

Protocol #31

Walking-Working Surfaces

DGS Accident and Illness Prevention Program (AIPP)

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Appendix A: P-31 Training Sign-In Sheet

References

- The DGS AIPP, including Secretary’s “Safety Program Policy Statement”
- PA Management Directive 530.31 Amended
- PA Code Title 34 Chapter 129
- 29 CFR 1910 Subpart D, and 29 CFR 1910.145

A. Policy Statement

The following protocol for walking-working surfaces is official policy for the PA Department of General Services (DGS) and all of its employees. Authority and responsibility for its execution are pursuant to DGS Secretary Topper’s “Safety Program Policy Statement,” PA Management Directive 530.31, PA Code Title 34 Chapter 129 and “Element C” of the DGS Accident & Illness Prevention Program (AIPP). All of these documents are available for review online.

This policy includes material that applies directly to DGS operations. It is closely based upon the OSHA Walking-Working Surfaces Standard.

B. Application and Purpose.

This protocol applies to all walking-working surfaces unless specifically excluded within this protocol.

The purpose of this protocol is to protect DGS employees from injury as they move about or work.

In addition to following the guidelines included here, employees should observe the fundamentals outlined in all of the elements and protocols within the DGS AIPP.

C. Definitions.

Alternating tread-type stair – a type of stairway consisting of a series of treads that usually are attached to a center support in an alternating manner such that an employee typically does not have both feet on a same level while using the stairway

Anchorage – a secure point of attachment for equipment such as lifelines, lanyards, deceleration devices, and rope descent systems

Authorized – an employee who management assigns to perform a specific type of duty, or allows in a specific location or area

Cage – an enclosure mounted on the side rails of a fixed ladder or fastened to a structure behind the fixed ladder that is designed to surround the climbing space of the ladder, also called a “cage guard” or “basket guard”

Carrier – the track of a ladder safety system that consists of a flexible cable or rigid rail attached to the fixed ladder or immediately adjacent to it

Combination ladder – a portable ladder that can be used as a stepladder, extension ladder, trestle ladder, or stairway ladder (The components of a combination ladder also may be used separately as a single ladder.)

Dangerous equipment – equipment, such as vats, tanks, electrical equipment, machinery, equipment or machinery with protruding parts, or other similar units, that, because of their function or form, may harm an employee who falls into or onto the equipment

Designated area – a distinct portion of a walking-working surface delineated by a warning line in which employees may perform work without additional fall protection

Dockboard – a portable or fixed device that spans a gap or compensates for a difference in elevation between a loading platform and a transport vehicle (Dockboards include but are not limited to, bridge plates, dock plates, and dock levelers.)

Equivalent – alternative designs, equipment, materials, or methods, that management can demonstrate will provide an equal or greater degree of safety for employees compared to the designs, equipment, materials, or methods specified in this protocol

Extension ladder – a non-self-supporting portable ladder that is adjustable in length

Failure – a load refusal, breakage, or separation of component parts (Load refusal is the point at which the ultimate strength of a component or object is exceeded.)

Fall hazard – any condition on a walking-working surface that exposes an employee to a risk of harm from a fall on the same level or to a lower level

Fall protection – any equipment, device, or system that prevents an employee from falling from an elevation or mitigates the effect of such a fall

Fixed ladder – a ladder with rails or individual rungs that is permanently attached to a structure, building, or equipment (Fixed ladders include individual rung ladders, but not ship stairs, step bolts, or manhole steps.)

Grab bar – an individual horizontal or vertical handhold installed to provide access above the height of the ladder

Guardrail system – a barrier erected along an unprotected or exposed side, edge, or other area of a walking-working surface to prevent employees from falling to a lower level

Handrail – a rail used to provide employees with a handhold for support

Hoist area – any elevated access opening to a walking-working surface through which equipment or materials are loaded or received

Hole – a gap or open space in a floor, roof, horizontal walking-working surface, or similar surface that is at least 2 inches in its least dimension

Individual-rung ladder – a ladder that has rungs individually attached to a building or structure. An individual-rung ladder does not include manhole steps

Ladder – a device with rungs, steps, or cleats used to gain access to a different elevation

Ladder safety system – a system designed to eliminate or reduce the possibility of falling from a ladder (A ladder safety system usually consists of a carrier, safety sleeve, lanyard, connectors, and body harness. Cages and wells are not ladder safety systems.)

Low-slope roof – a roof that has a slope less than or equal to a ratio of 4 in 12 (vertical to horizontal)

Lower level – a surface or area to which an employee could fall (Such surfaces or areas include, but are not limited to, ground levels, floors, roofs, ramps, runways, excavations, pits, tanks, materials, water, equipment, and other similar surfaces and structures or portions thereof.)

Management – managers, supervisors, foremen, or other employees with supervisory authority over others

Manhole steps – steps that are individually attached to or set into the wall of a manhole structure

Maximum intended load – the total load (weight and force) of all employees, equipment, vehicles, tools, materials, and other loads that management reasonably anticipates could be applied to a walking-working surface at any one time

Mobile – manually propelled or moveable

Mobile ladder stand (ladder stand) – a mobile, fixed-height, self-supporting ladder that usually consists of wheels or casters on a rigid base and steps leading to a top step (A mobile ladder stand also may have handrails and is designed for use by one employee at a time.)

Mobile ladder stand platform – a mobile, fixed-height, self-supporting unit having one or more standing platforms that are provided with means of access or egress

Open riser – the gap or space between treads of stairways that do not have upright or inclined members (risers)

Opening – a gap or open space in a wall, partition, vertical walking-working surface, or similar surface that is at least 30 inches high and at least 18 inches wide, through which an employee can fall to a lower level

Personal fall arrest system – a system used to arrest an employee in a fall from a walking-working surface (It consists of a body harness, anchorage, and connector. The means of connection may include a lanyard, deceleration device, lifeline, or a suitable combination of these.)

Personal fall protection system – a system (including all components) used to provide protection from falling or to safely arrest an employee's fall if one occurs (Examples of personal fall protection systems include personal fall arrest systems, positioning systems, and travel restraint systems.)

Platform – a walking-working surface that is elevated above the surrounding area

Portable ladder – a ladder that can readily be moved or carried, and usually consists of side rails joined at intervals by steps, rungs, or cleats

Positioning system (work positioning system) – a system of equipment and connectors that, when used with a body harness or body belt, allows an employee to be supported on an elevated vertical surface, such as a wall or window sill, and work with both hands free

Qualified – describes a person who, by possession of a recognized degree, certificate, or professional standing, or who by extensive knowledge, training, and experience has successfully demonstrated the ability to solve or resolve problems relating to the subject matter, the work, or the project

Ramp – an inclined walking-working surface used to access another level

Riser – the upright (vertical) or inclined member of a stair that is located at the back of a stair tread or platform and connects close to the front edge of the next higher tread, platform, or landing

Rope descent system – a suspension system that allows an employee to descend in a controlled manner and, as needed, stop at any point during the descent (A rope descent system usually consists of a roof anchorage, support rope, a descent device, carabiner(s) or shackles(s), and a chair (seatboard). A rope descent system also is called controlled descent equipment or apparatus. Rope descent systems do not include industrial rope access systems.)

Rung, step, or cleat – the crosspiece of a ladder on which an employee steps to climb up and down

Runway – an elevated walking-working surface, such as a catwalk, a foot walk along shafting, or an elevated walkway between buildings

Scaffold – any temporary elevated or suspended platform and its supporting structure, including anchorage points, used to support employees, equipment, materials, and other items (For the purpose of this protocol, a scaffold does not include a crane-suspended or derrick-suspended personnel platform or a rope descent system.)

Ship stair (ship ladder) – a stairway that is equipped with treads, stair rails, and open risers, and has a slope that is between 50 and 70 degrees from the horizontal

Side-step ladder – a type of fixed ladder that requires an employee to step sideways from it in order to reach a walking-working surface, such as a landing

Spiral stairs – a series of treads attached to a vertical pole in a winding fashion, usually within a cylindrical space

Stair rail or stair rail system – a barrier erected along the exposed or open side of stairways to prevent employees from falling to a lower level

Stairway (stairs) – risers and treads that connect one level with another, and includes any landings and platforms in between those levels (Stairways include standard, spiral, alternating tread-type, and ship stairs.)

Standard stairs – a fixed or permanently installed stairway (Ship, spiral, and alternating tread-type stairs are not considered standard stairs.)

Step bolt (pole step) – a bolt or rung attached at intervals along a structural member used for foot placement and as a handhold when climbing or standing

Stepladder – a self-supporting, portable ladder that has a fixed height, flat steps, and a hinged back

Stepstool – a self-supporting, portable ladder that has flat steps and side rails (For purposes of the final rule, stepstool includes only those ladders that have a fixed height, do not have a pail shelf, and do not exceed 32 inches in overall height to the top cap, although side rails may extend above the top cap. A stepstool is designed so an employee can climb and stand on all of the steps and the top cap.)

Through ladder – a type of fixed ladder that allows the employee to step through the side rails at the top of the ladder to reach a walking-working surface, such as a landing

Tieback – an attachment between an anchorage (e.g., structural member) and a supporting device (e.g., parapet clamp or cornice hook)

Toeboard – a low protective barrier that is designed to prevent materials, tools, and equipment from falling to a lower level, and protect employees from falling

Travel restraint system – a combination of an anchorage, anchorage connector, lanyard (or other means of connection), and body support that an employer uses to eliminate the possibility of an employee going over the edge of a walking-working surface

Tread – a horizontal member of a stair or stairway, but does not include landings or platforms

Unprotected sides and edges – any side or edge of a walking-working surface (except at entrances and other points of access) where there is no wall, guardrail system, or stair rail system to protect an employee from falling to a lower level

Walking-working surface – any horizontal or vertical surface on or through which an employee walks, works, or gains access to a work area or workplace location

Warning line – a barrier erected to warn employees that they are approaching an unprotected side or edge, and which designates an area in which work may take place without the use of other means of fall protection

Well – a permanent, complete enclosure around a fixed ladder

D. General Requirements.

Surface conditions. Management must ensure:

1. All places of employment, passageways, storerooms, service rooms, and walking-working surfaces are kept in a clean, orderly, and sanitary condition.
2. The floor of each workroom is maintained in a clean, and to the extent feasible, in a dry condition. When wet processes are used, drainage must be maintained and, to the extent feasible, dry standing places, such as false floors, platforms, and mats must be provided.
3. Walking-working surfaces are maintained free of hazards such as sharp or protruding objects, loose boards, corrosion, leaks, spills, snow, and ice.

Loads. Management must ensure that each walking-working surface can support the maximum intended load for that surface.

Access and egress. Management must provide, and ensure each employee uses, a safe means of access and egress to and from walking-working surfaces.

Inspection, maintenance, and repair. Management must ensure:

1. walking-working surfaces are inspected, regularly and as necessary, and maintained in a safe condition;
2. hazardous conditions on walking-working surfaces are corrected or repaired before an employee uses them again (If the correction or repair cannot be made immediately, the hazard must be guarded to prevent employees from using the walking-working surface until the hazard is corrected or repaired.); and
3. when any correction or repair involves the structural integrity of the walking-working surface, a qualified person performs or supervises the correction or repair.

E. Ladders.

Application. Management must ensure that each ladder used meets the requirements of this section. This section covers all ladders, except when the ladder is:

1. used in emergency operations such as firefighting, rescue, and tactical law enforcement operations, or training for these operations; or
2. designed into or is an integral part of machines or equipment.

General requirements for all ladders. Management must ensure:

1. ladder rungs, steps, and cleats are parallel, level, and uniformly spaced when the ladder is in position for use;
2. ladder rungs, steps, and cleats are spaced not less than 10 inches and not more than 14 inches apart, as measured between the centerlines of the rungs, cleats, and steps, except that:
 - (a) ladder rungs and steps in elevator shafts must be spaced not less than 6 inches apart and not more than 16.5 inches apart, as measured along the ladder side rails; and
 - (b) fixed ladder rungs and steps on communication towers must be spaced not more than 18 inches apart, measured between the centerlines of the rungs or steps;
3. steps on stepstools are spaced not less than 8 inches apart and not more than 12 inches apart, as measured between the centerlines of the steps;
4. ladder rungs, steps, and cleats have a minimum clear width of 11.5 inches on portable ladders and 16 inches (measured before installation of ladder safety systems) for fixed ladders, except that:
 - (a) the minimum clear width does not apply to ladders with narrow rungs that are not designed to be stepped on, such as those located on the tapered end of orchard ladders and similar ladders;

- (b) rungs and steps of manhole entry ladders that are supported by the manhole opening must have a minimum clear width of 9 inches;
 - (c) rungs and steps on rolling ladders used in telecommunication centers must have a minimum clear width of 8 inches; and
 - (d) stepstools have a minimum clear width of 10.5 inches;
5. wooden ladders are not coated with any material that may obscure structural defects;
 6. metal ladders are made with corrosion-resistant material or protected against corrosion;
 7. ladder surfaces are free of puncture and laceration hazards;
 8. ladders are used only for the purposes for which they were designed;
 9. ladders are inspected before initial use in each work shift, and more frequently as necessary, to identify any visible defects that could cause employee injury;
 10. any ladder with structural or other defects is immediately tagged “Dangerous: Do Not Use” or with similar language in accordance with 29 CFR 1919.145 and removed from service until repaired in accordance with 29 CFR 1910.22(d), or replaced;
 11. each employee faces the ladder when climbing up or down it;
 12. each employee uses at least one hand to grasp the ladder when climbing up and down it; and
 13. no employee carries any object or load that could cause the employee to lose balance and fall while climbing up or down the ladder.

Portable ladders. Management must ensure:

1. rungs and steps of portable metal ladders are corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize the possibility of slipping;
2. each stepladder or combination ladder used in a stepladder mode is equipped with a metal spreader or locking device that securely holds the front and back sections in an open position while the ladder is in use;

3. ladders are not loaded beyond the maximum intended load;
4. ladders are used only on stable and level surfaces unless they are secured or stabilized to prevent accidental displacement;
5. no portable single rail ladders are used;
6. no ladder is moved, shifted, or extended while an employee is on it;
7. ladders placed in locations such as passageways, doorways, or driveways where they can be displaced by other activities or traffic:
 - (a) are secured to prevent accidental displacement; or
 - (b) are guarded by a temporary barricade, such as a row of traffic cones or caution tape, to keep the activities of traffic away from the ladder;
8. the cap (if equipped) and top step of a stepladder are not used as steps;
9. portable ladders used on slippery surfaces are secured and stabilized;
10. the top of a non-self-supporting ladder is placed so that both side rails are supported, unless the ladder is equipped with a single support attachment;
11. portable ladders used to gain access to an upper landing surface have side rails that extend at least 3 feet above the upper landing surface;
12. ladders and ladder sections are not tied or fastened together to provide added length unless they are specifically designed for such use;
13. ladders are not placed on boxes, barrels, or other unstable bases to obtain additional height.

Fixed ladders. Management must ensure:

1. fixed ladders are capable of supporting their maximum intended load;
2. the minimum perpendicular distance from the centerline of the steps or rungs, or grab bars, or both, to the nearest permanent object in back of the ladder is 7 inches, except for elevator pit ladders, which have a minimum perpendicular distance of 4.5 inches;

3. grab bars do not protrude on the climbing side beyond the rungs of the ladder that they serve;
4. the side rails of through or sidestep ladders extend 42 inches above the top of the access level or landing platform served by the ladder. For parapet ladders, the access level is:
 - (a) the roof, if the parapet is cut to permit passage through the parapet; or
 - (b) the top of the parapet, if the parapet is continuous;
5. for through ladders, the steps or rungs are omitted from the extensions, and the side rails are flared to provide not less than 24 inches and not more than 30 inches of clearance. When a ladder safety system is provided, the maximum clearance between side rails of the extension must not exceed 36 inches;
6. for side-step ladders, the side rails, rungs, and steps must be continuous in the extension;
7. grab bars extend 42 inches above the access level or landing platforms served by the ladder;
8. the minimum size (cross-section) of grab bars is the same size as the rungs of the ladder;
9. when a fixed ladder terminates at a hatch, the hatch cover:
 - (a) opens with sufficient clearance to provide easy access to or from the ladder; and
 - (b) opens at least 70 degrees from horizontal if the hatch is counterbalanced;
10. individual-rung ladders are constructed to prevent the employee's feet from sliding off the ends of the rungs;
11. fixed ladders having a pitch greater than 90 degrees from the horizontal are not used;
12. the step-across distance from the centerline of the rungs or steps is:
 - (a) for through ladders, not less than 7 inches and not more than 12 inches to the nearest edge of the structure, building, or equipment accessed from the ladders;

- (b) for side-step ladders, not less than 15 inches and not more than 20 inches to the access points of the platform edge;

13. fixed ladders that do not have cages or wells have:

- (a) a clear width of at least 15 inches on each side of the ladder centerline to the nearest permanent object; and
- (b) a minimum perpendicular distance of 30 inches from the centerline of the steps or rungs to the nearest object on the climbing side. When unavoidable obstructions are encountered the minimum clearance at the obstruction may be reduced to 24 inches, provided deflector plates are installed.

Mobile ladder stands and mobile ladder stand platforms. Management must ensure:

1. mobile ladder stands and platforms have a step width of at least 16 inches;
2. the steps and platforms of mobile ladder stands and platforms are slip resistant. Slip-resistant surfaces must be either an integral part of the design and construction of the mobile ladder stand and platform, or provided as a secondary process or operation, such as dimpling, knurling, shotblasting, coating, spraying, or applying durable slip-resistant tapes;
3. mobile ladder stands and platforms are capable of supporting at least four times their maximum intended load;
4. wheels and casters under load are capable of supporting their proportional share of four times the maximum intended load, plus their proportional share of the unit's weight;
5. unless otherwise specified in this section, mobile ladder stands and platforms with a top step height of 4 feet or above have handrails with a vertical height of 29.5 inches to 37 inches, measured from the front edge of a step. Removable gates or non-rigid members, such as chains, may be used instead of handrails in special use applications.
6. the maximum work-surface height of mobile ladder stands and platforms does not exceed four times the shortest base dimension, without additional support. For greater heights, outriggers, counterweights, or comparable means that stabilize the mobile ladder stands and platforms and prevent overturning must be used;

7. mobile ladder stands and platforms that have wheels or casters are equipped with a system to impede horizontal movement when an employee is on the stand or platform, and
8. no mobile ladder stand or platform moves when an employee is on it.

Design requirements for mobile ladder stands. Management must ensure:

1. steps are uniformly spaced and arranged, with a rise of not more than 10 inches and a depth of not less than 7 inches. The slope of the step stringer to which the steps are attached must not be more than 60 degrees, measured from the horizontal;
2. mobile ladder stands with a top step above 10 feet have the top step protected on three sides by a handrail with a vertical height of at least 36 inches; and top steps that are 20 inches or more, front to back, have a midrail and toeboard. Removable gates or non-rigid members, such as chains, may be used instead of handrails in special-use applications; and
3. the standing area of mobile ladder stands is within the base frame.

Design requirements for mobile ladder stand platforms. Management must ensure:

1. steps are uniformly spaced and arranged, with a rise of not more than 10 inches and a depth of not less than 7 inches. The slope of the step stringer to which the steps are attached must not be more than 60 degrees, measured from the horizontal. But if the manager or supervisor demonstrates that this requirement is not feasible, steeper slopes or vertical rung ladders may be used, provided the units are stabilized to prevent overturning;
2. mobile ladder stand platforms with a platform height of 4 to 10 feet have, in the platform area, handrails with a vertical height of at least 36 inches and midrails; and
3. all ladder stand platforms with a platform height above 10 feet have guardrails and toeboards on the exposed sides and ends of the platform.
4. removable gates or non-rigid members, such as chains, may be used on mobile ladder stand platforms instead of handrails and guardrails in special-use applications.

F. Step Bolts and Manhole Steps.

Step bolts. Management must ensure:

1. each step bolt installed on or after January 17, 2017 in an environment where corrosion may occur is constructed of, or coated with, material that protects against corrosion.
2. each step bolt is designed, constructed, and maintained to prevent the employee's foot from slipping off the end of the step bolt.
3. step bolts are uniformly spaced at a vertical distance of not less than 12 inches and not more than 18 inches apart, measured center to center. The spacing from the entry and exit surface to the first step bolt may differ from the spacing between the other step bolts.
4. each step bolt has a minimum clear width of 4.5 inches.
5. the minimum perpendicular distance between the centerline of each step bolt to the nearest permanent object in back of the step bolt is 7 inches. When a manager or supervisor demonstrates that an obstruction cannot be avoided, the distance must be at least 4.5 inches.
6. each step bolt installed before January 17, 2017 is capable of supporting its maximum intended load.
7. each step bolt installed on or after January 17, 2017 is capable of supporting at least four times its maximum intended load.
8. each step bolt is inspected at the start of the work shift and maintained in accordance with the applicable provisions of Section D. General Requirements.
9. any step bolt that is bent more than 15 degrees from the perpendicular in any direction is removed and replaced with a step bolt that meets the requirements of this section before an employee uses it.

Manhole steps. Management must ensure:

1. each manhole step is capable of supporting its maximum intended load.

2. each manhole step installed on or after January 17, 2017:
 - (a) has a corrugated, knurled, dimpled, or other surface that minimizes the possibility of an employee slipping;
 - (b) is constructed of, or coated with, material that protects against corrosion if the manhole step is located in an environment where corrosion may occur;
 - (c) has a minimum clear step width of 10 inches;
 - (d) is uniformly spaced at a vertical distance not more than 16 inches apart, measured center to center between steps. The spacing from the entry and exit surface to the first manhole step may differ from the spacing between the other steps.
 - (e) has a minimum perpendicular distance between the centerline of the manhole step to the nearest permanent object in back of the step of at least 4.5 inches; and
 - (f) is designed, constructed, and maintained to prevent the employee's foot from slipping or sliding off the end.
3. each manhole step is inspected at the start of the work shift and maintained in accordance with the applicable provisions of Section D. General Requirements.

G. Stairways.

Application. This section covers all stairways (including standard, spiral, ship, and alternating tread-type stairs), except for stairs serving floating roof tanks, stairs on scaffolds, stairs designed into machines or equipment, and stairs on self-propelled motorized equipment.

General requirements. Management must ensure:

1. handrails, stair rail systems, and guardrail systems are provided in accordance with section J, below;
2. vertical clearance above any stair tread to any overhead obstruction is at least 6 feet, 8 inches, as measured from the leading edge of the tread (Spiral stairs must have a minimum headroom above stair treads of at least 6 feet, 6 inches, measured from the leading edge of the tread.);
3. stairs have uniform riser heights and tread depths between landings;
4. stairway landings and platforms are at least the width of the stair and at least 30 inches in depth, as measured in the direction of travel;
5. when a door or a gate opens directly on a stairway, a platform is provided, and the swing of the door or gate does not reduce the platform's effective usable depth to:
 - (a) less than 20 inches for platforms installed before January 17, 2017; and
 - (b) less than 22 inches for platforms installed on or after January 17, 2017.
6. each stair can support at least five times the normal anticipated live load, but never less than a concentrated load of 1,000 pounds applied at any point;
7. standard stairs are used to provide access from one walking-working surface to another when operations necessitate regular and routine travel between levels including access to operating platforms for equipment (Winding stairways may be used on tanks and similar round structures when the diameter of the tank or structure is at least 5 feet.);
8. spiral, ship, or alternating tread-type stairs are used only when management can demonstrate that it is not feasible to provide standard stairs.
9. when paragraph 8 of this section allows the use of spiral, ship, or alternating tread-type stairs, they are installed, used, and maintained in accordance with manufacturer's instructions.

Standard stairs. In addition to the General Requirements section, above, management must ensure standard stairs:

1. are installed at angles between 30 to 50 degrees from the horizontal;
2. have a maximum riser height of 9.5 inches;
3. have a minimum tread depth of 9.5 inches;
4. have a minimum width of 22 inches between vertical barriers;
5. exceptions to items 1. and 2. above exist for standard stairs installed prior to January 17, 2017. Contact the Safety Coordinator for advice on this matter if needed.
[1910.25(c)(5)]

Spiral stairs. In addition to the General Requirements section, above, management must ensure spiral stairs:

1. have a minimum clear width of 26 inches;
2. have a maximum riser height of 9.5 inches;
3. have a minimum headroom above spiral stair treads of at least 6 feet, 6 inches, measured from the leading edge of the tread;
4. have a minimum tread depth of 7.5 inches, measured at a point 12 inches from the narrower edge;
5. have a uniform tread size.

Ship stairs. In addition to the General Requirements section, above, management must ensure ship stairs:

1. are installed at a slope of 50 to 70 degrees from the horizontal;
2. have open risers with a vertical rise between tread surfaces of 6.5 to 12 inches;
3. have minimum tread depth of 4 inches; and
4. have a minimum tread width of 18 inches.

Alternating tread-type stairs. In addition to the General Requirements section, above, management must ensure alternating tread-type stairs:

1. have a series of treads installed at a slope of 50 to 70 degrees from the horizontal;
2. have a distance between handrails of 17 to 24 inches;
3. have a minimum tread depth of 8.5 inches; and
4. have open risers if the tread depth is less than 9.5 inches;
5. have a minimum tread width of 7 inches, measured at the leading edge of the tread (i.e., nosing).

H. Dockboards.

Management must ensure that:

1. dockboards are capable of supporting their maximum intended load;
2. dockboards put into initial service on or after January 17, 2017 are designed, constructed, and maintained to prevent transfer vehicles from running off the dockboard edge;
3. portable dockboards are secured by anchoring them in place or using equipment or devices that prevent the dockboard from moving out of a safe position. When management demonstrates that securing the dockboard is not feasible, management must ensure there is sufficient contact between the dockboard and the surface to prevent the dockboard from moving out of a safe position;
4. measures, such as wheel chocks or sand shoes, are used to prevent the transport vehicle (e.g. a truck, semitrailer, trailer, or rail car) on which a dockboard is placed, from moving while employees are on the dockboard; and
5. portable dockboards are equipped with handholds or other means to permit safe handling of dockboards.

I. Scaffolds and rope descent systems.

Scaffolds. Scaffolds must meet the requirements included within DGS AIPP Protocol #29, Scaffolding Safety.

Rope descent systems. N/A - DGS does not currently possess, rent, or use rope descent systems for any purpose. Prior to using any rope descent system, this section will be developed.

J. Duty to have fall protection and falling object protection.

General.

1. This section requires management to provide protection for each employee exposed to fall and falling object hazards. Unless stated otherwise, management must ensure that all fall protection and falling object protection required by this section meet the requirements in section K., except that personal fall protection systems required by this section meet the criteria of DGS AIPP Protocol #19 (Fall Hazard Prevention and Control).
2. This section does not apply:
 - (a) to portable ladders;
 - (b) when inspecting, investigating, or assessing workplace conditions or work to be performed prior to the start of work or after all work has been completed. (This exemption does not apply when fall protection systems or equipment meeting the requirements of Section K have been installed and are available for workers to use for pre-work and post-work inspections, investigations, or assessments.);

- (c) to fall hazards presented by the exposed perimeters of entertainment stages and the exposed perimeters of rail-station platforms;
- (d) to powered platforms and aerial lifts covered under DGS AIPP Protocol #P-16 (Elevating Work Platforms);
- (e) to telecommunications work if covered under other protocols; and
- (f) to electric power generation, transmission, and distribution work if covered under other protocols.

Protection from fall hazards.

1. Unprotected sides and edges:

- (a) except as provided elsewhere in this section, managers, and supervisors must ensure that each employee on a walking-working surface with an unprotected side or edge that is 4 feet or more above a lower level is protected from falling by one or more of the following:
 - (1) guardrail systems;
 - (2) safety net systems; or
 - (3) personal fall protection systems, such as personal fall arrest, travel restraint, or positioning systems;

2. Hoist areas:

- (a) Management must ensure:
 - (1) that each employee in a hoist area is protected from falling 4 feet or more to a lower level by:
 - a. a guardrail system;
 - b. a personal fall arrest system; or
 - c. a travel restraint system.
 - (2) when any portion of a guardrail system, gate, or chains is removed, and an employee must lean through or over the edge of the access

opening to facilitate hoisting, the employee is protected from falling by a personal fall arrest system.

- (3) that if grab handles are installed at hoist areas, they are:
 - a. at least 12 inches long;
 - b. mounted to provide at least 3 inches of clearance from the frame or opening;
 - c. capable of withstanding a maximum horizontal pull-out force equal to two times the maximum intended load or 200 pounds, whichever is greater.

3. Holes:

(a) Management must ensure:

- (1) each employee is protected from falling through any hole (including skylights) that is 4 feet or more above a lower level by one or more of the following:
 - a. covers;
 - b. guardrail systems;
 - c. travel restraint systems; or
 - d. personal fall arrest systems
- (2) each employee is protected from tripping into or stepping into or through any hole that is less than 4 feet above a lower level by covers or guardrail systems;
- (3) each employee is protected from falling into a stairway floor hole by a fixed guardrail system on all exposed sides, except at the stairway entrance;
- (4) each employee is protected from falling into a ladderway floor hole or ladderway platform hole by a guardrail system and toeboards erected on all exposed sides, except at the entrance to the hole, where a self-closing gate or an offset must be used;

- (5) each employee is protected from falling through a hatchway and chutefloor hole by:
 - a. a hinged floor-hole cover and a fixed guardrail system that leaves only one exposed side (When the hole is not in use, management must ensure the cover is closed or a removable guardrail system is provided on the exposed sides;
 - b. a removable guardrail system and toeboards on not more than two sides of the hole and a fixed guardrail system on all other exposed sides (management must ensure the removable guardrail system is kept in place when the hole is not in use.);
or
 - c. a guardrail system or a travel restraint system when a work operation necessitates passing material through a hatchway or chute floor hole.
4. Dockboards – Management must ensure that each employee on a dockboard is protected from falling 4 feet or more to a lower level by a guardrail system or handrails.
 - (a) A guardrail system or handrails are not required when:
 - (1) dockboards are being used solely for materials-handling operations using motorized equipment;
 - (2) employees engaged in these operations are not exposed to fall hazards greater than 10 feet; and
 - (3) those employees have been trained in accordance with Section L. of this protocol.
5. Runways and similar walkways – Management must ensure each employee on a runway or similar walkway is protected from falling 4 feet or more to a lower level by a guardrail system.
6. Dangerous equipment –
 - (a) Management must ensure that:
 - (1) each employee less than 4 feet above dangerous equipment is protected from falling into or onto the dangerous equipment by a

guardrail system or a travel restraint system, unless the equipment is covered or guarded to eliminate the hazard;

- (2) each employee 4 feet or more above dangerous equipment must be protected from falling by guardrail systems, safety net systems, travel restraint systems, or personal fall arrest systems.

7. Openings –

- (a) Management must ensure that each employee on a walking-working surface near an opening, including one with a chute attached, where the inside bottom edge of the opening is less than 39 inches above that walking-working surface and the outside bottom edge of the opening is 4 feet or more above a lower level is protected from falling by the use of:

- (1) guardrail systems;
- (2) safety net systems;
- (3) travel restraint systems; or,
- (4) personal fall arrest systems.

8. Repair pits, service pits, and assembly pits less than 10 feet in depth – The use of a fall protection system is not required for a repair pit, service pit, or assembly pit that is less than 10 feet deep, provided management:

- (a) limits access within 6 feet of the edge of the pit to authorized employees trained in its use;
- (b) applies floor marking at least 6 feet from the edge of the pit in colors that contrast with the surrounding area; or places a warning line at least 6 feet from the edge of the pit as well as stanchions that are capable of resisting without tipping over a force of at least 16 pounds applied horizontally against the stanchion at a height of 30 inches; or places a combination of floor markings and warning lines at least 6 feet from the edge of the pit. When two or more pits in a common area are not more than 15 feet apart, contrasting floor markings at least 6 feet from the pit edge around the entire area of the pits may be applied and considered in compliance; and
- (c) posts readily visible caution signs that state “Caution – Open Pit”

9. Fixed ladders that extend more than 24 feet above a lower level.

- (a) For existing fixed ladders of this type, management must ensure that each such ladder is equipped with a personal fall arrest system, ladder safety system, cage, or well;
 - (b) For new fixed ladders of this type, management must ensure that each such ladder is equipped with a personal fall arrest system or a ladder safety system.
10. Stairways – Management must ensure that:
- (a) each employee exposed to an unprotected side or edge of a stairway landing that is 4 feet or more above a lower level is protected by a guardrail or stair rail system;
 - (b) each flight of stairs having at least 3 treads and at least 4 risers is equipped with stair rail systems and handrails as appropriate; and
 - (c) each ship stairs and alternating tread type stairs is equipped with handrails on both sides.
11. Scaffolds – Management must ensure that each employee on a scaffold is protected from falling in accordance with DGS Protocol #29, Scaffolding Safety.
12. Work on low-slope roofs –
- (a) When work is performed less than 6 feet from the roof edge, management must ensure each employee is protected from falling by a guardrail system, safety net system, travel restraint system, or personal fall arrest system.
 - (b) When work is performed at least 6 feet but less than 15 feet from the roof edge, management must ensure each employee is protected from falling by using a guardrail system, safety net system, travel restraint system, or personal fall arrest system.
 - (c) When work is performed 15 feet or more from the roof edge, management must:
 - (1) protect each employee from falling by a guardrail system, safety net system, travel restraint system, or personal fall arrest system or a designated area. Management is not required to provide any fall protection, provided the work is both infrequent and temporary; and

- (2) implement and enforce a work rule prohibiting employees from going within 15 feet of a roof edge without using fall protection in accordance with paragraphs a. and b. of this section.

13. Protection from falling objects –

- (a) When an employee is exposed to falling objects, management must ensure that each employee wears approved head protection.
- (b) In addition, management must protect employees from falling objects by implementing one or more of the following:
 - (1) erecting toeboards, screens, or guardrail systems to prevent objects from falling to a lower level;
 - (2) erecting canopy structures and keeping potential falling objects far enough from an edge, hole, or opening to prevent them from falling to a lower level; or
 - (3) barricading the area into which objects could fall, prohibiting employees from entering the barricaded area, and keeping objects far enough from an edge or opening to prevent them from falling to a lower level.

K. Fall protection systems and falling object protection-criteria and practices.

Management shall ensure that fall protection systems and falling object protection are provided and used when required in accordance with DGS AIPP Protocol #P-19, Fall Hazard Prevention & Control.

L. Training requirements.

1. Fall hazards –

- (a) Before any employee is exposed to a fall hazard, management must provide training by a qualified person for each employee who uses personal fall protection systems or who is required to be trained as specified elsewhere in this protocol.
- (b) Management must train each employee in at least the following topics:
 - (1) the nature of the fall hazards in the work area and how to recognize them;
 - (2) the procedures to be followed to minimize those hazards;
 - (3) the correct procedures for installing, inspecting, operating, maintaining, and disassembling the personal fall protection systems that the employee uses; and
 - (4) the correct use of personal fall protection systems and equipment, including but not limited to proper hook-up, anchoring, and tie-off techniques, and methods of equipment inspection and storage as specified by the manufacturer.

2. Equipment hazards –

- (a) Management must train each employee in the proper care, inspection, storage, and use of equipment covered by this protocol before an employee uses the equipment.
- (b) Management must train each employee who uses a dockboard to properly place and secure it to prevent unintentional movement.
- (c) Management must train each employee who uses a designated area in the proper set-up and use of the area.

3. Retraining – Management must retrain an employee when management has reason to believe the employee does not have the understanding and skill required to work safely. Situations requiring retraining include, but are not limited to:

- (a) when changes in the workplace render previous training obsolete or inadequate;

- (b) when changes in the types of fall protection systems or equipment to be used render previous training obsolete or inadequate; or
- (c) when inadequacies in an affected employee's knowledge or use of fall protection systems or equipment indicate that the employee no longer has the requisite understanding or skill necessary to use equipment or perform the job safely.

