

UPF Scaffold Control and Management



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REVISION LOG

Revision	Description	Intent	Non Intent
2	<p>Major revision – No revision bars used.</p> <p>This revision is responsive to the following Condition Reports:</p> <ul style="list-style-type: none"> • 25774-000-GCA-GAM-01186, <i>Finding 1 -Damaged Scaffold Components Stored in Laydown Area with In Service Components (IMA-PM-801768-FY19-046)</i> • 25774-000-GCA-GAM-01187, <i>Finding 2 -Scaffold Request Form Not Submitted to UPF DMC (IMA-PM-801768-FY19-046)</i> • 25774-000-GCA-GAM-01188, <i>Observation 1 - Scaffold Materials Used for Stair Access (IMA-PM-801768-FY19-046)</i> <p>An evaluation determination has been performed confirming this Command Media implements BNI quality requirements, as tracked in PRMS.</p>	X	
1	<p>Major revision. Updated procedural references to current, re-organized procedure to align with current format. Due to extensive changes in format, no revision bars were utilized. This revision incorporates and supersedes CNS Bluesheet CNS-Y17-95-64-831 and PRCN-Y17-95-64-831-A001.</p>	X	
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1.0 INTRODUCTION

1.1 Purpose

This procedure defines the work process for the erection, control, and dismantling of scaffolding at the Uranium Processing Facility (UPF) construction site and provides direction for scaffold inspection and usage during work activities.

1.2 Scope

This procedure is applicable to all scaffolding activities under the administrative control of UPF Construction. Applicability to subcontractor employees is as specified in subcontract language.

2.0 RESPONSIBILITIES

2.1 UPF Site Manager

The UPF Site Manager is responsible for ensuring that the requirements of this procedure are properly implemented.

2.2 Project Field Engineer

The Project Field Engineer (PFE) is responsible for ensuring that the requirements of this procedure are properly implemented and supervising field engineering personnel providing technical support of installation operations.

2.3 Project Field Superintendent

The Project Field Superintendent (PFS) is responsible for ensuring the requirements of this procedure are properly implemented and supervising superintendents providing supervision and coordination of craft labor.

2.4 Responsible (Scaffold Erection) Superintendent

The Responsible Superintendent (RS), typically the Lead Civil or Mechanical Superintendent, is responsible for implementing the scaffold control and management.

2.5 Responsible (Scaffold Erection) Foreman

The Scaffold Erection Foreman is responsible for identifying scaffold material needs and ensuring that the scaffolds are built complete and in a safe manner.

2.6 Scaffold Competent Person

The Scaffold Competent Person (typically one or more of the scaffold erection foremen) is responsible for ensuring that scaffolds are built and maintained according to requirements, are properly tagged, and all erected scaffolds are inspected at the commencement of each shift.

2.7 Discipline Superintendent

The Discipline Superintendent, responsible for the installation work, is also responsible for planning installation activities in accordance with construction schedules and identifying and coordinating access needs with the Field Superintendent and other Discipline Superintendents.

2.8 Craft Foreman (Scaffold Requestor)

The Craft Foreman is responsible for directly supervising scaffolding installation work.

2.9 Field Environmental, Safety, and Health Representative

The Field Environmental, Safety, and Health (ES&H) Representative has oversight responsibility to ensure compliance with all National, Federal, State, and local scaffold safety requirements.

3.0 PROCESS

3.1 Training

- 3.1.1 All personnel accessing scaffolds shall be trained in general scaffold hazard recognition. This training may be documented in the implementing Construction Work Package.

3.2 General

NOTE: *The PFS may delegate actions in this procedure, without written documentation. The Indirect Superintendent may perform many of the PFS actions in this procedure.*

- 3.2.1 The PFS, working with the Field Superintendents, shall establish a work access strategy that is consistent with the project erection strategies. It shall include general guidelines for balancing the use of scaffold and access equipment, while maintaining the maximum practical workspace. Where practical, use scissor lifts and mast climbers in paved areas to minimize ground-level interferences. As practicable, scaffolds should be erected starting from the first elevation of steel, not the ground, in order to keep the ground level clear for movement of personnel and materials.
- 3.2.2 Inventories of project scaffolding requirements will be provided by the PFS to the extent practical. The Indirect Superintendent should coordinate with project early to ensure a comprehensive scaffold material supply program is established whether the supply is from company-owned inventories or from rental agreements with vendors. Deviations from these requirements shall be coordinated through the respective UPF Site Manager.
- 3.2.3 Mingling or mixing of products of different manufacturers (whether tube and coupler or fabricated frame) is strictly prohibited unless physical dimensions and strength characteristics are equal, or the mixing of products has been approved in advance in writing by each manufacturer.
- 3.2.4 A system scaffold is the material of choice due to its flexibility, speed of erection and removal, and ease of visually confirming proper connection of components. Tube and coupler scaffolding would normally be used for non-standard applications. Fabricated frame scaffold is difficult to handle (end frames can weigh over 50lbs [22.7Kg]) and lacks flexibility – this should be considered before using.

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- 3.2.5 A scaffold material management program shall be implemented and should include:
- Capability to manage scaffold component inventories
 - Cost
 - Location of scaffold material by area.
 - Capability to monitor erected scaffolds and inspections by tag
- 3.2.6 A scaffold request process shall be implemented using CFN-1096, *UPF Scaffold Request Form*.
- 3.2.7 The superintendent requiring access should initiate the scaffold request. The PFS shall review and approve the request to ensure it is consistent with the project access strategy and ensure that the proper cost code is identified for charging of scaffold erection labor hours.
- 3.2.8 The scaffold request should be submitted at least three working days prior to the scaffold need date to give the scaffold crews sufficient time for manpower and material planning.
- 3.2.9 Each scaffold shall be uniquely numbered (e.g., by area/unit/structure or equipment). The number should be placed both on the scaffold tag and the request. A Scaffold Competent Person shall inspect each new scaffold, as well as all existing scaffolds, prior to use at the start of each shift.
- 3.2.10 The scaffold erector is responsible for completing the lower portion of CFN-1096 showing the size of the scaffold and the date erected, revised, or dismantled, as appropriate. A new CFN-1096 form is required for modification of existing scaffolding.

3.3 Scaffold Metrics

The PFS or designee may establish a process to collect the daily scaffold metrics shown in **Appendix F, Sample Scaffold Metrics**, which includes:

- The number and volume of scaffolds built,
 - The number and new volume added to scaffolds revised,
 - The number of scaffolds dismantled, and
 - The total number of craft hours expended.
- 3.3.1 The PFS should ensure that the total hours reported on the metric collection form match the hours charged to the appropriate charge code(s).
- The number of craft hours per scaffold can be calculated from the worksheet in **Appendix F**, to assist in determining the actual cost of scaffolds. This may be used to compare against the relative cost of alternative access means. (scissor lifts, aerial lifts, etc.)
 - The number of cubic feet erected per total craft hours spent can also be calculated from the above metrics and should be used as the primary measure of productivity. Depending upon the scaffold system used, rates exceeding 500 cubic feet (14.16 cubic meters) per hour have been recorded under ideal conditions. While actual rates experienced are typically lower, this calculation is a guide to help identify and eliminate waste and inefficiencies.

- 3.3.2 When the scaffold is no longer needed, the Superintendent shall advise the PFS of the availability of scaffold material and shall ensure the scaffolding is removed from the location.

3.4 Scaffold Safety

NOTE: Refer to **Appendix J, Safety Requirements for Scaffolding**, for a list of safety requirements.

- 3.4.1 Free climbing on scaffold is prohibited (e.g., cups, diagonal members). All scaffolds shall be provided with an access ladder that extends at least 36 inches above the platform, or an equivalent safe access (e.g. horizontals equal to ladder spacing). Hook-on and attachable ladders shall be positioned so that their bottom rung is not more than 24 inches above the scaffold support level. Where possible, gates should be used integral to the scaffold guardrail system.
- 3.4.2 Ensure an adequate working surface during erection/dismantlement activities (e.g., provide 1-2 pans or planks during process of building/dismantling scaffold).
- 3.4.3 All scaffolds shall comply with Federal Occupational Safety and Health Association (OSHA), state, and local requirements.
- 3.4.4 The RS shall ensure scaffolds are designed by a qualified person and are constructed and loaded in accordance with that design (refer to OSHA 1926).
- OSHA requires tube and coupler, and fabricated frame scaffolds over 125ft (38m) in height, be designed by a registered Professional Engineer.
 - Pole scaffolds exceeding 60 ft in height are required to be designed by a registered Professional Engineer.
- 3.4.5 The RS shall ensure scaffolds are erected, moved, dismantled, or altered under the supervision and direction of a competent person qualified in scaffold erection, moving, dismantling, or alteration. Such activities shall be performed only by experienced and trained employees selected for such work by the competent person (refer to OSHA 1926).
- 3.4.6 The PFS ensures that adjustable suspension scaffolds are subject to the same tagging and inspection requirements as supported scaffolds, and shall ensure scaffolds meet specific rigging, personnel fall protection, and protection of the suspension wire rope from welding currents.

3.5 Load Capacity

- 3.5.1 Scaffold is classified into light, medium, or heavy categories: See **Appendix H, Requirements for Light, Medium, and Heavy Duty Scaffold**, for minimum member sizes required for each scaffold classification.
- 3.5.2 The RS shall ensure each scaffold and scaffold component is capable of supporting, its own weight and at least four (4) times the maximum intended load applied or transmitted to it (refer to OSHA 1926). Materials shall be evenly distributed on platforms and not concentrated in one area. Access platforms must not be used to store heavy materials such as cable, valves, blind flanges, etc.
- 3.5.3 The RS shall ensure each suspension rope, including connecting hardware, used on non-adjustable suspension scaffolds shall be capable of supporting at least six times the maximum intended load applied or transmitted to that rope (refer to OSHA 1926).

- 3.5.4 Each suspension rope, including connecting hardware, used on adjustable suspension scaffolds shall be capable of supporting at least six times the maximum intended load applied or transmitted to that rope with the scaffold operating at either the rated load of the hoist, or two (minimum) times the stall load of the hoist, whichever is greater (refer to OSHA 1926).
- 3.5.5 Caster ratings on mobile/rolling scaffolds may be the limiting factor in calculating the maximum allowable load for scaffolds. Because caster ratings vary, check the manufacturer's specifications for the rating of casters in use.

3.6 Scaffold Inspection

- 3.6.1 The Scaffold Competent Person shall inspect scaffolds and scaffold components for visible defects before each work shift, and after any occurrence that could affect a scaffold's structural integrity (refer to OSHA 1926). Any identified defective components shall not be used and shall be discarded.
- 3.6.2 The Scaffold Competent Person shall ensure the scaffold is tagged (i.e., green, yellow, or red) and sign and date the tag. Refer to **Appendix E, Instructions for Completing the Scaffold Safety Tags (Green, Yellow, and Red)**.
- 3.6.3 The RS, or designee, shall inspect scaffold components before erecting and while dismantling. Scaffold components must be straight, and free from bends, kinks, dents, and severe rusting. Inspections shall include the following components:
- Handrails, mid-rails, cross bracing, and steel tubing for nicks and other damage, especially near the center span
 - Weld zones on the scaffold frame for cracks
 - Ends of tubing for splits or cracks
 - Manufactured decks for loose bolts or rivet connections and bends, kinks, or dents
 - Plywood surfaces for softening due to rot or wear and for peeling at the edges of laminated layers
 - Scaffold planks for rot, cracks, cuts, and other external damage
 - Tie rods or bolts and angle iron cleats
 - Cams, springs, threaded connections, clamps, toggle pins, or other quick connecting devices
 - Casters for rough rolling surfaces, sticky swivels, and defective locks.

Defective components shall not be used.

- 3.6.4 Component inspection does not require documentation.
- 3.6.5 The RS shall ensure scaffolding and scaffold components are maintained in accordance with the manufacturer's instructions, ensure fittings are serviced with a manufacturer's approved lubricant, and ensure planks that are partially damaged are cut to usable lengths.

3.7 Scaffold Tagging

- 3.7.1 The PFS shall ensure the use of scaffold tagging. **Appendix I, Example Guidelines for Tagging Multi-Tier Level Scaffolds with Different Tagging Designations**, provides guidance that depicts how to tag multi-tier level scaffolds with different tagging designations.

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3.7.2 A competent person shall tag all scaffolds.

WARNING: <i>No one shall work from an untagged scaffold. Untagged scaffolds shall be “off-limits” to all personnel not authorized to erect, dismantle or make repairs to scaffolds.</i>
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3.7.3 Scaffold tagging procedures shall not be used as a substitution to building a complete scaffold.

3.7.4 Alternate or equivalent tagging systems (e.g., Scafftag or other proprietary systems) are allowed provided they meet the intent and requirements of this procedure.

3.7.5 The scaffold tagging system shall include:

- **Green Tag** - to be placed in scaffolds at the access points that comply with all regulatory requirements (see **Appendix B**).
- **Yellow Tag** - to be placed on scaffolds that are structurally sound, but an accessory such as a handrail cannot be installed due to the location of the scaffold, or the nature of the work that is to be performed. Fall protection is required on all yellow-tagged scaffolds (see **Appendix C**).
- **Red Tag** – to be placed at the access points on scaffolds that are damaged, defective, being constructed, or dismantled (see **Appendix D**), where no access is permitted by personnel not authorized to erect, dismantle or make repairs to scaffolds.

3.8 Removal of Scaffolding

3.8.1 The PFS shall ensure that scaffolding is removed from the site when the scaffolding is no longer needed. See **Appendix G, Loading and Shipping Guidelines for Scaffolding Materials**.

4.0 RECORDS

None

5.0 REFERENCES

5.1 Source References

4MP-T81-02103, *Scaffold Control and Management*

NS&E 213, *Scaffolding*

PL-CM-801768-A001, *Construction Management and Execution Strategy for the UPF Project*

PL-PJ-801768-A001, *Document Control and Records Management Plan for the Uranium Processing Facility Project*

UPF-CP-214, *Barricades and Signs*

Y17-95-64-800, *UPF Construction Work Control Program*

Y73-95-100, *UPF Dropped Object Prevention*

5.2 Interfacing References

CFN-1096, *UPF Scaffold Request Form*

Occupation Safety and Health Administration (OSHA), U.S. Department of Labor, 29 CFR 1926, Subpart L, *Scaffolds* (1926.450 to 1926.454)

6.0 SUPPLEMENTAL INFORMATION

Appendix A, *Acronyms and Definitions*

Appendix B, *Green Scaffold Safety Tag*

Appendix C, *Yellow Scaffold Safety Tag*

Appendix D, *Red Scaffold Safety Tag*

Appendix E, *Instructions for Completing the Scaffold Safety Tags (Green, Yellow, and Red)*

Appendix F, *Sample Scaffold Metrics*

Appendix G, *Loading and Shipping Guidelines for Scaffolding Materials*

Appendix H, *Requirements for Light, Medium, and Heavy Duty Scaffold*

Appendix I, *Example Guidelines for Tagging Multi-Tier Level Scaffolds with Different Tagging Designations*

Appendix J, *Safety Requirements for Scaffolding*

APPENDIX A Acronyms and Definitions

ACRONYMS:

ES&H	Environmental, Safety, and Health
OSHA	Occupational Safety and Health Association
PFE	Project Field Engineer
PFS	Project Field Superintendent
RS	Responsible Superintendent
STR	Subcontracts Technical Representative
UPF	Uranium Processing Facility

DEFINITIONS:

Competent Person	A person who is capable of identifying existing and predictable hazards in the surrounding area or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.
Fabricated Frame Scaffold (Tubular Welded Frame Scaffold)	A scaffold consisting of platforms supported on fabricated end frames with integral posts, horizontal bearers, and intermediate members. Some manufacturers refer to their fabricated frame products as "sectional" scaffolding.
Mobile (Rolling) Scaffold	A powered or unpowered, portable, caster or wheel-mounted, supported scaffold.
Qualified Person	A person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience, has successfully demonstrated their ability to solve or resolve problems related to the subject matter, work, or the project.
Scaffold	Any temporary elevated platform (supported or suspended) and its supporting structure (including points of anchorage), used for access points, supporting employees, materials, or both.
Scaffold Erector/Dismantler	Employees who are trained and qualified to build, erect, and or dismantle scaffolds on project. Scaffold erectors and dismantlers provide direct support to the scaffold competent person for scaffold erection and/or dismantlement and are trained to recognize hazards associated with scaffold work.
Scaffold User	Any personnel whose work requires them to be supported by scaffolding in order to access the area of a structure where that work is performed.
Suspension Scaffold	One or more platforms suspended by ropes or other non-rigid means from overhead structures. An adjustable suspension scaffold is a suspension scaffold equipped with a hoist or hoists that can be operated by an employee(s) on the scaffold. Adjustable suspension scaffolds can be single-point, two-point (swing stage), or multi-point.
System Scaffold	A scaffold consisting of posts with fixed connection points that accept runners, bearers, and diagonals that can be interconnected at predetermined levels.
Tube and Coupler (or Clamp) Scaffold	A supported or suspended scaffold consisting of platforms supported by tubing, erected with coupling devices connecting uprights, braces, bearers, and runners.

APPENDIX D

Red Scaffold Safety Tag Example



This tag must be attached to a scaffold which is partially erected or dismantled, or which is found to be defective or damaged in any way. Employees are prohibited from using this scaffold for any reason when this tag is displayed. Only authorized employees assigned to erect, dismantle, or make repairs to this scaffold are allowed on this scaffold. Authorized employees shall be required to wear and use all required personal protective equipment.

APPENDIX E

Instructions for Completing the Scaffold Safety Tags (Green, Yellow, and Red)

One of three scaffold safety tags shall be attached to any and all erected scaffolds:

- The green tag shall be affixed to scaffolds that meet all regulatory/UPF requirements and are safe for all craft uses.
- The yellow tag shall be affixed to scaffold that has been completed, but does not meet all regulatory requirements.
- The red tag shall be affixed to scaffold which is partially erected / dismantled, or which is defective or damaged in any way. Only authorized employees assigned to scaffold erection are allowed to climb the scaffold.

Entry	Description
Green, Yellow, and Red Tags Front	
Date	Enter the date and shift (if applicable) that the erection or modification of the scaffold was completed (i.e. night-shift 8/3/04)
Scaffold Erection Foreman	Enter the name of the Responsible Scaffold Erection Foreman, who oversaw the erection.
Scaffold No.	Enter the unique Scaffold Number. This number shall be the same as the number on the Scaffold Request Form. This does not apply to Red Tags.
Green and Yellow Tags Back	
Date	Enter the date and shift (if applicable) that a Competent Scaffold erector re-inspected the scaffold. Use of the scaffold is not authorized for a particular shift until a Competent Scaffold Erector has inspected and signed the tag.
Name	Enter the name of the Competent Scaffold Erector who inspected the scaffold.

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APPENDIX F

Sample Scaffold Metrics

		Date							
		Mon.	Tue.	Wed.	Thurs.	Fri.	Sat	Sun.	
	Scaffolds								
1	Built								Number of new scaffolds built
2	Revised								Number of scaffolds revised
3	Dismantled								Number of scaffolds dismantled
4									
5	Volume (cu.ft./cu.m.)								
6	Built								Volume of new scaffolds built
7	Added								New volume added to existing scaffolds
8									
9	Hours								Total daily scaffold builder hours
10									
11	Daily								
12	cu.ft.(cu.m.)/hr								(Row 6 + Row 7)/Row 9
13	hrs/scaffold								Row 9/Row 1
14									
15	Cumulative								
16	cu.ft.(cu.m.)/hr								SUM(Row 6+Row 7)/Row 9
17	hrs/scaffold								SUM(Row 9)/SUM(Row 1)

APPENDIX G

Loading and Shipping Guidelines for Scaffolding Materials

The following should serve as guidelines for the proper handling, storage and shipment of scaffolding materials. They have been developed to allow for efficient inventory control as well as the safe loading and shipment of materials.

TUBE & CLAMP TYPE SCAFFOLDING

TUBE: Tubes should be sorted by length and bundled in quantities of 50. All damaged or cut tubes should be segregated and bundled separately.

NOTE: This will allow for easy counting and weight calculations prior to shipment. The damaged tubes should be bundled with a red flag or tag identifying them as damaged.

Material Handling: Bundles should be loaded using a forklift or crane. Bundles should have cribbing of no less than 4 in. (10.2 cm) between levels to allow for unloading and proper securing/strapping of the load for shipment.

CLAMPS: All clamps should be removed from the tubes and sorted/segregated between the two types Rigid Clamps and Swivel Clamps. The clamps should be counted and placed into shipping containers; Crates, Barrels, Wire Bins. There are five common types of scaffold fittings that require a degree of servicing with manufacturers approved lubricant (right angle couplers, swivel couplers, sleeve couplers, single couplers, girder couplers). These fittings should also be inspected to ensure the gate on the fitting is not closed or distorted and that the bolts of the fitting are not elongated from over tightening. Damaged clamps should be placed in a separate container for return shipment with a red flag or tag identifying them as damaged.

SYSTEMS TYPE SCAFFOLDING

VERTICALS Verticals members (uprights/legs) should be sorted by length/size paying close attention so they are not coupled/connected together.

Verticals should be placed in shipping racks in quantities of no more than 100 pieces per rack, with the coupling pin ends facing the same direction.

NOTE: The Verticals should be placed in a manner that allows for the storage rack to be in the center of the legs. All verticals should be banded to the shipping rack prior to loading and shipment. All damaged verticals should be separated and shipped in separate storage racks with a red flag or tag identifying them as damaged.

HORIZONTALS Horizontals should be sorted by length/size and loaded in separate storage racks in quantities of 100 pieces. Contact your local Safway Branch for the stacking order.

NOTE: The Horizontals should be placed in a manner that allows for the storage rack to be in the center of the horizontal. All damaged horizontals should be separated and shipped in a separate storage rack with a red flag or tag identifying them as damaged.

PLANKING Wood Planking should be sorted by length and stacked in bundles 4 plank wide and 12 plank high. Bundles should be banded using 2 bands with each band being no more than 3 ft (.91 m) from the end of the bundle.

Material Handling: Bundles should be loaded using a forklift or crane. Bundles should have cribbing of no less than 4 in. (10.2 cm) between levels to allow for unloading and proper securing/strapping of the load for shipment

APPENDIX H Requirements for Light, Medium, and Heavy Duty Scaffold

Minimum Size of Members

	Light duty	Medium duty	Heavy duty
Maximum intended load.....	25 <u>lbs/ft</u> (2)	50 <u>lbs/ft</u> (2) ..	75 <u>lbs/ft</u> (2) .
Posts, runners and braces.....	Nominal 2 in. (1.90 inches) OD steel tube or pipe.	Nominal 2 in. (1.90 inches) OD steel tube or pipe.	Nominal 2 in. (1.90 inches) OD steel tube or pipe.
Bearers.....	Nominal 2 in. (1.90 inches) OD steel tube or pipe and a maximum post spacing of 4 ft. x 10 ft.	Nominal 2 in. (1.90 inches).. OD steel tube or pipe and a maximum post spacing of 4 ft. x 7 ft. or Nominal 2 1/2 in. (2.375 in.). OD steel tube or pipe and a maximum post spacing of 6 ft. x8 ft. (*)	Nominal 2 1/2 in. (2.375 in.). OD steel tube or pipe and a maximum post spacing of 6 ft. x 6 ft.
Maximum runner spacing vertically.....	6 ft. 6 in..	6 ft. 6 in.....	6 ft. 6 in.

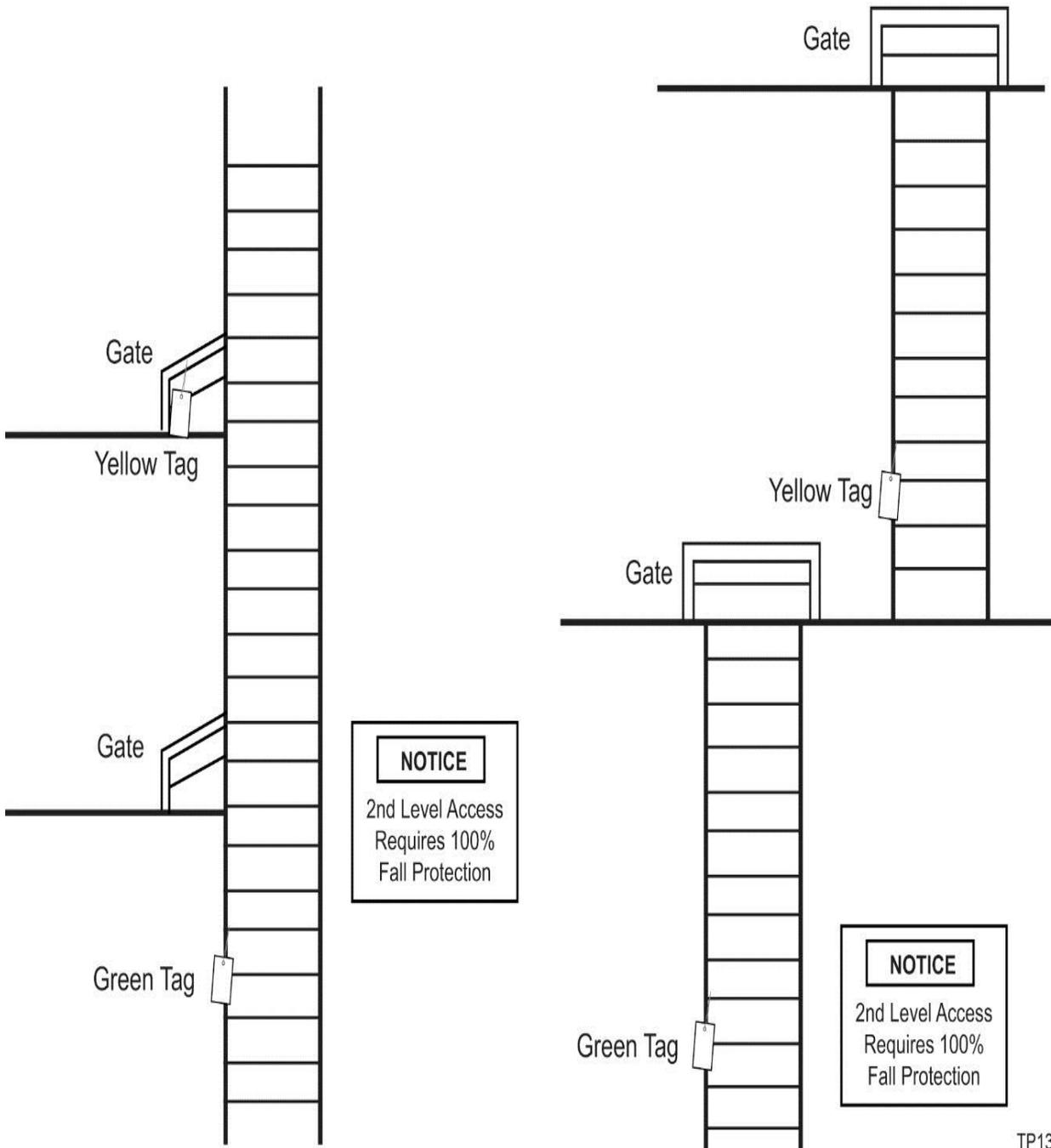
Footnote(*) Bearers shall be installed in the direction of the shorter dimension.

APPENDIX I

Example Guidelines for Tagging Multi-Tier Level Scaffolds with Different Tagging Designations

Single Ladder to Multiple Levels

Ladder Access on Each Elevation



APPENDIX J

Safety Requirements for Scaffolding

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GENERAL

1. Scaffolds shall be designed by a qualified person and shall be constructed and loaded in accordance with that design (OSHA 1926.451). Appendix A to Subpart L contains examples of criteria that will enable an employer to comply with this requirement.
2. Scaffolds shall be erected, moved, dismantled, or altered only under the supervision and direction of a competent person qualified in scaffold erection, moving, dismantling, or alteration. Only experienced and trained employees selected for such work by the competent person (OSHA 1926.451) shall perform such activities.
3. Scaffolds and scaffold components shall be inspected for visible defects by a competent person before each work shift, and after any occurrence that could affect a scaffold's structural integrity (OSHA 1926.451).
4. Each scaffold and scaffold component shall be capable of supporting, without failure, its own weight and at least 4 times the maximum intended load applied or transmitted to it (OSHA 1926.451).
5. Supported scaffolds with a height to base width (including outrigger supports, if used) ratio of more than four to one (4:1) shall be restrained from tipping by guying, tying, bracing, or equivalent means (OSHA 1926.451).
6. Guys, ties, and braces shall be installed according to the scaffold manufacturer's recommendations or at the closest horizontal member to the 4:1 height and be repeated vertically at locations of horizontal members every 20 feet (6.1m) or less thereafter for scaffolds 3 feet (0.91m) wide or less, and every 26 feet (7.9m) or less thereafter for scaffolds greater than 3 feet (0.91m) wide. The top guy, tie or brace of completed scaffolds shall be no further than the 4:1 height from the top. Such guys, ties and braces shall be installed at each end of the scaffold and at horizontal intervals not to exceed 30 feet (9.1m) measured from one end (not both) towards the other (OSHA 1926.451).
7. Supported scaffold poles, legs, posts, frames, and uprights shall bear on base plates and mudsills or other adequate firm foundation (OSHA 1926.451).
8. Footings shall be level, sound, rigid, and capable of supporting the loaded scaffold without settling or displacement (OSHA 1926.451).
9. Unstable objects shall not be used to support scaffolds or platform units (OSHA 1926.451) (e.g., bricks, concrete blocks, or other unstable materials).
10. Hook-on and attachable ladders shall be positioned so that their bottom rung is not more than 24 inches (61cm) above the scaffold support level (OSHA 1926.451). All scaffolds shall be provided with an access ladder that extends at least 36 inches (91 cm) above the platform, or an equivalent safe access. Where possible, gates should be used integral to the scaffold guardrail system.
11. When hook-on and attachable ladders are used on a supported scaffold more than 35 feet (10.7m) high, they shall have rest platforms at 35-foot (10.7m) maximum vertical intervals (OSHA 1926.451).

APPENDIX J

Safety Requirements for Scaffolding

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12. The clearance between scaffolds and power lines shall be as follows: Scaffolds shall not be erected, used, dismantled, altered, or moved such that they are or any conductive material handled on them might come closer to exposed and energized power lines than as follows:
Insulated Lines – Less than 300 volts – 3 feet (0.9m); 300 volts to 50 kV – 10 feet (3.1m);
More than 50 kV - 10 feet (3.1m) plus 0.4 inches (1.0cm) for each 1 kV over 50 kV.
Uninsulated Lines – Less than 50 kV – 10 feet (3.1m); More than 50 kV - 10 feet (3.1m) plus 0.4 inches (1.0cm) for each 1 kV over 50kV (OSHA 1926.451).
13. Employees shall be prohibited from working on scaffolds covered with snow, ice, or other slippery material except as necessary for removal of such materials (OSHA 1926.451), it is the Scaffold User's responsibility to inspect before use.
14. Work on or from scaffolds is prohibited during storms or high winds unless a competent person has determined that it is safe for employees to be on the scaffold and those employees are protected by a personal fall arrest system or wind screens. Windscreens shall not be used unless the scaffold is secured against anticipated wind forces imposed (OSHA 1926.451).
15. Guardrails, midrails and toe boards must be placed on all open sides of platforms more than 6 feet (1.83 m.) above ground or floor. The toprail must be placed 38-45 inches (96-114 cm) high (with minimum 200 pound (91Kg) toprail capacity) with a midrail placed halfway between the scaffold planking and the toprail. Toe-boards must be at least 3.5 inches (9 cm) high. 4-inch (10 cm) toe boards are preferred.
16. All scaffolds shall be built as complete as possible. All guardrails and toe boards shall be securely fastened. There shall be no more than a 1/4-inch (.635 cm.) space between the toe board and scaffold deck. Toe boards shall be built from materials equivalent in strength to nominal 1-inch X 4-inch (2.54cm x 10.16cm) construction grade lumber.
17. Where persons are required to work or pass under a scaffold, scaffolds shall be provided synthetic netting, or equivalent, between toe board and the toprail. This netting must be attached in such a way as to be secure and strong enough to hold expected load requirements. Barricades may be substituted if necessary.
18. Platforms shall be tightly planked for the full width of the scaffold and they should extend over the end supports between 6 inches (15.24 cm.) and 12 inches (30.5 cm.). A cleat or equivalent shall be used on the bottom edges of the plank to prevent slippage. All wood scaffold planking shall be a minimum of nominal 2" X 10" and certified and stamped as scaffold grade lumber. Other scaffold planking shall have proof of certification as an equivalent: metal, laminated planks, etc.
19. Scaffolds should not block or prevent access to fire protection and/or safety equipment
20. Personnel shall be prohibited from using any untagged scaffold.
21. Adjusting screws shall be installed only between the baseplate and the vertical frame section. The use of adjusting screws with casters is prohibited. Extending adjusting screws beyond 12 inches (30.5 cm.) is prohibited unless built for the scaffold system by the manufacturer.

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22. Scaffolds should be properly braced with cross braces and/or diagonal braces to laterally secure vertical members. The length of cross braces should automatically square and align vertical members so the erected scaffolds are always plumb, square, and rigid.
23. Scaffold components fabricated by different manufacturers shall not be intermixed unless written permission is obtained from both manufacturers.
24. Scaffolds should be cleaned off upon completion of daily work by the craft using the scaffold.
25. A toe board should never be used to aid access to a working platform; grab bars should be used instead.
26. Tools or materials shall be removed or secured so they cannot fall or roll off when a scaffold is moved.
27. The responsible supervisor using the scaffold must ensure tools, materials, and debris do not accumulate in quantities that create a falling objects or tripping hazard.
28. Scaffolds should be checked before each work shift for quality/safety and tags signed/updated accordingly.
29. Guardrails shall be surfaced to prevent injury to an employee from punctures or lacerations and to prevent snagging of clothing.
30. When dismantling scaffold structures, materials should not be thrown down. The material should be lowered to prevent damage to scaffold materials and danger to the surrounding area or personnel.
31. Access scaffolds shall not be used to store heavy materials.

SUSPENSION SCAFFOLDS

1. Each suspension rope, including connecting hardware, used on non-adjustable suspension scaffolds shall be capable of supporting, without failure, at least 6 times the maximum intended load applied or transmitted to that rope (OSHA 1926.451).
2. Each suspension rope, including connecting hardware, used on adjustable suspension scaffolds shall be capable of supporting, without failure, at least 6 times the maximum intended load applied or transmitted to that rope with the scaffold operating at either the rated load of the hoist, or 2 (minimum) times the stall load of the hoist, whichever is greater (OSHA 1926.451).
3. Ropes shall be inspected for defects by a competent person prior to each workshift and after every occurrence that could affect a rope's integrity.
4. Suspension ropes shall be shielded from heat-producing processes.

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5. To reduce the possibility of welding current arcing through the suspension wire rope when performing welding from suspended scaffolds, the following precautions shall be taken, as applicable: An insulated thimble shall be used to attach each suspension rope to its hanging support. Excess suspension wire rope and any additional independent lines from grounding shall be insulated (OSHA 1926.451); The suspension wire rope shall be covered with insulating material extending at least 4 feet (1.2m) above the hoist. If there is a tail line below the hoist, it shall be insulated to prevent contact with the platform. The portion of the tail line that hangs free below the scaffold shall be guided or retained, or both, so that it does not become grounded (OSHA 1926.451); Each hoist shall be covered with insulated protective covers (OSHA 1926.451); In addition to a work lead attachment required by the welding process, a grounding conductor shall be connected from the scaffold to the structure. The size of this conductor shall be at least the size of the welding process work lead, and this conductor shall not be in series with the welding process or the work piece (OSHA 1926.451); If the scaffold grounding lead is disconnected at any time, the welding machine shall be shut off and an active welding rod or uninsulated welding lead shall not be allowed to contact the scaffold or its suspension system (OSHA 1926.451);
6. Each employee on a single-point or two-point adjustable suspension scaffold shall be protected by both a personal fall arrest system and guardrail system (OSHA 1926.451);
7. Personnel using suspension scaffolds may require additional training.

FABRICATED FRAME SCAFFOLDS

Fabricated frame scaffolds over 125 feet (38.0m) in height above their baseplates shall be designed by a registered professional engineer, and shall be constructed and loaded in accordance with such design (OSHA 1926.452).

TUBE AND COUPLER SCAFFOLDS

1. Tube and coupler scaffolds over 125 feet (38.0m) in height above their baseplates shall be designed by a registered professional engineer, and shall be constructed and loaded in accordance with such design (OSHA 1926.452).
2. A light duty tube and coupler scaffold shall have all posts, bearers, runners, and bracing of nominal 2 inch (5.1 cm.) O.D. steel tube, aluminum tube, or pipe. The posts shall be spaced no more than 4 feet (1.22 m.) apart by 10 feet (3 m.) along the length of the scaffold. The runners shall be spread no more than 6 feet 6 inches (1.98m) vertically. Other structural metals, when used, must be designed to carry an equivalent load. No dissimilar metals shall be in contact with each other.
3. A medium duty tube and coupler scaffold shall have all posts, runners, and bracing of nominal 2 inch (5.1 cm.) O.D. steel tube, aluminum tube, or pipe. Posts spaced not more than 6 feet (1.83 m.) apart by 8 feet (2.4 m.) along the length of the scaffold shall have bearers of nominal 2 1/2-inch (6.35 cm.) O.D. steel tubing. Posts spaced not more than 4 feet (1.22 m.) apart by 8 feet (2.4 m.) along the length of the scaffold shall have bearers of nominal 2-inch (5.1 cm.) O.D. steel tubing. The runners shall be spread no more than 6 feet 6 inches (1.98m) vertically. Other structural metals, when used, must be designed to carry an equivalent load. No dissimilar metals shall be in contact with each other.

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4. A heavy-duty tube and coupler scaffold shall have all posts, runners, and bracing of nominal 2-inch (5.1 cm.) O.D. steel tube, aluminum tube, or pipe, with the posts spaced not more than 6 feet (1.83 m.) by 6 feet (1.83 m.). Bearers shall be nominal 2 ½" (6.35cm) O.D. steel tubing, aluminum tube, or pipe. The runners shall be spaced no more than 6 feet 6 inches (1.98m) vertically. Other structural metals, when used, must be designed to carry an equivalent load. No dissimilar metals shall be in contact with each other.
5. Posts shall be accurately spaced, erected on suitable bases, and maintained plumb.
6. Cross bracing shall be installed across the width of the scaffold at least every third set of posts horizontally and every fourth runner vertically. Such bracing shall extend diagonally from the inner and outer runners upward to the next outer and inner runners.
7. Longitudinal diagonal bracing on the inner and outer rows of poles shall be installed at approximately a 45-degree angle from near the base node point of the first outer post upward to the top working platform node point of the scaffold. Where the longitudinal length of the scaffold permits, such bracing shall be duplicated beginning at every fifth post. In a similar manner, longitudinal diagonal bracing shall also be installed from the last post extending back and upward toward the first post. Where conditions preclude the attachment of this bracing to the posts, it may be attached to the runners.

MOBILE (ROLLING) SCAFFOLDS

1. Scaffolds shall be braced by cross, horizontal, or diagonal braces, or combination thereof, to prevent racking or collapse of the scaffold and to secure vertical members together laterally so as to automatically square and align vertical members. Scaffolds shall be plumb, level, and squared, and should rest on a level surface. All brace connections shall be secured (OSHA 1926.452).
2. Scaffold casters and wheels shall be locked with positive wheel and/or wheel and swivel locks, or equivalent means, to prevent movement of the scaffold while the scaffold is used in a stationary manner (OSHA 1926.452). Where feasible, mobile scaffold should be tied off.
3. Manual force used to move the scaffold shall be applied as close to the base as practicable, but no more than 5 feet (1.5m) above the supporting surface (OSHA 1926.452).
4. The height to base width ratio of the scaffold during movement is two to one or less, unless the scaffold is designed and constructed to meet or exceed nationally recognized stability test requirements (OSHA 1926.452).
5. A ladder or stairway shall be provided for proper access and exit and shall be affixed or built into the scaffold and so located that when in use it will not have a tendency to tip the scaffold.
6. Scaffolds in use by any persons shall rest upon a suitable footing and shall stand plumb. The casters or wheels shall be locked to prevent any movement.
7. Employees shall not be allowed on scaffolds while they are being moved from one location to another.