

## Guardrails

Guardrails are one of the most reliable and convenient means of fall protection and must be the first consideration when protecting workers from fall hazards. A worker at risk of falling from certain heights must be protected by a guardrail system or, if guardrails are not practical, by a travel-restraint system, fall-restricting system, fall-arrest system, or safety net. In Saudi Arabia, these systems must comply with Saudi Arabian Occupational Health and Safety Regulations and, where applicable, the specific standards of clients such as Saudi Electricity Company (SEC) and Saudi Aramco (SA).

### When Guardrails Are Required

Guardrails or other appropriate fall protection methods must be used when:

- There is a fall hazard of more than 1.2 metres from any location.
- A worker may fall into operating machinery, hazardous substances, or onto a hazardous object or an opening on a work surface.
- A worker could have access to the unprotected edge of any of the following work surfaces (but not limited to) and is exposed to a fall:
  - A roof while formwork is in place.
  - A scaffold platform, work platform, runway, or ramp.
- There are openings in floors, roofs, and other working surfaces, including skylights.
- There are open edges of slab formwork for floors and roofs.

### Additional Requirements for Wooden Guardrails

For guardrail systems made of wood, the following additional requirements apply:

- The wood must be spruce, pine, or fir (S-P-F) timber of construction grade or better.
- The wood must not have any visible defects that may affect its load-carrying capacity.
- The wood must be free of sharp objects (e.g., splinters, nails).
- The guardrail system must have posts at least 38 by 89 millimetres, securely fastened to the surface, and spaced no more than 2.4 metres apart.
- The top and intermediate rail must be at least 38 by 89 millimetres.

Note: If the wooden guardrail system is constructed and installed to resist all loads that may be applied by a worker, some subsections for load capacity may not apply.

### Additional Requirements for Wire Rope Guardrails

For guardrail systems made of wire rope, the following additional requirements apply:

- The top and intermediate rails must be at least 10 millimetres in diameter.
- The wire rope must be kept taut by a turnbuckle or other device.
- The outward deflection of the top rail and intermediate rail resulting from the specified loads must not extend beyond the edge of the work surface.
- Vertical supports or posts must be no more than 2.4 metres (8 feet) apart.
- Horizontal supports must be installed at intervals of no more than 9 metres.

### NCC T&D Project Leaders Key Responsibilities

NCC T&D Project Leaders must ensure the following:

- Design and Installation: Verify that guardrail systems are designed and installed in compliance with Saudi Arabian regulations and client-specific standards.
- Inspections: Ensure guardrail systems are inspected before use by a competent person.
- Training: Provide workers with adequate training on the use and inspection of guardrail systems.
- Documentation: Maintain records of inspections, design drawings, and load test results.
- Safety Measures: Implement additional safety measures, such as regular inspections and real-time monitoring, to ensure compliance with guardrail safety procedures.

## Worker Responsibilities

Workers using or working near guardrail systems must:

- **Follow Procedures:** Adhere to all safety protocols and instructions provided by supervisors.
- **Inspect Equipment:** Conduct pre-use inspections of guardrail systems and report any defects or damage.
- **Use PPE:** Wear appropriate personal protective equipment (PPE), including helmets, gloves, and safety harnesses.
- **Report Hazards:** Notify supervisors of any unsafe conditions or potential hazards.

## Additional Considerations for NCC T&D Projects

Given the high-risk nature of NCC T&D's operations, the following measures are recommended:

- **Pre-Work Planning:** Conduct pre-work hazard assessments to identify potential fall hazards and ensure proper guardrail installation.
- **Regular Inspections:** Perform regular inspections of guardrail systems during all stages of construction.
- **Rescue Preparedness:** Develop and implement rescue procedures for workers involved in high-risk activities.
- **Training and Drills:** Conduct regular training sessions and drills to ensure workers are familiar with guardrail safety procedures.

## Key Takeaways

- **Guardrail Requirements:** Guardrails must be used when workers are at risk of falling from certain heights, and they must meet specific design and load capacity requirements.
- **Project Leader Duties:** NCC T&D Project Leaders are responsible for ensuring compliance with design, installation, and safety requirements.
- **Worker Duties:** Workers must follow safety protocols, inspect equipment, and report hazards.
- **Material-Specific Requirements:** Additional requirements apply for guardrail systems made of wood or wire rope.
- **Safety Measures:** Regular inspections, training, and rescue preparedness are essential for ensuring worker safety.

For more information, refer to NCC T&D's relevant IMS procedures or consult our HSE Department for expert guidance and training resources aligned with Saudi Arabian regulatory requirements.