

Standard Operating Procedure (SOP)

Hot Works

Ahmedabad Fire & Emergency Services









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1. Scope:

1.1 Parties and Jurisdiction Area

- Within the jurisdiction of AMC & AUDA, Parties obtaining permission for plan approval for Structure's construction from AMC Estate Department.
- To the Parties including Temporary Structures, Pandal and Shamiana erectors, etc.
- **1.2** Activities included under the scope of this document is mentioned hereafter in the SOP. (see Section 6.1)

1.3 Applicable Duration:

- From Date of receipt of Commencement Letter/Developement Permission from AMC Estate Department (Raja Chitthi)
- Till Receipt of B. U. Permission.

2. Definitions:

2.1 Hot Work

Hot Work Permit is an activity which produce sparks or sufficient heat to ignite flammable/combustible substance or a flammable air - hydrocarbon mixture and the job, which can cause serious hazard to the life or health of personnel, is treated as hot work.

Hot work includes electric or gas welding, cutting, brazing, and similar heat-generating operations.

2.2 Fire Watch.

A person or persons responsible for continuously observing the hot work area, maintaining fire-safe conditions, and responding to emergencies during hot work operations and in the established period.

2.3 Fire Resistant Blanket.

A heat-resistant fabric, approved, and designed to be placed in the vicinity of a hot work operation; intended for use in horizontal applications with light to moderate exposures such as that resulting





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from chipping, grinding, heat treating, sand blasting, and light horizontal welding; designed to protect machinery and prevent ignition of combustibles such as wood that are located adjacent to the underside of the blanket.

2.4 Fire Resistant Curtain

A heat-resistant fabric, approved, and designed to be placed in the vicinity of a hot work operation, intended for use in vertical applications with light to moderate exposures such as that resulting from chipping, grinding, heat treating, sand blasting, and light horizontal welding; designed to prevent sparks from escaping an area.

2.5 Management

For the purpose of hot work, all persons, including owners, contractors, educators, or designated agents, who are responsible for hot work operations.

2.6 Safe Separation Distances

The safe separation distance refers to the minimum required space between hot work operations (such as welding, cutting, grinding, or brazing) and flammable or combustible materials/storage to prevent ignition, fire, or explosion hazards. This distance ensures that sparks, heat, or molten metal from hot work do not ignite flammable vapours, liquids, solids, or gases. (Refer Fig.2, 3, 4)

3. Authority Having Jurisdiction:

AMC Estate Dept	AMC Fire Dept





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4. Roles & Responsibilities:

Sr. No.	Department	Role				
1.	AMC Fire	Prepare the SOP, stakeholders and mass				
		circulation.				
		Carry out Surprise Checks of the sites.				
2.	AMC Estate	Inculcation of Hot work SOP with the Raja				
		Chitthi (Commencement Letter) Procedure.				
3.	Owner/Site In-	Follow the SOP.				
	charge/	Display the authorised Welder name				
	Developer/	Display Contact Information –				
	Applicant Party.	 Safety Officer/Supervisor, 				
	(Management)	• Fire Consultant				
		➤ Submit the approved plan to Ahmedabad				
		Fire Emergency Services (AFES).				
		➤ Self-declaration as per CGDCR 2017				
		Form 2E to be submitted to AMC Estate				
		Dept, AMC Fire Dept.				
		Site implementation of SOP in letter and spirits.				

5. Applicability

- 5.1 Permanent Structures
- 5.2 Temporary Structures

6. Hot Work Activities. SOP

- 6.1 Any job that requires the use of the following:
- a) Arc welding equipment, gas cutting and welding torched, plasma cutting, Thermit welding, soldering equipment, any type of electric heating devices, blowtorches and other open flames.
- b) Grinding wheels machine.
- c) Usage of diesel generator, diesel vibrator, Fuel storage
- d) Electric drills & other electric equipment, power-driven fasteners
- e) Hot Riveting
- f) Thermal Spraying





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- g) Thawing Pipe
- h) Torch Applied Roofing.
- i) Shot/sand blasting and similar spark producing surface preparation.
- j) Stress relieving, preheating and convective, induction heating.
- k) Similar applications producing or using a spark, flame, or heat, etc.

7. Hot Work Procedure Incorporation by AMC Estate Authority

- 7.1 While valid Permission from authorities is sought by Applicant Party/Management for commencement of construction activity of structure/building, Standard Operating Procedures (SOP) and Precautionary Measures in the form of 'Mandatory Directives' (MDs) to be interlinked for carrying out/by means of hot work activities as mentioned (see Section 6) during the construction of buildings.
- 7.2 Beforehand initiation of construction, while application filed and approval for commencement of construction is sought, during Building plan approval stage through BPSP team, these MDs to be incorporated in the instructions per se.
- 7.3 Competency of welders, cutters, other Hotwork related workers to be ensured regarding Certification for Firefighting Training, Welding Procedure, etc. which trains these workers and related helpers regarding to check work area hazards, safe operation of their equipment and understand the emergency procedures in the event of a fire.
- 7.4 It is the sole responsibility of Applicant Party/Management to establish and ensure Hot work MDs in context to respective Hot work activity(s) are implemented at site prior to initiation and thereafter maintained in healthy condition during and till completion in toto while executing of construction activities by Party himself/contractor/erector/Management.
- 7.5 A self-declaration in the format as prescribed on a Rs. 300 valid stamp paper or by franking to be submitted to AMC Estate/AMC Fire Department by the Applicant Party/Management.





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The permissions received by the Applicant Party/Management after understanding the MDs, must ensure that the contractor, erector workmen also understand/follow the safety regulations mentioned in the permission.





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Annexure-I

Mandatory Directives (MDs) for Hot Work Permission

The check-list items in the HOTWORK are elaborated below to explain the underlying concepts and highlight their significance.

1. Equipment and Work Area Inspected.

Equipment or area where work is to be conducted, should be inspected to ensure that it is safe to carry out the work and assess other safety requirements/stipulations.

2. Surrounding *area checked, cleaned up* e.g. grass, combustible material etc., removed.

Unsafe conditions for performance of work may arise from surrounding area. It should be cleaned-up to remove material such as rags, grass, combustible material, etc. Combustible scrap and other construction debris should be disposed-off site on a regular basis. Proper Housekeeping to be maintained at site.

3. Sewers Manholes, etc. and Flammable gases may be released from nearby sewers. Therefore, these are to be properly *covered* to prevent fires.

Underground CNG/PNG Gas lines, Electrical HT lines to be prechecked in nearby area before initiation of any Hot Work activity.

4. Proper Ventilation and Lighting Provided.

Proper ventilation and lighting are to be provided. Some types welding work may generate fumes. Facilities may be required for the speedy dispersal of these fumes.

5. Safe Separation Distances from Hot work area to nearby flammable and combustible fire hazard. ("35 Foot Rule")

At least 35 feet (10.7 meters) from any flammable or combustible materials.





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Separation distances between buildings under construction and construction related structures, such as temporary offices, trailers, sheds, and other facilities for the storage of tools and materials having combustible construction or contents, shall be in accordance with (Refer Table-1).

If a 35-foot separation is not feasible, fire-resistant blankets, curtains, or shields should be used to protect combustible materials. (Refer Fig.3)

Table-1 Safe Separation Distance

Temporary Structure Exposing Wall Length		Minimum Separation Distance		
m	ft	m		
6	20	9	30	
9	30	11	35	
12	40	12	40	
15	50	14	45	
18	60	15	50	
>18	>60	18	60	

Note: The Separation Distances apply to single level (3.6 mtr.) Temporary Structures only.

6. Considered *Fire hazard* from other operation.

Other activities being carried out near-by which can create conditions unsafe for performance of the welding work, should be taken into consideration. Steel scaffolding or approved fire-retardant lumber and planking should be used on both the outside and inside of the structure.

7. Precautionary *Tags/Boards* Provided.

To prevent any unwarranted entry in the work area and also to caution other personnel taking actions, which may endanger people working on the job, precautionary tags/boards are to be provided like "No Entry", "Welding Hot work" sign in work area. (refer Fig.1)





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8. Area Cordoned Off.

In order to prevent the un-authorized entry of people and to avoid accidents during welding hot work jobs, work area is to be cordoned off. (refer Fig. 2)

9. Shield Against Sparks, Hot Work Booth Provided.

In order to protect against welding sparks which can provide ignition in vulnerable areas, shields are to be provided. The shield material should be non-flammable and should be kept wet with water.

If hot work is done near walls, partitions, ceilings, or roofs of combustible construction, they shall be protected by a Fire-resistant Curtain, Fire-resistant Blanket secured in the form of closed booth. (refer Fig.2, 3)

10. Portable Welding Equipment Properly *Grounded* and Cable is *Without any Joint*.

As a precaution against, portable welding equipment / hose nozzles e.g. nozzle of a shot / sand blasting gun, are to be grounded properly.

11. Waste Disposal

Accumulations of combustible waste material, dust, and debris shall be removed from the structure and its immediate vicinity at the end of each work shift or more frequently as necessary for safe operations.

Rubbish shall not be burned on the premises.

Materials susceptible to spontaneous ignition, such as oily rags, shall be stored in a listed disposal container.

12. Fire Water Hose, Portable Extinguisher, Sand buckets, Fire blankets Provided.

Portable fire extinguishers are required respectively to put out small fires immediately.





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13. Fire Water provision for readiness.

In order to meet any contingency, it should be ensured that the fire water in 200 Ltr. Drums, buckets, etc. is checked and kept ready respectively to wet area or to quench sparks and to put out small fires immediately.

14. Personal Protective Equipment (PPEs) for worker safety.

The Management shall consider the safety of the hot work operator and fire watch with respect to Personal Protective Equipment (PPE).

15. Proper Fire Evacuation Plan/Means of Exit Provided.

Proper means of exit is required in case of emergencies developed on account of the work or otherwise. Availability of an alternate route of escape should be considered.

A written 'Fire Evacuation Plan' with display of Escape routes from the remotest point of the site to the 'Safe Assembly Point' and Emergency procedures/Line-of-action to be prepared and displayed at Entrance.

Special attention shall be given to evacuation, means of ingress/egre ss, and smoke venting procedures.

16. Standby personnel provided as *Fire Watch*.

A person or persons responsible for continuously observing the hot work area, maintaining fire-safe conditions, and responding to emergencies during hot work operations and in the established period to be provided by Management, depending on the criticality of the job.

The fire watch shall watch for fires in all exposed areas and try to extinguish them only when the fires are obviously within the capacity of the equipment available. If the fire watch determines that the fire is not within the capacity of the equipment, the fire watch shall sound the alarm immediately.





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17. Prohibition of Smoking

Areas where smoking should be prohibited include, but are not limited to, temporary holding areas for combustible construction materials, storage areas, and areas where oil, gasoline, propane, or flammable material is stored or used.

18. Access Roadways

Every building shall be accessible by fire department apparatus by means of roadways having an all-weather driving surface of not less than 6 mtr. of unobstructed width, having the ability to withstand the live loads of fire apparatus, and having a minimum of 4 mtr. of vertical clearance.

19. Safeguarding Underground Operations

At each aboveground entrance, underground operations shall have a check-in/checkout system, supervised by a qualified individual at all times, that provides an accurate record of each person who is underground.

Compartmentation by means of the installation of fire and smoke barriers shall be at intervals that limit the extent and severity of the fire and that provide areas of refuge for occupants.

Audible and visible alarm and emergency lighting for safe evacuation shall be required.

Two means of communications with the surface shall be available at all times from all areas of the underground facility.

Electrical cords and plugs shall be heavy duty and suitable for use in damp locations.

An equipment grounding conductor shall be run with circuit conductors inside the metal raceway or inside the multiconductor cable jacket.

Acetylene, liquefied petroleum gas (LPG), liquefied oxygen (LOX), and methylacetylene propadiene stabilized gas (MPS) shall be





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permitted to be used underground only for welding, cutting, and hot work and only if the quality of air is within permitted limits.

The quantity of combustible materials to be used underground shall be kept to a minimum. Advance planning shall provide for the use of materials having the most favourable combination of high ignition points, low rates of combustion, and low emissions of smoke and harmful gases.

Oil, grease, and diesel fuel stored underground shall be kept in tightly sealed containers in fire resistant areas located at least 30 m from shafts. Storage areas shall be positioned or diked so that the contents of ruptured or overturned containers cannot flow from the storage area.

Where single entry shafts/tunnel ventilation systems are used, they shall be reversible from a location outside and in close proximity to the shaft/tunnel.

The ventilation system shall be sufficient for the number of personnel and equipment underground. Air sampling logs shall be maintained. Air tests shall be conducted before or after each shift. Fan houses, fan bulkheads for main and booster fans, and air ducts connecting main fans to underground openings shall be constructed of non-combustible materials.

20. Permit-to-work (Hot Work) Procedure.

Philosophy of area ownership viz. Area Owner acting as Permit Issuer (Builder/Project Owner) and Permit Receiver (Construction firm, Third Party Erector, Contractor, etc.) for proper documentation of work roles and responsibility to be established.

Area ownership assigns accountability for specific zones within a project site, ensuring that all activities are conducted under controlled and well-communicated conditions. This approach is fundamental in managing high-risk tasks and is operationalized through a structured Permit to Work (PTW) system.





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Roles & Responsibility for Work Permit System

- Permit Issuer Area Owner
- <u>Permit Requester</u> Work Supervisor/Main Contractor
- <u>Permit Receiver</u> Work Executor/Agency/Sub-contractor
- Fire Watch Provided by Permit Requester

21. Prohibition on use of Wooden Lumber/Scaffold structure.

Wooden lumber viz. wooden boards, supports, coconut coir, etc. Scaffold Structure material with MOC of wood/bamboo members (planks, transoms, ledgers, bracings, rails, etc.) to be prohibited from the site. Instead, metal members like pipes, planks and fastener/joint clamp to be used.





HOT WORK PRE-STARTUP CHECKLIST

Sr. No.	Checklist Item	Description	Yes	No	Remarks
1	Equipment and work area inspected for safety	Area and equipment inspected for safety before initiating hot work.			
2	Surrounding area checked and cleaned (e.g., grass, rags, combustible material)	Combustible materials like rags, grass, debris removed. Good housekeeping ensured.			
3	Sewers, manholes checked; gas/electrical lines verified	Covered to avoid gas release and checked for underground utilities like CNG/PNG and HT lines.			
4	Proper ventilation and lighting provided	Adequate ventilation and lighting provided to disperse fumes effectively.			
5	Safe separation distance (35 feet) maintained or fire-resistant protection used	Hot work kept at least 35 ft. from flammable materials. If not feasible, fire-resistant shields used.			
6	Other fire hazards from nearby operations considered	Nearby activities assessed for fire risks; fire- retardant scaffolding materials used.			





7	Precautionary tags/boards displayed (e.g., "No Entry", "Hot Work")	"No Entry", "Welding Hot Work" signage displayed in work area.		
8	Area cordoned off to prevent unauthorized entry	Work area barricaded to prevent unauthorized access.		
9	Shield/Hot work booth provided against sparks	Shields or booths made of fire-resistant material used to contain sparks.		
10	Portable welding equipment properly grounded and cable joint-free	Portable welding equipment grounded; no cable joints allowed.		
11	Waste disposal practices followed (no accumulation, proper bins used)	Combustible waste removed each shift. No open burning. Oily rags in approved containers.		
12	Fire hose, extinguisher, sand buckets, fire blankets provided	Fire water hose, extinguishers, sand buckets, fire blankets readily available.		
13	Fire water provision (drums, buckets) checked and ready	200 Ltr. water drums, buckets, etc. checked and available at site.		
14	PPE provided and used by hot work operators and fire watch	Workers and fire watch provided with necessary PPEs.		





15	Fire evacuation plan and escape routes displayed	Written & Schematic drawing evacuation plan with exit paths and safe assembly point displayed on site.		
16	Fire watch/standby personnel provided	Trained personnel stationed for continuous fire watch with authority to raise alarm.		
17	Smoking prohibited in/around hot work area	No smoking allowed in material storage or flammable areas.		
18	Access roadways clear, 6 m wide with proper clearance	6 m wide, all-weather roadways with 4 m vertical clearance maintained for fire dept.		
19	Underground operation safeguards in place	Check-in/out system, alarm, ventilation, compartmentation, and safe storage procedures followed.		
20	Hot Work Permit- to-Work (PTW) system implemented	Area ownership defined, permit issuer and receiver roles documented through PTW.		
21	Wooden scaffold structures prohibited; metal scaffolding used	Only metal scaffold/planks allowed. Wooden and bamboo structures banned.		





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Annexure-II

EQUIPMENT CHECKS

WELDING MACHINE SAFETY CHECKLIST

Sr. No.	Checklist Item	Yes	No	Remarks
1	Welding machine is in safe working condition. No open electrical wiring.			
2	Transformer for arc welding has Ammeter, Voltmeter, and separate main power switch.			
3	Ground/return cables securely attached with lugs/clamps/bolts. Not connected to equipment/apparatus.			
4	Electrode holder and earth clamp checked and in good condition.			
5	Correct current magnitude and appropriate electrodes selected.			
6	Welding machine not stationed in water; cables not lying in water. Duckboards/rubber protection used.			
7	Machine properly grounded and all leads well insulated.			
8	Current does not exceed 300 Amps for hand arc welding.			
9	Welding cables not in contact with hot metal/oil/grease; not dragged around sharp corners.			
10	Welding machine, cables, equipment, arc current controller inspected and certified by competent electrical engineer (biannually).			





GAS WELDING AND CUTTING SAFETY CHECKLIST

Sr. No.	Checklist Item	Yes	No	Remarks
1	Ensure pressure in oxygen line is higher than acetylene/LPG gas line.			
2	All gas cylinders shall be fixed with pressure regulator and dial gauges. Acetylene pressure not to exceed 1 Bar due to explosion risk.			
3	Back pressure valve must be fitted to Welding/Cutting Torch.			
4	Fit-to-use Non-return valve and Flashback arrester shall be fitted in both ends fuel gas & oxygen cylinder and at end of Welding/Cutting Torch.			
5	Hoses to be kept free of tangles, kinks, cracks, other defects and be of rated Design Working pressure.			
6	3-tube construction type Welding/Cutting Torch for safety against back fire.			
7	Gas cylinders in use shall be kept upright on a custom-built stand or trolley fitted with a bracket to accommodate the hoses and equipment or otherwise secured. The metal cap shall be kept in place to protect the valve when the cylinder is not connected for use.			
8	Hose clamp or clip shall be used to connect hoses firmly in both sides of cylinders and torches.			
9	Oxygen cylinders and flammable gas cylinders shall be stored separately, at least			





6.6 meters (20 feet) apart or separated by a		
fire proof, 1.6 meters (5 feet) high		
partition. Flammable substances shall not		
be stored within 50 feet of cylinder storage		
areas.		





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HOT WORK POST-COMPLETION CHECKLIST

(To be completed by Fire Watch or Supervisor after hot work activities such as welding, cutting, grinding, etc.)

Sr. No.	Checkpoint Description	Yes / No	Remarks
1	Hot work is fully completed		
2	Entire area inspected (above, below, around)		
3	No smouldering material or sparks present		
4	Cooling time observed (30–60 mins)		
5	Fire watch remains present post-work		
6	Fire extinguishers available and in place		
7	Combustible waste cleared		
8	Gas cylinders turned off and stored		
9	Electrical tools disconnected		
10	Ventilation adequate / fumes cleared		
11	Smoke detectors re-enabled (if disabled)		
12	Hot work permit signed and closed		
13	Area cleared for normal use		
D	ignature of Fire Watch: Pate & Time: upervisor Approval:		





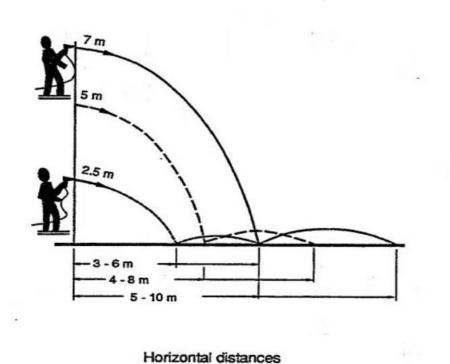
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Annexure-III

FIGURES



Figure-1



Vertical distances

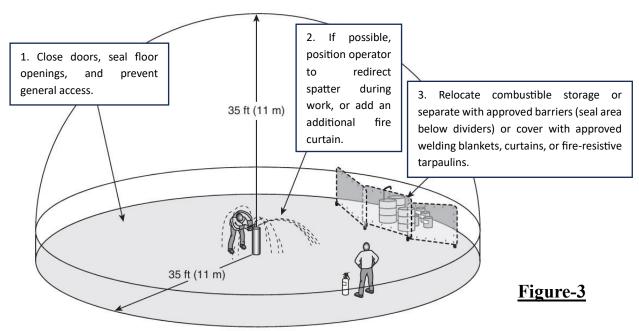
To 20 m

Figure-2





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4. Position fire watch with suitable fire extinguishers to protect potential hazard area and equip fire watch with means for emergency communications.

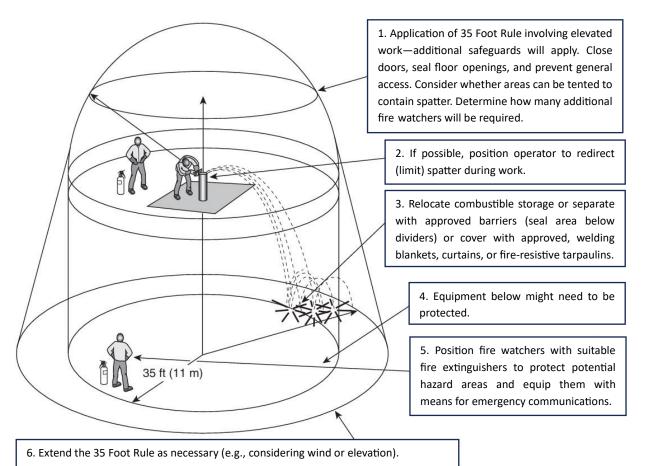


Figure-4





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FREQUENTLY ASKED QUESTIONS (FAQS)

1. A welding, cutting hotwork to be carried out at a residence inside apartment/society/colony e.g. window grill hotwork, door frame, etc.

Ans. Roles & Responsibility for Work Permit System

- <u>Permit Issuer</u> Society Chairman/Secretary
- <u>Permit Requester</u> Work Supervisor/Unit Owner
- <u>Permit Receiver</u> Work Executor/Welder/Fabricator/Field Supervisor
- <u>Fire Watch</u> Provided by work executor, to carry out Pre & Post Hotwork checks as per Checklists, establish precautionary measures at site, perform standby during Hotwork.
- 2. A construction site is under development and various hotworks are carried out for rebars, metal sheets, metal structure, etc.

Ans. Roles & Responsibility for Work Permit System

- Permit Issuer Area owner/Land owner/Unit owner
- <u>Permit Requester</u> Main Contractor Agency
- <u>Permit Receiver</u> Work Executor/Sub-contractor/Field Supervisor
- <u>Fire Watch</u> Provided by work executor, to carry out Pre & Post Hotwork checks as per Checklists, establish precautionary measures at site, perform standby during Hotwork.
- 3. A Fabrication Agency is carrying out hotwork at a site in public domain e.g. near public roads, near sewer manhole, water/gas pipeline, etc.

Ans. Roles & Responsibility for Work Permit System

- <u>Permit Issuer</u> Area owner/Company owner/Process owner
- Permit Requester Main Contractor Agency





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- <u>Permit Receiver</u> Work Executor/Sub-contractor/Field Supervisor
- <u>Fire Watch</u> Provided by work executor, to carry out Pre & Post Hotwork checks as per Checklists, establish precautionary measures at site, perform standby during Hotwork.
- 4. A building of any occupancy in which hotwork of metal fabrication is carried out for metal sheets, metal structure, etc.

Ans. Roles & Responsibility for Work Permit System

- <u>Permit Issuer</u> Area owner/Land owner/Building owner/ Unit Owner
- <u>Permit Requester</u> Main Contractor Agency
- <u>Permit Receiver</u> Work Executor/Sub-contractor/Field Supervisor
- <u>Fire Watch</u> Provided by work executor, to carry out Pre & Post Hotwork checks as per Checklists, establish precautionary measures at site, perform standby during Hotwork.
- 5. Erection of Temporary Structure/Pandals/Shamiana in which hotwork of metal fabrication is carried out for metal sheets, metal structure, etc.

Ans. Roles & Responsibility for Work Permit System

- <u>Permit Issuer</u> Area owner/Land owner/Building owner/ Unit Owner
- <u>Permit Requester</u> Main Contractor Agency/Temporary Structure Erector
- <u>Permit Receiver</u> Work Executor/Sub-contractor/Field Supervisor
- <u>Fire Watch</u> Provided by work executor, to carry out Pre & Post Hotwork checks as per Checklists, establish precautionary measures at site, perform standby during Hotwork.