
	SOP-647 (Ver. 2) Ladder Safety Program
Standard Operating Procedure (SOP)	Effective: 1/25/2022 Supersedes: 11/02/2020
Approved By: James D. Herberg General Manager 	

I. Purpose

The purpose of the Ladder Safety Program is to establish the minimum requirements for Orange County Sanitation District (OC San) employees regarding the proper selection, care, and use of portable ladders (including stepladders, extension ladders, and articulating ladders). This program also addresses fixed ladders to ensure safety under normal conditions of use. This program does not cover scaffolds or elevated work platforms which are covered by other separate programs.

OC San employees may be required to operate ladders as part of their job duties. To minimize risks to people and property OC San restricts the operation of all ladders to those persons who have been properly trained.

II. Background

The main hazard associated with the use of ladders is falls. Falls occur for several reasons, including but not limited to the following:

- The ladder is in poor condition or is the improper type or size for the task at hand.
- The ladder is poorly located and/or incorrectly positioned.
- The surface on which the ladder is located is slippery or uneven.
- Proper techniques are not observed when using the ladder.

The Ladder Safety Program applies to all OC San employees as well as to others such as contractors while using ladders on any OC San property. The intent of this program is to control ladder hazards by ensuring the following:

- Ladders are maintained and operated according to manufacturer's recommendations.
- Responsible persons are trained.
- Safe work practices and safety regulations are followed.
- Portable ladders are inspected for general ladder safety.

This program must be understood and complied with by all persons charged with the responsibility of operating, servicing, inspecting, and managing fixed and portable ladders, and related equipment on OC San's behalf.

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III. Definitions

Cage – a guard that may be referred to as a cage or basket guard which is an enclosure that is fastened to the side rails of a fixed ladder or the structure to encircle the climbing space of the ladder for the safety of the person who must climb the ladder.

Cleat - a ladder crosspiece of rectangular cross section placed on edge upon which a person may step while ascending or descending a ladder.

Extension Ladder - A non-self-supporting portable ladder adjustable in length. It consists of two or more sections traveling in guides or brackets so arranged as to permit length adjustment. Its size is designated by the sum of the lengths of the sections measured along the side rails.

Fixed Ladder - A ladder permanently attached to a structure, building, or equipment.

Job-made Ladder - a ladder that is fabricated by employees, typically at the construction site, and is not commercially manufactured. This definition does not apply to any individual rung/step ladders.

Ladder – An appliance usually consisting of two side rails joined at regular intervals by cross-pieces called steps, rungs, or cleats, on which a person may step in ascending or descending.

Ladder Gate – a climb preventive shield or cover installed on a fixed ladder to control access to tanks or other high structures.

Ladder Safety System – A device, other than a cage or well, designed to eliminate or reduce the possibility of falls from ladders. A ladder safety system usually consists of a carrier (the track of flexible cable or rigid rail), safety sleeve (moving component which travels on the carrier), lanyard, connectors, and body belt or harness (formerly called a ladder safety device).

Maximum Intended Load - the total load of all employees, equipment, tools, materials, transmitted loads, and other loads anticipated to be applied to a ladder component at any one time.

Pitch – the included angle between the horizontal and the ladder, measured on the opposite side of the ladder from the climbing side.

Platform Ladder – a self-supporting portable ladder that is non-adjustable in length, with a platform provided at the highest intended standing level. The top platform is surrounded on three sides by a railing that is at least 20 inches higher than the platform surface.

Point of Access - all areas used by employees for work related passage from one area or level to another. Such open areas include doorways, passageways, stairway openings, studded walls, and various other permanent or temporary openings used for such travel.

Rungs – Ladder cross-pieces of circular or oval cross-section on which a person may step in ascending or descending.

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Stepladder – a self-supporting portable ladder, nonadjustable in length, having flat steps and a hinged back. Its size is designated by the overall length of the ladder measured along the front edge of the side rails.

Trestle Ladder – a self-supporting portable ladder, nonadjustable in length, consisting of two sections hinged at the top to form equal angles with the base. The size is designated by the length of the side rails measured along the front edge.

IV. Responsibilities

A. Risk Management

1. Review the Ladder Safety Program on an annual basis and revise it as necessary.
2. Provide ladder safety training to affected personnel.
3. Provide technical support to employees and divisions using ladders.
4. Verify inspections are conducted.
5. Maintain training records.

B. Supervisors

1. Provide the proper type, rated, and ANSI-compliant ladders for employees to use based on the task.
2. Evaluate the effectiveness of the program as it applies to their employees and provide Risk Management with their conclusions and recommendations.
3. Ensure the proper safety equipment is supplied to their affected employees where needed.
4. Ensure that employees attend all required training.
5. Ensure designated employees perform documented portable ladder inspections.

C. Employees

1. Comply with this program and ensure that all ladders used are OSHA and ANSI-compliance.
2. Properly select, use, handle, and store ladders in accordance with the instructions and training received.
3. Thoroughly inspect and maintain ladders before and after use. Ladder inspections are to be documented. A ladder inspection tag that can be affixed to the ladder is available through the Warehouse.
4. Notify their supervisor when they are not physically able to use a ladder or when questions arise regarding the safe use of a ladder, such as defective equipment,

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needed accessories, or any other difficulties complying with the requirements of this program.

5. Report any hazards observed, which could compromise personal safety or the safety of others to their supervisor immediately.
6. Complete ladder safety training.

D. Contractors

1. Contractors shall be responsible for bringing and using their own portable ladders on OC San premises.
2. Contractors shall not use damaged or defective ladders.
3. Contractors shall inspect fixed ladders prior to use. Any defects or damage shall be reported to OC San.

V. General Ladder Safety

- A. Ensure all ladders are constructed and used in accordance with Cal/OSHA regulations and ANSI standards, and all commercially manufactured ladders have a label indicating it meets the requirements of the ANSI standard. The label must be legible.
- B. Visually inspect portable ladders before use and following any incident (i.e., dropped ladder). Ensure that any faulty ladders are decommissioned and taken out of service.
- C. Maintain ladders free of oil, grease, and other slipping hazards.
- D. Before climbing a ladder, muddy or slippery work boots shall be cleaned. Replace greasy or dirt-laden gloves.
- E. Do not carry tools or equipment in your hands when climbing a ladder. Carry tools on a work belt, in a shoulder bag, backpack, or use a hand line to raise or lower equipment.
- F. Do not load ladders beyond their maximum intended load nor beyond their manufacturers rated capacity.
- G. Use ladders only for their designated purpose.
- H. Use ladders only on stable and level surfaces unless secured to prevent accidental movement. Do not use ladders on slippery surfaces unless secured or provided with slip-resistant feet to prevent additional movement.
- I. Secure ladders placed in areas such as passageways, doorways, or where they can be displaced by workplace activities or traffic to prevent additional movement.,
- J. Only one person at a time is allowed on single-width ladder, including portable and fixed ladders, unless otherwise indicated by the manufacturer.
- K. Face the ladder when moving up or down.

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- L. Maintain 3 points of contact (two hands and a foot, or two feet and a hand) when ascending or descending (climbing) the ladder. Keep your body between the side rails. When climbing the ladder, the user shall face the ladder and maintain a firm hold on the ladder. It is preferable to grasp the rungs with an overhand grip as opposed to grabbing the rails. Grip strength is improved while grasping the rungs.
- M. Never connect short ladders to form a longer ladder.
- N. Use ladders only for their intended purpose (i.e., do not use as scaffolding, etc.)
- O. Where possible, straight ladders should be secured with a rope or wire at the top and blocked at the bottom.
- P. Do not over-reach, jump or slide a ladder while on it. Generally, always keep your belt buckle between the rails when on a ladder. Never put one foot on the ladder and the other on an adjacent surface. Ladders shall not be moved, shifted, or extended while occupied.
- Q. Barricades and warning signs should be posted when ladders are placed near doors or other locations where they could be struck.
- R. The area around the top and bottom of the ladder shall be always kept clear.
- S. The ladder shall be kept close to the work.
- T. The user shall not overreach and shall descend and relocate the ladder instead.
- U. When using a ladder, the user shall never push or pull unless the ladder is properly secured.
- V. Belt buckle area of the body should remain centered on the ladder and never extend beyond the side rails. If the user reaches outside the side rails, fall protection is required.
- W. Users are cautioned to take proper safety measures when ladders are used in areas containing electrical circuits. These precautions should prevent any contact or possible contact with an energized, uninsulated circuit or conductor to avoid electrical shock or short circuit.
- X. Users must maintain safe distance from overhead powerlines and energized circuits.

VI. Portable Ladders

- A. General Requirements
 - 1. Only use ladders for their intended purpose and not for platforms or as walk-boards.
 - 2. Select the correct type of portable ladder by considering the duty rating, ladder type and height required to safely complete the job task. The five ladder types and their duty ratings are as follows:
 - a. Type IAA – Extra Heavy Duty, 375-pound load capacity

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- b. Type IA – Extra Heavy Duty, 300-pound load capacity
 - c. Type I – Heavy Duty (Industrial), 250-pound load capacity
 - d. Type II – Medium Duty (Commercial), 225-pound load capacity
 - e. Type III – Light Duty (Household), 200-pound load capacity
3. Rungs and steps are corrugated, knurled, dimpled, coated with skid resistant material, or otherwise treated to minimize the possibility of slipping.
 4. Remove damaged ladders from service and tag as “Dangerous, Do Not Use”, or with other similar language, until the repairs are made. Note: Ladders that cannot be repaired must be withdrawn from service and destroyed in such a manner as to render it useless.
 5. Ensure portable ladders are equipped with non-slip bases or safety feet.
 6. Place ladders on a stable, slip-resistant surface.
 7. Do not place ladders on boxes, barrels, or other unstable bases or splice ladders together to obtain additional height.
 8. Block open, lock or otherwise guard doorways that open towards a ladder.
 9. Use barricades or cones and signage when ladders must be set-up in high traffic areas, such as hallways or stairwells.
 10. Never attempt to move, shift, or extend a ladder while standing or climbing on it. Set-up ladders close to the work area and do not over-reach.
 11. To maintain balance, do not climb higher than the second step from the top cap on a stepladder or the third rung from the top on a straight ladder.
 12. Do not use the rear of a stepladder for climbing or standing. These are designed solely for increasing stability.
 13. When accessing an upper landing surface, such as a roof or entry point into a confined space, ensure the side rails of non-self-supporting ladders extend at least three (3) feet above the upper landing, eave, or edge.
 14. Ensure that the top of a non-self-supporting ladder is placed with the two rails supported unless it is equipped with a single support attachment. Such an attachment is designed to provide greater stability.
 15. When setting up an extension ladder, follow the 4 to 1 rule: place the base of the ladder one foot away from the supporting wall, for every four feet in height the ladder is extended.
 16. When transporting ladders on vehicles or equipment equipped with ladder racks, ensure the ladders are properly supported. The support points should be constructed of material that will minimize the effects of vibration, chafing and road shock. If a ladder extends out three (3) feet beyond the end of the vehicle, a red flag must be attached to the end of it.

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17. Wood and metal portable ladders are prohibited unless Risk Management has evaluated and provided exception to such use.

B. Stepladders

1. The spreader assembly is a required component of all stepladders and must be fully opened and locked before use. Never climb a folded stepladder.
2. Stepladders cannot exceed twenty (20) feet in height.
3. Do not use the top cap of a stepladder as a step or permit a plank to be placed on the top step.
4. Portable ladders are designed to support one person along with all necessary equipment (tools, materials, etc.).

C. Platform Ladders

1. Platform Ladders range in size from two (2) feet to eighteen (18) feet in length as measured from the bottom along the side rail to the top of the platform.
2. The top platform is surrounded on three sides by a railing that is at least 42 inches higher than the platform surface. A folding Bucket (Pail) Shelf may also be provided.
3. Ensure that the platform ladder is on level ground before use, such that all four of its side rails are supported.
4. Never use a platform ladder as a single ladder or in the partially open position.

D. Single Ladders and Extension Ladders

1. Individual sections of extension ladders cannot exceed thirty (30) feet in length.
2. Two-section extension ladders cannot exceed forty-eight (48) feet in length. Extension ladders with more than two-sections cannot exceed sixty (60) feet in length.
3. When a person is climbing an extension ladder at heights of twenty (20) feet or higher, ensure that a second person is present to steady the ladder's base or that the top of the ladder is effectively secured to a sound anchor point.
4. On two-section extension ladders, ensure that the minimum overlap for the two sections is in accordance with the manufacturer's recommendations.

E. Mobile Ladder Stands

1. Use mobile ladder stands and platforms on level surfaces.
2. When provided, use the handrails while ascending or descending the mobile ladder.
3. Always face the mobile ladder while ascending or descending, except when the slope of the steps is 50 degrees or less above the horizontal.

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4. Never move a mobile ladder stand while standing on climbing on it.
5. Do not store materials and/or equipment on the steps or platform.
6. Maintain mobile ladder stands in good condition and ensure exposed surfaces do not develop sharp edges, burrs, or other safety hazards, such as corrosion or deterioration.
7. Never exceed the maximum work-level height of a mobile ladder stand, which is calculated as four (4) times the minimum or least base dimension. Where the least base dimension requirement is not met, either install suitable outrigger frames or make provisions to guy or brace the unit against tipping.
8. Never use boxes, ladders, or other objects on a platform, or sit or stand on the guard rails to increase the working height.

VII. Fixed Ladders

A. General Requirements

1. Know the basic minimum design requirements for fixed ladders:
 - a. Ladders, at a minimum, must support a single concentrated load of two hundred (200) pounds. If necessary, they should be painted or treated to prevent rust and deterioration depending on their location.
 - b. The distance between rungs, cleats and steps must not exceed twelve (12) inches and must be uniform throughout the length of the ladder.
 - c. The clear length of rungs must be sixteen (16) inches.
 - d. The rungs of an individual-rung ladder must be designed so that an employee's foot cannot slide off the end.
 - e. Rungs are at least three quarter (3/4) inch diameter on metal ladders
 - f. The side rails of through or side-step ladder extensions must extend three and a half (3.5) feet above parapets and landings.
 - g. The preferred pitch of fixed ladders is in the range of 75° and 90° with the horizontal.
 - h. Substandard pitch is in the range of 60° and 75° with the horizontal and is only permitted where it is necessary to meet the conditions of installation.
 - i. Ladders having a pitch more than 90° with the horizontal are prohibited.
 - j. There must be a clear width of 15 inches on each side of the center line of the ladder unless the ladder is equipped with a cage or well.
 - k. Fixed ladders must have cages if they are longer than 20 feet. Landing platforms must be provided on ladders greater than 20 feet long. A platform is required every 30 feet for caged ladders and every 20 feet for unprotected ladders.
 - l. There must be at least a 7-inch clearance behind the ladder to provide adequate toe space.
 - m. No more than one person at a time is allowed on each section of the ladder.

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2. Maintain ladders in safe condition and perform fixed ladder inspections regularly, with the interval between inspections determined by use and exposure.
3. When a defect is not repairable, ensure the ladder is tagged as “out of service”.

B. Cages and Wells

1. Ensure cages or wells are provided on ladders of more than twenty (20) feet to a maximum unbroken length of thirty (30) feet, except where suitable sliding fall protection devices are installed:
 - a. Cages must extend a minimum of forty-two (42) inches above the top of landing unless other acceptable protection is provided.
 - b. Cages must extend down the ladder to a point not less than seven (7) feet nor more than eight (8) feet above the base of the ladder, with bottom flared not less than four (4) inches, or portion of cage opposite ladder shall be carried to the base.
2. There should be no projections inside the cage or well.
3. Ladder safety devices may be used on tower, water tank, and chimney ladders over twenty (20) feet in unbroken length in lieu of cage protection.

C. Platform Landings

1. When ladders are used over twenty (20) feet in height, ensure that landing platforms are provided for each thirty (30) feet of height:
 - a. If no cage, well, or ladder safety device is provided, a landing platform must be provided for each twenty (20) feet of height.
 - b. Each ladder section must be offset from adjacent sections.
 - c. Where an offset is required, a landing platform must be provided.
 - d. Landing platforms cannot be less than twenty-four (24) inches in width by thirty (30) inches in length.
2. Where a person must step a distance greater than twelve (12) inches from the centerline of the rung of a ladder to the nearest edge of structure or equipment, ensure that a landing platform is provided with a minimum step-across distance of two and a half (2.5) inches.
3. Ensure all landing platforms are equipped with standard railings and toe boards.

D. Ladder Safety Systems

1. All ladder safety systems, such as those that incorporate lifebelts, friction brakes, and sliding attachments, must meet the design requirements of the ladders which they serve.
2. Ladder safety systems are required on fixed ladders 24 feet or more in height.
3. Do not allow the connection between the carrier or lifeline and the point of attachment to the body belt or harness to exceed nine (9) inches in length.

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4. Ensure all ladder safety systems and related support systems on fixed ladders conform to the following:
 - a. All safety devices must be able to withstand, without failure, a drop test consisting of a five hundred (500) pound weight dropping eighteen (18) inches.
 - b. All safety devices must permit the worker to ascend or descend without continually having to hold, push or pull any part of the system, leaving both hands free for climbing.
 - c. All safety devices must be activated within two (2) feet after a fall occurs and limit the descending velocity of an employee to seven (7) feet per second or less.
5. Follow all requirements for mounting ladder safety systems on fixed ladders:
 - a. Mountings for rigid carriers must be attached at each end of the carrier, with intermediate mountings spaced along the entire length of the carrier, to provide the necessary strength to stop workers' falls.
 - b. Mountings for flexible carriers must be attached at each end of the carrier.
 - c. Design and installation of mountings and cable guides must not reduce the strength of the ladder. Installation shall be in accordance with manufacturer recommendations and instructions.

VIII. Maintenance Requirements

- A. Only trained and qualified persons can make repairs to ladders.
- B. Ladder repairs must restore the ladder to a condition meeting the manufacturer's original design criteria before the ladder is returned to service.
- C. Follow ladder manufacturer instructions for lubrication of mechanical parts, such as metal bearings of locks, wheels, and pulleys.
 1. For articulated ladders, lubricate the hinges upon receipt and then annually or more frequently, depending upon use.
- D. Ensure all welding is performed in accordance with the "Code for Welding in Building Construction" (AWSD1.0-1966).
- E. Ensure metal ladders and appurtenances are painted or otherwise treated to resist corrosion and rusting, when location demands.
- F. Refer to manufacturer instructions for cleaning.
- G. Do not store ladders in direct sunlight, extreme temperatures or in damp environments.
- H. Store non-self-supporting ladders horizontally and ensure wall supports or brackets are provided at 4 to 6-foot intervals to prevent sagging.
- I. Store self-supporting ladders vertically in the closed position.
- J. Proper ladder maintenance ensures the safe condition of the ladder. Hardware, fittings, and accessories should be checked frequently and kept in proper working condition. All

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pivoting connections and the rung-lock cam surfaces should be lubricated frequently. All bolts and rivets shall be in place and secure before using a ladder, and no ladders shall be used if any bolts or rivets are missing or if the joints between the steps (or rungs) and the side rails are not tight. Ladders with safety shoes or padded feet which are excessively worn shall be taken out of service until repaired.

IX. Inspections

- A. Ensure that ladder inspections are conducted, as specified in this document, and that a record of the inspection is maintained either on a ladder inspection tag.
 - 1. Adhesive ladder inspection tags shall be affixed to the side rail of the extension ladder and A-frame ladder.
 - 2. Mobile staircase ladder inspection tags shall be affixed using a zip tie or cable tie to a support member of the ladder.
 - 3. Never permanently affix (e.g., rivets, screws, etc.) a ladder inspection tag or reference number to the ladder, unless it is approved by the manufacturer. Modifications to a ladder without the manufacturer's approval may compromise the integrity such that the ladder no longer meets specification.
- B. Portable extension ladders and A-frame ladders shall have a documented inspection at least every month. Users shall informally inspect prior to each use. The monthly inspections shall be documented on OC SAN ladder inspection labels, which can be found in the Warehouse (item No. 806151).
- C. Mobile staircase ladders shall have a documented inspection at least every quarter, unless noted otherwise by the manufacturer. Inspection tags can be obtained from Risk Management.
- D. Fixed ladders shall be visually inspected prior to each use. When conducting fixed ladder inspections, ensure that:
 - 1. Ladders are secured to the structure or object to which they are attached.
 - 2. All splices and connections have smooth transitions with the original members and have no sharp or extensive projections.
 - 3. Side rails (used as climbing aids), rungs, cleats and steps are free of splinters, sharp edges, and burrs.
- E. Employees should conduct inspections for general ladder safety for all portable ladder types by checking the following:
 - 1. Ladders should not have any damage, lack of structural integrity, missing components, or loose parts. The steps or rungs must be tight and secure to the side rails.
 - 2. The safety feet or other auxiliary equipment (such as ropes) are kept in good condition.

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3. The stepping surfaces are free of oil, grease, or other slippery substances.
4. Movable parts must be tested to see that they operate without binding or without too much free play.
5. All labels should be intact and readable.
6. Ladders shall be free of oil, grease, or slippery materials.
7. A ladder that has been exposed to fire or strong chemicals should be discarded.
8. All accessories such as leg levelers, paint shelves, stand-off shelves, etc. are in good condition.
9. The ladder base shall be placed on a secure and level footing. When necessary, ladder levelers shall be used to achieve equal rail support on uneven surfaces.
10. The ladder base must have the slip resistant material.
11. While inspecting extension ladders, you need to make sure that:
 - a. Ropes and pulleys are in good condition.
 - b. Ladder extension locks move freely and lock correctly
 - c. Rung locks are on the rails of the top section to ensure the top section will not fall.
 - d. Extension guide brackets are secure and in place
12. Fiberglass or plastic ladders should be inspected for the following elements as well:
 - a. cracks, chips, and splinters
 - b. deformed rails or rungs from heat, chemical or environmental exposure
 - c. bends and breaks

X. Selection

- A. The following shall be considered when selecting a ladder:
 1. Long or tall enough to provide access to the work area without having the employees stand on the top 2 steps of a step ladder or the top 3 rungs of a straight ladder.
 2. Consider the ladder rating and the maximum intended load-carrying capacity of the ladder for the task.
 3. Type of ladder necessary (extension, step ladder, etc.).
 4. The height which needs to be achieved.
 5. Material the ladder is made of.

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XI. Fall Protection

- A. Refer to OC San SOP-626 Fall Protection for additional information regarding protecting employees from fall hazards.
- B. Fixed ladders: fall protection must be provided for employees climbing or working on fixed ladders above 24 feet.
- C. Portable ladders: fall protection is not required for employees climbing or working on portable ladders provided all safety rules (such as maintaining three points of contact) can be observed while performing work.

XII. Training

- A. All employees that utilize ladders must participate in the “Ladder Safety Training Program” and shall receive online Ladder Safety Training.
- B. The training program is developed to ensure each employee can recognize hazards related to the selection, use, handling, and environmental surroundings affecting the safe use of ladders.
- C. Employees will receive information on the proper procedures and work practices to minimize these hazards.
- D. The program is designed to train each employee in the following areas, as applicable:
 - 1. The nature of fall hazards in the work area.
 - 2. The correct procedures for selecting, erecting, using, and maintaining ladders and their associated equipment including disassembly of fall protection systems, if applicable.
 - 3. The proper construction, use, placement, and care in handling of ladders.
 - 4. Retraining will be provided for each employee as necessary so that the employee maintains the understanding and knowledge acquired through compliance with this section.

XIII. Recordkeeping

All records created or generated during this procedure shall be legible and stored in a way that they are readily retrievable in facilities or electronic document/content management systems that provide a suitable environment to prevent damage, deterioration, or loss. Records may be in the form of any type of media, such as hard copy or electronic media. The OC SAN Records Retention Schedule is the official procedure governing the retention, retirement, and destruction of OC SAN records. Document owners should use these schedules to determine the item and series that best fit their records. Document owners are responsible for ensuring that documents are properly marked, indexed, and filed for their projects or area of responsibility.

XIV. References

Title 8, California Code of Regulations, Section 3276, Portable Ladders

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Title 8, California Code of Regulations, Section 3277, Fixed Ladders

Title 8, California Code of Regulations, Section 3278, Use of Fixed Ladders

XV. Revision History

Version	Date	By	Reason
1.0	09/11/2020	Frattali, John	New
2.0	09/17/2021	Spencer, Case	Periodic Update – Refer to Program Change Log