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İşin Adı : Mersin-Adana-Osmaniye-Gaziantep Yüksek Standartlı Demiryolu Hattı
The Name of : İnşaatı ile Elektromekanik Sistemlerinin Temini
the Job : Construction of Mersin-Adana-Osmaniye-Gaziantep Hight Standard Railway
Line With Supply Of Electromechanical Systems

Rapor Adı : PROCEDURE FOR CONTROL OF LIFE
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1. PURPOSE

Mersin-Adana-Osmaniye-Gaziantep High Standard Railway Project is to determine the minimum requirements for the control of life-threatening activities in the work area and regions and to increase compliance with HSE rules.

2. SCOPE

This document is valid for all personnel (including visitors, interns, etc.), activities within the project and all subcontractor employees operating.

3. DEVELOPMENT

Persons who detect ambiguity and inconsistency in this document can report their requests and suggestions using the "User Feedback Form" in the APPENDIX A.

4. REFERENCES

The content of this document has been developed to determine the minimum requirements for Rönesans Holding and all affiliated Group Companies; It can be developed according to the legal regulations of the working area, employer expectations and international standards.

- ISO 45001 Occupational Health and Safety Management System
- ISO 14001:2015 Environmental Management System,
- ISO 9001:2015 Quality Management System
- Occupational health and safety regulations in construction works
- Occupational Safety and Health Administration (OSHA)
- Health and Safety Executive (<http://www.hse.gov.uk>)
- OSHA 1926.1408 Power Line Safety (up to 350 kV) - Equipment Operations
- OSHA 1910.140 Personal Fall Protection Systems

5. RESPONSIBILITIES

5.1. Project Management:

Project Management is responsible for the implementation of this document in all worksite activities and ensuring that the subcontractors operating in the project/enterprise work in accordance with this document. Project Management is also responsible for the following matters:

- Implementation of the prepared Life-threatening Activities Control Procedure,
- To ensure that this document is transferred to its employees,
- Allocating the necessary resources to control the activities,
- Responsible for monitoring and developing the system for continuous improvement.



5.2. Department / Department Managers / Chiefs are also responsible for:

Department/Department Managers/Chiefs are responsible for the implementation of this document and ensuring that their subcontractors work in accordance with this document in their activities in their own work area. Department / Department Managers / Chiefs are also responsible for:

- To ensure that this document is transferred to the employees,
- The implementation and enforcement of this document in the departments and areas for which they are responsible.
- Responsible for monitoring and developing the system for continuous improvement.

5.3. Project HSE Units and Responsibilities

HSE Unit (Manager, Chief, Engineer, Supervisors and other HSE Personnel) and Operations Managers/Managers appointed as HSE Responsible are responsible for the coordination and monitoring of this document for its implementation in all field and business activities. Additionally, the HSE Unit is responsible for the following:

- Providing training to employees and subcontractors regarding the scope of this document,
- Ensuring coordination with the managers/supervisors responsible for the activities in the projects/enterprises for the implementation of this document,
- Organizing training and on-the-job talks to ensure communication of this document,
- Following up the KPIs (key performance indicators) prepared by the Project/Enterprise and reporting them to the Project/Enterprise management,
- Controlling the implementation of the document with field controls and following up the control by informing the Project Management in case of identifying life-threatening activities,
- Monitoring and reviewing that this document is implemented effectively and in accordance with its content, and for contacting the Group Company/Holding HSE Units in case of need for revision.

5.4. Subcontractors

Subcontractors are responsible for the following,

- To comply with the rules specified in this document while carrying out its activities,
- Correcting the nonconformities within the scope of this document specified to them by the Project Management or Project HSE Unit as soon as possible.

5.5. Headquarter E&S Manager:

Responsible for managing infrastructure and superstructure projects regarding environmental and social governance issues and member of the Executive E&S Committee on behalf of the REC.

5.6. PIU (Project Implementation Unit)

- **PIU Physics Engineer** who is responsible for supervising health and safety for the Project.
- **PIU Department Manager (Superstructure / Civil Engineer)** will be responsible for overseeing the implementation of all health, safety and social measures, as specified within the disclosure package of the Project, and regular reporting to AYGM PIU.

5.7. Executive Environmental and Social Management Committee

- **Executive E&S Committee Project Manager (Department Head / Branch Manager /Head of Department)** will be ultimately responsible for overseeing the activities undertaken by the AYGM/TCDD specialists (listed below), overseeing the implementation of mitigation measures and management procedures specified within the disclosure package of the Project, and overseeing the preparation and implementation of a CESMP, which will be based on this ESMP.
- **Executive E&S Committee Environmental, Health and Safety, and Social (EHSS) Manager (Specialist / Engineer)** will be responsible for overseeing all matters that relate to environment, health, safety and social aspects of the Project. Also, s/he will be appointed to be responsible for supporting the implementation of the SEP, by conducting regular consultation with affected communities on any concern regarding the Project. CLOs will also have responsibility for disseminating the Project disclosure package as described in the SEP. They will also conduct regular inspections of records relating to grievances received and their resolution. S/He will report regularly to AYGM PIU.

Further technical staff may be required during the course of the Project, who will be assigned internally by the AYGM, either by means of permanent or temporary basis until the completion of relevant tasks under the Project whilst they undertake their current responsibilities.

6. ABBREVIATIONS & DESCRIPTIONS

Rönesans: Rönesans Holding A.Ş. is a group of companies in Turkey and abroad in which Rönesans Holding A.Ş.'s subsidiaries, subsidiaries and the shareholders of Rönesans Holding A.Ş.

SIMOPS: Intersecting/Concurrent Works

PROJECT: MAOG (Mersin-Adana-Osmaniye-Gaziantep) High Standard Railway Project

HSE: Occupational Health and Safety and Environment

PPE: Personal Protective Equipment

SNR: Noise Value of the Cable

ANSI: American National Standards Institute

EN: European Norm

CE: A sign that a product is safe (Conformité Européenne).

7. IMPLEMENTATION

7.1. Confined Space Works

- Confined space works should be performed only under compulsory circumstances and when a safer way to work is not available.
- A document should be prepared defining the requirements / responsibilities of the team working in the confined space and explaining the rescue plan. This document should be reviewed and understood by everyone who participates in the work.

- Risk assessment should be prepared, the confined space should be isolated from energy sources, the air quality within the confined space should be measured/verified at appropriate levels depending on the activity. Compatible respiratory protection equipment should be chosen and a full-time watchman should be assigned
- Job Hazard Analysis (JHA) should be prepared and the hazards of the work should be communicated to the employees before commencing the work.
- Such work should be performed within the scope of Permit to Work. The Permit to Work Form should be kept in the area where the work is performed and removed after the work has been completed. The permit period should not exceed 1 day and should be associated with the related risk assessment.
- A confined space control system should be established by signs, indicators, tags and locking. The authorized individual or the watchman should be present in the work area during the entire confined space work and it should be ensured that adequate communication tools are used. Unauthorized entries should be prevented by barriers and safety signs.
- All employees should leave the confined space after the confined space work is completed (this should be checked by the confined space official using a checklist).
- Functional, calibrated personal or stationary atmospheric tracers/monitors should be used throughout the confined space work to continuously monitor the levels of oxygen, flammable gases and other toxic gases (O₂: 19.5%-23%, LEL<10%, CO<50 ppm, H₂S<10 ppm). In addition, an authorized person should perform a gas test periodically and record the measurements made during the work.
- Trained and equipped (safety belt, tripod, respiratory protection system, emergency mask, etc.) emergency team should be kept available in order to rescue the individuals working in a confined space as soon as possible. This team should be specified in the confined space permit to work form or the rescue plan.
- Electrical equipment used in confined spaces should be chosen as low voltage (24V) and explosion and fire proof (ex-proof).



Figure 1. Sample lighting in a confined space

- Electrical equipment used in confined spaces should be chosen as low voltage (24V) and explosion and fire proof (ex-proof).

7.2. Excavation works

- A valid excavation permit to work should be obtained prior to any excavation work. Drawings for the underground systems should be checked in order to identify all infrastructure systems and potential hazards.
- Excavation areas should be enclosed by rigid barriers in order to prevent humans, materials and equipment from falling in.
- The excavations should be checked and recorded by authorized individual weekly as a minimum.
- For excavations that are 1.2 meters and deeper, safe access-egress should be provided once in every 7.6 meters and the employees should be informed regarding the emergencies that could occur within the excavation area.
- All excavations that are 1.2 meters and deeper and excavations made around live lines are subject to the permit to work system.
- Excavations that are deeper than 1.2 meters should be braced (supported), benched or sloped at a suitable angle against collapsing (considering criteria such as the soil structure, climate conditions, additional loads, etc.). A distance of 60 cm is maintained between the earth removed from the excavation area and the edge of the excavation area, and suitable barriers are used in case there is a risk for earth to flow into the excavation area. Hard barricades should be set up at an appropriate distance from the excavation edge in order to indicate the hazard for vehicles and pedestrians.
- The atmospheric environment should be regularly tested and checked during excavations. The frequency of these tests should be increased if there is a vehicle operating in the excavation or operations such as welding, cutting, burning are available.
- Gas tests should be conducted before starting the work and at the necessary levels in every excavation where the depth exceeds 1.2 meters or has / expected to have a hazardous atmosphere (environments where oxygen is less than 19.5% or more than 23.5%, flammable gas concentration is more than 20% of the lower exposure limit (LEL) and hazardous substances at concentrations exceeding the limit value).
- The equipment and stored materials around the excavation area should not create a potential hazard for those working in the excavation and the safe distances should be defined clearly.
- A permit to work system should be established for excavation works and manual excavation or hydraulic and vacuum (hydrovac) excavation equipment should be used in areas where infrastructure systems are available.
- Excavations should be checked by an authorized individual on a weekly basis and following any changes in the conditions (such as heavy rain, high winds) and the permit to work form should be renewed before resuming the work. Excavation works should be suspended during heavy rain.
- Excavation activities shall commence in areas where there are overhead lines only after de-energizing and earthing the overhead lines and taking the necessary measures.
- A risk analysis should be carried out for the excavation areas and material dumping spots and a competent signalman should be provided.
- There should be assistant personnel, who have received driver training, in the vehicles at spots where it is not possible to provide signalmen.
- The trucks should not be loaded beyond capacity during excavation works. Tags indicating capacity should be placed on all trucks and loading should be checked by the related supervisor/foreman.



AYEM
Altyapı Yatırımları Genel Müdürlüğü

ALTAŞ
ALTYAPI

METROPLAN
MÜŞAVİRLİK MÜHENDİSLİK SAN. VE TİC. LTD. ŞTİ.



Figure 2. Barricading the excavation perimeter



İŞ SAĞLIĞI GÜVENLİĞİ & ÇEVRE



Figure 4. Equipment daily checks

- Image result for heavy equipment inspections During the use of the equipment, materials that block/restrict vision (curtains, screens, labels, etc.) should not be kept.
- Mobile equipment should not be used under the influence of substances such as alcohol and drugs, routine or non-routine controls should be carried out.
- The need for reverse gear maneuvering should be reduced by using one-way systems or certain turning areas. Reversing warning alarm, equipment to provide visibility (lighting, convex mirrors, closed circuit, etc.) should be installed on mobile equipment and daily checks should be carried out by the operators and recorded.

7.4. Hot works

- By checking the field studies, a work-specific Occupational Hazard Analysis (ITA) Form should be prepared.
- In operation areas, hot work should only be allowed if the work must be done and cannot be carried out in a safe environment.
- An authorized fire observer must be appointed during hot work activities.
- Functional, calibrated personal or stationary low-level measurement devices should be used to continuously monitor the level of flammable gases.
- Before starting the work, it should be checked that there are no flammable, combustible and explosive materials in the work area.
- In cases where it is not possible to remove it, necessary isolation/insulation measures (fire blanket, etc.) should be taken correctly between the flame and spark source and flammable explosive combustible materials. Hot works should not be carried out in areas where paint, pressure tubes, thinner, fuel oil are stored/stored.

- A fire watcher/observer should periodically test, verify and record the presence of gases in the ambient air prior to hot work; he must also be constantly on duty to detect and extinguish a fire during hot work.
- Any welding, grinding or cutting; Hot work work permit must be obtained from the Work Permit Coordinator before it is performed in an area classified as containing flammable materials and around the equipment.
- Persons performing gas tests and fire watchmen should have received training on both subjects.
- The competencies of personnel engaged in hot work should be evaluated and verified.
- Proper grounding should be done for welding machines. Cables and hoses should be checked daily by users.
- A work permit system should be applied for the hot works carried out in the areas determined after the risk analysis. Hot work permits should only be issued by trained and competent employees. The duration of the permit should not exceed 1 day.



- Adequate number and type of fire extinguishing systems should be kept in an easily accessible area, close to the work area, in accordance with the materials and risks around before each hot work.
- Operators using equipment/tools included in the scope of hot works should be given technical training on the tools they use.
- Personal Protective Equipment (PPE) suitable for hot work by employees should be used and PPE requirements should be specified in the work permit forum.

Figure-5: PPE examples for hot works

7.5. Lifting Operations

- A qualified specialist should be appointed for lifting operations and their responsibilities should be clearly understood.
- All persons performing lifting planning/operation and maintenance of lifting equipment must be trained and competent. Renewal trainings and performance evaluation are required for the continuation of competence.
- The supervisor or authorized persons should evaluate the ground conditions before work begins. The mobile crane installation floor must be flat and firm.
- All slinging equipment and fittings must be of appropriate standards and inspected prior to each use. After inspections, it should be checked that the color coding or labeling applied is up-to-date.

- The beacons controlling the lifting operation must protect communication with the operators (eye contact, hand signals, radio, etc.) at all times and must be within the operator's field of view. Make sure that the markers are easily recognizable to the operators (eg a high-reflective vest, a different colored helmet).
- The daily control forms of the lifting equipment should be filled in by the operators and kept in the equipment.
- Cranes should have a safe working load indicator or load tables and load limiters (switches) and emergency buttons should be used to ensure that the load limit is not exceeded.
- A work permit system should be implemented for critical lifting works and approved lifting plans should be established.
- Router/guide lines or other means to eliminate manual handling of the load should be used and should be long enough to allow slingers to be at a safe distance from the load.
- During lifting, all legs of the crane should be fully extended and appropriately sized base plates should be placed.
- Space delimitation and safety signs should be placed by the slinging team around the turning radius of the back weight and balance arm part of the crane to prevent access by workers.
- Audible and visual warnings should be used during lifting operations around work areas or employees to prevent workers from being under load.
- It is necessary to categorize the lifting operation according to the level of risk and complexity in order to carry out appropriate controls. The categorization of removal operations should be done to reflect the increased level of control in proportion to the increased risk.
- When working near high voltage lines, the safe working distance must be observed.

Table 1. Safe Working Distances

Voltage	Minimum Required Distance (m)
300V	Avoid contact
300V – 50KV	3
50KV – 200KV	5
200KV – 350 KV	6
350KV – 500 KV	8
500KV – 750KV	11
750KV – 1000KV	14

- The activity-based risk assessment should be carried out by the competent person by taking into account the shape, characteristics, weight, dimensions of the load to be lifted, the selection of the appropriate rope fastening method, the positions of the obstacles, the working radius, weather conditions, lifting method, communication type and ground conditions.
- Due to strong winds, lightning or other abnormal weather conditions, lifting operations should be stopped.

- It should not be operated above the limit values determined by the manufacturer of the mobile or fixed lifting equipment or in cases where the wind speed exceeds 45 km/h if the manufacturer's limit value is higher than 45 km/h.
- In cases where people are working on the lifting equipment (asam basket), the manufacturer's standards are taken into account instead of the speed of 45 km/h.
- If the wind measurements are not read on the mobile equipment in the studies carried out with mobile equipment, if the result of the field measurements reaches 45 km/h by adding 35% to the result of the field measurements, the equipment must be terminated and the equipment must be put into safe standby mode.

7.6. Energy insulation

- Mandatory EKED/LOTO implementation process should be: prepare, report, turn off/disconnect power, isolate, apply interlocks, zero energy state, test, perform work or activity, inspect and restore.
- Work activities should be planned away from the hazardous energy source, barriers should be used to separate/isolate people and activities, and a "Hazardous Energy Control Procedure" (EKED/LOTO etc.) should be established in the project to ensure the control of hazardous energy sources associated with machinery, equipment and processes.
- After the machine or equipment has been properly disconnected or isolated from the energy source, the machine or equipment should be tagged, locked, secured, and tested.
- Labels removed from the isolation device must not be reused. No changes should be made on the label.



Figure 6. Energy isolation labeling

- Energy isolation procedures/instructions should be defined clearly and clearly to be understood by all relevant employees, and the authorized and relevant persons working in the EKED/LOTO process should be trained on the scope of procedures/instructions.
- Work permit system and isolation certificate should be used to control the work to be done around the hazardous energy and/or the hazardous energy source.



Figure 7. Locking example



Figure 8. multi lock

- Only authorized and responsible persons, without exception, can manage the mandatory EKED/LOTO process. Control authorities for the EKED/LOTO system should be determined for each project, their names should be published and the lists should be kept up to date.
- The method for re-commissioning equipment and systems must be determined, the integrity and safety of the isolated system must be approved by the authorized person and the work permit must be signed before commissioning.
- In projects, special/specific systems should be defined before commissioning the systems during the commissioning period. These systems, restrictions and markings should be communicated to employees through on-the-job conversations and risks related to simultaneous activities (SIMOPS) should be controlled by the work permit system.
- In case of more than one person locking at one point, multi-lock hook should be used.
- Personal locking can only be done in case of simple maintenance or malfunction, in cases where all dangerous energy sources will be removed from a single point, working with a single equipment, and a single isolation point. Personal lock and tag are used. The key should remain with the person doing the work.
- In an emergency, a system for cutting/breaking the lock should be developed.
- Do not work on the energized system.
- Protocols or logbooks should be established for shift changes or any interrupted tasks to maintain a zero energy state, energy isolation status or a regular transfer of device protection.



Figure 10. Scaffolding net

- Image result for scaffolding net All scaffolding that has not been installed, is unsafe or has been modified should be securely isolated to prevent access to employees, identified with a red label and authorized scaffolding personnel should be notified to make the necessary corrections.
- Relevant precautions should be taken to minimize the risk of material dropping. (skirts, scaffolding nets, closing gaps, etc.)
- Scaffolding access ladders longer than 6 meters should have vertical lifelines installed or a landing platform at most every 6 meters to protect against falls.
- Work scaffolding should be built on solid and flat ground. Mobile scaffolds and ladders should be used after the trained surface has been made suitable.
- It should never be moved while there is an employee on the mobile scaffold.

7.8. Working at Height

- Personal fall protection equipment should be checked by an authorized person and the current color code and serial number should be on the PPE.
- All fall protection equipment and equipment (safety belt, retractable fall arrester, lifeline, anchors, etc.) must comply with international standards, be certified, undamaged and in good condition.
- Anyone working at height should have received training in working at height before using or installing fall protection equipment.
- Lifelines and connection points should be designed and installed by authorized/expert people who have been trained in the installation and should be checked at least weekly and followed up with the label system of the projects.
- Before starting to work at height, a rescue plan should be prepared to minimize suspension shaking, appropriate equipment should be available, and the effectiveness of emergency response procedures should be tested with drills.
- Shock absorbing and double-armed lanyards should be used for climbing. The lanyard connection should always be at the points above the head.

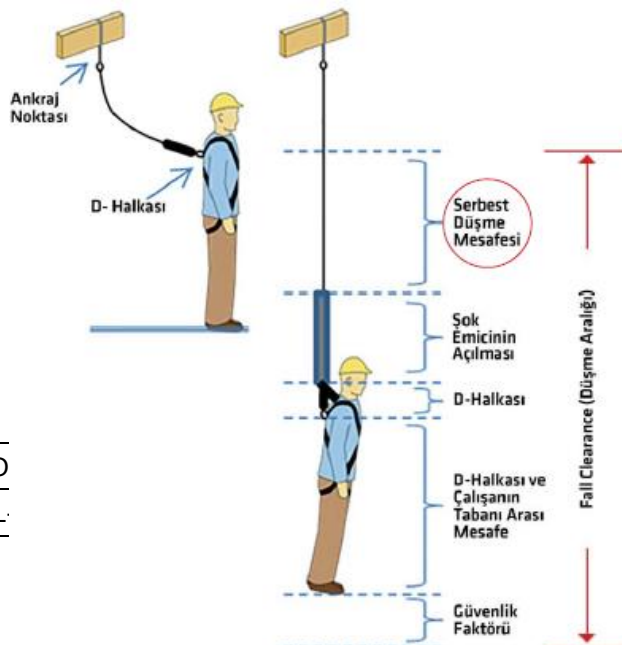


- Employees must use their seat belts correctly, operate in accordance with the 100% adherence rule (at least one lanyard must be attached while in motion), and must be attached to appropriate anchor points. The anchor point to which the fall arrest equipment is attached must be able to support at least 22.2kN and comply with the EN 795 standard.
- Anchor or tie-down points should always be above the worker's waist level, except for scaffolding assembly work.



Figure 11. Hand-tool

- Image result for wrist lanyard Tool lanyards, tool bags, mesh systems, and other similar control measures should be used to manage falling objects. Areas where there is a danger of material falling should be surrounded by safety strips or hard barriers, labeling should be made listing the responsible person, date and hazards.
- The openings in the floors or platforms should be closed with fixed covers that can carry at least 2 times the load expected to carry. In cases where closure cannot be done, the openings should be surrounded by hard barricades and the access of the employees should be prevented.
- Safety nets and edge guards should be checked regularly and these checks should be recorded. Tests should be carried out for edge guards and safety nets.
- The limits of the fall arrest system should be such as to allow free fall from a height of 1.5 meters and/or less.
- Lifeline anchor a minimum load The maximum horizontal lifeline otherwise manufacturer's
- Safety belts and considering the



points must be able to carry of 2500 kg per employee. number of employees in the should be 2 (unless specified in the instructions).

lanyards should be chosen fall distance.

Figure 12. Safety belt fall range calculation

7.9. Personal Protective Equipment (PPE):

- All Personal Protective Equipment (PPE) purchased, including subcontractors, must comply with the relevant ANSI, EN standard and be CE marked.
- Regular maintenance of PPE should be performed and these maintenances should be recorded.
- By carrying out hazard/risk assessments by the project management, minimum PPE requirements should be determined and these requirements should be communicated to all employees.
- A PPE Matrix should be created describing the PPE requirements prepared by the project management on the basis of activities.

									
Araç Kullanımı & Nakliye	X	X		X	X	X			
İnşaat	X	X	X	X	X	X	X		
İtfaie	X		X	X		X		X	X
Yemek İşleme	X							X	
Cam İşleri	X		X		X			X	
Sağlık Çalışmaları	X		X					X	
Maden İşleri	X	X	X	X		X		X	X
Petrol ve Doğalgaz	X	X	X	X	X	X		X	X
Kağıt Sanayii	X					X			
Tesisat	X			X		X	X	X	

Figure -13 Example PPE Matrix



- Regular field checks should be carried out and recorded to monitor PPE compliance.
- All employees regarding the use of PPE should be trained and during field inspections, it should be checked whether the employees use PPE correctly.
- Eye protection programs should be developed by the project management and eye protection equipment should be used according to the activity.
- S3 safety boots with EN ISO 20345:2011 specification should be used by employees in outdoor work (workers shoes with S3 occupational safety standard have a stainless steel reinforced sole).
- Considering the emergency plan and risk assessments, the PPE required for emergencies should be determined.
- Appropriate ear protectors should be selected considering the SNR values for work in noisy areas and it should be ensured that employees are not exposed to sounds higher than 85 dB.

7.10. Intersecting/Concurrent Works

- During the risk workshops held at the beginning of the project, simultaneous activities that are likely to cross should be determined, and risks arising from intersecting activities and precautions to be taken should be determined in the risk assessment.
- Over-the-top work should be avoided as much as possible. In unavoidable situations, engineering measures should be applied.
- In cases where the risk profile changes, such as commissioning or going into operation, a risk workshop should be held and an HSE plan should be created regarding how the transition will be made.
- During the commissioning process, daily work permit coordination meetings should be held and cross-cutting activities should be managed through the work permit system.
- Roles and responsibilities should be defined for the execution of cross-cutting activities and these responsibilities should be shared with all employees.
- A field and activity-based tracking system should be established for work permits, and simultaneous/intersecting activities should be determined in advance.
- In simultaneous activities, field supervisors should ensure that necessary precautions are taken among themselves, taking into account occupational safety standards.

7.11. Placing Barriers

- All rigid barriers used must be tested and regularly checked by authorized persons.
- The top railing height of rigid barriers must be at least 100 cm high. In barriers where intermediate guardrails must be used, the height of the intermediate barrier from the ground (from the 15 cm heel plate) should not be more than 47 cm, and the gap between two intermediate barriers should not be more than 47 cm.

- Rigid barriers constructed at an appropriate distance from the excavation edge, manhole openings and open drain edges should be installed to indicate the presence of danger to vehicles and pedestrians.
- Rigid, permanent barriers should be used at the edges of high places, floor or shaft openings where people can fall.
- Mold removal areas, working high slab edges, etc. hard barriers in areas and other areas where there is a risk of material falling should be limited with safety strips.
- Vehicles and facilities should be kept away from the power lines with barriers or warning signs in the areas where there are power transmission lines.
- Safety strip should be used to prevent pedestrians from entering the dangerous area during material unloading and lifting works performed with mobile cranes.



Figure -14 Rigid Barrier

- The entry of unauthorized persons during maintenance of electrical panels and high voltage tests should be prevented with barriers.

