

SOP 05 – Work at height & Fall prevention

S05.1 Purpose

The purpose of this Standard is to prevent injury and property damage when conducting work at height.

S05.2 Scope

This procedure is applicable to EESL and all vendors, their subcontractors (and all levels of supply chain) where there is presence of “persons working at height”.

S05.3 Definition

Competent Person	Person trained, experienced and authorized to carry out a particular function
Fall Protection Equipment	Equipment typically consisting of a Double hook full body harness, a lanyard not exceeding 2 meters in length and a deceleration device. The system needs to be attached to an anchor point capable of withstanding a load of at least 2270 kg.
Working at Height	All working at height is above 2 m height where there is a risk of falling and a person can become injured as per Factory Act.
Work permit system	All high works which are not regular in nature should to be covered under work permit system i.e. a work permit is to be issued and verified and checked by authorised persons prior to start of work

S05.4 Work/ process based operating procedures for work at height & fall prevention

In the following sections, operating procedures have been described for each process/work involving work at height.

S05.4.1 Elimination or Minimization Program for Work at Height

The first step to fall prevention is elimination or minimization of the need for manual work at height through

- Elimination of the need to perform work at height
- By eliminating the risk of fall (i.e. implementation of fixed barriers, scaffolds, mobile elevated work platform etc.)

Where reasonably practical as much work as possible will be done at ground level to minimize working at height e.g. sections of steel work can be bolted together, pipes welded, radiography carried out and the items painted before being lifted into position.

S05.4.2 Actions Prior to Starting Work at Height

If at all work at height cannot be eliminated or minimised, the following actions must be undertaken prior to starting the work.

- Prior to any person working at height a risk assessment must be carried out to identify the risks and the safety measures necessary to eliminate or reduce the risk
- Collective protection measures must always be considered in preference to individual protection measures
- Where it is not reasonably practicable to provide a safe working platform and a person has to rely on the use of a double hook full body safety harness, life line with fall arrestor, a suitable rescue plan must be considered along with the safety measures.
- A Competent Person must verify that the contents of this procedure have been implemented before the commencement of any work at height. Work may only commence with the written approval of the Competent Person.

S05.4.3 Verification of Procedure Implementation

Prior to initiating work, the equipment and location must be verified for safety and appropriateness using the following steps

- For all work of more than 1 day in duration, a systematic verification of the satisfactory implementation of this procedure must be carried out by a Competent Person, at a frequency appropriate to the duration and risk of the task.
- On completion of the work it must be formally verified by a Competent Person, that the work place has been left in a satisfactory condition and that all persons have safely returned from the workplace.

Note: Many accidents occur because floor gratings have been removed and not replaced, or superfluous materials are left in elevated positions causing slip, trip and fall hazards

S05.5 General Precautions for fall prevention

Apart from the above listed steps, following certain general precautions can help in minimizing the incidents related to fall while working at height.

S05.5.1 General precautions for fall prevention

The following precautions must be adhered to whenever work at height is undertaken. This is irrespective of the height at which the work is being undertaken.

- The first consideration must always be to provide a safe working platform.
- The sides of all stairways, floors/platforms, walkways, buildings, etc, from where a person can fall and suffer injury or from where articles could fall and injure someone must be protected with double guard rails and toe boards of at least 150mm in height.
- With regard to permanent structures such as stairways and platforms, as much of the permanent handrails as is reasonably practicable should be installed while the structure is at ground level. Where this is not possible then handrails/guard rails must keep pace with construction.

S05.5.2 Closing all Floor Openings

While ensuring fall prevention is essential, it is also imperative to ensure that any floor openings present in the vicinity of the height work are closed or covered properly, to avoid the person from falling into the floor opening.

- All openings, through which a person can fall and suffer injury, must be covered and secured using material that is sufficiently strong to support any forces that it may be subjected to. The word “Hole” or “Opening” must be printed on the top side. If a cover is not used the opening must be protected by rigid guardrails of adequate strength and toe boards.
- When floor gratings are removed for fitting instrument cables etc, the area must be physically fenced off and signs put in place. Rope or warning tape is not considered as being adequate. Fences must not be removed before the floor is reestablished and inspected.
- Collective safety measures, such as a safety net suspended beneath the area of work, must be adopted for persons installing floor panels and the floor panel’s locked/bolted in position as each one is fixed.
- Persons not connected with the works must be prevented from inadvertently walking into the area until all panels are fixed and work complete. Double guardrails must be used for closing off such areas and notices clearly displayed prohibiting unauthorized access.

S05.5.3 Careful usage of hand tools

While working at height, the worker must be careful in where hands are used for support and where they are used for undertaking work. In this case, usage of the approved hand tools becomes utmost important, as usage of heavier, loosely tagged or inappropriate equipment can misbalance the worker, leading to fall.

- Precautions must be taken to ensure that portable tools, hand tools etc, used in elevated work areas cannot fall onto people below. Safety nets and/or toe boards are suitable for this purpose.
- So far as is reasonably practicable, barriers must be erected below to prevent person walking below such areas.
- If none of the above is practical, then some form of protection from falling tools must be implemented e.g. use of straps/ropes attached to the tools and some appropriate anchor

S05.5.4 Usage of appropriate personal fall protection equipment

Usage of the approved (type and rating) fall protection equipment is mandatory.

- Fall Protection Equipment must be inspected by the user & trained person daily.
- Double hook full body Safety harnesses that have been used in a fall arrest situation must be withdrawn from service and not reused/issued until after a full examination.
- Records of the results of thorough examinations must be kept on site
- Lifelines fall arrestor used for the attachment of Double hook full body Safety harnesses must be:
 - Horizontal lifelines must be made of steel rope 12 mm diameter (min)
 - Installed at waist height or above
 - Tensioned by use of a turnbuckle or similar
 - Designed to support the maximum number of workers
 - Securely anchored at both ends with triplicate wire rope clamps at points able to withstand the dynamic load generated by a fall
- All lanyards must be made of flame resistant materials. Inertia reels may be used to enable more safe movement around certain areas.

- Safe access and egress must be provided to all places of work including access to lifelines, fall arrestor.

S05.6 Working at height during adverse weather conditions

No one must be allowed to work on wet or work in exposed positions in the rain, scorching heat or strong winds. Also, plant and equipment such as cranes, mobile elevating work platforms, cradles etc. must not be used in such conditions.

S05.7 Usage of Ladders, Scaffolds and Work Platforms

Usage of the approved (type and rating) fall protection equipment is mandatory. The following procedures must be followed to ensure that approved equipment is used in all scenarios.

S05.7.1 Material Examination and Storage

All material must be examined upon arrival at site or during unloading; any defective items must be removed from the site or put into a specially designated and marked storage area.

S05.7.2 Special Cases

Where the provision of a work platform is not reasonably practical and the work does not fit into the category referred to in the paragraph above, alternative safety measures must be agreed in advance with the EESL's EHS Representative.

S05.7.3 Usage of Ladders

The following procedures must be followed for the selection, approval, usage and storage of ladders.

- Ladders can be used for light tasks of low risk and short duration but not more than one person must be on the ladder and the ladder must be secured to prevent it from slipping outwards and sideways. The employee must inspect the ladder before use. The person on the ladder must wear a safety harness to prevent falling.
- Ladders must be inspected at least once a monthly, must be in good condition and must be painted. Ladders must be installed at an angle of 4-1, must extend approximately 1m above the working platform and must be secured so they cannot slip.
- Vertical ladders installed for construction purposes at a height where a person can fall more than 3 meters must have a cage/hoops or be fitted with a rappel line (vertical lifeline) as a continuous/sliding anchor point for a safety harness.
- Vertical ladders over 9 meters long must have a platform every 9 meters and be offset at every platform.
- Self-made ladders are not allowed on site.

S05.7.4 Scaffolds and Work Platforms

The following procedures must be followed for the selection, approval, usage and storage of scaffolds and work platforms.

- A register of all scaffolds erected and dismantled on site must be maintained

- A trained and competent scaffold inspector must inspect erected scaffolds before first use before use.
- A register of all scaffolds erected and dismantled on site must be maintained.
- A trained and competent scaffold inspector must inspect erected scaffolds before first use before use and at least once weekly thereafter. Additionally, Supervisors must inspect scaffolds daily.
- Scaffolds of “special” or “non-typical” design and any scaffold greater than 10-metres in height must be designed by a suitably qualified engineer.
- Persons erecting scaffolds, steel erectors and any other person likely to work in an area or in circumstances where the provision of a work platform is not practical must use fall protection equipment.
- All work platforms must have a top guardrail fixed at a height of 1.1 m, an intermediate guardrail and toe boards to all sides from where a person or articles can fall.
- Work platforms made from loose planks or boards are forbidden.
- Gangways must have guardrails and toe boards on all sides from where a person or articles may fall.
- Scaffolds erected around a structure, which may have electrical services, and where electrical equipment is to be used for work must be earthed to protect persons from electric shock. The earth cable must be routed to avoid damage from work equipment.

S05.8 Responsibility of implementing the procedure

While the responsibility of implementing the procedure lies on all EESL personnel, employees of the vendor, contractor and their supply chain actors, specific responsibilities have been allotted, keeping the significance of the standard in mind.

S05.8.1 Responsibilities of the Functional heads / Departmental coordinator / Site Manager

Over and above their responsibility of implementing the EHSS manual and its SOPs, the following additional responsibilities have to be handled

- The Site must ensure that arrangements are in place to ensure that:
 - All work at height is properly planned and organized
 - All work at height takes account of weather conditions that could endanger health and safety
 - Those involved in work at height are trained and competent
 - The place where work at height is done is safe
 - Equipment for work at height is appropriately inspected daily basis
 - The risks from fragile surfaces are properly controlled
 - The risks from falling objects are properly controlled

S05.8.2 EESL Employees

All employees have a duty to:

- Report any safety hazard to their Supervisor
- Use any equipment supplied (including safety devices) properly

- Follow Safety training and instructions (unless they think that would be unsafe, in which case they should seek further instructions before continuing)

S05.9 Training on the standard

Training for working at height must include:

- General Safety Needs, PPEs requirements, HSE policy, Risk from performing work at height.
- Details of the procedure for working at elevated work places i.e. Work permit,
- vertigo test, Safe use of safety equipment (fall arrestor, life line, double hook full body harness, safety net)
- Safe use of ladders
- Scaffolding erection
- Daily equipment checks including safety harness inspections
- Rescue techniques to rescue someone suspended from a safety harness or having fallen into a safety net
- Actions to be taken in case of emergency

S05.10 Documentation to be maintained for work at height

The following documentation must be maintained for work at height. The templates and formats will be provided by the EHSS department.

- Work permit
- Competent persons list
- Training records
- PPE inspection records.

History of amendments

The latest versions of the Documentation Format must be used at all times. This page needs to be updated whenever there is a change in the version number of the documents.

S. No	Date of amendment	Version	Details of amendment
1.	DD.MM.YYYY	01	Initial approval of the documentation format

Prepared by

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