Egg Harbor Fire Department and First Responders
Standard Operating Guideline

Subject: Ground Ladders SOG 309

Purpose: This guideline provides the Egg Harbor Fire Department's approach to the deployment and use of ground ladders.

Scope: This procedure applies to all members of the Egg Harbor Fire Department.

Guideline:

Ground ladder placement can facilitate fireground operations including rescue, access to upper floors/roof, ventilation, emergency egress, and above ground-level hoselines. Ground ladder operations should begin with proper ladder selection. EHFD uses the 10' attic, 14' and 16' roof, 14' extension, 24' extension, and two-section and three-section 35' extension ladders. All personnel must know the capabilities and limitations of ground ladders used on the fireground.

Operational Guidance:

I. Ladder specifications and applications

A. Ground ladder applications are detailed in Table 1.

Table 1

Ladder type	Applications
10' attic	Access to attics in interior of residential structures
14' extension	Interior use
14' roof 16' roof	Access to first-story residential roof. Access to second-story residential window. Used on roof for weight distribution and footing.
24' extension	Access to third floor windowsill and lower on residences. Access to second floor window and lower on commercial structures.
35' extension	Access to fourth floor windowsill and lower on residences. Access to third floor window and lower on commercial structures.

B. Figure 1 illustrates typical ground ladder applications.

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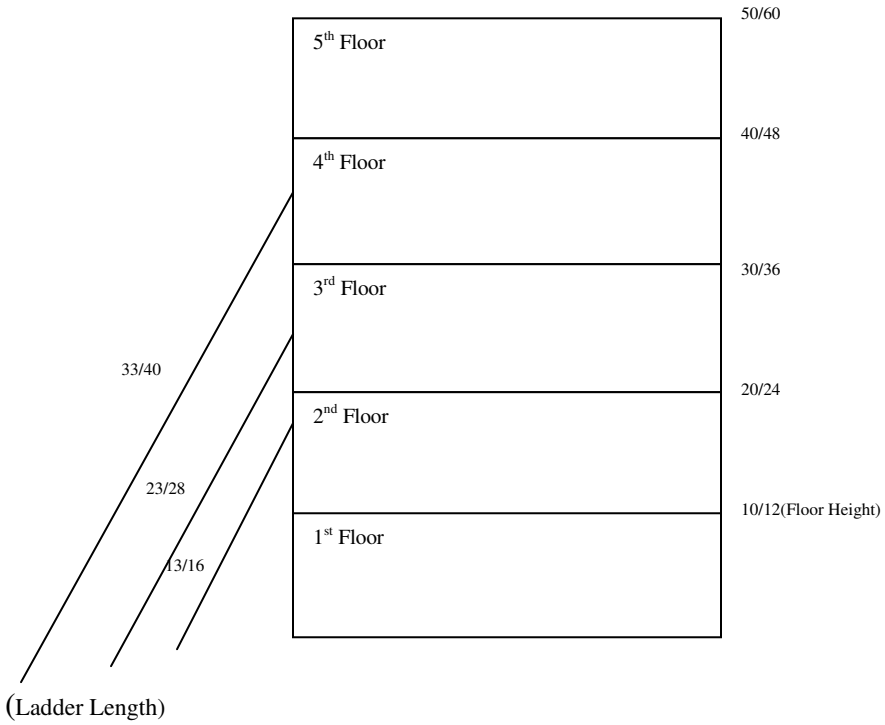
Figure 1.



C. When in doubt, use a longer ladder than you think you will need.
D. The bedded length of all ground ladders should be indicated at the butt end of the ladder, next to the total ladder length sticker.
E. Table 2 details ladder types and the bedded length of those ladders.

Table 2	
Ladder type	Bedded length
24' extension	14'
2-section 35' extension	20'
3-section 35' extension	15'

II. Climbing angle and proper tip placement

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A. The proper climbing angle for most ground ladder operations is approximately 70 degrees.

1. One exception to the 70 degree rule is when positioning the ground ladder at a windowsill for rescue or as a means for rapid escape.

2. When positioning for rescue or rapid escape, the ladder should be positioned at about a 60 degree angle to achieve a more comfortable, stable position for firefighters to work and rapidly deploy from a window.

B. Climbing guidelines.

1. A critical component ladder safety is the correct placement angle of ground ladders.

2. A simple formula for correct ladder placement is to position the bottom of the ladder at a distance from a vertical plane equal to 1/4 the total working length of the ladder.

C. Proper tip placement parameters include the following:

1. For rescue or firefighter access, place the tip of the ladder below the windowsill.

2. For breaking glass or ventilation, position the tip of ladder at the top of window on the windward side.

3. For roof access, position the ladder with a minimum of three rungs extending above the edge of the roof.

a. This will facilitate getting off and on the ladder, and make locating the ladder easier if conditions change and firefighters need to get off the roof quickly.

b. Parapet height may require a second ladder to provide access over the parapet and onto the roof.

III. Safety guidelines

A. All ground ladders should be secured in place before climbing.

B. Keep all ground ladders away from electrical lines.

C. Always set up two ladders to provide access to/exit from the roof, preferably at opposite ends of the structure.

D. Ladders to the roof should be placed away from the section of the roof that is being ventilated, in order to create a strong platform for use in walking to the venting location.

E. Ladder the strongest areas of the structure, specifically, at the corners.

1. Corners are structurally strong.

2. If ladders are positioned at the corners of the building, a disoriented firefighter on the roof can go to a corner with a 50% chance of finding a ladder.

F. Ladder the windward side of the proposed vent area.

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G. Avoid setting up ground ladders directly in front of entry/exit routes or where fire is likely to vent.
H. Consider that fire service ladders are assumed to be able to safely support a 750-pound working load with a 4:1 safety factor.

IV. Click method

A. The click method is a guide for having the tip of an extension ladder reach its objective the first time it is raised.

1. Rarely, on the fireground, is there sufficient time to extend the ladder, place the tip, assess the tip position as unworkable, bring the tip away from the building, raise the ladder to the appropriate tip height and place the tip against the building again.

B. The click method refers to the "click" that the fly section makes as the locks pass over a rung when the fly is extended.

1. Each "click" is equal to 14" of vertical travel.
2. To ensure that the ladder is extended the correct length for proper tip placement the first time, the following quick calculation can utilized:

a. Determine the target height (at the location where the tip makes contact with the building).
b. Subtract the bedded length of the ladder being used from the target height. This number equals the number of "clicks."

1. If the target is above the second-floor, subtract one "click". This is due to the fact that the ladder travels 14 inches per "click", not 12 inches.
2. If a three-section 35-foot ladder is used, the fly section travels twice as far with each "click". So, divide the number of "clicks" by two, and then subtract the one "click" for being above the second-floor.

V. Inspection and maintenance

A. Ground Ladder Inspection.

1. According to NFPA 1932, all ground ladders are to be tested at least annually.
2. Ground ladders should be inspected for damage after each use.
3. Ground ladders should be inspected for damage quarterly.

B. A complete visual inspection should include the following parameters:

1. The ladder sections.

Side rail condition, rail alignment, rung condition, rung to rail attachment, butt spurs/foot pads, ladder stops, stay poles, toggles, rail guides/lubrication.

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2. Halyard condition.

Rope size and condition, anchors, thimbles, clamps, pulleys, and adjustment

3. Roof hooks.

Hook size, hook condition, operation and sharpness, hook housing and adjustment.

4. General issues.

a. Heat sensor labels. NFPA 1931 certification, electrical hazard stickers, serial number identification, and ladder length marking within 12 inches of the butt.

b. Heat sensors are labels with a heat indicator. If the heat sensor in the label turns black, the ladder should be removed from service.

1. Figure 2 illustrates a ladder heat sensor.

Figure 2.

C. Ground ladder testing.

1. Ground ladders should be tested if any of the following conditions occur:

a. If they are suspected of being unsafe.

b. If the ladder has been subjected to overloading.

c. If the ladder has been subjected to impact loading or unusual conditions of use.

d. After any heat exposure.

e. After any deficiencies have been repaired, unless the only repair was replacing the halyard.

f. Before the ladder is placed in-service for the first time.

D. Ground ladder maintenance.

1. Clean and well-maintained ladders last longer.

a. General maintenance for ladders is a simple process of taking time to visually inspect all the parts: beams, fasteners, and rungs for damage or wear.

b. Candle wax or paraffin wax should be applied to all contacting surfaces.

1. Properly lubricated ladder sections slide easily and work better.

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2. If in doubt of the condition or quality of any ladder halyard, always replace it.

a. EHFD Officer should be contacted to have any ladder rope replaced.

b. Standard ground ladder pulleys accommodate 3/8" - 1/2" diameter ropes.

3. Heat sensor labels are made of heat-sensitive material that turns black in temperatures higher than approximately 300 degrees F.

a. Once aluminum fire ladder materials reach this 300 degree F temperature (even if only for a moment), the ladder material may have lost at least 25% of its load capacity.

b. This heat exposure effect is not reversible in the ladder and can continue to accumulate over time.

c. Any ground ladder with a blackened heat sensor label should be removed from service at once and that ladder should be load-tested before being put back into service.

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