Stairways and Stair Railings

Design Specifications stairs

- The ArcelorMittal Asset Risk Management Standards are also to be used concurrently with the H&S Design Specification (AM ST 201). Where there is a Health and Safety Standard it will take priority over the Asset Risk Management Standard. In all cases ArcelorMittal shall comply with the Occupational Health and Safety Regulations that prevail in the country.
- All stairs must be equipped with either railings or handrails. Specification of a stair and railings (one side, both sides, middle railing, …) can be different per country.
- The angle of the rise in the stairway should be between 30% and 50%, this varying degrees of rise require different riser heights and different tread run distances.
- The rise heights and tread width of the stairs must remain uniform for the entire distance of the stairway.
- Consider also in the specifications; drainage (no accumulation of water on walking surface), stairway lighting requirements, coefficient of Friction, slip resistance nosing, min. width of the landing, overhead clearance, stair strength, stairway fire stopping and stair top landing and the swing of the door……

Design Specifications stair railings and handrails

- Stair railings are a safety barriers along steps or stairs, must be installed also along each unprotected side.
- Consider fallowing specifications; hand-railing heights, wall clearance, railing projection into stairs, railing grip size and shape, concentrated load on railings, firmly fastened and capable of supporting normally imposed loads,
- Railing continuity: should be continuous – that is a hand can slide along the rail without interruption from above the top riser to above the bottom riser; rails can be interrupted at a newel post.
- Stair rail systems and handrails must be surfaced to prevent injuries such as punctures or lacerations and to keep clothing from snagging.

Safety Work Instructions

Use always the handrails when walking on stairs

- Use angular lighting and color contrast
- Avoid patterned carpeting that may visually hide differences in depth
- Avoid carrying objects with both hands when using stairs
- Do not carry bulky objects that block your vision
- Be very cautious on stairs if you are wearing bifocal glasses
- Housekeeping; nothing should be sticking out the surface of stairs
- Apply the so-called “tennis – racket grip” at all times

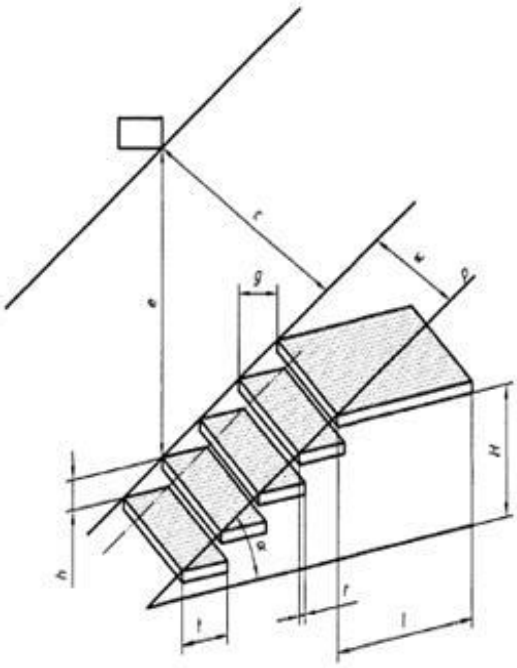
Safety Checks

- Periodically control and inspections of the stairs and fastening methods must be done by trained employees. The findings must be kept in records and corrective actions fallowed.
- All unsafe remarks must be solved immediately
- Broken or malfunctioning lighting should be repaired or replaced
- Regular maintenance have to be realized.

Main risks

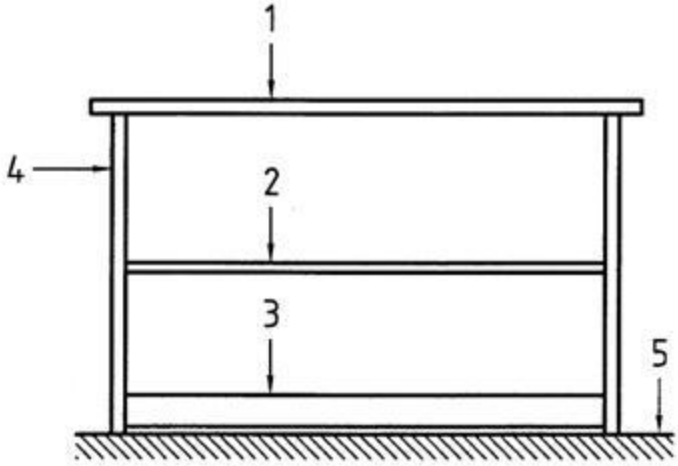
- Lack of maintenance of stairs, falling down when walking on it.
- Accidents caused by stumbling, twisting and mis-stepping due to non smooth and bad designed stairs
- Punctures or lacerations and to keep clothing from snagging due to bad design of the stair rail or handrail

Definitions



Key

H	Climbing height
g	Going
e	Headroom
h	Rise
l	Length of landing
r	Overlap
α	Angle of pitch
w	Width
p	Pitch line
t	Depth of step
c	Clearance

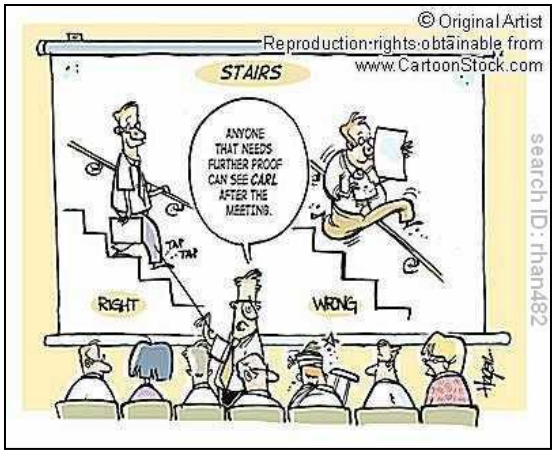


Key

1	Handrail
2	Kneerail
3	Toe plate
4	Stanchion
5	Walking level

Required checklist

- Y / N / NA — **Have responsible persons been nominated and trained to maintain and inspect stairs and railings?**
- Y / N / NA — **Are sudden changes in stairs surfaces clearly indicated?**
- N / Y — **Is there a poor lighting, sudden changes in lighting levels occur between areas on stairs?**
- Y / N / NA — **Are there steps who are not smoothly, slippery or don't have the same height?**
- Y / N / NA — **Is there a good housekeeping on the stairs?**
- Y / N / NA — **Are sturdy standard handrails or guard rails installed on all platforms, steps and stairs?**
- Y / N / NA — **Where doors open onto stairs – are landings with sufficient space for the door to open fully without striking the employee provided?**
- Y / N / NA — **Are handrails designed so they allow for all persons to use a power grip?**
- Y / N / NA — **Are all handrails and railings provided with a enough clearance between the handrail or railing and any other object, good grasp in an emergency?**



This document has to be used as a help before starting the work or performing a SFA