

# APPENDIX C

## Scaffold Safety Training Program

### OBJECTIVE:

To explain the proper safety procedures to be followed when erecting, moving, using, and dismantling scaffolds.

### SUGGESTED MATERIALS TO HAVE ON HAND:

- Scaffold Safety Videos
- Example of a properly built scaffold
- Examples of personal fall arrest systems

### INTRODUCTION:

Scaffolds, by definition, are temporary and typically built and modified at the work site. Because of their temporary nature and the fact that workers use them to work at elevated heights, special training must be given to all workers who use scaffolds, with additional training given to workers responsible for erecting, moving and dismantling scaffolds. The training included here will cover the safety procedures for erecting, moving, dismantling, and using scaffolds.

Scaffolds can be of two main types: supported or suspended. The only type presently used by the Plant Division is the fabricated frame type of supported scaffold. This training will focus on the procedures to be followed when using this type of scaffold. If at any time Plant will be using a different type of scaffold, supported or suspended, this should be coordinated with EHS to insure adequate training and procedures are being followed to maintain compliance with the regulation.

### HAZARDS:

The most obvious hazard associated with scaffolds is falling. Rather than simply stating that there is a fall hazard, root causes of the accidents on scaffolds should be examined. According to MIOSHA inspection records, many accidents can be attributed to specific deficiencies or failures of the scaffold. Most accidents on scaffolds happen because of failure or slipping of the planking used as the work platform. Workers slipping on debris or other material on the scaffold work platform, as well as workers being struck by falling objects, account for the majority of other scaffold accidents. Only about one third of scaffolds inspected were equipped with guardrails. If a scaffold is correctly built, has adequate fall protection, and is kept clean, most accidents can be avoided.

### SCAFFOLD CONSTRUCTION/MANUFACTURE:

In general, all scaffolds must be capable of supporting 4 times their rated load. All job-built, non-prefabricated scaffolds will be designed by a licensed professional engineer and built in accordance with the design.

All working levels of scaffolds will be fully planked unless the work being done or safety considerations preclude it. Any time the working level of the scaffold cannot be fully planked, additional fall protection techniques will be used, i.e., personal fall arrest systems.

Planking will consist of specifically designed hook on platforms or scaffold grade lumber. Lumber planking will extend over the end support at least 6 inches, but not more than 12 inches. Do not coat or cover the surfaces of planking so as to obscure the surface from inspection.

Scaffold components made by different manufacturers will not be mixed together on a single scaffold unless specifically designed to be interchangeable. Do not physically modify any scaffold components.

All scaffold platforms and walkways will be at least 18 inches wide and have guardrails on all sides unless the work being done or safety considerations preclude it, then personal fall arrest systems must be used.

The highest working level of a free standing scaffold will not be higher than a distance equal to 4 times its narrowest base dimension, i.e., height is equal to (or less than) 4 times the width. If outriggers are used, they count as part of the scaffold base. Scaffolds higher than 4 widths must be kept from tipping by using guy wires or attaching to a permanent structure. Vertically, guy wires or attachments will be placed at 4 times the width height and every 20 feet above or less (for a scaffold  $\leq$  3 feet wide) and every 26 feet above or less (for a scaffold  $>$  3 feet wide) to at least 4 widths distance from the top of the scaffold. Horizontally, guy wires or attachments will be placed every 30 feet or less. Scaffolds higher than 125 feet will be designed by a licensed professional engineer.

The base of a scaffold will be on a level, rigid surface capable of supporting the weight of the scaffold and its workload without settling or moving. Unstable objects will not be used as, or to support, a scaffold base or work platform.

Diagonal cross bracing will be installed in both directions on both sides of the scaffold, so as to form an "X." Cross bracing will be installed as often as possible and in sufficient amount to insure the structural integrity of the scaffold.

Mobile scaffolds will be locked or otherwise secured from moving while occupied. Do not move a mobile scaffold while occupied. Overhead clearance from power lines or other possible safety hazards must be checked before moving a mobile scaffold. Forklifts, front loaders, or other heavy equipment will not be use as, or to support, a scaffold unless specifically designed for it.

#### SCAFFOLD ERECTING, MOVING AND DISMANTLING:

All workers erecting, moving or dismantling a scaffold will be experienced in these activities, and protected from falling hazards. This protection will be the best feasible or practical as determined by the trained person in charge of the procedure. Overhead clearance from power lines or other possible overhead hazards must be checked before erecting or moving a scaffold.

Standard scaffold access methods will be added to the scaffold as soon as safely possible during the erection process. Diagonal cross bracing will not be used to support workers or as access to the scaffold.

The existing platform where the erectors/dismantlers are working from will be left in place until the next level of vertical posts are placed, braced, and have been platformed.

#### SCAFFOLD ACCESS:

Rest platforms for ladders will be placed at least every 35 feet. Rest platforms for stairs will be placed at least every 12 feet (measured on the vertical). Rest platforms will be at least 18 inches square.

If portable ladders are used to access working levels of a scaffold, they will be secured from moving by tying at the top and bottom of the ladder. Ladders, hand holds or railings will extend at least 36 inches above the landing where the worker gets off of the ladder or stairs.

Integrated, prefabricated scaffold access frames, i.e., the vertical scaffold ends designed to be used as a ladder to climb the scaffold, can act as the access to the working levels of a scaffold as long as the ladder rungs are lined up on the same vertical line, and rest platforms are supplied every 35 feet. Do not use diagonal cross bracing as a ladder, or to access the working levels of the scaffold.

## SCAFFOLD USE:

All scaffolds will be inspected before each work shift and after any incident that could affect the structural integrity of the scaffold. Do not load scaffolds beyond their load capacity. Any scaffold that has been weakened or damaged will be repaired or replaced before any workers are allowed to use it.

Always keep scaffolds a safe working distance from power lines, e.g., at least 10 feet, plus 4 inches for every kilovolt (kV) above 50 kV. For example, the safe working distance from a 53 kV electrical line would be at least 11 feet. Safe working distances do not apply to situations where a scaffold is being used for work on electrical lines. This type of work will be done only by certified electricians.

Keep scaffolds clean of debris, excessive amounts of materials or tools, ice, snow, or other slippery materials. Do not allow workers on scaffolds during bad weather or high winds. Do not use lean-to scaffolds. Do not use ladders or other similar devices on scaffolds to increase the working level height of employees. Use control or tag lines to control swinging loads of materials or equipment being lifted to a scaffold with an overhead cable or rope.

Scaffolds must be fully grounded when electric welding is being done. This grounding must also include possible current pathways through structures the scaffolds are attached to and any current pathways created through cables or other material/equipment hoisting operations.

## FALL PROTECTION:

Unless specifically exempted, all workers must be protected from falling hazards anytime they work on a scaffold greater than or equal to 10 feet. Standard fall protection on any scaffold will consist of a guardrail system.

If use of a guardrail system is not practical or would create an increased safety hazard, a personal fall arrest system (body harness and lanyard) may be used to protect employees from falling hazards. The use of personal fall arrest systems will be restricted to the specific areas of the scaffold where guardrails cannot be used, and guardrails will be used in all other areas. Guard rails may be left off of the working side of a scaffold and workers will not be required to use personal fall arrest systems as long as the scaffold is less than 14 inches from the face of the work.

Personal fall arrest systems will be attached by lanyard to the scaffold structure or vertical or horizontal lifeline. Vertical lifelines will be secured to a fixed safe point of anchorage independent of the scaffold, e.g., building or other structure and protected from sharp edges and abrasion. Horizontal lifelines will be secured to two separate points of the scaffold.

Guardrail systems will be installed on all open sides of the scaffold. Diagonal cross bracing may be used as a top rail only when the center crossing point of the two braces is 38-48 inches above the working surface.

## PROTECTION FROM FALLING OBJECTS:

When there is a falling object hazard, employees will wear head protection; toeboards or a canopy or a suitable barricade will also be used.

## WRAP-UP:

Scaffolds are useful and common on construction sites, but they are not always adequately built or used safely. Improperly built or used scaffolds are a sure recipe for an accident. If you follow the procedures of this program, the risks of an accident will be significantly reduced. Always use safety procedures, keep your eyes open, and don't take chances.

SUGGESTED DISCUSSION QUESTIONS:

1. What are the two basic types of scaffolds?
2. How much weight must a scaffold be capable of supporting?
3. How high can a scaffold be built before additional lateral support must be added?
4. How far must the scaffold be kept away from live electrical wires?
5. How often should a scaffold be inspected?
6. What is the standard method of fall protection used on a scaffold?
7. If guardrails can't be installed, what type of fall protection must be provided?

# Scaffold Safety Do's and Don'ts

## DO:

- Insure the scaffold has adequate weight capacity for the job.
- Inspect scaffolds before each use.
- Make sure work platforms are in good condition and clean.
- Use guardrails or type(s) of fall protection.
- Fully plank work platforms.
- Secure planking so it doesn't slip.
- Place scaffolds closer than 14 inches to the work.
- Place scaffolds on firm, level surfaces.
- Provide adequate access to the working levels.
- Anchor the scaffold when built higher than 4 widths.
- Replace broken parts immediately.
- Use tag lines to control suspended loads.
- Protect workers and passers-by from falling objects.
- Carry tools to the working level in your pocket, on your belt, or raise them by rope.

## DON'T:

- Overload the scaffold.
- Use scaffolds too near to electrical hazards.
- Use broken parts or planking.
- Mix incompatible brands of scaffolds.
- Build the scaffold too high without adequate lateral support.
- Use unstable objects to support the scaffold base.
- Climb on cross bracing.
- Move a scaffold while occupied.
- Use scaffolds during storms, high winds or other inclement weather.