



Office of the Fire Marshal
1320 Willamette St.
(541) 682-5411



Fire Escape Testing and Maintenance Policy 08-08

References: 2007 OFC 1027.16, 2007 OSSC 3404

Scope

This policy presents an explanation and summary of the OFC and OSSC maintenance and testing requirements for fire escapes.

***OFC 1027.16.5 Materials and Strength:** The fire code official is authorized to require testing or other satisfactory evidence that an existing fire escape stair meets the requirement of this section.*

References

1. 2007 Oregon Fire Code (OFC) Chapter 10, 1027.16
2. 2007 Oregon Structural Specialty Code (OSSC) Chapter 34, 3404
3. Oregon Revised Statutes (ORS) 479
4. 1982 UBC Appendix 1 section 111 and UFC Appendix 1-A section 2(d)

General

1. This policy is established May 28, 2008 but reflects code expectations that have been in effect as noted in the reference list.
2. It is the purpose of this policy to establish 1) procedures for the inspection, testing and certification of fire escapes, as well as providing information pertaining to acceptable methods of repair when needed; 2) the process for the removal of counterbalance stairs; and 3) the removal of fire escapes.
3. The city of Eugene has fire escapes that are attached to existing buildings and are part of the required emergency egress system or serve as firefighting platforms. Many of these fire escapes and the buildings they are attached to are very old. Through natural disintegration and/or neglect many of these fire escapes have fallen into a state of disrepair and may be unsafe if used by the occupants or by firefighters during an emergency.
4. When exit systems throughout a building are upgraded an owner may request removal of existing exterior fire escapes.

Origin of the Policy

For several years the Fire Marshal's Office has been requiring fire escapes to be inspected in accordance with the OFC and certified to be safe by a licensed engineer. Unfortunately, the engineering reports have not been adequate nor had any engineer or firm load tested the fire escapes as required by the fire code. One engineer said the testing could not be done. This is causing a disservice to building owners and occupants as well as put occupants and emergency responders at risk. In trying to determine how to get fire escapes certified as being safe to use it was discovered that Portland Fire Department (FD) had been working on the same issue. Portland FD researched other departments and has used Tacoma and Seattle's testing criteria as a starting point for their test procedure. Portland FD has collaborated with other engineering firms and the Building Department engineers to develop a reasonable testing procedure. Eugene's Fire Marshal's Office has adapted Portland's policy, with permission, for the local area.

Inspection, Testing, Maintenance, and Repair

1. Inspection
 - A. Fire escapes shall be certified as safe and can pass the load performance test every five years. A final test packet and report shall be submitted by the Engineer of Record (EOR). The final test packet shall include a summary report of the condition of the fire escape(s), Fire Escape Inspection Checklist(s), Fire Escape Affidavit, and the test drawings and procedure(s).
 - B. The Engineer of Record shall use and complete the Fire Escape Inspection Checklist, **Attachment 1**.
 - C. At the time of a fire inspection, the fire inspector will perform a visual inspection of the fire escape(s), using the inspection checklist as a guide, refer to **Attachment 1**. If the condition of the fire escape, between the five (5) year certification processes, appears to be an imminent hazard based upon key visual indicators the inspector shall order an evaluation and certification by a structural engineer or licensed architect at that time. Key visual indicators include missing pieces, deformation of joints due to rust development, loose or absent connections between pieces,

or degraded connections to the structure.

- D. If the fire escape(s), between the five (5) year certification processes, appears to be safe for use following the visual inspection, the inspector shall cite the responsible party to provide any needed maintenance such as minor repairs to steps, handrails, cleaning, and painting. Refer to **Attachment 2**, Fire Escape Repair, Cleaning, and Painting.
- E. Fire Escape Access: Access to exterior fire escapes is commonly via doors/windows at the end of a common hallway or via a tenant space/apartment unit. Exit access requirements limit the number and types of locks/locking devices, the size of the opening, size and type of breakable glass, the presence of tools for breaking the glass, and signage for locating the fire escape.
- F. Locks: The final access opening to a fire escape is limited to a single locking device that can be operated without a key or special knowledge. Generally, this is a simple window latch located where it can be easily seen and reached. Additional storm windows and screens shall be as approved by the fire inspector. Doors at the end of a hallway may have a simple passage handle or a thumb-turn lock.
- G. Signage: Fire escape access points are to be provided with a sign "FIRE ESCAPE" to be visible on approach. These signs have been installed as paper/plastic/metal signs with external illumination, older style glass light fixtures (green or red) with FIRE ESCAPE painted on them, or newer internally illuminated signs indicating either FIRE ESCAPE or EXIT. Modifications or upgrades to existing signage may be ordered by the Fire Marshal or required as part of permitted work through the PIC. The preferred wording for signage leading to an exterior fire escape is "FIRE ESCAPE".

2. Ongoing Maintenance

- A. All fire escapes shall be subject to a visual inspection by a fire inspector.
- B. All fire escapes shall be certified every five (5) years according to the following standard acceptable to the Fire Marshal:
 - 1. Testing: When a load test is required by the Fire Marshal's Office (FMO), or when a fire inspector deems a fire escape is an imminent hazard based upon key visual indicators, the following steps shall apply:
 - a) A load test process and report must be prepared by a licensed engineer or licensed architect, and approved by the Fire Marshal. Major repairs shall be performed under benefit of permit through the Permit Information Center (PIC). See **Attachment 4**, Performance/Testing Criteria.
 - b) Certification that the fire escape has been tested, repaired, and is determined to be structurally safe according to the approved load test process shall be provided through affidavit by a licensed engineer, licensed architect, or other qualified testing agency acceptable to the Fire Marshal. Refer to **Attachment 3**, Fire Escape and Fire Balcony Affidavit.

Requests for Removal of Counterbalance Stairs or a Fire Escape

Requests for removal may be granted by the Fire Marshal and Building Official when the counterbalance could be used by unauthorized persons to enter the building. For the Fire Marshal and Building Official to review the removal request all of the following conditions must be met and provided by a licensed architect or engineer.

- 1. All requests for removal of counterbalance stairs or fire escape shall be handled through a consultation or review process, which includes payment of a fee.
- 2. An egress code study shall be submitted by an architect or engineer.
- 3. The number of existing exits and distance to the exit complies with the current OSSC requirements.
- 4. A request for the removal of either shall include floor plan(s) of the building which specifically detail all stairways, interior corridors, fire escape locations and location of counter-balance stairs to be removed.
- 5. The building is equipped throughout with a currently serviced and repaired sprinkler system.
- 6. If the counterbalance stair is removed, the hole in the platform shall be filled with a permanent grate or other material capable of supporting 300 pounds.
- 7. Plot Plan, showing the building in relation to adjacent property lines and the fire escape location(s)

The Fire Marshal and Building Official shall approve, approve with conditions, or disapprove the request.

If the request is granted, documentation shall be maintained justifying the removal of the counterbalance stairs or fire escape.



Eugene Fire & EMS
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Fire Escape Inspection Checklist
For Existing Buildings, OFC 1027.16, OSSC 3404

Building Name: _____ Address: _____

Building Age: _____ Stair Location: _____

Building Owner and Mailing Address: _____

- | Yes | No | |
|----------|------|---|
| 1. ____ | ____ | Location and anchorage are of approved design and construction. |
| 2. ____ | ____ | Access is clear and unobstructed through the intervening room? Yes or No Note: Access is not permitted through an intervening room. OFC 1027.16.4 |
| a. ____ | ____ | If yes, what is the use of the room? _____ |
| b. ____ | ____ | Is there a lock on the room door? If yes, what type? _____ |
| 3. ____ | ____ | Are all required fire exit and fire escape signs in place, lighted, and in good working order? OFC 1027.3 |
| 4. ____ | ____ | Are all openings within 10 feet of the fire escape protected by ¾ hour fire –rated assemblies? Not required if the building is sprinklered throughout. OFC 1027.16.2 |
| 5. ____ | ____ | Does egress from the building onto the fire escape have a clear opening of at least 29 inches minimum dimension? OFC 1027.7 |
| a. ____ | ____ | Is it openable from the inside without a key or special knowledge? Yes or No If no, explain. |
| b. ____ | ____ | Is the sill height within 30 inches above the floor and the fire escape platform within 18 inches of the sill? If no, what are the measurements from the: Floor: _____ Landing: _____ OFC 1027.16.4 |
| 6. ____ | ____ | Is there a top and intermediate handrail on both sides of the balcony and stairs? OFC 1027.16.5 |
| 7. ____ | ____ | Is the pitch of the stairway steeper than 60 degrees? If yes, the pitch is ____ degrees. |
| 8. ____ | ____ | Is the width of the stairway at least 22 inches? If no, the width is _____ inches. OSSC 3404.4 |
| 9. ____ | ____ | Is the run of the treads equal to or greater than 9 inches? If no, the width is ____ inches. OFC 1027.10 |
| a. ____ | ____ | Is the rise between treads equal to or less than 8.25 inches? If no, the rise is ____ inches. OFC 1027.10 |
| 10. ____ | ____ | Are the dimensions of the stairway openings in each balcony at least 22 inches by 44 inches? If no, the measurements are is: ____ inches by ____ inches. |
| 11. ____ | ____ | Is the height of the balcony railing a minimum of 30 inches? If no, the height is ____ inches. ORS 479 |
| 12. ____ | ____ | Is the height of the lowest balcony within 18 feet of the ground? The distance is: ____ feet. OFC 1027.16.6 |
| 13. ____ | ____ | Does the fire escape extend to the ground or is it provided with counterbalanced stairs? Ground ____ Counterbalanced stairs ____ If the fire escape does not terminate at the ground or by a stair, how does it terminate? _____ |
| 14. ____ | ____ | Is the escape clean and in good working order? If no, what issue exists? _____ |
| 15. ____ | ____ | Does the stairway and landings support the dead load plus a live load of not less than 100 pounds per square foot or concentrated load of 300 lbs placed anywhere on the landing? |
| 16. ____ | ____ | Will all stair and balcony railings support a horizontal force of not less than 50 pounds per lineal foot or a concentrated load of 200 lbs placed anywhere on the railing? |
| 17. ____ | ____ | Did the landing support the maximum loading event of load testing two adjacent platforms for fire escapes serving 4 to 8 stories or two adjacent stairs and a third of the engineer's choice for fire escapes serving greater than 8 stories? |
| 18. ____ | ____ | Did the fireman's ladder support a horizontal load of 100 lbs per lineal foot; each rung support a concentrated load of 500 lbs; and a vertical load of 100 lbs per lineal foot for each foot of width? |
| 19. ____ | ____ | A supplemental engineering report and affidavit shall be provided in addition to this check list explaining in detail the deficiencies found during the inspection and load test of the fire escape(s). Digital photos shall be provided showing each fire escape and labeled to coincide with each fire escape in the report. |

Engineer of Record:

I _____, on this date _____ have inspected and tested the fire escape in accordance with this form's criteria and good engineering practices. CE-05-10 5/28/08



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Fire Escape Repair, Cleaning, and Painting Recommendation
Exterior Fire Escapes
5/28/2008

The following information recommends the methods to be used in correcting deficiencies that have been noted on your fire escape(s). These repairs must be completed as soon as practical to ensure the continued safe use of these exiting systems. Cleaning and painting may be delayed upon written request. The following can assist you in expediting the repairs, cleaning, and painting:

1. **Repairs:** may be addressed in either or both of the following methods:
 - a) **Bolts/Nuts:** If used in the replacement of existing or missing nuts/bolts/rivets, they shall be a minimum 3/8" diameter, of appropriate length, and made of stainless steel. These specifications ensure both the strength and resistance to rust for years to come.
 - b) **Welding:** Any welding done on a fire escape shall be done only by a person holding current AWS (American Welding Society) certification for the type(s) of welding being done. Welding is the preferred method of repair.

Note: After a repair but prior to cleaning and painting, contact your Fire Inspector for a reinspection.

2. **Cleaning:** of the fire escape(s) prior to painting is an extremely important step. Studies show that paint applied to a surface prepared using hand tools (scrapers, grinders, wire wheels, etc.) will survive for approximately 2.3 years, while the same paint applied following preparation by sandblasting will last about 10.3 years.
3. **Painting:** your fire escape(s) preserves the integrity of the joining systems. Paint may be applied using brush, roller, or spray and shall be applied to all surfaces.

Paint coatings are recommended to be one of the following:

- a) One (1) coat of iron oxide primer, followed by one (1) coat of alkyd enamel finish (or)
- b) One (1) coat of "Hammerite" brand paint, or
- c) One (1) coat of Valspar "Val-Chem Epoxy Mastic 75-W-9W" or
- d) Alternative coatings of paints equivalent to "B" or "C" upon approval by this office.

Attachment # 3



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Fire Escape Affidavit

Date: _____ Which Fire Escape: _____

To: Fire Marshal, Fire Marshal's Office

I certify that I have inspected the exterior fire escapes, bridge, steel, concrete, or wooden stairways, or egress balcony(s) connected to the building located at:

_____ Site Address

_____ Property Owner

_____ Owner Address City State Zip

To the best of my knowledge, information and belief, this egress component is in conformity with the provisions of the Oregon Fire Code, Oregon Structural Specialty Code, and ORS 479.

Certification is required every three (3) years by an Oregon Licensed Engineer, Licensed Architect, or other qualified testing agency acceptable to the Fire Marshal and under the direction of a Licensed Engineer or Architect.

_____ Licensed Engineer, Name License Number

_____ Licensed Architect, Name (or other approved testing agency) License Number

_____ Address Phone Number

State of Oregon

Lane County

Then personally appeared the above named:
And made oath that the above statement by him/her is true.

Before me: _____

Date: _____

My commission expires on: _____

_____ Notary Public

Attachment # 4



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Fire Escape Performance Criteria

Fire escapes shall comply with the following performance standards:

1. Fire escape **stairways** and their **landings** shall support their dead load plus a live load of not less than 100 pounds per square foot or concentrated load of 300 pounds placed anywhere on the landing, balcony or stairway so as to produce the maximum stress.

In addition to individually testing each landing/platform, the fire escapes will be tested to evaluate a maximum loading event:

- A. Buildings 4 to 8 stories in height must load two adjacent platforms simultaneously.
 - B. Buildings greater than 8 stories in height must load two adjacent platforms and a third of the engineer's choice simultaneously.
2. All stairway and balcony **railings** shall support a horizontally applied force of not less than 50 pounds per lineal foot of railing applied at top of railing, or a concentrated load of 200 pounds placed anywhere on the railing so as to produce the maximum stress.
 3. Fireman's (firefighter's) **ladders** shall be designed and connected to the building to withstand a horizontal force of 100 pounds per lineal foot in any direction; each rung shall support a concentrated load of 500 pounds placed anywhere on the rung so as to produce the maximum stress. Ladder assemblies shall have a minimum vertical load capacity of 100 pounds per lineal foot for each foot of width.
 4. Test loads are the loads specified in the 2007 OFC 1027.16.5, ORS 479.040 and 1982 Uniform Fire Code Appendix 1-A.
 5. Engineered drawings must be submitted to the Fire Marshal's Office for approval that detail where and how loads will be placed for each test for each stair, platform, ladder, and railing. A test procedure will be provided outlining each test.
 6. Below are text and detail examples taken from an engineered test procedure and reprinted with permission from Miller Consulting Engineers, 9570 SW Barbur Blvd., Suite 100 Portland, OR. You may contact Andrew Leichty or Ron Vandehey for more information on their testing procedure at 1 (503) 246-1395.

2. Fireman's ladders shall support a total test vertical load equal to 2,400 lbs. The test load may be applied to the bottom of the ladder or uniformly loaded along the entire height, but the entire load must be applied at one time. This test load is based on (8) 300 lb firemen on the ladder simultaneously. **(See attached Test #1 Diagram)**
3. Fireman's ladder rungs shall support a test load of 500 pounds applied at the center of the ladder and a non-simultaneous 500 pound load applied at the end of the ladder rung. Three rungs shall be tested per level. The test rungs shall be selected by the Engineer of Record (E.O.R.). **(See attached Test #2 Diagram)**
10. Fire escape landings shall support a test load of 100 psf applied uniformly over the walkable area of the landing. An additional load shall be applied at the location of the stairway that is equivalent to one half of the horizontal projected area of the stairway multiplied by 100 psf. For this test, all components providing interconnection between landings must be disconnected. **(See attached Test #14, Test #15, and Test #16)**
11. After reconnecting all of the landings, two consecutive landings and their stairways shall be loaded simultaneously to 100 psf. The landings to be tested shall be identified by the E.O.R. **(See attached Test #17)**

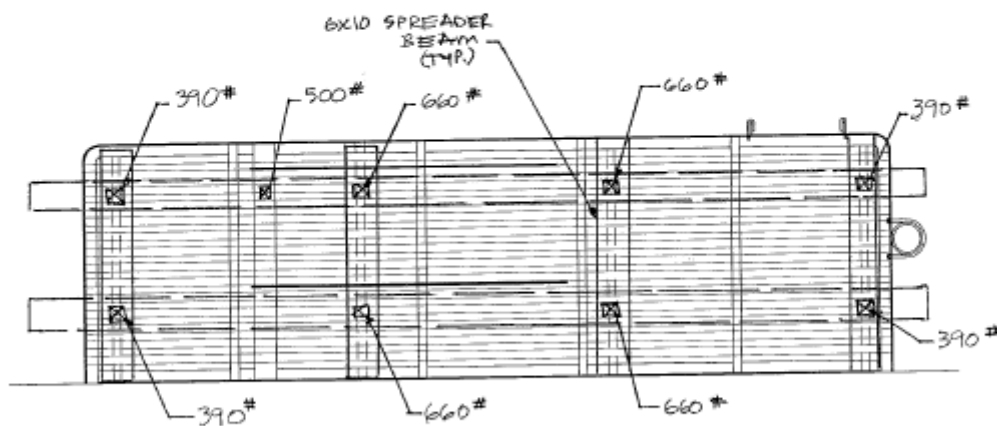
This is a partial procedure list for tests 14, 15, and 16.

REQUIRED PROCEDURE FOR TESTS #14, #15, & #16
(REFERENCE DIAGRAM #1 AND #2 FOR LOCATION OF STEPS 1-5)

- ① LOOSEN U-BOLT CONNECTING STANDPIPE TO LANDING
- ② LOOSEN U-BOLTS CONNECTING FIREMAN'S LADDER TO LANDING
- ③ DETACH GUARDRAIL FROM FIREMAN'S LADDER
- ④ DETACH STAIR RAIL FROM GUARDRAIL
- ⑤ DETACH STAIR FROM LANDING
- ⑥ INSTALL TEMPORARY SAFETY CABLES FROM LANDING ABOVE AND CONNECT TO LANDING - PROVIDE 3" OF SLACK IN CABLE
- ⑦ PLACE 6X10 SPREADER BEAMS ONTO LANDING AT LOCATIONS SHOWN.

TEST #14 - UNIFORM LOADING ON LEVEL 2 LANDING
(LOWEST LEVEL)

1. FOLLOW PROCEDURE GIVEN ON PREVIOUS PAGES
2. TEST EA. LANDING INDEPENDENTLY
3. APPLY ALL LOADS SHOWN SIMULTANEOUSLY
4. HOLD LOAD FOR 10 MINUTES
5. LOADS SHOWN ARE BASED ON A 100 PSF UNIFORM LOAD.



LEVEL 2 LANDING LOADING PLAN
(LOWEST LEVEL)