EXPRO
هيئة كفاءة الإنفاق والمشروعات الحكومية
Expenditure Efficiency & Projects Authority

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Barricades and Signs Procedure

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IMPORTANT NOTICE

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1.0 PURPOSE

This procedure describes the installation and maintenance of barricades and key essential types of safety signs. Projects and work entities will restrict entry into and/or provide warning about areas that contain safety hazards, abnormal conditions, or in which unusual operations are being performed.

It is important to remember that safety signs are intended to warn people of any residual risk following a proper Risk-Control process and not as a substitution for other means on the hierarchy of controls.

2.0 SCOPE

The scope of this procedure is to provide means to the user to create a custom procedure outlining and detailing the requirements and responsibilities for Barricades and signs. This procedure applies throughout the Kingdom of Saudi Arabia to Operations and Maintenance functions and activities on government owned facilities and projects.

3.0 DEFINITIONS

Definitions	Description
Barricade	System designed to warn of a hazard and physically identify the hazard's parameters. Barricades (also referred to as barriers) can be "soft" or "hard" in construction, depending on the intended use and the nature of the hazard being protected
CFR	Code of Federal Regulations
cm	Centimeter
HSE	Health, Safety and Environment
mrem	1/1000 of a rem.
OSHA	Occupational Safety and Health Administration
PPE	Personal Protective Equipment
Rem	A rem (or Roentgen Equivalent Man) is a measurement unit that measures the effective dose an individual receives from ionizing radiation. A mrem, or millirem is 1/1000 of a rem.
SASO	Saudi Standards, Metrology and Quality
Signs (or tags)	Signs are used in conjunction with barricades to provide specific warnings and/or other essential information about the hazard(s) that exist beyond the barricade.
Solid barriers (hard barricades)	A solid barricade is a wooden, metal or similar material guarding device, capable of withstanding a 90.7kg force from any direction, that is placed around a floor/ground hole or floor/ground opening to keep persons from walking into said hole or opening during anytime the hole or opening cover must be removed. Hard barricades are used to protect against exposure to long-term hazards, restriction of access, and/or fall protection.
Tape barriers (soft barricades)	Typically, a color-coded plastic tape that provide temporary warning or restricted access and must not be used as edge protection.

4.0 REFERENCES

- SASO-883 Safety colors and safety signs.
- SASO-ASTM-C825 Standard Specification for Precast Concrete Barriers
- OSHA 29 CFR 1926 Subpart G Signs, Signals and Barricades.
- EOM-KSS-PR-000029 Excavation and Trenching Procedure
- EOM-KSS-PR-000025 Floor and Wall Openings Procedure
- EOM-KSS-PR-000032 Powder Actuated Tools Procedure
- EOM-KSS-PR-000001 General Safe Working Requirement Procedure

5.0 RESPONSIBILITIES

5.1 Asset Manager

Asset Manager's responsibilities include the following:

- Overall responsibility for this procedure and for supporting this process and verifying all Facility's actively participate.
- Providing the personnel, facilities, and other resources necessary to effectively support and accomplish this procedure.

5.2 Facility Manager

The Facility Manager is responsible for monitoring that the site is in compliance with applicable HSE (Health, Safety, Security and Environment) requirements by:

- Providing the resources to implement the requirements of this procedure.
- Communicating with management concerning Project HSE expectations concerning barricades and signs procedure.
- Providing leadership regarding HSE requirements and expectations for Managers, Supervisors, Superintendents, Technical leads and other leadership.

5.3 HSE Manager

HSE Manager's responsibilities include the following:

- Auditing this procedure.
- Confirming that this procedure meets the government rules and regulations in the location of the Facility.

5.4 Facility Personnel

Facility personnel's responsibilities include the following:

- Knowing and understanding the HSE requirements of this Procedure and apply this Procedure to all work they perform.
- Requesting additional information and further clarification before starting work if personnel receive work assignments they do not understand.
- Report to their supervisor any deficiencies in barricades and signage so that it can be rectified as appropriate.

6.0 BARRICADES

6.1 General Requirements

- Imminent danger or hazardous areas will be cordoned off using appropriate red and white barrier tape. Only personnel working to eliminate a problem may be inside a cordoned off area. Entry by other personnel is prohibited.
- Where hazards are expected to exist for more than 24 hours, a physical barricade shall be erected using wooden or metal guardrails. A tag or sign shall be attached or posted to indicate the hazard, the supervisor responsible for the area and other pertinent warnings.
- Permanent barricades will surround permanent hazard areas. Appropriate access control will be provided. Permanent warning signs will be used to adequately mark the hazard.

- Physical hazard areas will require a barrier using appropriate “CAUTION” yellow and black (or international equivalent) barrier tape. Appropriate arrangements will be made, and instructions given, where access is required through these areas.
- Protective barricades provide physical protection from falling as well as serving as a warning. The barricades are generally made from wooden 5cm x 10cm material, but can be scaffold parts or 13 mm cable stretched tight between steel with turnbuckles. The barricades must be capable of protecting against 90.7kg of sideways force.
- A sign or tag will be used to provide personnel outside of all barricaded areas with important safety information (Figure 1). The supervisor responsible for the area must post the sign or tag so that it can be read from all potential access points.
- The swing radius of equipment will be barricaded as an imminent danger area when the superstructure is capable of rotating.
- Additional/Special signage and barricades requirements will be identified as a result of the considered findings of a risk assessment of the work area and/or tasks.

Refer to SASO-883 Safety colors and safety signs standard for further information.

Figure 1: Example of Safety Tags

6.2 Wood Guardrails

- The top rail must be made from a 5cm x 10cm board arranged such that the top of the 5cm x 10cm is 107cm from the floor or platform level.
- A mid-rail made from a board 5cm x 10cm must be located at the midpoint between top rail and floor or platform level.
- A toe plate must be used on all guardrails for floor holes, floor openings, or wall openings. It will be made from a 2.5cm x 10cm or board 5cm x 10cm, or their equivalent, and will be installed to prevent material from passing from any barricaded platform as a dropped object.
- The vertical support posts for guardrails must be made from boards 5cm x 10cm with pitch spacing not to exceed 3.4m.

6.3 Metal Guardrails

- Metal handrail material for a guardrail must be 3.8cm diameter nominal size or larger.
- The top rail must be located 107cm from the top of the rail to the floor or platform level.
- The mid-rail must be 3.8cm diameter nominal size or larger and located midway between the top rail and floor or platform level.
- A toe board made from .64cm x 15cm flat metal plate must be installed at the floor or platform level.
- Vertical support posts must be 3.8cm diameter nominal size or larger and located at pitch distances not to exceed 3.4m.

6.4 Erection of Barricades

- The employees initiating any work are responsible for the erection of the barricades around the work area. All employees working inside a barricade are responsible for maintaining the integrity of any barricades associated with the work.
- When employees erecting a barricade vacate the area, they should make sure that any remaining employees know who is now responsible for the barricade.
- Barricades should be 107 cm high. If proper construction stanchions are used, this height will be achieved. Barrier tape should be tied to stanchions and not to instrument lines, valves, etc.
- Barricades must be completed. The work area shall be entirely isolated and identified. Permanent structures that prevent entry may be used as part of the barricade. The barricaded area will be sufficient size to afford appropriate protection. If this condition cannot be met, consideration must be given to keeping materials from falling or protruding outside of the barricaded area. A general rule for barricade erection is: 30.5 cm out for every 61 cm up. If that is not possible, the supervisor should be contacted for help.
- A barricade should not block access or use of emergency equipment, such as plant fire extinguishers, safety showers, etc. Where this is not possible, alternative provisions must be made with plant area personnel.
- The blocking of a fire exit and routes with a barricade is prohibited.
- Separate barricades are not required when working within a permanent barricade. However, appropriate barricade signs will be posted.

6.5 Road Barricades

- A Traffic Control Plan shall be developed prior to any maintenance works commencing. Road signage and lighting shall be erected as per the Traffic Control Plan.
- Barricades across or next to a roadway will be semi-permanent concrete barricades and signs, or equivalent (Figure 2).
- Flashing amber lights will be required at barricades left after dark to alert vehicle traffic to their presence.

Refer to SASO-ASTM-C825 Standard Specification for Precast Concrete Barriers for further details.

Figure 2: Examples of Road Side Concrete barriers

6.6 Hazardous Chemicals

Signage is required to be placed around areas in which hazardous chemicals are stored. The placards required must state the class of chemical in place. See **attachment 2** for placard signage. Also, further signage may be required based on the risk assessment.

6.7 Radiography Barricades

- The radiography work area will be barricaded off to a distance to maintain a dosage level of 2 millirem (mrem) per hour or less level.
- All entries and exits will be blocked and warning signs posted at the barricaded areas.
- Except for the radiography crew, personnel will not be allowed to enter the barricaded area.

Figure 3: Examples of Radiography Signage

6.8 Excavations or maintenance pits etc.

- Soft barricades must be erected no closer than 1.8m from the edge of the excavation or pit open for more than one shift the excavation must be hard barricaded
- If excavation or pit is deeper than 1.2m, hard barricades are to be used and must be capable of supporting 90.7kg of sideways force.

7.0 SAFETY SIGNS

7.1 General Requirements

The signs depicted in this procedure are grouped as follows:

- Prohibition
- Mandatory
- Warning
- Danger
- Emergency
- Fire
- Exit

A sample sign of each type is demonstrated in **attachment 1**.

- Consideration should be given to signs exposed to high levels of ultraviolet radiated light (i.e., desert conditions), as the signs and warning barrier tape will fade over time.
- Signs and warning tape shall be regularly cleaned and replaced when faded or damaged.
- All emergency exits, passageways, fire doors, first aid stations, eye wash stations and emergency muster points shall be highlighted with safety condition signs.
- Warning signs shall be erected and displayed for fire hazards, electrical equipment, openings, overhead working, noisy areas, utilities, overhead power lines, and other hazards.
- Mandatory signs shall be provided for enforcing the use of personal protective clothing an equipment and providing specific instructions appropriate to the task or condition.
- Prohibition signs will be displayed for restricting access or entry, no smoking areas, no parking, and any other unauthorized acts.
- Fire signs shall be provided at areas where fire equipment has been sited (e.g. fire extinguishers, fire hydrants/points, fire blankets, etc.).
- Signs will be erected on work areas perimeters and entrance gates containing information about site entry requirements in dual language Arabic and English.
- Signs shall be erected in a way that does not cause a hazard by itself, example: cause a blind spot.

- Considerations must be given to potential wind-load on the erected sign, signs must be of rigid construction.
- Safety signs must be maintained to perform the function which they were intended to. They may include regular cleaning, lighting maintenance, etc.
- Appropriate use of signage will be included in periodic safety inspections and audits.

7.2 Facility Perimeter and Access Point Signs

Security of worksites and laydown areas is paramount, therefore both areas require to be fenced with secure access points (Figure 4, 5, 6 and 7). Both laydown and worksites entrances must display a display board with as a minimum the following signage (in both Arabic and English):

- Authorized Personnel Only
- Hard Hats Required
- Eye Protection Required
- Safety Footwear Required
- Hearing Protection Required
- Drivers Report To _____
- All Personnel Report to Security

Figure 4: Signage at Entrance to Facility


Figure 5: High Level Security Fence

Figure 6: Fencing Blocking Out-View

Figure 7: Signage at entrance to Facility

8.0 ATTACHMENTS

1. Signage Example by Category
2. Hazardous Substances Class Signs

Attachment 1 - Signage Example by Category

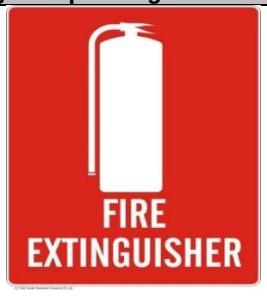
Prohibition - Prohibiting an action or behavior that is likely to cause harm

Mandatory - Prescribing a specific compulsory requirement

Warning - A sign alerting of an existing hazard or danger

Danger – An indication that a hazardous situation exists that could cause harm

Emergency/Fire/Exit – Signs stipulating locations



Attachment 2 - Hazardous Substances Class Signs