

SAFETY & HEALTH AWARENESS SHEET

Visual Evaluation of Elevated Work Areas on Soundstages and Similar Facilities

Soundstages and other Similar Facilities

This Safety & Health Awareness Sheet will focus on the visual evaluation of elevated work areas including trusses, stairways, catwalks, guardrails, and their associated elements. A visual evaluation does not take the place of an engineering assessment.

For more than a century, the motion picture industry has utilized soundstages, and other production facilities, to produce content. Sound stages are typically large, clear-span, soundproof structures with high ceilings. Similar facilities, such as a converted warehouse, may be clear span or contain support columns and/or posts within the production area. Exterior walls can be concrete, masonry, metal, or wood frame.

Clear span is typically accomplished using wood trusses, such as the bowstring truss; steel truss; or steel I-beams. A gridwork of “perms” (short for permanents) or “O-zone” typically made of load-rated, wooden girders and beams is installed throughout the soundstage at the bottom level of the truss to support equipment, backings, sets, and other elements required by the production. There may be a system of catwalks with guardrails, typically made of wood supports and wood planks, for access throughout the grid. Stairways and/or ladders are used to access the catwalks and/or perms.

Regulations

Applicable OSHA and Cal/OSHA regulations require that the employer ensures:

- All walking-working surfaces can support the maximum intended load for that surface.
- All walking-working surfaces are evaluated regularly, and as necessary, and are maintained in a safe condition.
- Hazardous conditions on walking-working surfaces are corrected or repaired before an employee uses the walking-working surface again.

- When any correction or repair involves the structural integrity of the walking-working surface, a qualified person performs or supervises the correction or repair.
- Catwalks should have 6 ½ feet clear headroom. In areas where an obstruction creates less headroom, a suitable warning should be placed near the obstruction, and padding should be installed if necessary.
- When wooden guardrails are made of 2x4s; the support posts should not be spaced more than 6 feet apart; and the top rails should be smooth with corners rounded.
- OSHA requires the top surface height of the guardrail to be 42” plus or minus 3” above the working surface. Cal/OSHA requires the top rail to be between 42” and 45”. A mid-rail is required between the top rail and the working surface, and a toe board is required at the bottom.
- Guardrails must be securely fastened to the posts and capable of withstanding a force of at least 200 pounds in any direction at any point on the top rail with minimal deflection and without failure.

Accessing Catwalks, Perms or other Stage Rigging Areas for Evaluation

Only personnel authorized by the employer should access elevated areas within a soundstage to perform any evaluation, assessment or repair.

Aerial lifts and/or fall protection systems may be required during the evaluation, assessment or repair process. Appropriate safety measures should be followed.

Visual Evaluations

Visual evaluations of the building elements listed in this document should be done in accessible areas by a qualified person(s):

- As part of preproduction or post-production, when possible
- At minimum, annually

SAFETY & HEALTH AWARENESS SHEET

Visual Evaluation of Elevated Work Areas on Soundstages and Similar Facilities

Structural Assessments

Structural assessments by an experienced building professional or a licensed professional structural engineer should be made:

- Every 10 years; and
- When a potential material defect is found
- After an event impacting structural integrity

Soundstage Information

The following details regarding the soundstage and/or comparable buildings should be available for the production upon request:

- Maximum allowed weight on the stage floor
- Location of any voids or tanks under floor
- Maximum load that can be hung from, or loaded on, the perms, trusses or other building elements that are intended by the studio to support production-related loads
- Allowable loads for ropes or other equipment (if permitted) that can be attached to the catwalk-guardrails and/or mid rails
- Perm height from the floor
- Length and width measurements of the stage interior

Assessments and/or Visual Observations Criteria

Catwalks

Catwalk components:

- Necessary support posts, handrails, knee or mid rails, and toe boards should be present and properly installed
- Any openings in guardrail to access the perms, or equipment hoisting areas, from the catwalk are protected by a self-closing gate or other effective means
- Walking surfaces, including planks, must be properly supported, secured so that they don't shift or slide, and can support the intended load.

- No unprotected holes or gaps that are greater than 2 inches wide should exist in the walking surface.
- The size, location, and number of holes may affect the structural integrity of the walking surface.

Wooden Perms

Perms should be structurally sound and able to support the intended loads. Damage such as significant checking (cracks), broken members, delaminating structural beams, significant insect damage, or advanced decay such as "dry rot", could impact the structural capacity.

When any significant structural concerns or damage are identified in the perms, an experienced building professional or a licensed structural engineer should perform an evaluation to determine its impact on the structural integrity of the perms.

Any significant damage to the perm system should be properly repaired before loads are rigged to the perms.

Wooden Trusses

In addition to the items addressed in the Wooden Perms section, trusses should be assessed for the following:

- Deformities in the truss or a change in the smooth curvature along the top chord
- Fractures, splits or deformities in the lower chord
- Missing or loose nuts or bolts in the steel gusset and/or splice plates
- Damaged support columns at either end of the truss

An experienced building professional or a licensed structural engineer should evaluate any significant damage to determine its impact on the structural integrity of the trusses

SAFETY & HEALTH AWARENESS SHEET

Visual Evaluation of Elevated Work Areas on Soundstages and Similar Facilities

Stairways

Stairways leading to the perms should be assessed for:

- Loose or damaged steps, ledgers, railings, and posts
- Stair handrails are smooth and continuous
- Open sides below the handrail should be blocked by a mid-rail or equivalent
- Stringers or other supports are in proper condition

Fixed Ladders

Fixed ladders leading to catwalks should be assessed for:

- Securely mounted with proper anchors
- Side rails should be free of cracks, bends, corrosion, or other damage
- Adequate head clearance above the ladder's top edge
- Cages, where used, should be free of damage, corrosion, and proper installation extending above the landing
- Personal fall arrest systems, if installed, are functional
- Rungs should be tight, secure, free of cracks, rot, or splinters, and not excessively worn
- Ladder's climbing path and, where necessary, landings are clear and free from any obstructions
- Rungs, landings and other surfaces are free of oil, grease, mud, or other slippery materials
- Ladder has a safe exit at the top
- Access to fixed ladder from catwalk is protected by a self-closing safety gate or other effective means or is offset to prevent an employee from walking or falling into the access opening.

Post Assessment

All potential issues found during the visual evaluations should be reported to Production Management, facility management, your supervisor or production safety representative.

SAFETY & HEALTH AWARENESS SHEET

Visual Evaluation of Elevated Work Areas on Soundstages and Similar Facilities

Glossary

Advanced Decay: The later stage of decay in which the destruction is readily recognized because the wood has become punky, soft and spongy, stringy, or crumbly. Discoloration or bleaching of the rotted wood is often apparent.

Beam: A structural member supporting a transversely applied load.

Bowstring or Bow Truss: A lightweight, arched roof structure for creating large, open-span industrial, commercial, and other buildings such as sound stages. It features a curved top chord under compression and a flat, tension-loaded bottom chord, resembling a bow and arrow. Traditionally constructed from heavy timber, though modern versions may use steel components.

Check (Checking): A lengthwise separation of the wood that usually extends across the rings of annual growth. Checking commonly results from stress set up in wood during seasoning.

Chord: In a truss, the upper and lower longitudinal members that extend the full length and carry the tensile and compressive forces that form the internal resisting moment.

Competent Person: One who can identify existing and predictable hazards in the surroundings or working conditions which are unsanitary, hazardous, or dangerous to employees, and who has authorization to take prompt corrective measures to eliminate them.

Compression Failure: Deformation of the wood fibers resulting from excessive compression along the grain either in direct end compression or in bending. In surfaced lumber, compression failures may appear as fine wrinkles across the face of the piece.

Connector, Timber: Metal rings, plates, or grids that are embedded in the wood of adjacent

members, as at the bolted points of a truss, to increase the strength of the joint.

Cyclical Loading: When a structure or component is subjected to repeated, fluctuating loads over time in a predictable repeating pattern (e.g., vibration from HVAC, bouncing from walking.)

Dead Load: The static load imposed by the weight of the materials that make up the structure.

Delamination: The separation of layers in laminated wood or plywood due to failure of the adhesive, either within the adhesive itself or at the interface between the adhesive and the adherent.

Design Load: The loading comprising magnitudes and distributions of all loads used in the determination of the stresses, stress distributions, and, ultimately, the cross-sectional areas and compositions of the various portions of a structure.

Dynamic Loading: When the load moves, accelerates or changes rapidly causing forces greater than static loads. (e.g., hoist, people running/platform, wind loads, earthquake shaking).

Excessive Nailing: Excessive nailing in a wood structural element means driving too many nails. Excessive nailing can weaken the element by damaging the wood fibers and potentially causing splitting, compromising its structural integrity, especially if the nails are placed too close together.

Experienced Building Professional: An industry professional with a significant level of skill and knowledge, often evidenced by certifications, years of experience, a strong educational background, such as construction design and/or engineering, and a proven track record of successful project completion.

Fatigue: The decrease in member strength when subjected to cyclical loading (as applied to static loading).

SAFETY & HEALTH AWARENESS SHEET

Visual Evaluation of Elevated Work Areas on Soundstages and Similar Facilities

Girder: A large or principal beam used to support concentrated loads at isolated points along its length.

Glued-Laminated Timber (Glulam): An engineered, stress-rated product comprising assemblies of specially selected and prepared wood laminations securely bonded together with adhesives.

Gusset: A structural connector, often a steel plate or wood panel (like plywood/OSB), used to join the members (top chord, bottom chord, web members) at the joints of a truss, providing strength and stability by distributing loads, especially crucial for large-span roofs in buildings, and can be exposed or hidden within the wood for a cleaner look.

I-Beam: An I-beam, also known as an H-beam or universal beam, is a structural element with an "I" or "H"-shaped cross-section designed for superior strength-to-weight efficiency in construction and engineering. Composed of a vertical web and horizontal flanges, I-beams resist bending and support heavy loads. I-beams are usually made of structural steel but can also be made of extruded aluminum.

Live Load: A dynamic load that is applied to a structure suddenly or that is accompanied by vibration, oscillation, or other physical condition affecting its intensity.

Nominal Size: The size by which lumber is known and sold in the market. The nominal size often differs from the wood's actual dimensions.

Permanents, referred to as "Perms", aka O-zone: A gridwork, typically made of load-rated wooden or steel girders and beams at the bottom level of the truss system to support equipment, backings, sets, and other elements required by production.

Qualified Person: A person designated by the employer who by reason of training, experience or instruction has demonstrated the ability to safely

perform all assigned duties or, when required, is properly licensed in accordance with federal, state, or local laws and regulations.

Shake: A separation along the grain, the greater part of which occurs between the rings of annual growth.

Split: A separation of the wood from the tearing apart of the wood cells.

Strength: The ability of a structural member to sustain stress without failure.

Truss: An assembly of members such as beams, bars, rods, chords, spreaders, webs, and the like that combine to form a rigid framework; members are interconnected to form triangles.