A taxonomy of surface mining slip, trip, and fall hazards as a guide to research and practice

Supplementary data

Slip, trip, and fall hazard taxonomy for walkways

Primary category	Secondary category	Observable hazard	Standard	Remedial recommendation
Carpet		Carpet moves when stepped on.	ANSI A117.1-2009 302.2 ASTM F1637-13 5.3.1	Install carpet and mats securely to prevent movement. Routinely stretch carpets and inspect and maintain mats and carpets to ensure they are not frayed, curled, buckled, have unsecured seams, worn holes, wrinkles, or other defects that may pose a tripping hazard.
		Carpet has frayed edges, unsecured seams, worn areas, holes, wrinkles, or otherwise poses a trip hazard.	ASTM F1637-13 5.3.1	
		Abrupt change of greater than ¼ inch along walking/working surface including floor hardware (hinges, handles, bolts on covers) or between adjoining surfaces including door thresholds, carpets, and mats.	ANSI A117.1-2009 302.2; ASTM F1637-13 5.3.3	Design walking surfaces such that they are level. Ensure adjoining surfaces, floor hardware, door thresholds, carpets and mats are level. Routinely inspect and maintain surface transitions. Repair or provide edge treatments if there is greater than ½ inch change in height between adjoining surfaces.
Change in level / Transition		Abrupt change of greater than ¼ inch along walking/working surface including floor hardware (hinges, handles, bolts on covers) or between adjoining surfaces including door thresholds, carpets, and mats.	ANSI A117.1-2009 303.3 ANSI A117.1-2009 303.4 ASTM F1637-13 5.2.3 ASTM F1637-13 5.2.4 IBC-2015 Chapter 1010.1.7	Design walking surfaces such that they are level. Ensure adjoining surfaces, floor hardware, door thresholds, carpets and mats are level. Routinely inspect and maintain surface transitions. Repair or provide edge treatments if there is greater than ½ inch change in height between adjoining surfaces.
Contaminants		Pooled water/liquid on the walking/working surface and landings.	CFR 29 §1910.22(a)(2) ANSI A117.1-2009 405.10 ANSI A1264.2 2012 E8.2 IBC-2015 Section 1012.7.2	Install walkway surfaces, such as gratings, that prevent the pooling/accumulation of liquid in wet process areas. Install drains to route liquid away from walking/working surfaces. Routinely inspect and maintain walking surfaces and drains.

Primary category	Secondary category	Observable hazard	Standard	Remedial recommendation
		Snow or ice on walking/working surface.	CFR 30 §56.11016 CFR 29 §1910.22(a)(3) ANSI A1264.2 2012 11.3 ANSI A1264.2 2012 11.3.1	Install covered walkways in high traffic areas to prevent accumulation of snow/ice on the walking surface. Provide snow and ice removal tools and supplies such as shovels, brushes, de-icing agent, or a snow blower near where they will be used. Routinely inspect and treat surfaces and promptly remove any snow/ice accumulation.
Crossovers		Crossovers not provided to cross over conveyor.	CFR 30 §56.11013	Install clearly marked, designated cross over points for crossing over moving conveyors. Establish a policy and training plan to ensure workers cross over conveyers only at the designated cross over points.
Elevated walkways	General characteristics	Width of elevated walkway less than 22 inches (1 foot 10 inches).	ASAE S412.1 MAR1990 (R2014) 6.3.2	Design elevated walkways to allow at least 22 inches (1 foot 10 inches) of free width for the length of the walkway. Remove/reroute any temporary obstructions (such as cables, hoses, pipes, debris, accumulation) that reduce width. Routinely inspect and maintain elevated walkways.
		Guardrail/handrail is missing, broken, or damaged along elevated walkway surface, elevated conveyor belts, stairs, ramps, scaffolding, mezzanines, aisles, and landings (more than 48 inches (4 feet) above ground level).	CFR 30 §56.11002 CFR 30 §56.11009 CFR 30 §56.11027 CFR 29 §1910.28(b)(5) CFR 29 §1926.502(b)(14) ASAE S412.1 MAR1990 (R2014) 6.3.3	Install guardrails with top and intermediate rails along elevated walkways and conveyor belts, stairs, ramps, scaffolding, mezzanines, aisles, and landings more than 48 inches (4 feet) above ground level or where there is a danger of falling. Install top guardrails between 39 – 45 inches (3 feet 3 inches – 3 feet 9 inches) above the floor. Install intermediate guardrails approximately halfway between the top guardrail and floor/stair tread. Routinely inspect and maintain guardrails.

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	Inclined walkways/ramps and their landings	Inclined walkway/ramp with slope greater than 35°.	CFR 30 §57.11040	Design inclined walkways with slope less than 35° from the horizontal. Install stairs between 30° – 50° or ladders between 70° – 90° from the horizontal with appropriate landings.
	Inclined walkways/ramps and their landings	Inclined walkways with rise less than 6 inches do not have high contrasting finish to adjacent floor surfaces or handrail is missing, broken or damaged.	IBC-2015 Section 1003.5	Install handrails or use contrasting floor finish on ramps less than 6 inches high. Routinely inspect and maintain handrails and contrasting floor finish to ensure they are clearly visible.
		Inclined walkways/ramps or their landings have a cross slope (slope of walkway perpendicular to direction of travel is greater than 1°).	ANSI A117.1-2009 403.3 ANSI A117.1-2009 405.3 ANSI A117.1-2009 405.7.1 IBC-2015 Section 1012.3 IBC-2015 Section 1012.6.1	Install inclined walkways/ramps that are level from side to side and do not have a cross slope. Routinely inspect and maintain inclined walkways/ramps to ensure they are free from accumulation, damage, or warping.
		Handrails are missing, broken or damaged on either side for the entire length of an inclined walkway with rise greater than 6 inches.	ANSI A117.1-2009 405.8 ANSI A117.1-2009 505.2 ANSI A117.1-2009 505.3 IBC-2015 Section 1012.8 IBC-2015 Section 1014.6	Install handrails on either side of and for the entire length of an elevated inclined walkway/ramp greater than 6 inches high. Install handrail extensions that extend at least 12 inches (1 foot) beyond the top and bottom. Routinely inspect and repair or replace damaged handrails.
		Handrails do not extend horizontally for at least 12 inches (1 foot) beyond the top and bottom of inclined walkway or stairs onto the landing.	ANSI A117.1-2009 505.10.1 IBC-2015 Section 1014.6	
Floor walkway surface		Walking/working surface moves.	ANSI A117.1-2009 302.1 IBC-2015 Section 1003.4 IBC-2015 Section 1012.7.1	Install walking surfaces that are stable, securely attached, and fit properly. Ensure the surface does not have loose, broken, or cracked pieces. Routinely inspect and maintain the walking surface.
		Loose pieces on walking/working surface from broken, cracked, or damaged surface.	ASTM F1637-13 5.7.1.2	

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		Abrupt change of greater than ¼ inch along walking/working surface including floor hardware (hinges, handles, bolts on covers) or between adjoining surfaces including door thresholds, carpets, and mats.	ASTM F1637-13 5.1.1 ASTM F1637-13 5.2.1 ASTM F1637-13 5.7.2 ASTM F1637-13 5.7.3	Design walking surfaces such that they are level. Ensure adjoining surfaces, floor hardware, door thresholds, carpets and mats are level. Routinely inspect and maintain surface transitions. Repair or provide edge treatments if there is greater than ½ inch change in height between adjoining surfaces.
		Any debris accumulation, spillage, contaminants on walking/working surface.	CFR 29 §1910.22(a)(3) CFR 29 §1926.25(a)	Routinely inspect and maintain all walkways, work areas, and stairs. Promptly clear any debris, accumulation, tools, or other objects from these areas.
Handrails		Circular handrail outside diameter is not between 1¼ – 2 inches.	ANSI A117.1-2009 505.7.1 IBC-2015 Section 1014.3.1	Install circular handrails with diameters between 1¼ – 2 inches and non-circular handrails with perimeter dimensions that are between 4 – 6½ inches and cross-section dimensions that are less than 2¼ inches. Ensure handrails do not have protrusions, burrs, or sharp edges. Routinely inspect and maintain handrails.
		Non-circular handrails have perimeter dimensions that are not between 4 – 6¼ inches and cross-section dimension that are more than 2¼ inches.	ANSI A117.1-2009 505.7.2 IBC-2015 Section 1014.3.1	
		Clearance width between handrail and wall, or any object, is less than 2¼ inches for the entire length of the handrail.	CFR 29 §1910.29(f)(2) ANSI A117.1-2009 505.5 IBC-2015 Section 1014.7	Install handrails that have no obstructions on the top or sides with at least 2¼ inches of clearance from the nearest object. Design posts and brackets so that they take up less than 20% of the length of the handrail. Routinely inspect and maintain handrails.
		Handrails have an obstruction on the top or sides; or posts or obstructions that take up greater than 20% of the length of the handrail at the bottom.	ANSI A117.1-2009 505.6 IBC-2015 Section 1014.4	
		Handrails are not continuous with adjacent handrails or are not continuous for the entire flight of stairs or ramp.	ANSI A117.1-2009 505.3 ANSI A117.1-2009 505.10 ASAE S412.1 MAR1990 (R2014) 7.2.4 IBC-2015 Section 1014.4	Install handrails that are continuous with the adjacent handrail and at a consistent height (34 – 38 inches (2 feet 10 inches – 3 feet 2 inches) above the floor) for the length of the

Primary category	Secondary category	Observable hazard	Standard	Remedial recommendation
		Handrail height is not consistent above walking/working surface or stair nosing.	ANSI A117.1-2009 505.4	handrail. Routinely inspect and maintain handrails and surrounding flooring.
		Height of handrail (top) is not between 34 – 38 inches (2 feet 10 inches – 3 feet 2 inches) (above the walking/working surface or stairs.	CFR 29 §1910.29(f)(1)(i) ANSI A117.1-2009 505.4 ASAE S412.1 MAR1990 (R2014) 7.2.1 IBC-2015 Section 1014.2	
		Clothing can get snagged or risk of puncture, cuts, or lacerations on handrail/guardrail due to protrusions, burrs, or sharp edges.	CFR 29 §1910.29(f)(3) ANSI A117.1-2009 505.8 ASAE S412.1 MAR1990 (R2014) 7.2.5 IBC-2015 Section 1014.7	Install handrails and guardrails that do not have protrusions, burrs, or sharp edges. Routinely inspect and maintain handrails and guardrails.
		Handrail rotates/moves in the fitting.	ANSI A117.1-2009 505.9 IBC-2015 Section 1014.5	Install handrails securely in their fitting. Routinely inspect and maintain handrails to ensure they do not rotate or move.
Mats		No mat present with contaminants, water/liquid, or particles tracked onto floor.	ANSI A1264.2 2012 7.1 ANSI A1264.2 2012 E7 ANSI A1264.2 2012 7.7 ASTM F1637-13 5.4.1 ASTM F1637-13 5.4.2 ASTM F1637-13 5.4.3	Provide secured floor mats designed to trap contaminants or grating in areas where operators may track contaminants onto floors. Routinely inspect mats to ensure they are not saturated. Clean and replace the mat if saturated.
		Contaminants tracked onto floor when mats are present.	ANSI A1264.2 2012 7.7 ASTM F1637-13 5.4.4	
		Abrupt change of greater than ¼ inch along walking/working surface including floor hardware (hinges, handles, bolts on covers) or between adjoining surfaces including door thresholds, carpets, and mats.	ANSI A1264.2 2012 7.4 ASTM F1637-13 5.4.5	Design walking surfaces such that they are level. Ensure adjoining surfaces, floor hardware, door thresholds, carpets and mats are level. Routinely inspect and maintain surface transitions. Repair or provide edge treatments if there is greater than ½ inch change in height between adjoining surfaces.

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		Mat has frayed, curled, or other edge defects, is buckling, has an unsecured seam, worn holes, wrinkles, or otherwise poses a trip hazard.	ANSI A1264.2 2012 7.4 ANSI A1264.2 2012 7.5 ASTM F1637-13 5.4.6	Install carpet and mats securely to prevent movement. Routinely stretch carpets and inspect and maintain mats and carpets to ensure they are not frayed, curled, buckled, have unsecured seams, worn holes, wrinkles, or other defects that may pose a tripping hazard.
		Mat moves when stepped on.	ANSI A1264.2 2012 E7.2 ANSI A1264.2 2012 7.3 ASTM F1637-13 5.4.5	
		Mats overlap or have gaps between them.	ANSI A1264.2 2012 7.4.1	Install adjoining mats such that they are flush and do not overlap. Routinely inspect and maintain mats.
Openings	Floor opening covers	Abrupt change of greater than ¼ inch along walking/working surface including floor hardware (hinges, handles, bolts on covers) or between adjoining surfaces including door thresholds, carpets, and mats.	ASTM F1637-13 5.2.2 ASTM F1637-13 6.1	Design walking surfaces such that they are level. Ensure adjoining surfaces, floor hardware, door thresholds, carpets and mats are level. Routinely inspect and maintain surface transitions. Repair or provide edge treatments if there is greater than ½ inch change in height between adjoining surfaces.
		Guardrail or cover is open, missing, broken, or damaged on any exposed sides of temporary or other floor opening, hole, pit, vat, ditch, manhole, or trapdoor.	CFR 30 §56.11012 CFR 30 §77.204 CFR 29 §1910.22 (c) CFR 29§1910.28(b)(3)(B) CFR 29 §1926.502(b)(11)	Install guardrails on all unprotected sides (with no more than one side being removable) or hinged covers over holes, manholes, chutes, trapdoors, or other floor openings though the walking/working surface. Routinely inspect and maintain guardrails and covers to ensure they are closed when not in use and are free from damage. When guardrails or covers are open, provide high-visibility warning signs.
		Temporary or other opening in floor surface, hole, pit, vat, ditch, manhole, or trapdoor without permanent guardrails or with open covers do not have warning signs not present, not constantly guarded by someone or does not have a removable guardrail.	CFR 30 §56.11012 CFR 29 §1910.28(b)(8)	

Primary category	Secondary category	Observable hazard	Standard	Remedial recommendation
	Hatchway and chutes	Trapdoor, cover, or guardrail is open, missing, damaged, or broken in ladder ways that pass through walkways at any level.	CFR 30 §57.11036	Install trapdoor on or adequate guarding around ladder ways that pass through walkways. Routinely inspect and maintain trapdoors and guarding to ensure they are closed when not in use and are free from damage.
		Trapdoor/cover, permanent guardrail on at least three sides, or temporary/removable guardrail on at most one side is open, missing, broken or damage on hatchway or chute.	CFR 29 §1910.28(b)(3)(v)(A) CFR 29 §1910.28(b)(3)(v)(B)	Install guardrails on all unprotected sides (with no more than 1 side being removable) or hinged covers over holes, manholes, chutes, trapdoors, or other floor openings though the walking/working surface. Routinely inspect and maintain guardrails and covers to ensure they are closed when not in use and are free from damage. When guardrails or covers are open, provide high-visibility warning signs.
	Holes for passage of materials	When using floor holes for passage of materials temporary/removable guardrail are installed on two or more sides.	CFR 29 §1910.29(b)(12) CFR 29 §1926.502(b)(12)	Install guardrails on all unprotected sides (with no more than 1 side being removable) or hinged covers over holes, manholes, chutes, trapdoors, or other floor openings though the walking/working surface. Routinely inspect and maintain guardrails and covers to ensure they are closed when not in use and are free from damage. When guardrails or covers are open, provide high-visibility warning signs.
		Holes designed for the passage of materials when not in use does not have a guardrail system on all unprotected sides or edges or is not closed over with a cover.	CFR 29 §1910.29(b)(12) CFR 29 §1926.502(b)(12)	
	Other openings / skylights	Screen and guardrail on any exposed sides of skylight are missing, broken, or damaged.	CFR 29 §1910.28(b)(3)(i)	Install screens and guardrails on all exposed sides of skylights. Routinely inspect and maintain screens and guardrails.

Primary category	Secondary category	Observable hazard	Standard	Remedial recommendation
	Wall openings / hoisting areas	Chain, gate, removable guardrail, or picket fence is open, missing, broken, or damaged across the access opening at hoisting areas or at wall openings (drop of more than 48 inches (4 feet)).	CFR 29 §1910.28(b)(2)(i)(A) CFR 29 §1910.28(b)(3)(i)(B) CFR 29 §1910.28(b)(3)(ii) CFR 29 §1910.28(b)(5) CFR 29 §1910.29(b)(10) CFR 29 §1926.502(b)(10)	Install a chain, gate, removable guardrail, or fence across the access opening of hoisting areas or at wall openings where there is a drop of greater than 48 inches (4 feet). Routinely inspect and maintain guards to ensure they are closed when not in use and are free from damage.
Slip resistance		Spillage, debris, or accumulation from nearby areas are leaking onto walking/working surface.	ANSI A1264.2 2012 10.2	Install barriers to physically isolate walkways from areas where there is spillage of liquid or debris. Routinely inspect and maintain barriers to ensure they prevent leakage onto walkways.
		Painted areas on walkways/working surfaces are slippery.	ASTM F1637-13 5.1.3	Install walkways that are made of or are treated with slip-resistant material (such as etching, scoring, droving, brushing, appliques, or coatings). If walkways must be painted, use abrasive additives, cross grooving, or texturing to keep the surface slip resistant. Routinely inspect and maintain walkways or reapply treatments to maintain adequate traction.
		Walking/working surface is slippery under normal or expected environmental conditions.	CFR 30 §56.11009 ANSI A117.1-2009 302.1 ANSI A1264.2 2012 11.2 ASTM F1637-13 5.1.3 ASTM F1637-13 5.1.4 ASTM F1637-13 5.7.1.1 ASTM F1637-13 6.2 ASTM F1637-13 10.4 ASAE S412.1 MAR1990 (R2014) 6.3.1 IBC-2015 Section 1003.4 IBC-2015 Section 1012.7.1	

Primary category	Secondary category	Observable hazard	Standard	Remedial recommendation
Guardrail		Guardrail/handrail is missing, broken, or damaged along elevated walkway surface, elevated conveyor belts, stairs, ramps, scaffolding, mezzanines, aisles, and landings (more than 48 inches (4 feet) above ground level).	CFR 29 §1910.28(b)(5) IBC-2015 Section 1015.2	Install guardrails with top and intermediate rails along elevated walkways and conveyor belts, stairs, ramps, scaffolding, mezzanines, aisles, and landings more than 48 inches (4 feet) above ground level or where there is a danger of falling. Install top guardrails between 39 – 45 inches (3 feet 3 inches – 3 feet 9 inches) above the floor. Install intermediate guardrails approximately halfway between the top guardrail and floor/stair tread. Routinely inspect and maintain guardrails.
		Height of top guardrail is not between 39 – 45 inches (3 feet 3 inches – 3 feet 9 inches) above walking/working surface.	CFR 29 §1910.28(b)(5) CFR 29 §1910.29(b)(1) CFR 29 §1926.502(b)(1) ASAE S412.1 MAR1990 (R2014) 7.2.2 IBC-2015 Section 1015.3	
		Intermediate guardrail is not approximately halfway between the top guardrail and the walking/working surface or stair tread.	CFR 29 §1910.28(b)(5) CFR 29 §1910.29(b)(2)(i) CFR 29 §1926.502(b)(2)(i) ASAE S412.1 MAR1990 (R2014) 7.2.3	

Primary category	Secondary category	Observable hazard	Standard	Remedial recommendation
		Guardrail has missing, broken, or damaged top rail, intermediate rail, post, screen, or mesh between the top guardrail and the walking/working surface or stair tread.	CFR 29 §1910.28(b)(5) CFR 29 §1910.29(b)(2) CFR 29 §1926.502(b)(2) ASAE S412.1 MAR1990 (R2014) 7.2.2	Install guardrails with top and intermediate rails along elevated walkways and conveyor belts, stairs, ramps, scaffolding, mezzanines, aisles, and landings more than 48 inches (4 feet) above ground level or where there is a danger of falling. Install top guardrails between 39 – 45 inches (3 feet 3 inches – 3 feet 9 inches) above the floor. Install intermediate guardrails approximately halfway between the top guardrail and floor/stair tread. Routinely inspect and maintain guardrails. When using screens and mesh, they should be installed from the top guardrail to the floor/stair tread and along the entire length between posts. Routinely inspect and maintain mesh and screens.
		When screen and mesh are used, it does not extend from the top guardrail to the walking/working surface or stair tread and is not along the entire length between posts.	CFR 29 §1910.29(b)(2)(ii) CFR 29 §1926.502(b)(2)(ii)	When using screens and mesh, they should be installed from the top guardrail to the floor/stair tread and along the entire length between posts. Routinely inspect and maintain mesh and screens.
		The ends of the guardrails overhang the terminal posts and project into the walking/working surface.	CFR 29 §1910.29(b)(7) CFR 29 §1926.502(b)(7) ANSI A117.1-2009 505.10	Install guardrails such that they end flush with the posts and do not overhang. Routinely inspect and maintain guardrails and remove any portion of a guardrail that projects into the walking/working surface.
		Clothing can get snagged or risk of puncture, cuts, or lacerations on handrail/guardrail due to protrusions, burrs, or sharp edges.	CFR 29 §1910.29(b)(6) CFR 29 §1926.502(b)(6) CFR 29 §1926.502(b)(9) ASAE S412.1 MAR1990 (R2014) 7.2.5	Install handrails and guardrails that do not have protrusions, burrs, or sharp edges. Routinely inspect and maintain handrails and guardrails.

Primary category	Secondary category	Observable hazard	Standard	Remedial recommendation
		If top guardrail is made of wire rope, it is not flagged with high visibility material at least every 72 inches (6 feet).	CFR 29 §1926.502(b)(9)	If wire rope is used for top rails of guardrails, ensure that rails have high-visibility flags installed every 72 inches (6 feet). Routinely inspect and replace flags to maintain visibility.
Toe boards		Height of the toe board is less than 4 inches above walking/working surface.	CFR 29 §1910.29(k)(ii) ASAE S412.1 MAR1990 (R2014) 6.3.4	Install toe boards that are at least 4 inches high and have less than ¼ inch gap between the toe board and the walking/working surface. Routinely inspect and maintain toe boards for missing or damaged sections.
		Toe board has more than ¼ inch clearance above walking/working surface.	CFR 29 §1910.29(k)(iii)	
Vertical clearance		Vertical clearance along designated walkway or ramp is less than 80 inches (6 feet 8 inches).	ANSI A117.1-2009 307.4 ASTM F1637-13 5.6 IBC-2015 Section 1003.3.1 IBC-2015 Section 1012.5.2	Design walkways and ramps with at least 80 inches (6 feet 8 inches) vertical clearances. Remove/reroute any obstructions (i.e. debris, accumulation, cables, hoses, pipes) that result in less than 80 inches (6 feet 8 inches) of vertical clearance. Install warning signs indicating low clearance and padding when permanent obstructions are present. Routinely inspect and maintain warning signs.
		Warning signs, conspicuous markings, and padding are not present, are inadequate, or the area is not barricaded where vertical clearance is less than 80 inches (6 feet 8 inches) along designated walkway.	CFR 30 §56.11008 ASTM F1637-13 5.6 IBC-2015 Section 1003.3.1	
Warnings & markings		No markings present to indicate designated walkways.	CFR 29 §1910.22(a)(3)	Install bright yellow or high-visibility markings to indicate designated walkways. Routinely inspect and maintain markings to ensure they are visible and easily identifiable.
		Warning or makings on designated walkway are not bright yellow or other conspicuous color.	ASTM F1637-13 11.2	

Slip, trip, and fall hazard taxonomy for stairways

Primary category	Secondary category	Observable hazard	Standard	Remedial recommendation
General		Stairways not provided where there is regular travel (daily or at each shift) between levels.	CFR 29 §1910.25(b)(7) ANSI A1264.1-2017 7.1	Install stairways, rather than ladders, in areas with daily travel between levels when tools and equipment are normally carried by hand between levels.
		Pitch of fixed stairs is not between 30° – 50°.	CFR 29 §1910.25(c)(1) CFR 29 §1926.1052(a)(2) ANSI A1264.1-2017 7.5.1	Install stairs with a pitch between 30° – 50°.
Handrails (hand holds) & guardrails/stair rails (barrier)	General characteristics	Handrails have an obstruction on the top or sides; or posts or obstructions that take up greater than 20% of the length of the handrail at the bottom.	ANSI A117.1-2009 505.6	Install handrails that have no obstructions on the top or sides with at least 2¼ inches of clearance from the nearest object. Design posts and brackets so that they take up less than 20% of the length of the handrail. Routinely inspect and maintain handrails.
		Circular handrail outside diameter is not between 1¼ – 2 inches.	ANSI A117.1-2009 505.7.1	Install circular handrails with diameters between 1¼ – 2 inches and non-circular handrails with perimeter dimensions that are between 4 – 6½ inches and cross-section dimensions that are less than 2¼ inches. Ensure handrails do not have protrusions, burrs, or sharp edges. Routinely inspect and maintain handrails.
		Non-circular handrails have perimeter dimensions that are not between 4 – 6¼ inches and cross-section dimension that are more than 2¼ inches.	ANSI A117.1-2009 505.7.2	
		Clothing can get snagged or risk of puncture, cuts, or lacerations on handrail/guardrail due to protrusions, burrs, or sharp edges.	CFR 29 §1926.1052(c)(8) ANSI A117.1-2009 505.8 ISO 14122-3:2001 4.3	Install handrails and guardrails that do not have protrusions, burrs, or sharp edges. Routinely inspect and maintain handrails and guardrails.

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	Handrail clearance	Clearance width between handrail and wall, or any object, is less than 2¼ inches for the entire length of the handrail.	CFR 29 §1910.29(f)(2) CFR 29 §1926.1052(c)(11) ANSI A117.1-2009 505.5 ISO 14122-3:2001 7.2.6	Install handrails that have no obstructions on the top or sides with at least 2¼ inches of clearance from the nearest object. Design posts and brackets so that they take up less than 20% of the length of the handrail. Routinely inspect and maintain handrails.
	Handrails (hand holds) & guardrails/stair rails (barrier) placement	Guardrail missing when there is an open space of more than 8 inches adjacent to the stairs.	ISO 14122-3:2001 7.2.2	Install guardrails where there are open spaces of greater than 8 inches on either side of the stairs.
		Stairway with 4 or more steps does not have a handrail and guardrail.	CFR 29 §1910.28(b)(11)(ii) CFR 29 §1926.1052(c)(1)(i) CFR 29 §1926.1052(c)(1)(ii)	Install a handrail and guardrail on stairways with 4 or more steps.
		Handrail not placed on the right side when descending enclosed stairway that is less than 44 inches (3 feet 8 inches) wide or on both sides when descending enclosed stairway greater than 44 inches (3 feet 8 inches) wide.	CFR 29 §1910.28 Table D-2 ANSI A1264.1-2017 8.2.1 ANSI A1264.1-2017 8.2.2 ANSI A1264.1-2017 8.2.3 ISO 14122-3:2001 7.2.1	If the stairway is less than 44 inches (3 feet 8 inches) wide, install a handrail on the right-hand side when descending. If the stairway is between 44 – 88 inches (3 feet 8 inches – 7 feet 4 inches) wide, install handrails on both sides. For stairways wider than 88 inches (7 feet 4 inches), install handrails on both sides and intermediate handrails that are less than 30 inches (2 feet 6 inches) apart.
		On stairways more than 88 inches (7 feet 4 inches) wide, intermediate handrail is not provided in the middle of the width.	CFR 29 §1910.28 Table D-2 ANSI A1264.1-2017 8.2.4 IBC-2015 Section 1014.9	
	Handrails at landings	Top handrail extension does not extend horizontally above top landing for at least 12 inches (1 foot).	ANSI A117.1-2009 505.10.2 IBC-2015 Section 1014.6	Install handrail extensions at the top and bottom of the stairs. The top handrail extension should extend at least 12 inches (1 foot) beyond the top landing and the bottom

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		Bottom handrail extension does not extend for a horizontal distance equal to one tread depth beyond the bottom tread nosing, at the slope of the stairs.	ANSI A117.1-2009 505.10.3 IBC-2015 Section 1014.6	handrail extension should extend at least one tread depth beyond the bottom step. Repair/replace top and bottom handrails extensions that do not meet the specifications. Routinely inspect and maintain handrails.
		Handrails are not continuous with adjacent handrails or are not continuous for the entire flight of stairs or ramp. The ends of the guardrails overhang the terminal posts and project into the walking/working surface.	ANSI A117.1-2009 505.10.2 ANSI A117.1-2009 505.10.3 IBC-2015 Section 1014.6	Install handrails that are continuous with the adjacent handrail and at a consistent height (34 – 38 inches (2 feet 10 inches – 3 feet 2 inches) above the floor) for the length of the handrail. Routinely inspect and maintain handrails and surrounding flooring. Install guardrails such that they end flush with the posts and do not overhang. Routinely inspect and maintain guardrails and remove any portion of a guardrail that projects into the walking/working surface.
	Height	Height of top guardrail is not between 39 – 45 inches (3 feet 3 inches – 3 feet 9 inches) above walking/working surface.	CFR 29 §1910.28(b)(5) CFR 29 §1910.29(b)(1) CFR 29 §1910.29(f)(1)(ii) CFR 29 §1926.502(b)(1) CFR 29 §1926.1052(c)(3) CFR 29 §1926.1052(c)(3) ASAE S412.1 MAR1990 (R2014) 7.2.2 IBC-2015 Section 1015.3	Install guardrails with top and intermediate rails along elevated walkways and conveyor belts, stairs, ramps, scaffolding, mezzanines, aisles, and landings more than 48 inches (4 feet) above ground level or where there is a danger of falling. Install top guardrails between 39 – 45 inches (3 feet 3 inches – 3 feet 9 inches) above the floor. Install intermediate guardrails approximately halfway between the top guardrail and floor/stair tread. Routinely inspect and maintain guardrails.

Primary category	Secondary category	Observable hazard	Standard	Remedial recommendation
		Height of handrail (top) is not between 34 – 38 inches (2 feet 10 inches – 3 feet 2 inches) above the walking/working surface or stairs.	CFR 29 §1910.29(f)(1)(i) CFR 29 §1926.1052(c)(6) CFR 29 §1926.1052(c)(7) IBC-2015 Section 1014.2 ANSI A117.1-2009 505.4 ASAE S412.1 MAR1990 (R2014) 7.2.1	Install handrails that are continuous with the adjacent handrail and at a consistent height (34 – 38 inches (2 feet 10 inches – 3 feet 2 inches) above the floor) for the length of the handrail. Routinely inspect and maintain handrails and surrounding flooring.
		Handrail height is not consistent above walking/working surface or stair nosing.	ANSI A117.1-2009 505.4	
	Mid-rails/knee-rails and baluster/post	Guardrail has missing, broken, or damaged top rail, intermediate rail, post, screen, or mesh between the top guardrail and the walking/working surface or stair tread.	CFR 29 §1910.28(b)(5) CFR 29 §1910.29(b)(1) CFR 29 §1910.29(b)(2) CFR 29 §1926.1052(c)(1)(i) CFR 29 §1926.1052(c)(4) ASAE S412.1 MAR1990 (R2014) 7.2.2	Install guardrails with top and intermediate rails along elevated walkways and conveyor belts, stairs, ramps, scaffolding, mezzanines, aisles, and landings more than 48 inches (4 feet) above ground level or where there is a danger of falling. Install top guardrails between 39 – 45 inches (3 feet 3 inches – 3 feet 9 inches) above the floor. Install intermediate guardrails approximately halfway between the top guardrail and floor/stair tread. Routinely inspect and maintain guardrails. When using screens and mesh, they should be installed from the top guardrail to the floor/stair tread and along the entire length between posts. Routinely inspect and maintain mesh and screens.

Primary category	Secondary category	Observable hazard	Standard	Remedial recommendation
		Intermediate guardrail is not approximately halfway between the top guardrail and the walking/working surface or stair tread.	CFR 29 §1910.28(b)(5) CFR 29 §1910.29(b)(2)(i) CFR 29 §1926.1052(c)(4)(i) ASAE S412.1 MAR1990 (R2014) 7.2.3	Install guardrails with top and intermediate rails along elevated walkways and conveyor belts, stairs, ramps, scaffolding, mezzanines, aisles, and landings more than 48 inches (4 feet) above ground level or where there is a danger of falling. Install top guardrails between 39 – 45 inches (3 feet 3 inches – 3 feet 9 inches) above the floor. Install intermediate guardrails approximately halfway between the top guardrail and floor/stair tread. Routinely inspect and maintain guardrails.
		When screen and mesh are used, it does not extend from the top guardrail to the walking/working surface or stair tread and is not along the entire length between posts.	CFR 29 §1910.29(b)(2)(ii) CFR 29 §1926.1052(c)(4)(ii)	When using screens and mesh, they should be installed from the top guardrail to the floor/stair tread and along the entire length between posts. Routinely inspect and maintain mesh and screens.
Illumination on stairs		Less than 108 lux (10 foot-candles) illuminance provided on stairs and landings.	CFR 29 §1926.56(a) Table D-3 ANSI A117.1-2009 504.8.1 ANSI A117.1-2009 504.8.2	Provide at least 108 lux of illumination on stairs and landings. Remove debris from light fixtures or bulbs that causes the illuminance on stairways to be less than 108 lux or 10 foot-candles. Alert maintenance if bulbs or fixtures need to be repaired or replaced to meet lighting recommendations. Routinely inspect and light fixtures/sources. If auto lighting is used, ensure that stairways and landings above and below are also illuminated in unison.
Landing/platform		Landing not provided for every 144 inches (12 feet) climbing height (rise).	ANSI A1264.1-2017 7.10 ANSI A1264.1-2017 E7.10 IBC-2015 Section 1011.8 ISO 14122-3:2001 5.8	Provide a landing every 144 inches (12 feet) of climbing height that is at least 30 inches (2 feet 6 inches) long in the direction of travel, at least 22 inches (1 foot 10 inches) wide, and

Primary category	Secondary category	Observable hazard	Standard	Remedial recommendation
		Landing is less than 30 inches (2 feet 6 inches) long (in direction of travel).	CFR 29 §1910.25(b)(4) CFR 29 §1926.1052(a)(1) ANSI A1264.1-2017 7.11 ISO 14122-3:2001 5.8	that is level with the top step. Remove/reroute any obstructions (i.e. cables, hoses, pipes, debris, accumulation). Routinely inspect and maintain landings.
		Landing width is less than 22 inches (1 foot 10 inches).	CFR 29 §1910.25(c)(4) CFR 29 §1926.1052(a)(1) ANSI A1264.1-2017 7.11 IBC-2015 Section 10011.6 ISO 14122-3:2001 5.8	
		Top step/tread not level with landing.	ISO 14122-3:2001 5.4	
		Landing not provided when door or gate opens over/onto stairway.	CFR 29 §1926.1052(a)(4) ASTM F1637-10 7.1.3	Provide a landing whenever a gate or door opens either over or onto a stairway. Landing should provide at least 22 inches (1 foot 10 inches) in length (in the direction of travel when the door is open) or at least two door widths in length. Remove/reroute any obstructions (i.e. cables, hoses, pipes, debris, accumulation). Routinely inspect and maintain landings.
		When door or gate opens onto landing the available length (in the direction of travel) is less than 22 inches (1 foot 10 inches) or is less than half of when the door is not open.	CFR 29 §1910.25(b)(5) CFR 29 §1926.1052(a)(4) ANSI A1264.1-2017 7.12 IBC-2015 Section 1011.6 IBC-2015 Section 1010.1.6,	
		Guardrail/handrail is missing, broken, or damaged along elevated walkway surface, elevated conveyor belts, stairs, ramps, scaffolding, mezzanines, aisles, and landings (more than 48 inches (4 feet) above ground level).	CFR 29 §1910.25(b)(1) CFR 29 §1910.28(b)(5) CFR 29 §1926.1052(c)(12)	Install guardrails with top and intermediate rails along elevated walkways and conveyor belts, stairs, ramps, scaffolding, mezzanines, aisles, and landings more than 48 inches (4 feet) above ground level or where there is a danger of falling. Install top guardrails between 39 – 45 inches (3 feet 3 inches – 3 feet 9 inches) above the floor. Install intermediate guardrails approximately halfway between the top guardrail and floor/stair tread. Routinely inspect and maintain guardrails.

Primary category	Secondary category	Observable hazard	Standard	Remedial recommendation
Nosing		Stair nosing not easily identifiable.	ANSI A117.1-2009 504.5.1 ASTM F1637-10 7.1.2 ASAE S412.1 MAR1990 (R2014) 9.2.2.3	Provide visual cues to identify the stair nosing by adding contrast to the leading 2 inches of the tread with brightly colored paint or changes in material or texture. Routinely inspect and maintain (clean, repair, replace) visual cues to ensure they are visible and easily identifiable.
		Radius of leading edge greater than ½ inch.	ANSI A117.1-2009 504.5	Install stair tread with squared nosing. Repair/replace nosing when radius is greater than ½ inch. Routinely inspect and maintain stair nosing.
		For closed stairs, projection of nosing greater than 1½ inch over lower tread.	ANSI A117.1-2009 504.5 ANSI A1264.1-2017 7.6 IBC-2015 Section 1011.5.5.1	For closed stairs, install steps with nosing projecting no more than 1½ inch over the lower tread.
Rise		Rise height is not uniform throughout flight of stairs, including first and last step.	CFR 29 §1910.25(b)(3) CFR 29 §1926.1052(a)(3) ANSI A117.1-2009 504.2 ANSI A1264.1-2017 7.9 ASAE S412.1 MAR1990 (R2014) 9.2.2.4 IBC-2015 Section 1011.5.4 ISO 14122-3:2001 5.3	Design stairways with uniform rise height less than 8 inches from the first through the last step. Remove/reroute obstructions or (i.e. cables, hoses, pipes, debris, accumulation) that change rise height. Routinely inspect and maintain stairways.
		Rise height on stairs is greater than 8 inches.	CFR 29 §1910.25(c)(2) CFR 29 §1910.25(c)(5) Table D-1 ANSI A117.1-2009 504.2 ANSI A1264.1-2017 7.5 ASAE S412.1 MAR1990 (R2014) 9.2.2.5 IBC-2015 Section 1011.5.2	
		For closed stairs, riser slopes under tread at an angle greater than 30° from the vertical.	ANSI A117.1-2009 504.5	For closed sets of stairs, install risers that slope under the tread at an angle no greater than 30° from vertical.

Primary category	Secondary category	Observable hazard	Standard	Remedial recommendation
Short flight of stairs		No visual cues to identify short flight of stairs (3 or less steps) such as handrails, delineated nosing edges, tactile cues, warning signs, surface color contrast, accent lighting.	ANSI A1264.1-2017 7.1 ASTM F1637-10 7.2.2	Provide visual cues such as handrails, delineated nosing edges, tactile cues, warning signs, surface color contrast, or accent lighting to identify stairs with 3 or less steps. Routinely inspect and maintain (clean, repair, replace) visual cues to ensure they are visible and easily identifiable.
Spiral stairs		Spiral staircase provided where there is adequate space and it is feasible to provide conventional fixed stairs.	CFR 29 §1910.25(b)(8) ANSI A1264.1-2017 7.1.1	Provide conventional fixed stairs instead of spiral staircases when space allows.
		Vertical clearance on spiral stairways is less than 78 inches (6 feet 6 inches).	CFR 29 §1910.25(d)(3) ANSI A1264.1-2017 7.1.1.2 IBC-2015 Section 1011.10	Design spiral stairways with at least 78 inches (6 feet 6 inches) of vertical clearance. Remove/reroute any obstructions (i.e. cables, hoses, pipes, debris, accumulation) that cause less than 78 inches (6 feet 6 inches) vertical clearance on spiral stairways. Install warning signs if a hazard exists and remove the hazard as soon as possible. Routinely inspect and maintain spiral stairways.
		Tread depth for spiral stairway is less than 7½ inches at a point 12 inches (1 foot) from the narrow edge.	CFR 29 §1910.25(d)(4) ANSI A1264.1-2017 7.1.1.2 IBC-2015 Section 1011.10	Design spiral stairways with tread depths at least 7½ inches at a point 12 inches (1 foot) from the narrow edge. Remove any debris or accumulation that may reduce the tread depth to less than 7½ inches. Routinely inspect and maintain spiral stairways.
		Riser height for spiral stairways is more than 9½ inches.	CFR 29 §1910.25(d)(2) ANSI A1264.1-2017 7.1.1.2 IBC-2015 Section 1011.10	Design spiral stairways with riser heights of no more than 9½ inches. Remove any debris and repair bent or broken treads that may alter riser height. Routinely inspect and maintain spiral stairways.

Primary category	Secondary category	Observable hazard	Standard	Remedial recommendation
		Width of tread for spiral stairways is less than 26 inches (2 feet 2 inches).	CFR 29 §1910.25(d)(1) ANSI A1264.1-2017 7.1.1.2 IBC-2015 Section 1011.10	Design spiral stairways with a tread width of at least 26 inches (2 feet 2 inches). Remove/reroute any obstructions (i.e. cables, hoses, pipes, debris, accumulation) that reduce tread width. Routinely inspect and maintain spiral staircases.
Surface and finish		Tread, nosing, and landing are not corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.	ANSI A1264.1-2017 7.7 ASAE S412.1 MAR1990 (R2014) 9.2.2.3 ASTM F1637-10 7.1.2 ISO 14122-3:2001 4.4	Install stairways with a surface that is slip-resistant. Slip-resistant treatments include corrugations, dimples, knurling, or coatings of skid-resistant material on treads, nosing, and landings. Repair/replace when the surface becomes smooth. Routinely inspect and maintain stairway surfaces.
		Pooled liquid on stair treads and landings.	ANSI A117.1-2009 504.7 IBC-2015 Section 1011.7.2	Install stairway treads and landings that facilitate drainage and minimize or eliminate the pooling of liquid. If necessary, drains should be supplied. Routinely inspect, clean, and maintain stairs and drains to ensure they allow for sufficient drainage.
Tread		Stair treads are not level.	ANSI A117.1-2009 504.4 IBC-2015 Section 1011.7.1	Install stairs such that the treads are level. Remove debris or repair/replace stair treads that are not level due to wear or damage. Routinely inspect and maintain stair treads.
		Tread depth less than 9½ inches or less than 13 inches (1 foot 1 inch) for a short flight of stairs.	CFR 29 §1910.25(c)(3) CFR 29 §1910.25(c)(5) Table D-1 ANSI A117.1-2009 504.2 ANSI A1264.1-2017 7.1 ANSI A1264.1-2017 7.5 ASAE S412.1 MAR1990 (R2014) 9.2.2.1 IBC-2015 Section 1011.5.2	Install treads with uniform depth from the first through the last step. Install stairs with tread depths at least 9½ inches. Install stairways with 3 or fewer treads (short flight of stairs) with tread depths at least 13 inches (1 foot 1 inch). Remove any debris or accumulation that may reduce the tread depth. Routinely inspect and maintain staircases.

Primary category	Secondary category	Observable hazard	Standard	Remedial recommendation
		Tread depth is not uniform throughout flight of stairs including first and last step.	CFR 29 §1910.25(b)(3) CFR 29 §1926.1052(a)(3) ANSI A117.1-2009 504.2 ANSI A1264.1-2017 7.9 ASAE S412.1 MAR1990 (R2014) 9.2.2.4 IBC-2015 Section 1011.5.4 ISO 14122-3:2001 5.4	
		Width of stairway across any tread is less than 22 inches (1 foot 10 inches).	CFR 29 §1910.25(c)(4) ANSI A1264.1-2017 7.3 ASAE S412.1 MAR1990 (R2014) 9.2.1 ISO 14122-3:2001 5.7	Design stairways with tread width of at least 22 inches (1 foot 10 inches). Remove/reroute any obstructions (i.e. cables, hoses, pipes, debris, accumulation) that reduce tread width. Routinely inspect and maintain staircases.
Vertical clearance		Vertical clearance along stairways is less than 84 inches (7 feet) (including one tread depth beyond the bottom riser).	CFR 30 §56.11010 CFR 29 §1910.25(b)(2) ANSI A1264.1-2017 7.13 IBC-2015 Section 1011.3	Design stairways with at least 84 inches (7 feet) of vertical clearance. Remove/reroute any obstructions (i.e. cables, hoses, pipes, debris, accumulation) that result in less than 84 inches (7 feet) of vertical clearance. Install warning signs indicating low clearance when permanent obstructions are present. Routinely inspect and maintain stairways and warning signs.
		No warning sign provided when vertical clearance along stairway is less than 84 inches (7 feet).	CFR 30 §56.11010	

Slip, trip, and fall hazard taxonomy for fixed ladders

Primary category	Observable hazard	Standard	Remedial recommendation
Clearances	Obstruction on the climbing side of the ladder is less than 30 inches (2 feet 6 inches) (less than 24 inches (2 feet) with a deflector plate)	CFR 29 §1910.23(d)(13)(ii) CFR 29 §1926.1053(a)(14) CFR 29 §1926.1053(a)(15) ANSI-ASC A14.3-2008 5.4.1.1 ANSI-ASC A14.3-2008 5.4.1.3 ASAE S412.1 MAR1990 (R2014) 3.5.2	Install ladders without obstructions at least 7 inches behind the rungs and grab bars and 15 inches (1 foot 3 inches) from the centerline on each side. No obstructions should be present within 30 inches (2 feet 6 inches) on the climbing side (or within 24 inches (2 feet) when a deflector plate is used). Remove/reroute any obstructions (i.e. cables, hoses, pipes, debris, accumulation). Install warning signs if a hazard exists and remove the hazard as soon as possible. Routinely inspect and maintain ladders and the surrounding area.
	Less than 7 inches of clearance behind rungs or grab bars	CFR 30 §56.11005 CFR 29 §1910.23(d)(2) CFR 29 §1910.23(d)(3) CFR 29 §1910.24(a)(5) CFR 29 §1910.24(b)(2)(v) ANSI-ASC A14.3-2008 5.4.2.1 ASAE S412.1 MAR1990 (R2014) 3.5.1	
	Obstruction present within 15 inches (1 foot 3 inches) of the centerline on each side of the ladder.	CFR 29 §1910.23(d)(13)(i) CFR 29 §1926.1053(a)(17) ANSI-ASC A14.3-2008 5.4.3.1	
General	Ladder moves, shakes, or is not anchored securely.	CFR 30 §56.11005	Securely anchor fixed ladders to prevent movement when in use. When possible, install ladders so vibration from the equipment is not transmitted to the ladders. Routinely inspect and maintain fixed ladders to ensure they do not move, shake, or vibrate when in use.
	Ladders have oil, grease, ice, snow, or another slipping hazard on them (both walking and gripping surface).	CFR 29 §1926.1053(b)(2) ANSI-ASC A14.3-2008 9.2.6	Routinely inspect and clean fixed ladders to ensure the area around the top and bottom of the ladder is free from obstacles or debris and the ladder is free from oil, grease, ice, snow, or other slippery contaminants.
	Area around top or bottom of ladder is not clear.	CFR 29 §1926.1053(b)(9)	

Primary category	Observable hazard	Standard	Remedial recommendation
	Clothing can get snagged on ladder or puncture, cuts, or lacerations possible due protrusions, burrs, or sharp edges.	CFR 29 §1910.23(b)(7) CFR 29 §1926.1053(a)(11) ANSI-ASC A14.3-2008 4.1.5 ASAE S412.1 MAR1990 (R2014) 3.2.5 ASAE S412.1 MAR1990 (R2014) 3.3.1	Install ladders that do not have protrusions, burrs, or sharp edges. Routinely inspect and maintain ladders.
	Single rail ladder used.	CFR 29 §1926.1053(b)(19)	Install a double rail ladder rather than a single rail ladder.
Long ladders (multiple sections, cages, and wells)	Ladder more than 360 inches (30 feet) in length does not have a landing or back guard, cage, safety system, or equivalent and is missing, damaged, broken, or non-functional.	CFR 30 §56.11025 CFR 30 §56.11026 CFR 29 §1926.1053(a)(18) CFR 29 §1926.1053(a)(19) ANSI-ASC A14.3-2008 4.1.1 ANSI-ASC A14.3-2008 4.1.2 ANSI-ASC A14.3-2008 4.1.3 ANSI-ASC A14.3-2008 4.1.4	Install a landing every 360 inches (30 feet) of climbing length. Otherwise, install a safety system such as a back guard, cage, or equivalent that starts at no more than 84 inches (7 feet) from the ground, extends 42 inches (3 feet 6 inches) above the landing, and has between 27 – 30 inches (2 feet 3 inches – 2 feet 6 inches) of clearance on the climbing side. Routinely inspect and maintain ladder safety systems to ensure they are not broken, damaged, or missing and are free of protrusions or obstructions.
	The back guard, cage, or equivalent protection start more than 84 inches (7 feet) from the floor.	CFR 30 §56.11026 CFR 29 §1926.1053(a)(20)(vii) CFR 29 §1926.1053(a)(21)(v) ANSI-ASC A14.3-2008 6.1.2.4	
	Cage missing, broken or damaged and does not extend at least 42 inches (3 feet 6 inches) above landing.	CFR 29 §1910.29(b)(1) CFR 29 §1926.1053(a)(20)(viii) ANSI-ASC A14.3-2008 6.1.2.5	
	Ladder cage/well clearance is not between 27 – 30 inches (2 feet 3 inches – 2 feet 6 inches) on the climbing side.	CFR 29 §1910.29(g) Figure D-14 CFR 29 §1926.1053(a)(21)(iii) ANSI-ASC A14.3 2008, 6.1.2.1 ANSI-ASC A14.3-2008 6.2.2.1	

Primary category	Observable hazard	Standard	Remedial recommendation
	Enclosed ladder (with cages or in wells) have projections/obstructions.	CFR 29 §1926.1053(a)(20)(iv) CFR 29 §1926.1053(a)(21)(ii)	Install ladders without obstructions at least 7 inches behind the rungs and grab bars and 15 inches (1 foot 3 inches) from the centerline on each side. No obstructions should be present within 30 inches (2 feet 6 inches) on the climbing side (or within 24 inches (2 feet) when a deflector plate is used). Remove/reroute any obstructions (i.e. cables, hoses, pipes, debris, accumulation). Install warning signs if a hazard exists and remove the hazard as soon as possible. Routinely inspect and maintain ladders and the surrounding area.
	Ladder with multiple sections is not horizontally offset from adjacent section at landing.	ANSI-ASC A14.3-2008 4.1.4.1 (a)	Horizontally offset adjacent sections of ladders at landings.
Pitch	Pitch/angle/inclination of ladder is not between 70° – 90°.	CFR 30 §56.11026 CFR 29 §1910.23(d)(11) CFR 29 §1926.1053(b)(5)(iii)	Install ladders with pitch between 70° – 90°.
Platforms & landings	Landing platform is less than 24 inches (2 feet) wide.	CFR 29 §1910.29(g)(4)	Provide landings that are at least 30 inches (2 feet 6 inches) long in the direction of travel, at least 24 inches (2 feet) wide and flush with the top rung. Remove/reroute any obstructions (i.e. cables, hoses, pipes, debris, accumulation). Routinely inspect and maintain landings.
	Landing platform is less than 30 inches (2 feet 6 inches) in length (in direction of travel).	CFR 29 §1910.25(b)(4) CFR 29 §1910.29(g)(4) ANSI-ASC A14.3-2008 6.3.2	
	Swing gate that allows passage through railing to ladder is broken, damaged, or missing or passage though railing to ladder is not offset and a person can walk directly into the opening.	CFR 29 §1910.29(b)(13)(i)-(ii) ANSI A1264.1 2017 2.5 ANSI-ASC A14.3-2008 6.3.3	Install a swing gate that allows passage through a guardrail to a hole or ladder. Otherwise, the passage through the guardrail should be offset from the path of travel. Routinely inspect and maintain swing gates to ensure they are not broken, damaged, or missing.

Primary category	Observable hazard	Standard	Remedial recommendation
	Step across distance from the edge of the ladder to platform/structure is not between 7 – 12 inches. For a side-step ladder, step across distance is not between 15 – 20 inches (1 foot 3 inches – one foot 8 inches).	CFR 29 §1910.23(d)(12)(i)-(ii) CFR 29 §1926.1053(a)(16) ANSI-ASC A14.3-2008 5.4.2.2	Install ladders such that the platforms are between 7 – 12 inches from the centerline for step-through ladders and between 15 – 20 inches (1 foot 3 inches – one foot 8 inches) from the centerline for side-step ladders. Routinely inspect, clean, and maintain ladders and platforms to meet specified step across distances.
Rungs	Distance/spacing between rungs (cleats or steps) are not uniform throughout length of ladder.	CFR 29 §1910.23(b)(1) CFR 29 §1926.1053(a)(2) ANSI-ASC A14.3-2008 5.1.1 ASAE S412.1 MAR1990 (R2014) 3.2.1	Install ladders with rungs that are at least 16 inches (1 foot 4 inches) wide, level, parallel, uniformly sized, and consistently spaced (between 10 – 14 inches vertically). Ensure that the first rung is less than 14 inches (1 foot 2 inches) from the walking surface and that the top rung is flush with the landing. Routinely inspect and maintain ladders.
	Rungs are not of uniform size (cross section) throughout length of ladder.	ANSI-ASC A14.3-2008 5.1.3.1 (d)	
	Rungs are not parallel.	ANSI-ASC A14.3-2008 5.1.3.1 (e)	
	Rungs are not level.	ANSI-ASC A14.3-2008 5.1.3.1 (e)	
	The first rung of the ladder is greater than 14 inches (1 foot 2 inches) from the floor.	ANSI-ASC A14.3-2008 5.1.1	
	Distance between rungs are not between 10 – 14 inches.	CFR 29 §1910.23(b)(2) CFR 29 §1926.1053(a)(3)(ii) ANSI-ASC A14.3-2008 5.1.1 ASAE S412.1 MAR1990 (R2014) 3.2.1	
	Width of rung is less than 16 inches (1 foot 4 inches) .	CFR 29 §1910.23(b)(4) CFR 29 §1926.1053(a)(4)(i) ANSI-ASC A14.3-2008 5.1.2 ASAE S412.1 MAR1990 (R2014) 3.2.2	
	Top rung not level with the access/egress platform.	ANSI-ASC A14.3-2008 5.3.1	
	For circular rungs, rung diameter is less than ¾ inches (1 inch for corrosive environments).	ANSI-ASC A14.3-2008 5.1.3.1 (a) ANSI-ASC A14.3-2008 5.1.3.1 (a) ANSI-ASC A14.3-2008 5.1.3.2 (a) ANSI-ASC A14.3-2008 5.1.3.2 (b) ASAE S412.1 MAR1990 (R2014) 3.2.3	Install circular steel rungs that are at least 1 inch in diameter. Ensure all metal rungs are corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping. Routinely inspect and maintain ladders rungs.

Primary category	Observable hazard	Standard	Remedial recommendation
	Rungs not corrugated, knurled, dimpled, coated with skid-resistant material, or otherwise treated to minimize slipping.	CFR 29 §1926.1053(a)(6)(i)	
	Rust on metal ladders.	CFR 29 §1910.23(b)(6)	Paint or treat metal ladders to resist corrosion and rusting. Routinely inspect and maintain corrosion and rust-resistant treatments.
Side rails & Grab bars	Side rails do not have the same shape for the entire section of ladder.	ANSI-ASC A14.3-2008 5.2.1.2 ASAE S412.1 MAR1990 (R2014) 3.3.1	Install side rails with the same shape for the entire length of the ladder. Routinely inspect and maintain side rails to ensure they are of uniform shape for the length of the ladder.
	Grab bar cross-section is not equal to the rung.	CFR 29 §1910.23(d)(8)	Install grab bars that do not protrude beyond the rungs of the ladder and are not smaller (cross-section) than the rungs
	Grab bars protrude out beyond the rungs of the ladder	CFR 29 §1910.23(d)(3)	
	Handholds not provided above landing or side rails extend less than 36 inches (3 feet) above top of landing (platform).	CFR 30 §56.11006 CFR 29 §1910.23(d)(4) CFR 29 §1910.23(d)(7) CFR 29 §1910.23(c)(11) CFR 29 §1926.1053(a)(24) ANSI-ASC A14.3-2008 5.3.2.1	Install side rails that extend at least 36 inches (3 feet) above the landing and are flared to 24-30 inches (2 feet – 2 feet 6 inches) wide; or install substantial handholds above the landing. Routinely inspect and maintain side rail extensions and handholds.
	Side rails width is not flared to between 24 – 30 inches (2 feet – 2 feet 6 inches) on extension above landings.	CFR 29 §1910.23(d)(5) CFR 29 §1926.1053(a)(25) ANSI-ASC A14.3-2008 5.3.2.2	
Use of ladder	Individual not facing ladder when using it.	CFR 30 §56.11011 CFR 29 §1926.1053(b)(20) ANSI-ASC A14.3-2008 9.2.1	There are multiple behaviors that workers should use to stay safe on ladders. Do not use outdoor ladders in inclement weather. Wear shoes that have heels with a defined front edge. Clean debris, mud, ice, or grease from the ladder and from your gloves and shoes. Check for defects on the ladder such as broken, loose, or bent parts before climbing. Face the ladder when climbing up and down. Never jump from, slide down, or climb more than one rung at a
	Individual does not always maintain three points of contact	CFR 29 §1926.1053(b)(21) ANSI-ASC A14.3-2008 9.2.1	
	Individual carrying object or load in hand when ascending or descending ladders.	CFR 30 §56.11011 CFR 29 §1926.1053(b)(22) ANSI-ASC A14.3-2008 9.2.2	
	Individual jumps/slides off ladder.	ANSI-ASC A14.3-2008 9.2.3	

Primary category	Observable hazard	Standard	Remedial recommendation
	Individual wearing shoes without heels when using ladders.	ANSI-ASC A14.3-2008 9.2.4	time. When climbing, don't carry anything in your hands. Use a backpack or shoulder strap for tools and personal items. Establish a policy and training plan to ensure workers appropriately use ladders. Some useful resources include "Steps to Ladder Safety" and http://stopconstructionfalls.com.
	Individual uses ladder when there are inclement conditions such as high winds, storms.	ANSI-ASC A14.3-2008 9.2.7	
	Hands, gloves, or footwear has oil, grease, ice, snow, or another slipping hazard on them	ANSI-ASC A14.3-2008 9.2.5	
	Ladder used for purpose other than what it was designed.	CFR 29 §1926.1053(b)(4)	Use ladders only for the intended purpose, ascending and descending.