of OISD-STD-173, fully complied.	
14.2	Does the contractor engage electrician(s) having valid electrical license in line with provisions of Central Electricity Authority (CEA).	
14.3	Has the Electrical Line Clearance procedure been followed involving electrical and other concerned Dept. and filling of formats?	
14.4	Have Danger Signs with Voltage rating/ Men at work signboards been displayed at both Sub Station as well as the work site?	

14.5	Does the system exist for inspection & approval of electrical equipment (DG sets, Panels etc.) by the competent person/ authority before being put to use.	
14.6	Whether the cables from switchgear panels to portable equipment/ lighting transformers/ field distribution board are running in orderly manner with no insulation damage/ no joints.	
14.7	Are the cables/ wires identifiable along their route towards the load by using colour coding and or markers.	
14.8	Is the standard practice for termination of cables (i.e. proper lugs, crimping, cable glands etc.) being followed. Is cable armour in continuity from feeding point to load point.	
14.9	Are the ELCB used on the incoming side to protect against the current leakage. Is the device tested every time before start of work.	
14.10	Are all the portable appliances provided with insulated three pin plug & socket arrangement.	
14.11	Whether only industrial type extension boards & plug sockets used at all sites.	
14.12	Whether electrical PPEs (hand gloves, insulating mats, fuse pullers etc.) are available and maintained in good condition.	
14.13	Whether CO_2 fire extinguishers to control electrical fires are available and periodically tested?	
14.14	Visual inspection of electrical equipment for damaged cables, loose connections, improper earthing and exposed live parts.	
14.15	Whether all portable lights and tools are flame proof or intrinsically safe when working in a confined space where there is a potential flammable or explosive atmosphere.	

Section 15: Safety in abrasive blasting and painting jobs.

Ensuring safety during abrasive blasting and painting jobs in an oil refinery is essential to protect workers, prevent environmental damage, and maintain the integrity of equipment and structures. These tasks involve various hazards, including exposure to hazardous materials, respiratory risks, confined space work, and the potential for falls. This contractor safety audit checklist is designed to help refinery operators and contractors systematically assess and enhance safety measures during abrasive blasting and painting activities, promoting a secure work environment and regulatory compliance.

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
15.1	**General**	
15.1.1	Confirm that abrasive blasting is used only after getting approval from competent authority / work permit?	
15.1.2	Confirm that air compressor used for abrasive blasting are positioned away from workplace.	
15.2	**Respiratory Protection**	
15.2.1	Confirm that workers are provided with the correct type of respirators for the tasks, and they are fit-tested and trained in their use.	
15.2.2	Check that respirators are maintained, cleaned, and stored properly.	
15.3	**Ventilation and Dust Control**	
15.3.1	Inspect the availability and effectiveness of local exhaust ventilation systems to control dust and fumes.	
15.3.2	Confirm that dust collection systems are properly maintained and functioning.	
15.4	**Equipment Inspection**	
15.4.1	Check that abrasive blasting equipment, including blast pots, hoses, nozzles, and paint spraying equipment, is in good working condition.	
15.4.2	Confirm regular equipment inspections, maintenance, and safety checks are documented.	
15.5	**Paints and Coatings**	
15.5.1	Confirm that workers are trained in the safe handling and disposal of paints, coatings, and solvents.	

15.5.2	Confirm that hazardous materials are stored and labeled properly.	

Section 16: Safety in Radiography.

Safety in radiography within an oil refinery is crucial to protect personnel from radiation hazards and Confirm compliance with regulatory requirements. This specialized safety audit checklist focuses on Confirming the qualifications of radiography technicians, inspecting radiation equipment, ensuring proper shielding, monitoring individual exposure levels, and confirming adherence to safety protocols. Additionally, it assesses emergency response plans and the availability of radiation detection equipment. By conducting regular safety audits using this checklist, oil refineries can maintain a secure environment during radiography activities, mitigating the risk of radiation exposure and ensuring regulatory compliance.

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
16.1	**General**	
16.1.1	Are safety precautions for handling of source as per guidelines of AERB being followed?	
16.1.2	Is the potency of the source being used within acceptable limits as per the AERB regulations?	
16.1.3	Whether Radiation Safety Officer is available at site?	
16.2	**Qualified Personnel**	
16.2.1	Does the radiographer have valid certificate of radiography from competent authority (AERB)?	
16.3	**Equipment Inspection**	
16.3.1	Is the area being cordoned with proper signs during radiography as per guidelines of AERB?	
16.3.2	Confirm that radiographic equipment, including X-ray machines or gamma-ray sources, is in good working condition and has up-to-date inspection and calibration records.	
16.4	**Radiation Safety and Exposure Control**	
16.4.1	Is radiographer using Exposure Meter / Dosi Meter?	
16.4.2	Whether minimum occupancy of the premises / workplace is being monitored?	

Section17-21: Safety check list in various jobs as tabulated:

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
17.0	**SAFETY WHILE WORKING NEAR OR ABOVE THE WATER BODIES**	
17.1	Are the provisions as per clause 6.16 of OISD-GDN-192, being complied with.	
17.2	Are the sufficient provisions like safety nets, life buoys, life jackets, boats etc. available?	
17.3	Are rescue & emergency procedure in place for any eventuality?	
18.0	**NOISE POLLUTION RELATED SAFETY**	
18.1	Are there construction sites where continuous noise level exceeds 85 Decibels	
18.2	Is the noise level monitored? Explain the mitigation measures for high noise level equipment/ areas.	
18.3	Are the high noise areas, (i.e., the areas where verbal communication is difficult), been identified.	
18.4	Are approved hearing protection devices used by workers/ employees working in high noise areas (>85Db).	
18.5	Are the employees exposed to continuous noise level above 85 Db, tested periodically for audiometric test.	
19.0	**TRANSPORTATION, LOADING AND UNLOADING**	
19.1	Is any written down procedure available for material movement inside the premises? How to Confirm implementation of procedure?	
19.2	Is any written down procedure available for material loading unloading?	
20.0	**STORAGE AND PRESERVATION**	

20.1	Whether material like pipes, tubes, fittings etc. are stored with proper manner (stacking, tagging, capping)?	
21.0	**Safety in Road work**	
21.1	Whether site is barricaded and provided with warning signs including night warning lamps/ self glowing markers at appropriate location for diversion of traffic?	
21.2	Whether mixing aggregates with bitumen is done with the help of batch mixing plants? If no, whether adequate precautions have been taken?	
21.3	Whether road rollers, bitumen sprayers, pavement finishers are driven by experienced drivers with valid driving licenses?	
21.4	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?	

Section22: Documentation and Quality assurance plan

SR. NO.	DESCRIPTION	OBSERVATIONS BY AUDIT TEAM
22.1	Whether procedure is available for handover of as built/ final drawing, documents, datasheets, 3D model, Isometrics etc. to owner for future reference.	
22.2	Whether guidelines for quality control and assurance procedures and specifications for asset are available and implemented to Confirm that material, construction, and procedure (fabrication and inspection) during the fabrication stage are in accordance with the design specifications?	
22.3	What is the procedure of positive material identification (PMI) to identify metallurgy mismatch? What are the stages of PMI?	