MAHALAKSHMI ENGINEERING & CONSTRUCTION PVT. LTD.	**Safe Work Procedure & Risk Analysis**	HSE/MECPL/001/SWMS/01 R-001

Project Name: MHDC SOLAPUR SITE	**Address: DS,3rd Floor, ABC Complex, Adalat Road, Opp.Dist. Court Aurangabad.**
Company Name: MAHALAKSHMI ENGINEERING & CONSRTUCTION PVT LTD.	**Activity/Trade: All**
Address: DS,3rd Floor, ABC Complex, Adalat Road, Opp.Dist. Court Aurangabad.	**Date: - 25-02-2023**
Name: Azim Shaikh	**Contact No: 7796895781**

SR. NO.	Procedure (in steps) (Break the job down into steps. Each step should accomplish some major task and be in logical sequence.)	Possible Hazards (Identify the hazards associated with each step. Examine each to find possibilities that could lead to an accident or potential harm arising.)	Risk Rating (See below)	Control Measures (Describe what action or procedure will be taken to eliminate or minimize the risk of injury or damage. Use the Hierarchy of Controls below as a guide 1. Eliminate the Hazard 2. Substitute the material or equipment 3. Isolate the hazard 4. Implement Engineering control 5. Implement Administrative control 6. PPE	Person who will ensure this happens
1	**Scaffolding**				
1	Shifting of materials	Unbalanced	L	Training for shifting of materials will be provided.	
		Slip & Trip	M	Access will be made clear from all the rolling, slippery materials.	
		Fall of Scaffolding Materials & clamp	H	Only trained / experience persons will be deployed.	
		Striking	M	Warn to people about material shifting.	
2	Erection of Scaffolding	Ground Soil Condition	M	Ground surface will be compacted, levelled & made firm.	

				Scaffold will not be erected near loose soil area / excavated edge	
		Missing components	H	Experienced / trained persons will be engaged.	
				Scaffolding will be erected as per scheme drawing.	
				Work will be executed under the supervision.	
				Scaffolding tag system will be implemented. (Red – Unsafe, Green – Safe)	
		Inadequate Support	H	Scaffold erected as per our standard.	
				Scaffolding will be inspected by Form work department / trained scaffolds.	
				Scaffolding training will be provided to the skilled persons (Scaffolding Gang) of different area.	
				Lateral supports will be provided on every 6 metres intervals.	
				Scaffolding will be supported with rigid support after every 10 m intervals.	
		Erecting the material to height	M	Area will be barricaded by placing sign board work in progress to avoid entry of person.	
				Material will be transfer at height by making temporary platform on every 2 m height.	

3	Provision of working platform	Improper Access / Work platform in scaffold	M	Working Platform will be made with 600 mm width & Secured from both the sides, with handrails.	
				Ledgers will be provided at every 500 mm for climbing over scaffold.	
				Use of Full body Harness with Double lanyard will be ensured.	
		Loose materials at workplace	H	No loose material is allowed to keep at the working platform.	
				Hand tools shall be secured.	
		Aerophobia	H	Workers ability to work at height will be physically examined.	
		Working when Moist / poor lighting	M	No work will be carried out over scaffolding in rainy season / immediate after rain.	
				Adequate illumination of 150 lux will be ensured at workplace.	
4	Dismantling of Scaffold	Improper Access / Work platform in scaffold	H	Use of Full body Harness with Double lanyard is ensured	
				Working Platform will be made with 600 mm width & Secured from both sides.	
		Dismantling unit wise		Scaffolds will be dismantled from top to bottom.	
				Scaffolds will be dismantled row wise, before proceed to next row, the entire components will be removed.	
		Lowering of materials		Area will be barricaded by placing sign board work in progress.	

				Material will be lowered with the help temporary platform over scaffolds.	
				Trained Scaffold gang will be deployed.	
		Throwing the material from height		No materials will be thrown from height.	
				Training will be provided for safe handling of materials.	

2. Welding

1	Selection & Preparation of place for welding.	Injuries may takes place during Housekeeping.	M	Use of Proper PPE, like Safety Helmet, Safety shoes & reflective jackets.	
2	Transporting welding M/C to desired place.	Sharp edges of welding M/C may cut the hands.	H	Use of Proper PPE, Safety Helmet, Safety shoes & reflective jackets.	
		Leg may strike to wheels of M/C.		Training for handling of materials	
3	Electric Connection.	Electrocution.	H	Work is performing by authorised electrician with proper PPE, like rubber hand gloves, Safety Helmet, Safety shoes & reflective jackets.	
				Ensuring use of seamless cable	
				Using sockets for connection.	
4	Welding	Exposure to Electrocution.	H	Use of proper PPE like safety shoes, safety helmet, safety goggles, Face shield, nose mask, welding apron.	

				Ensuring housekeeping before start of work	
		Exposure of M/C to the sky	H	Providing roof for Welding M/C under natural cooling.	
		Overheating of transformer	H	Checking oil level before starting	
		Reeling welding cables over electrical cable & gas holder	H	Provision of overhead electric cable	
				Skilled persons are deployed.	
		Lugs are not used for protection.	H	Using Hot work permit system which includes physical inspection of M/C, Access & environment nearer to work.	
		Cables laying on access			
		Loose joining of cable to the M/C			
		Defective welding Holders			
		Failure to use PPE			
		Improper earthing to the part to be welded.	H	Connection are coming through ckt breakers.	
		Exposure to Radiation.	M	Health Monitoring at regular interval.	
		Exposure to welding fumes		Job performing in interval basis.	
		Sparks Falling on combustible materials	M	Removing combustible material from welding area.	
		Exposure to burning.		Fire Extinguisher is provided nearer to welding area.	
5	Cooling of weld material.	Material Heat may burn hand.	M	Use of Proper PPE, like Safety Helmet, Safety shoes, Hand gloves & reflective jackets.	

6	Detaching Electric connection.	Electrocution.	M	Work is performing by electrician with proper PPE, like rubber hand gloves, Safety Helmet, Safety shoes & reflective jackets. Using sockets for & cap for connection.	
7	House Keeping of welding area.	Slipping	M	Removing end part of electrode from site.	
8	Transporting welding M/C to stacked place.	Sharp edges of welding M/C may cut the hands. Leg may strike to wheels of M/C.	M	Use of Proper PPE, like Safety helmet, Safety shoes & reflective jackets. Training for handling of materials	

3. Material Handling

MANUAL MATERIAL HANDLING					
1	Manual lifting of Materials	Sharp edges	M	Sufficient number of skilled workmen will be deployed. Training & awareness for lifting technique ergonomics & for lifting of long & heavy materials. Hand gloves & other PPE will be used for lifting.	
2	Shifting of materials	Unbalanced	M	Training & awareness for shifting of materials will be provided. Shoulder pad, hand gloves & other PPE will be worn by workmen.	
		Slip & Trip	M	Access will be made clear from all the rolling, slippery materials.	

		Fall of Scaffolding Materials & clamp	H	Only trained / experience persons will be deployed.	
		Striking	M	Warn to people while material shifting.	
3	Stacking of Materials	Sharp edges / Trapping / Slip of material	M	Sufficient number of skilled workmen will be deployed.	
				Material will be stacked size and different type wise.	
				Materials will be stacked on the racks or by providing packing material.	
				Materials will be not stacked above overhead.	
				Training for maintaining body posture	
4	Rigging (Material to be lift)	Trap / Sharp edge / Wrong use	M	Trained & experience persons will be deployed.	
				Work will be supervised by the signal man.	
				Usage of right slinging method with right lifting gears.	
				Training for safe rigging operation.	
				Hand gloves & other PPE will be used.	
5	Lifting & Lowering of load by Tower crane	Uncontrolled movement of load lifted	H	Tag line of 2 m will be tied with the load to avoid oscillations of bucket.	

				Crane will be operated by only authorised operator.	
				Medical fitness of operator will be done before commencing the job.	
				For communication walkie - Talkie will be used by crane operator and signal man.	
		Failure of lifting tools and tackles	H	Daily inspection by operator.	
				Weekly maintenance by P & M persons.	
				Monthly joint inspection by Safety & P & M persons.	
				Colour coding system for inspection of lifting tools and tackles will be used.	
				Third party inspection of lifting tools & tackles.	
		Overloading of Crane	H	Before starting work activity crane will be check for all the tripping of limit switches by operator.	
				Load chart will be available in crane operator cabin.	
		Miscommunication / Fatigue	H	Reflective jacket will be worn by signal man & use of mobile phone is strictly prohibited.	

				Ensuring work in regular shift.	
				Trained & experience signal man will be deployed.	
5	Lifting & Lowering of load by Hydra	Uncontrolled movement of pump	H	Tag line of 2 m will be tied with the bucket to avoid oscillations of pump.	
				Licence operator will be allowed to operate the Hydra.	
				Hand signals will be used for communications between signal man & operator.	
				Work will be executed under the supervision.	
		Workmen hit by hydra while reversing	H	P & M person will ensure reverse horn to the hydra or signal man will deployed.	
		Failure of lifting tools and tackles	H	Hydra Hook & safety latch will be check before commencing work.	
				Monthly joint inspection by Safety & P & M persons.	
				Colour coding system for inspection of lifting tools and tackles will be used.	
				Third party inspection of lifting tools & tackles.	

		Miscommunication	H	Reflective jacket will be worn by signal man & use of mobile phone is strictly prohibited.	
				Trained Signal man will be deployed.	

4. Gas Cutting

1	Selection & Preparation of place for Gas Cutting.	Injuries may takes place during Housekeeping.	M	Use of Proper PPE, like Safety Helmet, Safety shoes & reflective jackets.	
2	Transporting Gas Cutting cylinders to desired place.	Cylinder may fall down from trolley.	H	Trolley with locking system is used	
		Leg may strike to wheels of trolley.	M	Use of Proper PPE, like Safety Helmet, Safety shoes, Hand gloves & reflective jackets.	
3	Connecting Gas cutting holder to gas cylinders.	Leakage of gas / fire	E	Work is performing by trained person with proper PPE, like Safety Helmet, Safety shoes & reflective jackets.	
				Ensuring use of regulator with pressure gauge.	
				Using clamps for connection.	
4	Gas Cutting	Back fire.	H	Work is performing by authorised gas cutter with proper PPE, like Safety Helmet, Safety shoes, safety goggle.	
				Using work permit system.	

				Connections are fitted with flash back arrester on both sides.	
		Fire.	M	Fire Extinguisher is provided nearer to gas cutting area.	
				Provision of safety awareness poster	
				Placing cylinders in vertical position in trolley.	
				Removing combustible material from gas cutting area.	
5	Detaching Gas cutting connection.	Leakage of gas / fire	H	Work is performing by trained person with proper PPE, like Safety Helmet, Safety shoes & reflective jackets.	
				Ensuring use of seamless hose pipe	
				Ensuring use of regulator with pressure gauge.	
				Using clamps for connection.	
6	House Keeping of gas cutting area.	Burn	M	Use of Proper PPE, like Safety Helmet, Safety shoes & reflective jackets while housekeeping.	
7	Transporting Gas cutting cylinders to stacked place.	Sharp edges of trolley may cut the hands.	M	Use of Proper PPE, like Safety Helmet, Safety shoes & reflective jackets.	
		Leg may strike to wheels of trolley.			

5. Excavation

1	**Site Clearing**	Insecticide bite	M	Use Gumboots and PPE	

		Snakebite in grassy area		Carbolic acid will be sprayed before start of work & In grass area gumboot will be worn to avoid snake bite	
2	**Levelling by Man & machinery**	hit / Struck by Equipment	M	P&M person will check the fitness of equipment with respect to safety aspects like reverse horn.	
				Provision of signal man.	
		Unauthorized operation		Get operator's certificate & license before engage work.	
		People resting under vehicle.	H	Delay mechanism should place & Maintain mechanism well and good.	
				Inspect before starting the vehicle.	
				Providing rest shed for the workmen.	
				Provision of signage's.	
		Damage to Underground Utilities	H	Reading & understanding layout plans for all underground utilities.	
				Digging the top portion of underground utilities manually.	
				De-emerging utilities if possible	
				Get the clearance from concern dept. (Govt Or Client) & Work permit system to be followed.	
		Working near Overhead lines	H	De-emerging utilities if possible	
				Erecting goal post with warning signs. Restricting the vehicle movement by fencing.	
Mechanical Excavation					
3	Excavation & Preparation of Ramp	Damage to underground electrical, Telecom cables and water services.	H	Reading & understanding layout plans for all underground utilities.	

	area.			Digging the top portion of underground utilities manually.	
				De-energing utilities if possible	
				Get the clearance from concern dept. (Govt Or Client) & Work permit system to be followed.	
		Vehicle movement near the edge of excavation	H	Provision of hard barricading with min clearance of 2m from the excavated pit with Compaction of soil.	
				Ensure adequate illumination 150 lux.	
				Provision of signal man	
		Walking / Working near the edge of excavation (Fall of person)	M	Provision of hard barricading with min clearance of 2 m from the excavated pit with Compaction of soil.	
				Provision of Signage's.	
		Fall of objects (stone, boulder, soil etc.) into excavated pit	M	Authorised operator / Competent operator are allowed to perform work	
				Entry will be restrict in the pit during excavation	
				Excavation will be done in the form of step marking / bench marking / maintaining 45^0 slope	
				Provision of safety net over the flat excavated wall.	
				No material will be stacked within 1m area of from edge of excavation	
		Exposure to the dust	M	Sprinkling of water	

				Use of dust mask & goggles are mandatory	
				Work will be perform at regular interval	
		Congested work site; too many persons working in the pits or trenches.	M	Authorised operator / Competent operator are allowed to perform work	
				Provision of training to work in congested space.	
				P & M person will ensure swing alarm for excavators & reverse alarm for dumpers	
				Provision of emergency access	
		Hit / struck by Earth moving equipment		Work will be executed under the supervision of execution person	
				Excavator swing area will be barricaded	
				Dedicated Signal will be deployed	
				Required number of workmen will be allowed to work in that area.	
4	Incomplete excavation after duty hrs.	Fall of persons / machinery into the pit / Fall of excavated wall.	M	Provision of hard barricading with min clearance of 1 m from the excavated pit with Compaction of soil.	
				Provision of Signage's.	
				Hard barricading will be painted in two colours red & white for visibility. Reflective tape will be used for barricading	
				Excavation will be done in the form of step marking / bench marking / maintaining 45^0 slope	

				Provision of safety net over the flat excavated wall.	
				Ensure adequate illumination 150 lux.	
5	Transportation of excavated materials	Over loading of vehicles Flying of Materials on the road		Restriction on load limits with the capacity of the vehicle. Loading above the body height will be avoided	
		Dust	M	Designated separate path for vehicle & workmen movement.	
				Provision of signage's for maintaining speed of 10 Km/hr.	
				Sprinkling of water over demarked path	
				Use of nose mask for signal mans	
				Provision of tire washing pit	

6. Concreting

Concreting By Concrete Bucket					
1	Levelling of area / Provision of access	Hit / Struck M/C to Labour or concrete bucket	M	Use of proper PPE like Safety Shoes, Safety Helmet, etc.	
				Training to the labour and M/C operator.	
				Only authorised operator will be allowed to execute the work	
				P & M person will ensure reverse horn to the M / C or signal man will be deployed	
				Area will be barricaded by placing sign board of work in progress	

2	Filling concrete in the tower crane bucket	Hit by concrete bucket	H	Gye rope / tag line 2 m will be tied with the bucket to avoid oscillations of bucket	
				Deployment of trained signal man	
		Spillage of concrete		Filling of concrete in the bucket will be done under the supervision	
				For checking level of concrete in the bucket fabricated stand will be used for standing of workmen	
				Signal man will ensured closure of gate of concrete bucket	
				Regular maintenance of concrete bucket will done	
3	Lifting of concrete bucket	Uncontrolled movement of bucket	H	Gye rope / Tag line of 2 m will be tied with the bucket to avoid oscillations of bucket	
				Crane will be operate by only authorised operator	
				Medical fitness of operator will be done before commencing the job	
				For communication walkie - Talkie will be used by crane operator and signal man	
		Failure of lifting tools and tackles	H	Daily inspection by operator	
				Weekly maintenance by P & M persons	
				Monthly joint inspection by Safety & P & M persons	

				Colour coding system for inspection of lifting tools and tackles will be used	
				Third party inspection of lifting tools & tackles	
		Overloading of bucket	H	Before starting work activity crane will be check for all the tripping of limit switches by operator.	
				Design capacity / Safe working load of bucket will displayed over the bucket	
		Miscommunication / Fatigue	H	Reflective jacket will be worn by signal man & use of mobile phone is strictly prohibited	
				Ensuring work in regular shift	
				Trained Signal man will be deployed	
4	Pouring of concrete	Falls, Slips & trips	M	Provision of access either by ladder or by placing jali over reinforcement of working platform	
				Ensuring stair case free from slippery materials like sand / concrete slurry, rolling materials, shuttering ply, steel, etc.	
		Fall of person / materials	H	The entire working platform will be placed closed without gaps & will be secured from both the ends.	
				Use of full body harness will be ensured	
				Ensuring top and middle railing for the working platform	

				Two no. of jali will be used for working platform over the scaffoldings.	
		Contact with concrete / Failure to use PPE	H	Use of gumboot, safety goggle & rubber hand gloves will be ensured to avoid contact of concrete with skin.	
				Ensuring work permit before start of the work	
				Training to workmen about material safety data sheet of concrete for its safe handling.	
5	Connection / placement / Use of vibrator	Electrocution	H	All the connection will be pass through circuit breakers.	
				Male and female sockets will be used for power supply to vibrators	
				Cable joining will be done with the help of insulation tape.	
				Vibrators will not be place in direct contact with metals.	
				Monthly inspection of circuit breakers will be ensured.	
		Vibrations	M	Work will be executed in regular interval / regular shift	
		Slip & trip	H	Vibrator cables will place away from access / separate pole will be used for cable routing	

Concreting By Concrete Pump

6	Placement of Concrete pump	Uncontrolled movement of pump	M	Gaye rope / Tag line of 2 m will be tied with the bucket to avoid oscillations of pump	

				Hydra will be operate by only authorised operator	
				Hand signals will be used for communications between signal man & operator	
				Work will be executed under the supervision.	
		Workmen hit by hydra while reversing	H	P & M person will ensure reverse horn to the hydra or signal man will deployed	
		Failure of lifting tools and tackles	H	Hydra Hook & safety latch will be check before commencing work	
				Monthly joint inspection by Safety & P & M persons	
				Colour coding system for inspection of lifting tools and tackles will be used	
				Third party inspection of lifting tools & tackles	
		Miscommunication	H	Reflective jacket will be worn by signal man & use of mobile phone is strictly prohibited	
				Trained Signal man will be deployed	
7	Connection of concrete pipe lines	Obstruction for workmen movement	M	Route will be identified for placing of concrete pipe line before commencing the work	
				Separate platform will be made for crossing the pipe line	
		Figures trap in between clamp & pipe	M	Training for maintaining body posture	

8	Operation of concrete Pump	Exhaust Emission	M	Weekly maintenance by P & M persons	
				Inspection before commencing the pump operation	
		Excessive Noise	H	Weekly maintenance by P & M persons	
				Inspection before commencing the pump operation	
		Oil / Fuel Spillage	M	Use of funnel to fill the fuel / lubricating oil	
				Use of drip tray for collection of spillage of fuel / lubricating oil	
		Concrete waste	M	Residue / waste concrete will be used to make concrete blocks	
		Excess Pressure in concrete pipe line / Burst of concrete pipe line	H	Trained person will be deployed for the operation of concrete pump	
				Pipe line will be supported with help of rigid support	
				Pipes will be connected with the help of clamps and washer	
		Operator stands over pipe line / Fall of person / Splashing of concrete in eyes	H	Separate working platform will be provided for the operator for easy scanning of hopper.	
				Job specific PPE specially goggles, rubber hand gloves	
9	Pouring of concrete	Vibrations of concrete pipe line / Hit by concrete stone	H	Hose will be connected at the end of the pipe	
				Training for handling hose pipe of concrete pipe line	
				Work will be executed in regular interval / regular shift	

				No person will be allowed to stand in front of discharge end of pipe	
				Life line rope will be provided around the circumference of working area for anchoring of full body harness will be ensured	
10	Cleaning of Concrete Pipe line / Ball passing	Hit by passing Ball	H	Ball catcher will be attached at the discharge end of pipe line & no one will be allowed to work in front of discharge end	
				Work will be executed under the supervision.	
Concreting By Convectional Method					
11	Placement of GI sheet slope / Pouring of concrete through it.	Sharp edges of GI sheet	H	Use of Hand gloves will be strictly adhered while placing slope made of GI sheet	
				If possible sharp edges will bend	
				Training for handling of sharp edge materials	
		Fall of slope made to excavation pit	M	Slope made of GI sheet will be secured with rigid support from both the end	
		Hit by concrete stone	M	No person will be allowed to stand in front of discharge end of slope	
				Ensuring use of job specific PPE like Gumboot, goggles, rubber hand gloves, etc.	
		Fall of person / materials	M	Hard barricading will be provided on upper portion of slope & use of full body harness will be strictly monitored	

				Work will be executed under the supervision.	
		Hit by trolley / tilting of trolley	H	Tyre will filled with design air pressure before commencing the concreting work activity	
				Access will made clear from all the obstacles & will be made free from uneven surface	

7. Carpentry

1	Ply cutting Operation	Unauthorized Operation	H	Engagement of experienced / trained workmen.	
				Authorised operators will be displayed to the carpentry yard.	
		Exposure to rotating parts	M	All rotating parts are guarded.	
				Training for maintaining body posture while operating cutting machine.	
				Pre-inspection of machine before commencing work.	
				Monthly inspection of machine with inspection tag.	
		Poor Illumination	H	Carpentry yard is located in open area with roof for natural illumination.	
				Min. of 54 lux illumination is provided.	
		Ergonomics	M	Wooden table is made as platform for all carpentry work.	
				Training for operation of ply cutting machine.	

		Obstacles in the access	M	Access to carpentry yard is kept clean from all the slippery, rolling, other materials.	
				Daily Housekeeping before starting work.	
		Poor Housekeeping	M	Regular Housekeeping is maintained.	
				Working area around machine will cleaned before starting work.	
				Location is identified for deposal of wooden scrap.	
		Fire	H	Continue removal of saw dust accumulated.	
				Saw dust are regularly collected & dumped in wooden box.	
				Fire Extinguishers are kept.	
				Fire bucket filled with sand are kept.	
				Smoking is strictly prohibited.	
		Electrical connection	H	Cables are routed through conduits and through circuit breakers.	
				Regular inspection of circuit breakers.	
				Body earthing for distribution board.	
				Authorized electricians are deployed for maintenance & rectification works	
		Waste Generation	M	Saw dust are regularly collected & dumped in dumping yard wooden box.	
				Dumped saw dust are given for Domestic use.	
		Excessive Noise / Fly saw dust	M	Regular maintenance is carried out.	

				Workmen provided with Ear Plug, nose mask, goggle, etc.	
2	Nailing / De-nailing operation	Exposure to sharp edges of nails	M	Training for handling nails / nailing operation.	
				Regular Housekeeping is maintained.	
				Hammer is used for nailing / de-nailing operation.	
				Removal of nails from used ply.	
				Wooden box for collection of nails.	
		Failure of hammering tool	M	Tools will be inspected daily by operator for cracks in welded portion.	
				No wooden hammer is allowed to use.	
		Slipping of hammer / nails	M	Training for hammering operation.	
				No other person is allowed stand near carpenters.	
				Engagement of experienced / trained personnel's.	
		Use of wrong tools	M	Training for the use of correct tools for correct work.	
				Operation will be supervised.	
		Failure to use PPE	M	Work will be executed under the supervision.	

8. Air Compressor

1	Air Compressor	Failure of the pressure vessel	H	Pressure gauge to display vessel pressure	

				Pressure limit switch to trip the compressor when designed capacity of pressure vessel will be achieved.	
				Regular maintenance is carried out.	
				Inspection by third party will be organised. (TPI)	
				Regular inspections and users checking	
		Sudden pressure release	M	Daily inspection of discharge valve before starting the compressor	
				Regular maintenance of suction & discharge valves.	
		Failure of an air pipe	H	Seamless (without joints) pipe will be used to avoid failure of it	
				Air pipe will be routed through ducts to avoid damage of it	
		Exposure to dust particles	M	Job specific PPE will be worn like safety goggle, safety helmet, Safety shoes and reflective jacket	
				Use of hand gloves, goggles will be ensured by supervision.	
				Job specific training will be provided	
				No person will be allowed to work in front of air tools while cleaning	
		Horseplay with air tools	H	Cleaning process will be supervised	

				Job specific training will be provided	
		Exposure to compressed air	M	Training will be provided to maintain the body posture while cleaning to avoid contact of compressed air with the skin.	
		Mis use	M	Safe working practice will be ensured with the help of work permits & inspection checklist.	
		Electrocution	M	All the electric connection of the compressor will come through circuit breakers.	
				Regular electrical inspection of compressor power supply will be carried out	

9. Crane Operation

1	Pre-arrangement	Soft Soil condition	H	The Safe Bearing capacity of the soil is determined.	
				The base foundation will be designed by considering all type of load transmission from tower crane.	
		Presence of overhead electrical lines in operating radius.	H	Trained & experience operator will be allowed to operate the crane.	
				Swinging movement of crane boom will be controlled by limit switch.	
2	**Lifting operation**	Acrophobia	H	Medical Fitness of Crane operators.	
				Regular health monitoring.	

		Uncontrolled movement	H	Only authorized operator will be allowed to operate the crane.	
				Operators name & contact number with photos will displayed at site.	
		Miscommunication	H	Walkies talkies will for communication between operator & signal man.	
				Use of mobile phone prohibited for operator & signal man.	
		Excessive working Hours	H	Not allowed to work for more than a shift.	
		Inadequate access to the tower crane cabin	H	Provision of access to approach platform of crane from ground level.	
				Access free from material stacking.	
				Fall arrester is being used while climbing over the crane.	
				Access area is barricaded.	
		Unsecured materials at tower crane platform	H	Keeping material inside the box at ground level.	
				Use of tool box for keeping tools in operator cabin.	
				Daily inspection by Operator	
		Inadequate illumination	H	System of providing Illumination of at least 150 Lux in practice.	
				Practice of providing metal halide lamp (1000 Watts) in the main Jib.	
		High Wind Velocity / Thunder storm / Lightening	H	Avoid the use of crane during lightning.	
				Lightning arrester with grounded earthing is provided.	

				At high wind pressure of 40 Km / hr operation of crane will be stopped.	
				Anemometer is provided for recording wind pressure.	
				Crane operation will suspend after rising crane hoist at highest level & bringing the trolley nearer to cabin.	
		Airways movement	M	Aviation lamp is provided.	
		Adjacent Cranes	M	Maintaining the sufficient height clearance between two Cranes	
				Locking of boom radius for entering into other crane working boom radius.	
		Non-functioning of safety Device	H	Crane Fitness Certificate system.	
				Third party inspection system at regular scheduled.	
				Crane hook must have hook latch.	
				Over load, Over hoist limit switch & Trolley limit switch in the Tower crane is provided & checked for its function daily before lifting load.	
				Daily inspection by the Operator.	
				Weekly Maintenance by the P&M Engineer.	
				Monthly Joint inspection by the Safety & P & M persons.	
		Defects in Lifting gears		System of obtaining Competent Certificate.	
				Weekly Maintenance by the P&M Engineer.	
				Monthly Inspection by P&M / HSE Dept.	

		Crane overloading	H	Verifying the weight of an object to be lifted against the crane SWL (Safe Working Load) with respect to boom length and horizontal angle by referring manufacturer chart.	
				Over load limit switch will be in functioning.	
				Load chart of the Crane to be displayed at the operator Cabin.	
		Improper communication	H	Engagement of trained / experience signal man.	
				Signal man wearing the reflective jacket.	
				Use of mobile phone prohibited for operator & signal man.	
				Walkies talkies will for communication between operator & signal man.	
		Wrong rigging practices	H	Trained / experience riggers are deployed.	
				Work will be supervised by the signal man.	
				Training for safe rigging operation.	
				Hand gloves & other PPE will be used.	
				Provision of Tag line to control the oscillations of load lifted.	
				Usage of right slinging method with right lifting gears.	
		Pulling the Object	H	Tower crane will not be used for pulling the object.	
				Avoiding tower crane use for lifting embedded object.	

				Training for safe rigging operation.	
		Inclined Load line	H	While Lifting, the load line & load will be kept vertical.	
				Training to signal man for finding out centre of gravity.	
				Keeping the Centre of Gravity of the Load in line with the crane hook centre line.	
		Sharp corner of the load	M	Proper PPE will be worn.	
				Use of packing's at the Sharp corners.	
		Lifting loose materials (like bricks, blocks, etc.)	M	Use of separate lifting cage.	
				Safe load lifting capacity will be displayed over the cage.	
3	Maintenance	Negligent operation of Crane during Maintenance / Lubricating oil	M	Informing the entire department regarding maintenance.	
				Work permit system for maintenance.	
				Lockout & tag out system before starting maintenance activity.	
		Lubrication Oil	M	Use of funnel to fill the hydraulic / lubricating oil etc.	
				Contain the spillage by spill tray.	

10. Shuttering (Mivan, RMD, Convectional Method (Ply))

MANUAL LIFTING OF SHUTTRING MATERIALS					
1	Manual lifting of Materials	Sharp edges	M	Sufficient number of skilled workmen will be deployed.	
				Training & awareness for lifting technique ergonomics & for lifting of long & heavy materials.	

				Hand gloves & other PPE will be used for lifting.	
2	Shifting of materials	Unbalanced	M	Training & awareness for shifting of materials will be provided.	
				Shoulder pad, hand gloves & other PPE will be worn by workmen.	
		Slip & Trip	M	Access will be made clear from all the rolling, slippery materials.	
		Fall of Scaffolding Materials & clamp	M	Only trained / experience persons will be deployed.	
		Striking	M	Warn to people while material shifting.	
3	Stacking of Materials	Sharp edges / Trapping / Slip of material	M	Sufficient number of skilled workmen will be deployed.	
				Material will be stacked size and different type wise.	
				Materials will be stacked on the racks or by providing packing material.	
				Materials will be not stacked above overhead.	
				Training for maintaining body posture	
MECHANICAL LIFTING OF SHUTTRING MATERIALS					
4	Rigging (Material to be lift)	Trap / Sharp edge / Wrong use	M	Trained & experience persons will be deployed.	

				Work will be supervised by the signal man.	
				Usage of right slinging method with right lifting gears.	
				Training for safe rigging operation.	
				Hand gloves & other PPE will be used.	
5	Lifting & Lowering of load by Tower crane	Uncontrolled movement of load lifted	H	Tag line of 2 m will be tied with the load to avoid oscillations of load.	
				Crane will be operated by only authorised operator.	
				Medical fitness of operator will be done before commencing the job.	
				For communication walkie - Talkie will be used by crane operator and signal man.	
		Failure of lifting tools and tackles	H	Daily inspection by operator.	
				Weekly maintenance by P & M persons.	
				Monthly joint inspection by Safety & P & M persons.	
				Colour coding system for inspection of lifting tools and tackles will be used.	

				Third party inspection of lifting tools & tackles.	
		Overloading of Crane	H	Before starting work activity crane will be check for all the tripping of limit switches by operator.	
				Verifying the weight of an object to be lifted against the crane SWL (Safe Working Load) with respect to boom length and horizontal angle by referring manufacturer chart.	
				Load chart will be available in crane operator cabin.	
		Miscommunication / Fatigue	H	Reflective jacket will be worn by signal man & use of mobile phone is strictly prohibited.	
				Ensuring work in regular shift.	
				Trained & experience signal man will be deployed.	
				Trained Signal man will be deployed.	
6	Stacking of Shuttering Materials	Hit by shuttering material	H	Training about handling of materials.	
				Housekeeping will be done before stacking of material.	
				Proper PPE will be worn.	

				Warn to others during material stacking.	
		Fall of shuttering materials	H	Training for stacking of materials.	
				Proper stand will be used for material stacking.	
7	Applying shuttering oil	Spillage of shuttering oil	M	Oiling work will be done by placing material in drip tray.	
				Hand gloves & other proper PPE will be worn.	
				Waste shuttering oil is collected in waste oil drum & then will be disposed.	
8	Fixing of wall, slab & column shuttering	Fall of men / materials (Nails / Mivan pin / RMD Clamp)	M	Provision of proper working platform with the help of brackets / scaffolding materials.	
				Full body harness, safety goggle & other PPE will be worn.	
				Provision of vertical safety netting before starting shuttering.	
				Provision catching safety netting before starting shuttering.	
				Daily housekeeping before & after shuttering.	
				Wooden boxes are used for temporary storage of nails & aluminium bucket for Mivan pins.	

				Cut outs will be closed with the help of steel mesh, wooden ply & safety net.	
				Provision of access with the help of ladder.	
				Training to the workmen for working at height.	
		Fall of shuttering	H	Shuttering will be done as per design & drawing.	
				Shuttering supports will be check as per the scheme.	
9	Removal of excess material	Trip / slip	H	All excess materials will be removed from shuttering floor.	
				Housekeeping will be done after completion of shuttering work.	

11. De - shuttering

1	Removal of wall, slab & column shuttering	Fall of men / materials (Nails / Mivan pin / RMD Clamp)	M	Provision of proper working platform with the help of brackets / scaffolding materials.	
				Full body harness, safety goggle & other PPE will be worn.	
				Provision of vertical safety netting before starting shuttering.	
				Provision catching safety netting before starting shuttering.	

				Housekeeping before & after De - shuttering.	
				Wooden boxes are used for collection of loose materials like Mivan pin, RMD shuttering clamps, nails, etc.	
				Cut outs will be closed with the help of steel mesh, wooden ply & safety net.	
				Provision of access with the help of ladder.	
		Fall of shuttering	H	De - shuttering will be done from outside to inside.	
				Removing shuttering simultaneously with the removal of its supports.	
2	Stacking of De – shuttered materials on De – shuttering floor	Hit by shuttering material	M	Training about handling of materials.	
				Housekeeping will be done before stacking of material.	
				Proper PPE will be worn.	
				Material will be stacked size and different type wise.	
				Materials will be stacked on the racks or by providing packing material.	
				Warn to others during material stacking and Sign board of de – shuttering work is in progress will be displayed.	

		Fall of shuttering materials	H	Training for stacking of materials.	
				Proper stand will be used for material stacking.	
3	Shifting of De – shuttered materials	Unbalanced	M	Training & awareness for shifting of materials will be provided.	
				Sufficient number of skilled workmen will be deployed.	
				Shoulder pad, hand gloves & other PPE will be worn by workmen.	
		Slip & Trip	M	Access will be made clear from all the rolling, slippery materials.	
		Fall of Materials	H	Only trained / experience persons will be deployed.	
		Striking	H	Warn to people while material shifting.	

12. Reinforcement

MANUAL LIFTING OF SHUTTRING MATERIALS					
1	Manual lifting of Materials	Sharp edges	M	Sufficient number of skilled workmen will be deployed.	
				Training & awareness for lifting technique ergonomics & for lifting of long & heavy materials.	
				Hand gloves & other PPE will be used for lifting.	
2	Shifting of materials	Unbalanced	M	Training & awareness for shifting of materials will be provided.	

				Shoulder pad, hand gloves & other PPE will be worn by workmen.	
		Slip & Trip	M	Access will be made clear from all the rolling, slippery materials.	
		Fall of Scaffolding Materials & clamp	M	Only trained / experience persons will be deployed.	
		Striking	M	Warn to people while material shifting.	
3	Stacking of Materials	Sharp edges / Trapping / Slip of material	M	Sufficient number of skilled workmen will be deployed.	
				Material will be stacked size and different type wise.	
				Materials will be stacked on the racks or by providing packing material.	
				Materials will be not stacked above overhead.	
				Training for maintaining body posture	
4	Rigging (Material to be lift)	Trap / Sharp edge / Wrong use	M	Trained & experience persons will be deployed.	
				Work will be supervised by the signal man.	
				Usage of right slinging method with right lifting gears.	
				Training for safe rigging operation.	

				Hand gloves & other PPE will be used.	
5	Lifting & Lowering of load by Tower crane	Uncontrolled movement of load lifted	H	Tag line of 2 m will be tied with the load to avoid oscillations of load.	
				Crane will be operated by only authorised operator.	
				Medical fitness of operator will be done before commencing the job.	
				For communication walkie - Talkie will be used by crane operator and signal man.	
		Failure of lifting tools and tackles	H	Daily inspection by operator.	
				Weekly maintenance by P & M persons.	
				Monthly joint inspection by Safety & P & M persons.	
				Colour coding system for inspection of lifting tools and tackles will be used.	
				Third party inspection of lifting tools & tackles.	
		Overloading of Crane	H	Before starting work activity crane will be check for all the tripping of limit switches by operator.	

				Verifying the weight of an object to be lifted against the crane SWL (Safe Working Load) with respect to boom length and horizontal angle by referring manufacturer chart.	
				Load chart will be available in crane operator cabin.	
		Miscommunication / Fatigue	H	Reflective jacket will be worn by signal man & use of mobile phone is strictly prohibited.	
				Ensuring work in regular shift.	
				Trained & experience signal man will be deployed.	
				Trained Signal man will be deployed.	
		Striking	H	Warn to people while material shifting.	
6	Lying steel over slab, Placing steel ring & lapping of steel	Sharp edges of steel / trap	H	Hand gloves, Safety shoes & other PPE will be worn.	
				Sufficient number of experience / trained workmen will be deployed.	
				Work will be under executed under the supervision.	
				Training for handling of steel.	
		Fall of men / materials	H	Provision of proper working platform with the help of brackets / scaffolding materials.	

				Full body harness, safety goggle & other PPE will be worn.	
				Provision of vertical / catching safety netting before starting shuttering.	
				Daily housekeeping before & after shuttering.	
				Wooden boxes are used for temporary storage of steel ring.	
				Cut outs will be closed with the help of steel mesh, wooden ply & safety net.	
				Provision of access with the help of ladder.	
				Training to the workmen for working at height.	
7	Binding with the help of binding wire	Sharp edges of steel / trap	M	Hand gloves & other PPE will be worn.	
				Experience / trained workmen will be deployed.	
				Work will be under executed under the supervision.	
				Training for binding of steel.	

13. Installation of Safety Net

1	Manual lifting of Materials	Sharp edges	M	Sufficient number of skilled workmen will be deployed.	

				Training & awareness for lifting technique ergonomics & for lifting of long & heavy materials.	
				Hand gloves, Safety helmet & other PPE will be worn.	
2	Shifting of materials (Pipes, clamps, brackets, etc.)	Unbalanced	H	Training & awareness for shifting of materials will be provided.	
				Shoulder pad, hand gloves & other PPE will be worn.	
		Slip & Trip	M	Access will be made clear from all the rolling, slippery & loose materials.	
		Fall of Safety net / CT Prop	H	Only trained / experience persons will be deployed.	
		Striking	M	Warn to people while material shifting.	
3	Stacking of Materials	Sharp edges / Trapping / Slip of material	M	Sufficient number of skilled workmen will be deployed.	
				Material will be stacked size and different type wise.	
4	Adjusting of CT Props between floors surfaces	Fall of CT prop / trap	H	Deployment of sufficient number of experienced / trained workmen.	
				Training for use proper use of hand tools like hammer, ring spanner, etc.	
				Hammer is used for tightening of CT prop lock pin.	
				CT prop will be placed at right angle to the floor.	

				Proper PPE will be worn.	
5	Fixing the swivel clamp	Fall of clamp / ring spanner / trap / slip	H	Deployment of experienced / trained workmen. Training for the safe use of hand tools & maintaining safe body posture. Only ring spanner will be used for tightening clamp over CT prop. Washers will be used below nut.	
6	Lowering of PP rope	Fall men / material	H	Hard barricading will be provided at edges of the floor. Full body harness & other PPE will be worn. Ground level area below installation area will be barricaded by placing sign board of work in progress.	
7	Dragging pipe out & tying safety net with pipe	Fall of men / materials	H	Hard barricading will be provided at edges of the floor. Full body harness & other PPE will be worn. Ground level area below installation area will be barricaded by placing sign board of work in progress.	
8	Fixing pipe over CT prop with the help of clamp	Fall of men / material / Trap	H	Deployment of sufficient number of experienced / trained workmen.	

				Hard barricading will be provided at edges of the floor.	
				Full body harness & other PPE will be worn.	
				Work will execute under supervision.	
				Ground level area below installation area will be barricaded by placing sign board of work in progress.	
9	Tightening of PP rope & tying with rigid structure	Fall of men / trap	H	Deployment of sufficient number of experienced / trained workmen for tightening of PP rope.	
				Work will be executed by more than one man.	
				Hand gloves & other PPE will be worn by workmen.	
				Training for maintaining body posture.	
10	Transferring remaining part of safety net to other pipe.	Fall men / Material	M	Deployment of sufficient number of experienced / trained workmen.	
				Hard barricading will be provided at edges of the floor.	
				Full body harness, hand gloves & other PPE will be worn.	
				Work will execute under supervision.	
				Ground level area below installation area will be barricaded by placing sign board of work in progress.	

				PP rope will be used for transferring remaining part of safety net from one pipe to other pipe.	
11	Joining two safety nets	Trap	M	Training for maintaining body posture during tying work.	
11	Drilling	Slip / breakage of drill bit	M	Training for positioning of drilling machine.	
				Drilling will be positioned at right angle to the drill area.	
				Safety goggle & other proper PPE will be worn.	
				No one will be allowed to work near drilling work except driller.	
				Housekeeping will be ensured after completion of drilling work.	
		Exposure to dust	M	Nose mask & other PPE will be worn.	
				Before starting drilling work water will be splash over the surface of the floor.	
		Electrocution	M	All the connections are routed through circuit breakers.	
				Seamless cable will be used / cable joining will be done with the help of insulation tape.	

				Drilling machine will be inspected by P & M person before commencing for work & inspection tag will be placed over it.	
				Male & Female socket are used for connections.	
				Circuit breakers & earthing will be inspected by electrician monthly in the presence of safety person.	
		Fall	H	Cable will be routed overhead will the help of insulated hooks.	
				Separate stand will be used for routing cable.	
12	Fixing Safety net bracket with the help of anchor fastener	Hit / slip	H	Training for operating hand tools & maintaining body posture.	
				Groove will be made for initial fixing of anchor fastener.	
				Only ring spanner will be used for tightening of nut.	
				Proper PPE will be worn by workmen.	
13	Lowering of PP rope	Fall men / material	M	Hard barricading will be provided at edges of the floor.	
				Full body harness & other PPE will be worn.	

				Ground level area below installation area will be barricaded by placing sign board of work in progress.	
14	Dragging pipe out & tying safety net with pipe	Fall of men / materials	H	Hard barricading will be provided at edges of the floor. Full body harness & other PPE will be worn. Ground level area below installation area will be barricaded by placing sign board of work in progress.	
15	Fixing pipe over CT prop with the help of clamp	Fall of men / material / Trap	H	Deployment of sufficient number of experienced / trained workmen. Hard barricading will be provided at edges of the floor. Full body harness & other PPE will be worn. Work will execute under supervision. Ground level area below installation area will be barricaded by placing sign board of work in progress.	
16	Tightening of PP rope & tying with rigid structure	Fall of men / trap	H	Deployment of sufficient number of experienced / trained workmen for tightening of PP rope. Work will be executed by more than one man. Hand gloves & other PPE will be worn by workmen.	

				Training for maintaining body posture.	
17	Transferring remaining part of safety net to other pipe.	Fall men / Material	H	Deployment of sufficient number of experienced / trained workmen. Hard barricading will be provided at edges of the floor. Full body harness, hand gloves & other PPE will be worn. Work will execute under supervision. Ground level area below installation area will be barricaded by placing sign board of work in progress. PP rope will be used for transferring remaining part of safety net from one pipe to other pipe.	
18	Joining two safety nets	Trap	M	Training for maintaining body posture during tying work.	
19	Adjusting of CT Props between floors surfaces	Fall of CT prop / trap	M	Deployment of sufficient number of experienced / trained workmen. Training for use proper use of hand tools like hammer, ring spanner, etc. Hammer is used for tightening of CT prop lock pin. CT prop will be placed at right angle to the floor. Proper PPE will be worn.	
20	Fixing the swivel clamp	Fall of clamp / ring spanner / trap / slip	M	Deployment of experienced / trained workmen.	

				Training for the safe use of hand tools & maintaining safe body posture.	
				Only ring spanner will be used for tightening clamp over CT prop.	
				Washers will be used below nut.	
21	**1** Fixing of outward pipe over CT prop with the help of clamp. **2** Lowering of pipe & fixing with outward pipe with the help of clamp. **3** Provision of hand Barricading.	Fall of men / material / Trap	H	Deployment of sufficient number of experienced / trained workmen.	
				Hard barricading will be provided at edges of the floor.	
				Full body harness & other PPE will be worn.	
				Work will execute under supervision.	
				Provision of catching net.	
				Ground level area below installation area will be barricaded by placing sign board of work in progress.	
				Life line rope will be provided for anchorage of safety belt on the working floor.	
22	Tying safety net with hard barricading with the help of gye rope.	Fall of men / material	H	Hard barricading will be provided at edges of the floor.	
				Full body harness & other PPE will be worn.	
23	**23.1** Fixing pipe vertically over Mivan brackets with the help of clamp.	Fall of men / material / Trap	H	Deployment of sufficient number of experienced / trained workmen.	
				Hard barricading will be provided at edges of the floor.	

	23.2 Fixing Horizontal pipe or bracings			Full body harness & other PPE will be worn.	
				Work will execute under supervision.	
				Training for installation of safety net.	
				Catching Safety net will be provided.	
24	Tying of safety net with pipe / Lowering of safety net	Fall of men / material	H	Deployment of sufficient number of experienced / trained workmen.	
				Hard barricading will be provided at edges of the floor.	
				Full body harness & other PPE will be worn.	
				Work will execute under supervision.	
				Training for installation of safety net.	
				Catching Safety net will be provided.	

14. Working at Height

1	Provision of access for the working platform	Fall / slip / trip	H	Stair case will be made clean from all the slippery materials / loose materials / rolling materials, etc.	
		Fall of ladder / Failure of rugs / Use of damage ladder	H	Ladder will be provided for access to the working floor (If stair is not available)	
				Ladder will be secured properly from both the ends.	
				Ladder will be inspected for any damage before installing.	
				During inspection if damage ladder found then that will be repaired.	

2	Fixing Life line rope / hard barricading around periphery of working floor	Exposed steel rebar's	H	Experienced / trained persons will be engaged.	
				Use of hand gloves will be ensured by the supervision person.	
		Fall of Person / materials	H	Use of full body harness will be ensured.	
				Catching safety net will be provided.	
				Training will be provided for safe handling of materials.	
3	Working at Height	Fall of person / materials	H	Safety belt & other PPE will be worn.	
				Provision of catching, climbing & vertical safety net along periphery of building.	
				Provision of hard barricading & life line rope.	
				Training, daily TBT & awareness.	
				Safety awareness signages.	
				Provision of working platform with the help of external periphery brackets / cantilever platform / scaffolding.	
				Safe access & egress will be provided.	
				Daily housekeeping.	
				Deployment of trained & experience workmen.	
				Work permit procedure will be followed before start of job.	
				Execution of work under the supervision.	
				Physical medical examination of workmen for height phobia.	

				Vertigo height test passes for workmen working at height.	
				Inspection of ladder / scaffolding / full body harness for any damages.	
				Closings of all floors cut outs with steel mesh and ply.	
	Working at height	Electrocution / Fall of person	H	All the connections are routed through circuit breakers.	
				All the connections cables are routed over head with the help of insulated hooks.	
				Inspection of circuit breakers & earthing at regular interval.	
				Cable joining will be done with the help of insulation tape.	
				Male & female sockets will be used for connections from distribution boards.	
				All the distribution boards will be earthed.	
				Deployment of trained & experienced electricians.	

15. Stores

MANUAL MATERIAL HANDLING					
1	Manual lifting of Materials	Sharp edges	M	Sufficient number of skilled workmen will be deployed.	

				Training & awareness for lifting technique ergonomics & for lifting of long & heavy materials.	
				Hand gloves & other PPE will be used for lifting.	
2	Shifting of materials	Unbalanced	M	Training & awareness for shifting of materials will be provided.	
				Shoulder pad, hand gloves & other PPE will be worn by workmen.	
		Slip & Trip	M	Access will be made clear from all the rolling, slippery materials.	
		Fall of Scaffolding Materials & clamp	M	Only trained / experience persons will be deployed.	
		Striking	M	Warn to people while material shifting.	
3	Stacking of Materials	Sharp edges / Trapping / Slip of material	M	Sufficient number of skilled workmen will be deployed.	
				Material will be stacked size and different type wise.	
				Materials will be stacked on the racks or by providing packing material.	
				Materials will be not stacked above overhead.	
				Training for maintaining body posture	

4	Rigging (Material to be lift)	Trap / Sharp edge / Wrong use	M	Trained & experience persons will be deployed.	
				Work will be supervised by the signal man.	
				Usage of right slinging method with right lifting gears.	
				Training for safe rigging operation.	
				Hand gloves & other PPE will be used.	
5	Lifting & Lowering of load by crane / Tower crane	Uncontrolled movement of load lifted	H	Tag line of 2 m will be tied with the load to avoid oscillations of bucket.	
				Crane will be operated by only authorised operator.	
				Medical fitness of operator will be done before commencing the job.	
				For communication walkie - Talkie will be used by crane operator and signal man.	
		Failure of lifting tools and tackles	H	Daily inspection by operator.	
				Weekly maintenance by P & M persons.	
				Monthly joint inspection by Safety & P & M persons.	

				Colour coding system for inspection of lifting tools and tackles will be used.	
				Third party inspection of lifting tools & tackles.	
		Overloading of Crane	H	Before starting work activity crane will be check for all the tripping of limit switches by operator.	
				Load chart will be available in crane operator cabin.	
		Miscommunication / Fatigue	H	Reflective jacket will be worn by signal man & use of mobile phone is strictly prohibited.	
				Ensuring work in regular shift.	
				Trained & experience signal man will be deployed.	
5	Lifting & Lowering of load by Hydra	Uncontrolled movement of pump	H	Tag line of 2 m will be tied with the bucket to avoid oscillations of pump.	
				Licence operator will be allowed to operate the Hydra.	
				Hand signals will be used for communications between signal man & operator.	
				Work will be executed under the supervision.	

		Workmen hit by hydra while reversing	H	P & M person will ensure reverse horn to the hydra or signal man will deployed.	
		Failure of lifting tools and tackles	H	Hydra Hook & safety latch will be check before commencing work.	
				Monthly joint inspection by Safety & P & M persons.	
				Colour coding system for inspection of lifting tools and tackles will be used.	
				Third party inspection of lifting tools & tackles.	
		Miscommunication	M	Reflective jacket will be worn by signal man & use of mobile phone is strictly prohibited.	
				Trained Signal man will be deployed.	
6	Storage of materials Over the racks	Fall of materials / Fall of person	H	Use of ladder for stacking of materials over the racks.	
				Training & awareness for stacking of materials.	
				Inspection of store / ladder on monthly basis.	
				Heavy materials will be kept at ground.	
				Deployment of sufficient number of trained & experience workmen for stacking of materials.	
				Materials will be stacked as per the type of materials and at their respective place.	

				All the rolling materials will be stacked at ground level with the stoppers.	
				Loose materials will be stacked in wooden boxes.	
7	Handling and storage of Chemicals	Spillage of chemicals over ground / skin	M	Training & awareness for handling of chemical & MSDS of chemicals.	
				Drip tray will be used.	
				Spillage chemicals will be disposed as per MSDS of those chemicals.	
				Display of MSDS & emergency contact details near storage of chemicals.	
				Hand gloves, safety goggle, nose mask & other PPE will be worn.	
				Safety awareness signage's will be displayed.	
				Deployment of trained & experience workmen.	
		Usage of wrong chemicals	H	Identification tag will be displayed over the containers of chemicals.	
				Deployment of skilled workmen.	
		Wrong storage	H	Chemicals will be stored as per their properties wise under the roof & in well - ventilated area.	
				Chemicals will not be placed directly over the ground.	
		Miss use	L	Chemicals will be used with the permission of authorised persons.	
				Awareness about use of chemicals.	
		Unauthorised use	M	Chemicals will be stored in lock room.	
				Only authorised persons will be allowed to operate the room.	

		Exposure to Flames	H	Nose mask, hand gloves & other PPE will be worn.	
				Work will be performed in the regular interval.	
				Chemicals will be stored in air tied containers.	
8	Handling and storage of flammable liquids	Spillage of flammable liquids over ground / skin	M	Training & awareness for handling of flammable liquids & MSDS of flammable liquids.	
				Drip tray will be used.	
				Spillage flammable liquids will be disposed as per MSDS of those flammable liquids.	
				Display of MSDS & emergency contact details near storage of flammable liquids.	
				Hand gloves, safety goggle, nose mask & other PPE will be worn.	
				Safety awareness signage's will be displayed.	
				Hand pump will be used for removal of flammable liquids from container.	
				Deployment of trained & experience workmen.	
		Usage of wrong flammable liquids	H	Identification tag will be displayed over the containers of flammable liquids.	
				Deployment of skilled workmen.	
		Wrong storage	M	Flammable liquids will be stored as per their properties wise under the roof & in well - ventilated area.	

				Flammable liquids will not be placed directly over the ground.	
		Miss use	M	Flammable liquids will be used with the permission of authorised persons.	
				Awareness about use of chemicals.	
		Unauthorised use	M	Flammable liquids will be stored in the lock & key room.	
				Only authorised persons will be allowed to operate the room.	
		Exposure to Flames	M	Nose mask, hand gloves & other PPE will be worn.	
				Flammable liquids will be stored in air tied containers.	
		Fire	H	Anti – static safety shoes & other PPE will be worn.	
				Use of mobile phone is strictly prohibited near storage area.	
				Safety awareness through displayed of signage's.	
				Adequate number of fire extinguishers & fire buckets will be placed nearer to storage area.	
				Smoking & other igniting sources will not be allowed to use nearer to the storage area.	
9	Stacking of materials at ground level.	Fall person / material / Trap / Slip	H	Materials will not be placed in direct contact with the ground.	
				Materials will be stacked away from the access / access will maintain clear from loose materials.	
				Demarked path will be marked.	

				Material identification tag will be placed.	
				All the rolling materials will be stacked with the help of stopper.	
				Materials will not be stacked overhead height.	
				Provision of signage's.	
		Fire	H	All the combustible materials will stack away from heat source like electric board / panel.	
				Smoking will be strictly prohibited.	
				Materials will be stacked with the over the stands / in wooden boxes.	
				Fire & sand buckets will be placed near the combustible materials.	
				Display of emergency contact numbers / emergency evacuation route.	

16. Cube Testing Machine (CTM)

1	Preparation of Moulds for cube	Trap / Hit / Slip of tools	M	Deployment of sufficient number of experience & trained workmen.	
				Only ring spanner will be used for tightening nut and bolts of the moulds.	
				Training for preparation of moulds & handling of hand tools.	
				Hand gloves & other PPE will be worn.	
		Spillage of chemicals over ground / skin	M	Training & awareness for handling of chemical & MSDS of chemicals.	

				Drip tray will be used oiling & greasing work of moulds.	
				Spillage chemicals will be disposed as per MSDS of those chemicals.	
				Display of MSDS & emergency contact details near storage of chemicals.	
				Hand gloves, safety goggle, nose mask & other PPE will be worn.	
				Safety awareness signage's will be displayed.	
				Deployment of trained & experience workmen.	
		Usage of wrong chemicals	H	Identification tag will be displayed over the containers of chemicals.	
				Deployment of skilled workmen.	
		Wrong storage	H	Chemicals will be stored as per their properties wise under the roof & in well - ventilated area.	
				Chemicals will not be placed directly over the ground.	
		Miss use	M	Chemicals will be used with the permission of authorised persons.	
				Awareness about use of chemicals.	
		Exposure to Flames	H	Nose mask, hand gloves & other PPE will be worn.	
				Work will be performed in the regular interval & regular health monitoring.	
				Chemicals will be stored in air tied containers.	
2	Transportation of	Exposure to concrete	M	Hand gloves & other PPE will be worn.	

	concrete to Quality Room with the help of trolley.			Training & awareness for handling of concrete.	
		Spillage of concrete over the ground	M	Concrete will be filled in the trolley in the presence of supervision.	
				Identification mark will be made over trolley to avoid over filling.	
				Training for avoiding of overfilling in trolley.	
		Tilting of trolley	M	Tire pressure will be maintained.	
				Access for the trolley movement will be made levelled.	
				Training for maintaining body posture while pushing trolley.	
3	Preparation of concrete cube / Pouring of concrete in the cube	Spillage of concrete	M	Concrete mould will be placed in the drip tray & then concrete will be poured in the mould.	
		Exposure with concrete	M	Hand gloves & other PPE will be worn.	
4	Placing cube in water tank / curing of cube	Edges of the tank	M	Edges will be made curved to avoid sharpening edge.	
		Breading of mosquito	M	Weekly cleaning of tank to avoid breading of mosquito.	
5	Testing of cube for compression strength over CTM	Trap / cut	M	All the rotating & sliding part of machine will be guarded.	
				Stringent supervision & training.	
				Testing area of the machine will be guarded with the flexibility.	

		Strike by pieces of cube	M	Front guard the machine will be closed while operating machine.	
		Electrocution	M	Provision of double earthing. (Body earthing & phase earthing)	
				Regular inspection of circuit breakers.	
				All the connections are routed through circuit breakers.	
				Machine operation will be done by standing non conduction materials.	
				Seamless cable will be used for connecting M / C with power supply.	
6	Cleaning of the machine	Cut	M	Hand Gloves & other PPE will be worn by workmen.	
		Electrocution	H	Provision of double earthing. (Body earthing & phase earthing)	
				Deactivation of power supply during cleaning work.	
				Regular inspection of circuit breakers.	
				All the connections are routed through circuit breakers.	
				Machine operation will be done by standing non conduction materials.	
				Training, awareness & displaying signage's.	
				Seamless cable will be used for connecting M / C with power supply.	
7	Testing of cube in oven for heat deviation due to	Electrocution	H	Provision of double earthing. (Body earthing & phase earthing)	

	heat.			Regular inspection of circuit breakers.	
				All the connections are routed through circuit breakers.	
				Machine operation will be done by standing non conduction materials.	
				Seamless cable will be used for connecting M / C with power supply.	
		Contact with heat source / hot air inside oven	H	Training, awareness & display of signage's.	
				After testing front door will not be open until the inside temperature lowers.	
				Heat resistance hand gloves & other PPE will be worn.	
		Damage thermocouple / temperature indicator	M	Regular periodic maintenance will be done.	
				All the indicators part will be check for functioning before commencing test.	

17. Passenger Cum Material Hoist (Rack & Pinion arrangement)

1	Lifting of mast for installation	Uncontrolled movement of load lifted	H	Tag line of 2 m will be tied with the load to avoid oscillations of bucket.	
				Crane will be operated by only authorised operator.	
				Medical fitness of operator will be done before commencing the job.	
				For communication walkie - Talkie will be used by crane operator and signal man.	

		Failure of lifting tools and tackles	H	Daily inspection by operator.	
				Weekly maintenance by P & M persons.	
				Monthly joint inspection by Safety & P & M persons.	
				Colour coding system for inspection of lifting tools and tackles will be used.	
				Third party inspection of lifting tools & tackles.	
		Overloading of Crane	H	Before starting work activity crane will be check for all the tripping of limit switches by operator.	
				Load chart will be available in crane operator cabin.	
		Miscommunication / Fatigue	H	Reflective jacket will be worn by signal man & use of mobile phone is strictly prohibited.	
				Ensuring work in regular shift.	
				Trained & experience signal man will be deployed.	
2	Installation of mast & hoist car	Fall of person / materials	H	Safety belt & other PPE will be worn.	
				Training, daily TBT & awareness.	
				Safety awareness signage's.	
				Safe access & egress will be provided.	
				Deployment of trained & experience workmen.	

				Work permit procedure will be followed before start of job.	
				Execution of work under the stringent supervision.	
		Collapse of installed mast	H	Tightening of all mast with the help nut & bolts / pin will be ensured by stringent supervision.	
				Provision of limit switches for door opening, overloading, upper & lower.	
				Safety awareness signage's.	
				Safe access & egress will be provided.	
				Deployment of trained & experience workmen.	
				Work permit procedure will be followed before start of job.	
				Execution of work under the stringent supervision.	
		Collapse of installed mast	H	Tightening of all mast with the help nut & bolts / pin will be ensured by stringent supervision.	
		Electrocution / Fall of person	H	All the connections are routed through circuit breakers.	
				All the connections cables are routed over head with the help of insulated hooks.	
				Inspection of circuit breakers & earthing at regular interval.	
				Cable joining will be done with the help of insulation tape.	
				Male & female sockets will be used for connections from distribution boards.	
				All the distribution boards will be earthed.	
				Deployment of trained & experienced electricians.	

3	Transporting of workmen to upper level / Regular use	Fall of person / materials	H	Covering of all sides of hoist car by small size steel mesh	
				Limit switches for opening of door.	
				Adequate landing platform.	
		Overloading	E	Display of safe load lifting capacity.	
				Limit switches for overloading.	
				Training & awareness to workmen / operator.	
		Unauthorised operation	E	Display of authorised operator details.	
				Arrangement of lock & key with operator & P & M person.	
		Failure of driving unit / brakes / limit switches	H	Periodic maintenance. (Replacement of worn out part)	
				Lubrication of rolling / sliding contacts.	
				Installation of anti – falling device.	
				Inspection from third party at regular interval.	
				Inspection at regular interval with inspection tag.	
		Electrocution	H	Routing of all electrical connection through circuit breakers.	
				Inspection of circuit breakers at regular intervals.	
				Seamless cables will be used / joining of cable with the help of insulation tape.	
				Double earthing. (Body earthing & phase earthing)	
		Fire	H	Smoking strictly prohibited through training, awareness & signage's.	
				Display of emergency contact numbers.	

				Placing of fire extinguisher in the hoist car.	
		Hit by hoist / trap below hoist	M	Ground level entrance of hoist will be barricaded from all the sides.	
				Ground level entrance door will be with lock & key and provision of opening from hoist side.	
				Landing platform of the floors will be provided with doors and opening from hoist side.	
				Landing platform will be made with no gap between hoist platform & floor platform.	
		Collapse of structure	E	At regular interval mast of the hoist will be supported by rigid structure.	
				Tightening lock pin / nut & bolt will be ensured during installation.	
				Every day connecting between two masts will be inspected by operator.	
				Daily inspection by operator.	
				Periodic inspection by P & M person.	

18. Tower crane Operation

1	**Pre-arrangement**	Soft Soil condition	H	The Safe Bearing capacity of the soil is determined.	
				The base foundation will be designed by considering all type of load transmission from tower crane.	
		Presence of overhead electrical lines in operating radius.	H	Trained & experience operator will be allowed to operate the crane.	

				Swigging movement of crane boom will be controlled by limit switch.	
2	**Lifting operation**	Acrophobia	H	Medical Fitness of Crane operators.	
				Regular health monitoring.	
		Uncontrolled movement	H	Only authorized operator will be allowed to operate the crane.	
				Operators name & contact number with photos will displayed at site.	
		Miscommunication	H	Walky talky will for communication between operator & signal man.	
				Use of mobile phone prohibited for operator & signal man.	
		Excessive working Hours	H	Not allowed to work for more than a shift.	
		Inadequate access to the tower crane cabin	M	Provision of access to approach platform of crane from ground level.	
				Access free from material stacking.	
				Fall arrester is being used while climbing over the crane.	
				Access area is barricaded.	
		Unsecured materials at tower crane platform	H	Keeping material inside the box at ground level.	
				Use of tool box for keeping tools in operator cabin.	
				Daily inspection by Operator	
		Inadequate illumination	M	System of providing Illumination of at least 150 Lux in practice.	
				Practice of providing metal halide lamp (1000 Watts) in the main Jib.	

		High Wind Velocity / Thunder storm / Lightening	H	Avoid the use of crane during lightning.	
				Lightning arrester with grounded earthing is provided.	
				At high wind pressure of 40 Kph operation of crane will be stopped.	
				Anemometer is provided for recording wind pressure.	
				Crane operation will suspend after rising crane hoist at highest level & bringing the trolley nearer to cabin.	
		Airways movement	H	Aviation lamp is provided.	
		Adjacent Cranes	M	Maintaining the sufficient height clearance between two Cranes	
				Locking of boom radius for entering into other crane working boom radius.	
		Non-functioning of safety Device	H	Crane Fitness Certificate system.	
				Third party inspection system at regular scheduled.	
				Crane hook must have hook latch.	
				Over load, Over hoist limit switch & Trolley limit switch in the Tower crane is provided & checked for its function daily before lifting load.	
				Daily inspection by the Operator.	
				Weekly Maintenance by the P&M Eng.	
				Monthly Joint inspection by the Safety & P & M persons.	
		Defects in Lifting gears	H	System of obtaining Competent Certificate.	

				Weekly Maintenance by the P&M Eng.	
				Monthly Inspection by P&M / HSE Dept.	
		Crane overloading	E	Verifying the weight of an object to be lifted against the crane SWL (Safe Working Load) with respect to boom length and horizontal angle by referring manufacturer chart.	
				Over load limit switch will be in functioning.	
				Load chart of the Crane to be displayed at the operator Cabin.	
		Improper communication	H	Engagement of trained / experience signal man.	
				Signal man wearing the reflective jacket.	
				Use of mobile phone prohibited for operator & signal man.	
				Walkies talkies will for communication between operator & signal man.	
		Wrong rigging practices	H	Trained / experience riggers are deployed.	
				Work will be supervised by the signal man.	
				Training for safe rigging operation.	
				Hand gloves & other PPE will be used.	
				Provision of Tag line to control the oscillations of load lifted.	
				Usage of right slinging method with right lifting gears.	

		Pulling the Object	M	Tower crane will not be used for pulling the object.	
				Avoiding tower crane use for lifting embedded object.	
				Training for safe rigging operation.	
		Inclined Load line	M	While Lifting, the load line & load will be kept vertical.	
				Training to signal man for finding out centre of gravity.	
				Keeping the Centre of Gravity of the Load inline with the crane hook centre line.	
		Sharp corner of the load	H	Use of PPE like hand gloves, safety helmet, etc.	
				Use of packing's at the Sharp corners.	
		Lifting loose materials (like bricks, blocks, etc.)	H	Use of separate lifting cage.	
				Safe load lifting capacity will be displayed over the cage.	
3	Maintenance	Negligent operation of Crane during Maintenance / Lubricating oil	M	Informing the entire department regarding maintenance.	
				Work permit system for maintenance.	
				Lockout & tag out system before starting maintenance activity.	
		Lubrication Oil	L	Use of funnel to fill the hydraulic / lubricating oil etc.	
				Contain the spillage by spill tray.	

4	Proximity hazards	Fall of Materials	H	Avoiding movement of boom in public area by fixing limit switches. Site is barricaded by hard barricading to avoid public movement. Deployment of security near gate Avoiding trolley movement in public area by fixing limit switches. Provision of Safety netting both vertical & horizontal.	
5	**Tower crane height extension by telescopic hydraulic cage**	Fall of material due to improper slinging while assembling of cage	H	1. Only approved & valid certified lifting tools shall be used for this activity. 2. Work area shall be proper barricaded. 3. Ensure work shall be going under the supervision of authorized PIC only. 4. Separate work permit shall be taken. 5. Crane shall be check as per the approved checklist before start the work activity.	
		Soil contamination due to hydraulic oil leakage.	H	1. Ensure don't apply the excess pressure on hydraulic Cylinder. 2. Ensure & checked of hydraulic telescopic cage automatic system before use on site. 3. Check the oil leakage in cylinder before start of activity.	
		Fall of material due to lifting the excess weight above the capacity of cage.	H	1. Check the limit switch as per load chart. 2. Only valid & certified tool use for this activity. 3. Authorized crew shall be deployed for this activity.	
		May be chance of crane topple due to unbalance.	H	1. Separate work permit shall be taken for this activity. 2. Work shall be done as per the approved plan with including the all surrounding obstruction. 3. Authorized person & trainee crew/crane operator shall be deployed for this activity. 4. Ensure don't stand any person below the suspended load. 5. Ensure Crane shall be in erection position.	
		Fall of mast during stacking on suspended platform.	H	1. Ensure all hooking point of mast is in good condition. 2. Trained crane operator & signal man shall be deployed for work. 3. Check the suspended platform shall be firm & fixed attached with structure.	
6	Housekeeping.	Slip, Trip, Cut injury.		1. After finishing the work area should be clean and clear. 2. Work permit should be closed by authorized person 3. Safety Helmet, Safety shoes, Hand gloves, Safety goggles,	

				etc. 4. Material stacking area should be barricaded.	
19	**Temporary**	**light fixing**			
1	Mobilization of new manpower	'Unskilled worker leads to bodily injury.	M	1. Before entering plant conduct safety induction training. 2. Ensure gate pass. 3. HSE Induction should be given..	
2	Connection from Distribution Board	'Improper cable connection and earthing leads to Electrocution, Skin Burn.	H	1. Ensure work permit before start of work activity. 2. Provide the 30mA ELCB for all electrical connection. 3. Earthing to be provided to distribution board. 4. Avoid joints a damage cable while electrical connection 5. Weekly audit to be done by inspection check list. 6. Task specific training to be done. 7. Deployment of proper supervision during work.	
3	'Site area clearance	May cause of slip, trip & cut hazard, damage to other equipment's & property	H	1. Before start of work activity take required work permit. 2. Permission to be obtained from competent authorities, 3. Prior to area clearance if required. 4. Use obstruction free access way. 5. Deployment of proper supervision where work is going on. 6. Use safety helmet, shoes, safety jacket and goggles at site. 7. Skilled and authorized workers to be deployed for work, 8. Daily TBT to be conducted before start of work.	
4	'Shifting the conduit material at the work area	excess load may cause back injury; shoulder injury, fingers entrapment, foot injury	M	1. No workers are allowed lift more than 20kg. of weight manual. 2. Use shoulder pad for shifting the conduit materials. 3. Ensure work permit before start of any work activity. 4. Skilled and authorized workers to be deployed for material handling.. 5. Use safety helmet, shoes, safety jacket and goggles at site. 6. Deployment of proper supervision where work is going on. 7. Daily TBT to be conducted before start of work.	
5	'Shifting the conduit material at the work area	'Short Circuit could lead to major fire.	M	1. Use only approved electrical equipment. 3. All distribution board should be equipped with 30mA ELCB/RCCB. 4. Cables to be used with appropriate gauge and standard. 5. Damaged insulated cable shall not be in use. 4. Connection should be inspected by competent person.	
6	Electrical Cable routing	'Trailing cables may lead to trip hazard	H	1. Ensure work permit before start of work activity. 2. Cable should be routed overhead (Min-7Ft) with appropriate insulation. 3. Ensure cable should be kept on dry place. 4. Skilled and authorized workers should be deputed for	

				electrical work. 6. Deployed proper supervision during work.	
7	Electrical Cable routing	'Trailing cables may lead to trip hazard	H	1. Do not pass cable from metallic parts. 2. Provide insulating material to prevent current flow in metal parts. 4. Information, instruction and supervision to be provided.	
8	Electrical Cable Coiling	'Improper Cable Coiling may generate heat in the cable	H	1. Cable should not be coiled when it is in use. 2. Knots or bend on cable should be prevented. 3. Load should not be kept on cable which can interrupt the current flow and heat the cable. 4. Fire fighting arrangements should be in place.	
9	'Site area clearance	May cause of slip, trip & cut hazard, damage to other equipment's & property	M	1. Before start of work activity take required work permit. 2. Permission to be obtained from competent authorities, 3. Prior to area clearance if required. 4. Use obstruction free access way. 5. Deployment of proper supervision where work is going on. 6. Use safety helmet, shoes, safety jacket and goggles at site. 7. Skilled and authorized workers to be deployed for work, 8. Daily TBT to be conducted before start of work.	
10	'Shifting the conduit material at the work area	excess load may cause back injury; shoulder injury, fingers entrapment, foot injury	M	1. No workers is allowed lift more than 20kg. of weight manual. 2. Use shoulder pad for shifting the conduit materials. 3. Ensure work permit before start of any work activity. 4. Skilled and authorized workers to be deployed for material handling.. 5. Use safety helmet, shoes, safety jacket and goggles at site. 6. Deployment of proper supervision where work is going on. 7. Daily TBT to be conducted before start of work.	
11	'Shifting the conduit material at the work area	Cut injury if there are any sharp edges or projections on the material.	M	1. All the sharp edges will be rounded off. 2. Material will be lifted properly before movement. 3. Daily TBT to be conducted before start of work. 4. Using of cotton hand gloves during material shifting. 5. Skilled and authorized workers should be deployed for material shifting. 6. Ensure work permit before start of any work activity. 7. Deployment of proper supervision during work.	
12	Electric panel operation	bodily injury due to unauthorized entry / work	H	1. Ensure work permit before start of any work activity. 2. All electrical panels are must be lock. 3. Display list of authorized persons list 4. Workers should be aware of LOTO procedure. 5. Task specific training to be done. 6. Use safety helmet, shoes, jackets and safety goggles at	

				site. 7. Weekly audit to be done by inspection check list. 8. Implementation of LOTO procedure. 9. Fire extinguisher and fire stand shall be there.	
13	Electric supply to all power hand tools	Joints in the cables can lead to electric shock if they come in contact with a conducting material such as metal or liquids or body parts.	H	1. Ensure work permit before start of work activity. 2. Electrical cables are inspected and replaced as required. 3. The area is kept free of any conducting material. 4. Maintained electrical cable height (Min-7Ft). 5. Ensure cable should be kept on dry place. 6. Ensure all electrical panels have gland/edge protection 7. Electrical supply to power tools procedure should be follow and check. 8. Skilled and authorized workers should be deputed for electrical work. 9. Weekly audit to be done by inspection check list. 10. Deployed proper supervision during work.	
14	Handling / using of drilling machine	Crush injury if any body parts comes in contact with exposed/unguarded moving/rotating parts.	H	1. All the moving/rotating parts are guarded. 2. Machine should be inspected for effectiveness before use. 3. Skilled and authorized workers should be deputed for drilling. 4. Area to be barricaded and no one should enter barricading. 5. Drilling bit to be used only once and it should be properly store in scrap box. 6. Ensure work permit before start of any work activity.. 7. Task specific training to be done. 8. Use safety helmet, shoes, jackets and safety goggles at site. 9. Pre check of machinery should be done by inspection check list.. 10. Deployment of proper supervision during work	
20	**Diesel Filling**				
1	Transport of diesel drums by vehicle	Spillage and fire hazard	M	Securing of drums, Fire extinguishers, Diesel to be transported by approved metallic containers	
2	Opening of diesel containers	Fire hazard due to presence of static electricity	H	Vehicle shall be earthed fire extinguisher shall be present & PPE shall be used	
3	Filling of diesel	Fire hazard due to presence of static electricity and operating of vehicles	H	Vehicle shall be earthed fire extinguisher shall be present & PPE shall be used. Barrel pump only should be used, Vehicles to be shut off	
4	Diesel Generators	Fire hazard and Entrapment	H	Keep fire extinguisher and barricade the area	

21	**Backfilling**				
1	Preparation	Falling of equipment	H	Proper approach to be made to the excavation pits, which is required to be backfilled. -Entire area where vehicle moves shall be clearly demarcated by proper barricading. -Provide a bank man along with the truck/equipment to control the movements. -Provide stop block	
2	Back filling	Human injury Hit by vehicle Equipment failure Dumping earth over utility Dust hazards	H	Ensure backup alarm is functioning -Before moving backward for backfilling, blow horn and clear off all workmen -Ensure all the earth moving equipment's are inspected properly. -Equipment must be driven by authorized operator/driver. - Check the area to be back filled and remove all materials away and protect other stored materials. -Proper PPE (safety helmet, dust mask, goggles, shoe etc.) to be used.	
3	Compaction	Human injury	M	Before moving backward for backfilling, blow horn and clear off all workmen	
22	**Pest control**				
1	Pest control / Anti-Termite Treatment work	Inhalation of Chemical	H	Experienced persons, Avoiding inhalation , usage of nose mask	
		Contact of chemical to skin	M	Experienced persons, Avoiding skin contact, use of hand gloves	
		Contact of chemicals in to eyes	M	Experienced persons, Usage of Safety goggle	
		Pump operation- contact with moving parts	H	Experienced persons, Guarded moving parts	
2	Handling and storage of	Spillage of chemicals over ground / skin	M	Training & awareness for handling of chemical & MSDS of chemicals.	

	Chemicals				
		Usage of wrong chemicals	H	Identification tag will be displayed over the containers of chemicals. Deployment of skilled workmen.	
		Wrong storage	H	Chemicals will be stored as per their properties wise under the roof & in well - ventilated area. Chemicals will not be placed directly over the ground.	
		Miss use	L	Chemicals will be used with the permission of authorised persons. Awareness about use of chemicals.	
		Unauthorised use	M	Chemicals will be stored in lock room. Only authorised persons will be allowed to operate the room.	
		Exposure to Flames	H	Nose mask, hand gloves & other PPE will be worn. Work will be performed in the regular interval. Chemicals will be stored in air tied containers.	
23	**Masonry-Bricks , Block & Tiles work**				
	Mobilization of manpower	Unskilled worker, leads of person injury/property damage	M	1. Gate pass won't be issues until safety training is conducted. HSE Induction 2. Job Specific Training 3. Daily general Tool Box Talk conducted by Safety representative & site Eng. 4. Only authorized people are allowed to work on respective jobs. 5. Medical fitness is must for all workers	
	Mobilization and de-mobilization vehicle	Untrained operator may cause of incident lead to property damage or bodily injury	H	1. Driver have Valid RTO approved driving license. 2. In company premises vehicle speed limit must be 15Kmph. 3. Vehicle needs to escort by authorized person. 4. After entering the project gate entry, thoroughly	

				inspection should be carried out as per standard checklist. 6. Remove the vehicle key after parking/ stop or completion of day to days work inside project premises and submit the authorized person. 7. Vehicle movements on site should be avoiding without daily inspection and work permit system. 8. Ensure Driver authorization pass should be available on individual person. 9. Key of the equipment shall be given only to authorised person, once permit is fully approved. 10. Vehicle internal inspection shall be done as per the approved vehicle checklist.	
	Site survey and clearance	Slip/trip and fall hazard leads to bodily injury	L	1. Maintained the housekeeping in working place. 2. Identified the bricks stacked area before stacking. 3. Ground level well compacted & planed. 4. Parking area should be identified. 5. Ensure stacking of bricks should not be more than shoulder height.	
	Unloading & stacking of Bricks/Blocks/ Tiles	Bodily injury due to person falling from vehicle	M	1. Separate unloading permit shall be taken before start the work activity. 2. Conduct the TBT. 3. Only trained person deployed for the work. 4. Provide the full body safety harness (FBSH) with anchorage point, provide the life line. 5. Provide the appropriate PPEs. 6. Proper access for ascending & descending for vehicle. 7. Material should be properly stacked as per standard. 8. Provide the path way for the man movement. 9. Area should be barricade with displayed the signage board. 10. After finishing the work area should be clean and clear. 11. Safety Helmet, Safety shoes, Hand gloves, Safety goggles, etc. 12. Material stacking area should be barricaded. 13. Material should not be stack over height. 14. Material should not be thrown from height, material should be unload by hand to hand.	
	Shifting of bricks /block / Tiles from stack area to working place. By wheel barrow &	STF hazard leads to bodily injury	M	1. Making proper access for man movement. 2. Checked the condition of wheel barrow. 3. Ensure person don't lift the load above 20 kg . 4. Ensure avoid the overloading of brick in wheel barrow. 5. Work should be done under the continuous supervision.	

	manually			6. Access should be neat & clean. 8. Area should be well compacted & plan level. 9. Visual checking of stacked area & identified the loose bricks. 10. After shifting main stacked area properly hard barricaded with display the cautionary signage for avoid the man movement. 11Ensure avoid the overloading of sand in wheel barrow. 12. Work should be done under the continuous supervision. 13. Access should be neat & clean. 14. Checked the wheel barrow before use. 15. Provide the appropriate PPEs.	
	Bricks , Blocks & Tiles work	Bodily injury due to bricks falling person Bodily injury due to faulty tools use like cutter, hammered Bodily injury due to person falling from height. Health problem/ skin irritation due to cement partial flying Soil contamination due to concrete falling on ground	H	1. Scaffolding should be checked before start the work. 2. Proper and adequate working platform. 3. Provide the full body safety harness (FBSH) 4. Work carried out Under the continuous supervision. 5. Provide the mid rail, Top rail for scaffolding for anchorage safety belt. 6. Avoid the loose stacking of bricks on scaffolding. 7. Over stacking of material on work platform should be avoid. 7. Use of safety goggle. 8. Provide the dust mask. 9. Provide the PVC hand gloves. 10. Below brick work area should be cover with gunny bags. 11. Barricade the work area. 12. After finish the work removed the all loose material from working place. 13. Use of tray for mixing the cement & crush sand. 14. Ensure all hand tool are in good condition before start the work activity. 15. Provide the rubber sleeve for hammer & other masonry work tools.	
	Housekeeping	Hand/Foot Injury, Cut injury		Safety shoes, Hand gloves, Safety goggles, etc. Area to be barricaded.	
24	**Debris chute installation**				
1	Manual lifting of MS/HDPE Drum Materials	Sharp edges	M	Sufficient number of skilled workmen will be deployed. Training & awareness for lifting technique ergonomics & for lifting of long & heavy materials. Hand gloves & other PPE will be used for lifting.	

2	Shifting of MS/HDPE Drum materials	Unbalanced Slip & Trip Fall of Scaffolding Materials & clamp Striking	M	Training & awareness for shifting of materials will be provided. Shoulder pad, hand gloves & other PPE will be worn by workmen. Access will be made clear from all the rolling, slippery materials. Only trained / experience persons will be deployed. Warn to people while material shifting.	
3	Stacking of MS Drum Materials	Sharp edges / Trapping / Slip of material	M	Sufficient number of skilled workmen will be deployed. Material will be stacked size and different type wise. Materials will be stacked on the racks or by providing packing material. Materials will be not stacked above overhead. Training for maintaining body posture	
4	Gas cutting work	Fire due to gas cutting flame coming in contact with any flammable material in the work area.	H	1.Ensure that gas cutting torch should be ignited with magnetic stone spark 2. The work area shall be free of any combustible material. 3. Fire extinguishers & Water buckets. 4. Fire watcher to be kept. 5.Fire blanket must be used wherever required 6. Fortnightly Audit Shall be done of the process and equipment's. 7. Empty and full gas cylinder store separately with identification signage's. 8. Proper trolley should be use and cylinder should be secured by chain. 9. All cylinder should have valid HPT certificates. 10. Use DA and Oxygen cylinder, LPG should not be allowed.	
		Flame to reach inside the cylinders and lead to fire/explosion.	H	1. Flashback arrestors shall be provided to both sides. 2. Fire extinguishers & Water buckets to be kept. 3. Fire watcher should be available. 4. Nosily always kept clean. 4. Only authorised person should be involved in this activity. 5. Fortnightly Audit Shall be done of the process and equipment's	
5	welding work	Burn injury if hand and frontal body parts are exposed to hot material.	H	1. No unauthorized person shall be allowed in the work area. 2. Leather hand gloves and apron shall be used. 3. Unattended hot material will be barricaded and marked as 'JOB IS HOT, DO NOT TOUCH' 4. Fortnightly Audit Shall be done of the process and equipment's.	

				5. Welding machine should be inspecting before use. 6. Damaged welding machine should not be allowed to work. 7. All connection should be proper without damage. 8. Body earthing should be given to welding machine. 9. Holder should be insulated and without damaged. 10 Welding and earth cable should be double insulated and 16MM size with colour coding as per IS standard.	
		Eye irritation due to fumes. Eye injury due to flying of particles.	H	1. Safety goggles and fresh water is provided for washing eyes in case of injury. Use of welding shield. 2. Fortnightly Audit Shall be done of the process and equipment's	
6	Welding work/gas cutting work on height.	Head injury due to fall of material from height.	H	1. Material anchor to rigid support before cutting activity. 2. Proper work platform should be providing for height work and inspection should be done before use. 2. Use of safety helmet, safety shoes, safety goggle, etc. 3. Activity should be carried out under continuous supervision. 4. Fortnightly Audit Shall be done of the process and equipment's	
7	Hammering work	Finger injured in between hammer & metal.	M	1. Use of cotton hand gloves. 2. Hammer used should be of standard with handle grip. 3. Fortnightly Audit Shall be done of the process and equipment's	
8	Shifting the scrap material	Cut injury for hand due to contact with sharp edges.	M	1.Use of safety hand gloves	
9	Grinding/Drilling & Cutting operation	Joints, cuts and/or damage in the cables of drilling machine may lead to electric shock if they come in contact with a conducting material such as metal or liquids or body parts.	H	1.All electric cables shall be as per standard, properly inspected & shall always be free from any cuts, damage and/or joints and the same condition shall be monitored by the supervisor. 2. Proper inspection shall be done and replacement shall be done as & when required. 3. Fortnightly Audit Shall be done of the process and equipment's. 4. 30mA ELCB provided in DB.	
25	**Labour camp**				
1	Unskilled worker, leads to person	Unskilled worker, leads to person injury	M	1. Safety training is conducted by HSE. 2. Provide the appropriate personal protective equipment's. 3.Ensure only valid/licensing person deployed for the work.	

	injury Camp dismantling and installing at Near Building4/5			4.Ensure all person shall be physical fit for the Job. 5.Job Specific Training shall be conducted before start the work activity. 6. Provide the rest room for the workers. 7.Ensure proper follow the mobilization procedure	
2	Untrained Driver may cause of incident lead to property damage or injury	Untrained Driver may cause of incident lead to property damage or injury	H	1. Driver have Valid RTO approved driving license. 2. In company premises vehicle speed limit must be 15Kmph. 3. Vehicle needs to escort by authorized person. 4. After entering the project gate entry, thoroughly inspection should be carried out as per standard checklist approved by JLL 5. Pre entry inspection should be done by competent person. 6. Remove the vehicle key after parking/ stop or completion of day to day's work inside project premises and submits to the authorized person. 7. Vehicles movements on site should be avoiding without daily inspection and work permit system. 8. Ensure that before issuing permit area should be in level 9. Inspection checklist & permit should be with authorised person. 10. After finishing the activity vehicles should be parked in its designated place. 11. Separate work permit should be issued for vehicle maintenance on site.12. All movements of vehicle shall be conducted only in presence of authorize person. 13. Proper stopper for the vehicle whenever standing on stopped ground. 14.Ensure proper Follow the Vehicle movement Procedure	
3	Bodily Injury due to person falling from vehicle to Loading or unloading of camp material	Bodily Injury due to person falling from vehicle to unloading	H	1. Ensure that area should be level for vehicle movement 1.Seprate unloading permit shall be taken before start the work activity. 2. Conduct the TBT. 3. Only trained person deployed for the work. 4. Provide the full body safety harness (FBSH) with anchorage	

				point, provide the life line which can bear a 100-120 kg weight 5.provide the appropriate PPEs. 6. Proper access for ascending & descending for vehicle. 7.Work should be carried out under continuous supervision	
4	Fall of material due to uneven surface	Fall of material due to uneven surface	H	1. After finishing the work area should be clean and clear. 2. Safety Helmet, Safety shoes, Hand gloves, Safety goggles, nose mask etc. 3. Material stacking area should be barricaded & isolated 4.Stacking of material should not be more than shoulder height on uneven surface 5.Barricading material has to stacked by given both side support	
5	Sharp edge, Rusty surface	Sharp edge, Rusty surface	M	1. Hand gloves should be provided to worker. 2. Shoulder pad should be given to worker while shifting the material. 3. Required work permits should be taken before start of activity. 4. Work Shall be carried out under continuous Supervision. 5.Provide proper access &, access to basement area should be clear if any	
6	Shoulder injury	Shoulder injury	M	1.Use of shoulder pad	
7	Cut injury due to sharp edges	Cut injury due to sharp edges	H	1.Use of PPE's 2.Use of edge protection to barricading stands	
8	Bodily Injury due to sharp edges	Bodily Injury due to sharp edges	H	1. Use of sharp edge protection 2.Ensure that before starting activity TBT should be given 3.TBT includes subject, facilitators approval of safety officer & Egg. 4.Use of PPEs like safety shoes, helmets & safety goggles is must & hand gloves (Cut Resistant)	
9	flayed away of G.I sheet due to wind can lead bodily injury	flied away of G.I sheet due to wind can lead bodily injury	H	1.Before starting activity work permit should be taken from JLL 2.This activity should be carried out under continuous supervision 3.All loose G.I sheets should be placed at a single safe place & kept under heavy weight to prevent flying of material	
10	Bodily Injury due	Bodily Injury due to fall of material	H	1. Use of PPE's likes safety helmet, shoes, hand gloves, etc.	

	to fall of material			2.Use of material trolley for material shifting 3.List of persons appointed & trained should be display unit wise with barricading tag on helmet	
				1.Use of all mandatory PPE's 2.GI sheet should be tie with MS pipe or channel 4.Continuous supervision should be required	
				1.Use of all mandatory PPE's 2.Ensure that before starting activity Tool box talks should be given 3.Ensure that training should be given to all involved persons	
				1.Use of all mandatory PPE's 2.Continuous supervision should be carried out	
11	Fall of camp erection due to wind	Fall of structure due to wind	H	1.Before starting work take permit from JLL 2.Ensure that no two G.I sheets attached to each other vertically (Space maintained of 50 mm for air passing) 3.Make a foundation of Main structure in such a way that it can bear a maximum wind pressure 4.Ensure that all G.I sheets attached to each other with foundation	
12	Manual lifting of GI Sheet and MS Materials Camp dismantling and installing at Near Building 4.	Sharp edges	M	Sufficient number of skilled workmen will be deployed. Training & awareness for lifting technique ergonomics & for lifting of long & heavy materials. Hand gloves & other PPE will be used for lifting.	
13	Shifting of GI sheet and MS Pipe materials	Unbalanced Slip & Trip Fall of mobile Scaffolding Materials & clamp Striking	M	Training & awareness for shifting of materials will be provided. Shoulder pad, hand gloves & other PPE will be worn by workmen. Access will be made clear from all the slippery materials. Only trained / experience persons will be deployed. Warn to people while material shifting.	
14	Stacking of camp Materials	Sharp edges / Trapping / Slip of material	M	Sufficient number of skilled workmen will be deployed. Material will be stacked size and different type wise. Materials will be stacked properly or by providing packing material. Materials will be not stacked above overhead.	

15	Gas cutting work - camp dismantling and installing at Near Building 4.	Fire due to gas cutting flame coming in contact with any flammable material in the work area.	H	1.Ensure that gas cutting torch should be ignited with magnetic stone spark 2. The work area shall be free of any combustible material. 3. Fire extinguishers & Water buckets. 4. Fire watcher to be kept. 5.Fire blanket must be used wherever required 6. Fortnightly Audit Shall be done of the process and equipment's	
		Flame to reach inside the cylinders and lead to fire/explosion.	H	1. Flashback arrestors shall be provided to both side. 2. Fire extinguishers & Water buckets to be kept. 3. Fire watcher should be available. Nosily always kept clean. 4. Only authorised person should be involved in this activity. 5. Fortnightly Audit Shall be done of the process and equipment's	
16	Welding work - camp dismantling and installing at Near Building 4.	Burn injury if hand and frontal body parts are exposed to hot material. **Fall of person from height**	H	1. No unauthorized person shall be allowed in the work area. 2. Leather hand gloves and apron shall be used. 3. Unattended hot material will be barricaded and marked as 'JOB IS HOT, DO NOT TOUCH' 4. Fortnightly Audit Shall be done of the process and equipment's. 5. Proper work platform should be providing for height work and inspection should be done before use.	
		Eye irritation due to fumes. Eye injury due to flying of particles.	H	1. Safety goggles and fresh water is provided for washing eyes in case of injury. Use of welding shield. 2. Fortnightly Audit Shall be done of the process and equipment's	
17	Welding work/gas cutting work on camp dismantling and installing at Near Building 4.	Head injury due to fall of material from height.	H	1. Material anchor to rigid support before cutting activity. 2. Use of safety helmet, safety shoes, safety goggle, etc. 3. Activity should be carried out under continuous supervision. 4. Fortnightly Audit Shall be done of the process and equipment's	
18	Shifting the scrap material	Cut injury for hand due to contact with sharp edges.	M	1.Use of safety hand gloves	
19	Grinding/Drilling & Cutting operation	Joints, cuts and/or damage in the cables of drilling machine may lead to electric shock if they come in contact with a conducting material such as metal or liquids or body parts.	H	1. All electric cables shall be as per standard, properly inspected & shall always be free from any cuts, damage and/or joints and the same condition shall be monitored by the supervisor. 2. Proper inspection shall be done and replacement shall be	

				done as & when required. 3. Fortnightly Audit Shall be done of the process and equipment's. 4. 30mA ELCB provided in DB.	
20	GI sheet fixing work	Sharp edge Electrical Hazard Fall of person	H	1. Provide job specific PPE's to workers. 2. Sufficient and trained manpower should be deploy for work. 3. All cable should be taken from height with using of insulated hooks. 4. All Power tools should be inspecting before use. 5. Provide lifeline for height work activity. 6. Height work permit should be taken and all compliance should be done before start of work. 7. Lifeline should be check before use. 8. Lifeline should be protecting from sharp edge. 9. Ensure usage of FBSH by workers and activity should be carried under continuous supervision only.	
26	**PM Lift Erection**				
	Mobilization of manpower	Lack of site safety risks analysis like slip, trip fall, vehicle movement, fall of material from height leads to serious bodily injury		1.HSE Induction is conducted before mobilization of manpower, Gate pass is issued only after HSE induction 2.Provide safety shoes, helmets, Gloves, safety glasses & HV Jackets for all workers on site 3.Follow manpower mobilization procedure (Ref: PIIPL-HSE-MOB-00) 4. Daily Safety observation Tours/ Safety Audit is conducted by TCE Safety Team 5. Risk signage displayed on site to alert workers on different hazards. 6. Provide the sufficient lux level minimum 55 lux for External road & path way & 110 lux for working place.	
	Unloading of PM lift material on designated place by using the crawler, Mobile, tower crane	Improper/ inadequate lifting tools/ tackles/ equipment's use can lead to injury or property damage		1. Approved rigging plan with drawings (marked with all identified obstructions) shall be available. 2. Ensure Safety checklist is compiled before issue of permit. 3. Authorized people shall be available throughout the work (PIC -TCE & PIIPL & Safety - TCE & PIIPL). 4. Tool box talk shall be conducted by PIC and safety officer on rigging plan before starting the activity. 5. Random Audit of rigging plan is to be conducted.	

				6. Ensure proper placement of tackles/lifting belt on the lifting elements. 7. Ensure lifting belt is not twisted, must be completely flat while lifting. 8. Ensure equal length of both side lifting belts for ensures material balance. 9. Check & ensure adequacy and condition of lifting belt & tackle. 10. Write the lifting capacity of lifting belt & tackle on it.	
		Swing of material may lead to personal injury		1. Unloading periphery area should be adequately barricaded. 2. Securely fixed 18mm guide rope on both side. Held by two persons. 3. Check & ensure condition of guide rope before use. 4. Guide rope shall be always in tight condition. 5. Ensure guide ropes are free from obstructions. 6. Ensure no person is close to the load and below the suspended load.	
		Fall of material due to improper slinging lead to major injury		1. Activity shall be conducted in presence of authorized person. (PIC) 2. Trained person shall only conduct slinging activity. 3. Sketch used in the rigging plan shall only be followed. 4. Random Audit of rigging plan is conducted. 5. Deviation of any with respect to lifting plan shall be brought into notice of TCE installation -in-charge before implementation. 6. Ensure no person is under suspended load.	
		Mechanical failure of lifting equipment may lead to major injury		1. Ensure no person is below the suspended load at any time. 2. Use of safety helmet, safety shoes etc. 3. Preventive maintenance plan and daily inspection record of cranes, tools - tackles shall be maintained. 4. Ensure the lifting hooks of cranes having safety latch in working condition.	

				5. Weight of lifting material & capacity of crane, tools & tackles, pulleys etc. shall be identified.	
	Erection & fixing the mast, gear box & motors on base frame by using mobile crane/Crawler crane/Tower crane.	Topple of crane due to instability of ground.		1. Prior to placement of the crane, survey the ground condition & level / strengthen it if necessary. 2. Check the PCC Level as per the lay out before resting the mast on base frame. 3. While erecting the mast check level vertical & horizontal. 4. Out riggers shall be on firm/Compacted ground.	
		'Mechanical failure lead to personal injury		1. Only valid & certified crane to be used for the lifting activity. 2. Both side wheel stopper (wheel chock) to be placed for all parked vehicles. 3. Only authorized crew should be deployed for erection activity. 4. Erection periphery area should be barricaded with display of cautionary signage.	
		Personal injury due to person standing below the suspended load.		1. Only authorized crew should be deployed for erection activity. 2. Erection periphery area should be barricaded with display of cautionary signage. 3. Safety professional should be engaged for identifying and immediate rectification of unsafe act and condition before start the activity shall be done. 4. Work shall be done under the continuous supervision. 5. No person shall be allowed to stand under suspended load at any time during lifting operation.	
		Hit of boom to other material due to boom slinging leads to property damage		1. Swing route of crane boom and counterweight operation to be checked before lifting, it shall be part of lifting plan. 2. Use of both side proper guide ropes for reduces the boom swinging. 3. Only authorized person should be allowed for this activity. 4. Trained signal man with expert erection crew should	

				be deployed. 5. Securely fixed 18mm guide rope should be used.	
		Personnel fall while climbing on the mast,etc for slinging / de-slinging		1. Use approved cherry picker for Slinging & de-slinging of crane. 2. Use of FBSH for person engaged in cherry picker. 3. Ensure adequate anchorage point should be available at the time of erection.	
		Improper method of lifting operation may lead to Fall of material / property damage / personal injury.		1. Engage experienced & trained personnel. 2. Prior to lift adequate work platform to be in place. 3. Prior to lift organize proper packing to place below the load. 4. Use of safety hand gloves. 5. Proper signalling shall be done.	
	Fixing frame with MS roller on mast in vertical position	None inspected of lifting media due to fall of material may lead personal injury.		1. Work carried out under the continuous supervision (PIC). 2. Ensure use only valid lifting tools & tackles for lifting activity. 3. Trained signal man shall be deployed for the activity. 4. Barricade the all lifting area. 5. Ensure no any person standing below the suspended load. 6. Activity shall be carried out as per the approved lifting plan. 7. All hand tools to be tied with rope while working on height. 8. Use of FBSH with fall arrester while working on height. 9. Provide the appropriate PPEs like hand gloves, Helmet goggles etc.10.Removed the unwanted material from working place.11.L frame shall be anchored on the building as per design intervals.	
		Unapproved access way may lead to personal injury.		Use unobstructed access. Display signage board.	
	Housekeeping	Slip, trip, fall Hazards may leads of personal injury.		1. After finishing the work area should be clean and clear. 2. Work permit should be closed by PIC.	

				3. Safety Helmet, Safety shoes, Hand gloves, Safety goggles, etc. shall be provided to all concerned. 4. Material stacking area should be barricaded.	
25	RMC PLANT				
	Preparation	Unskilled and Unauthorised workmen.		1. Plant authorised and skilled workmen only allow performing the task area.	
				2. All third party workmen should be trained on WAH, PPE & material handling as per CAPACITE induction standards.	
		Lack of Supervision		Skilled supervision is required. During dismantling Signalman should guide the operator.	
		Environmental Hazards		If heavy wind, Rain, lightning or any other natural calamities warnings then strictly task will be stopped immediately. - No such risk at the time of work.	
	Crane for lifting silo structure	Collapse, Tilt or Asset damage		1. Check the Operator License and operating skills & capacity of crane (50 tons).	
				2. Check the crane's third party inspection certificate.	
				3. Check the Crane physical conditions (Side mirrors, indicators, Horn, Brakes & Hydraulic oil leakages)	
				4. Check the weight handling capacity, Check the ground surface and condition.	
		Damaged Hoist & Safety pin locking		5. Check safety lock pin & Hoist boom operations.	
				Park the crane on the firm surface (no loose soil), use MS plate for fixing the jacks.(Riggers)	
				6. Check the D-shackles and slings to avoid unexpected falls of dead weight.	
		Improper barrication the task area		7. Cordon the work area with safety barricades and arrange a display sign board of work under progress.	

		Poor communication		8. Signalman should be at the work place to signalling to safe operation.	
		Electrical Hazards		9. Mandatory to check overhead HT cables should not be there at work area.	
				10. Hydra crane (15 tonnes) cannot be operated while there is heavy wind, rain or lightning.	
				11. Vehicle movement should be stopped while task is going on.	
				12. Fire extinguisher & first aid box mandatory in Hydra crane.	
	Silo basement structure Bolts fixing	Hand injury while removing with the help of spanner		Carefully carry out the task & wear the task based PPE (Hand gloves).	
				Hurry and rush may leads incidents.	
		Unbalancing of silo		Tightly hold the Silo's with the help of crane.	
				Provide the guy with rope for controlling the swinging of the detached silo.	
				Area should be completely cordoned. No unauthorised person should enter in that area.	
	Lifting the Silo	unbalancing of silo		Need to lift the silo slowly and maintain the safe distance.	
				Signalman should properly guide both the operators.	
				Keep the silo slowly on structure after confirmation of fixed properly.	
	Silo structure Bolts fixing	Hand injury while removing with the help of spanner		Carefully carry out the task & wear the task based PPE (Hand gloves).	

		Fall from height		Wear good conditioned safety Harness and should be checked before wear.	
				Work at height permit required.	
				Reach the height with the help of Man lift.	
				2. Hurry and rush may leads incidents.	
		unbalancing of silo		Tightly hold the Silo's with the help of crane.	
				Provide the guy with rope for controlling the swinging of the detached silo.	
				Area should be completely cordoned. No unauthorised person should enter in that area.	
	Climbing a person on the Silo for Railing & PRV Filter fix work..	Work at height - workman may fall from height		1. **Work at height** permit required for the task to avoid falls of workmen.	
				2. Only authorised workmen allow performing the task.	
				3. Check physical condition of task performer.	
				4. Safety Harness & fall arrestor should be inspected and in working condition.	
				5. Follow the 03 point contact step methods to avoid falls.	
				6. Wear task based PPEs (Hand gloves, Safety Harness) along with Mandatory PPEs Safety Helmet, Safety shoes, Safety goggles & Safety Jacket all the time when working in the PPE zone/ Dismantling area.	
				7. Once reached on the top need to anchor the different points with the help of scaffolding hooks.	

				8. Need to use hand rails of inter connected platforms for safe passing on silo top.	
	Fixing the Silo railing	Hand injury due to use of hand tools		Use proper hand tools for fix the nut bolts.	
		Fall of railing from top		Put the slings to the railing before starting the dismantling.	
		Person may fall		Always anchor the safety harness to Silo anchoring point.	
	Lifting the silo PRV Filters	Fall On workmen		Fix properly with D-Shackles & Slings.	
				Task area barricaded & Unauthorised entry restricted.	
				Proper signals required till the filter reach the top.	
				Landing of PRV filter should safe way.	
				Block the PRV Filter hole with iron rods with strong welding.	
				If anchoring point is not available, make the arrangement by welding separate hook.	
	Fixing of Silo Filters from top.	Hand injury due to use of hand tools		Use proper hand tools for removing the nut bolts.	
		Fall of tools while dismantling		Cordon the Silo below area from protect against falling tools.	
		Fall of filters while dismantling		Ensure that ground connects / fittings are removed / isolated before starting the work	
				Put the slings to the filters before starting the dismantling.	
		Person may fall from height		Always anchor the safety harness to Silo anchoring	

				point.	
	Workmen Descending from the silo	Fall from height		1. Need to recheck the safety harness before coming down.	
				2. Follow the 03 point contact step system.	
				3. Not need to rush and hurry while coming down.	
				4. Handle boom lifter till the workman safely reach the ground.	
	RMC PLANT PLATFORM				
	Preparation	Unskilled and Unauthorised workmen.		1. Plant authorised and skilled workmen only allow performing the task area.	
				2. All third party workmen should be trained on WAH, PPE & material handling as per Nauvoo induction standards.	
				3. All the third party workers should wear the Mandatory PPE and Task based PPE.	
		Lack of Supervision		1. Skilled and authorised person should guide the task till the complete and Signalman also leads the task.	
		Environmental Hazards		1.If heavy wind, Rain, lightning or any other natural calamities warnings then strictly task will stopped immediately.	
	Reaching with man lift at task area	Fall from Height		Check the physical condition of the Man lift.	
				Check the Operator validity of licence & Competency levels.	

		tilt & collapse		Check the Ground surface for proper work completion.	
		Unauthorized workmen		Check the physical condition of the task performer.	
				Check the safety harness thoroughly before wearing.	
	Lifting the divided platform through Hydra	Fall On Workmen		1. Check the Operator License and operating skills.	
				2. Check the Hydra or Crane physical conditions (Side mirrors,indicators,Horn,Brakes & Hydraulic oil leakages)	
				3. Check the weight handling capacity, Check the ground surface and condition.	
				4. Check safety lock pin & boom operations.	
				5. Check the D-shackles and slings to avoid unexpected falls of dead weight.	
				6. Check the hydra's third party inspection certificate.	
		unauthorized entries of workmen		7. Cardon the work area with safety barricades and arrange a display sign board of work under progress.	
				8. Signalman should be at the work place to signalling to safe operation.	
	Task performers at platform	Fall from Height		Check the physical condition of task performer.	
				Work at height permit required.	
				Check the safety harness thoroughly for damages inspection.	
				Anchor the harness scaffolding hooks to man lift cage railing.	

				Once reach the task area, need to do self-anchoring to strong variable points.	
	Platform Railing & Floor fixing work	Burns, Injuries & explosions		1. Check the physical condition of gas cutter set , welding machine through standard checklist.	
				2. Keep upright the cylinders positions always & Keep at a shade place.	
				3. Wear leather hand gloves and safety goggles along with mandatory PPE.	
				4. Maintain the hose pipe while movements should be free from friction on edge of plat form.	
	Coming down from Man lift	workman may fall		1. Remove the scaffolding hooks from the man lift railing and come down slowly to avoid falls.	
				2. Not need to rush and hurry while getting down.	
	Ground Material Collection	Unwanted Material leads workmen cuts & Tyre bursts		1. Collect all the unwanted material from the task area to avoid incidents.	

E - Extreme Risk:
The hazard has the potential to kill or permanently disable a person

H - High Risk: The hazard has the potential to cause a LTI ≥ 7 days

M - Medium Risk: The hazard has the potential to cause a LTI < 7 days

L - Low Risk: The hazard has the potential to cause a minor injury that will not disable a person (ie: Nil LTI)

Prepared by

Reviewed By

Approved By

Safe Work Method Statement SUMMARY SHEET