



**BRIAN TAYLOR**  
STATE FIRE MARSHAL

February 5, 2025

Mr. Zack Tomlin, PE  
Barton Associates Inc.  
708 St. Mary's Street  
Raleigh, NC 27607

**RE: 2018 NCMC 306.5 Equipment and appliances on roofs or elevated structures**

Mr. Tomlin:

This letter is in response to your request for a formal interpretation from the Office of State Fire Marshal ("OSFM") dated 5/16/24 and received by OSFM the same day. This delayed formal response letter serves to complete the documentation you requested. Thank you for your patience in waiting for this formal interpretation response while our office handled other commitments over the last several months, including disaster recovery efforts in WNC. Requests are addressed below in the order in which they are posed.

Stated in relevant parts:

"Dear Mr. Rittlinger

The purpose of this letter is to request a formal interpretation of NC Mechanical Code Section 306.5 from the 2018 edition.

**306.5 Equipment and appliances on roofs or elevated structures.** Where equipment or appliances requiring periodic maintenance are installed on, located on, or suspended from an elevated structure or the roof of a building such that personnel will have to climb higher than 16 feet (4877 mm) above grade or finished floor to access such equipment or appliances, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope). Such access shall not require the use of portable ladders. Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.

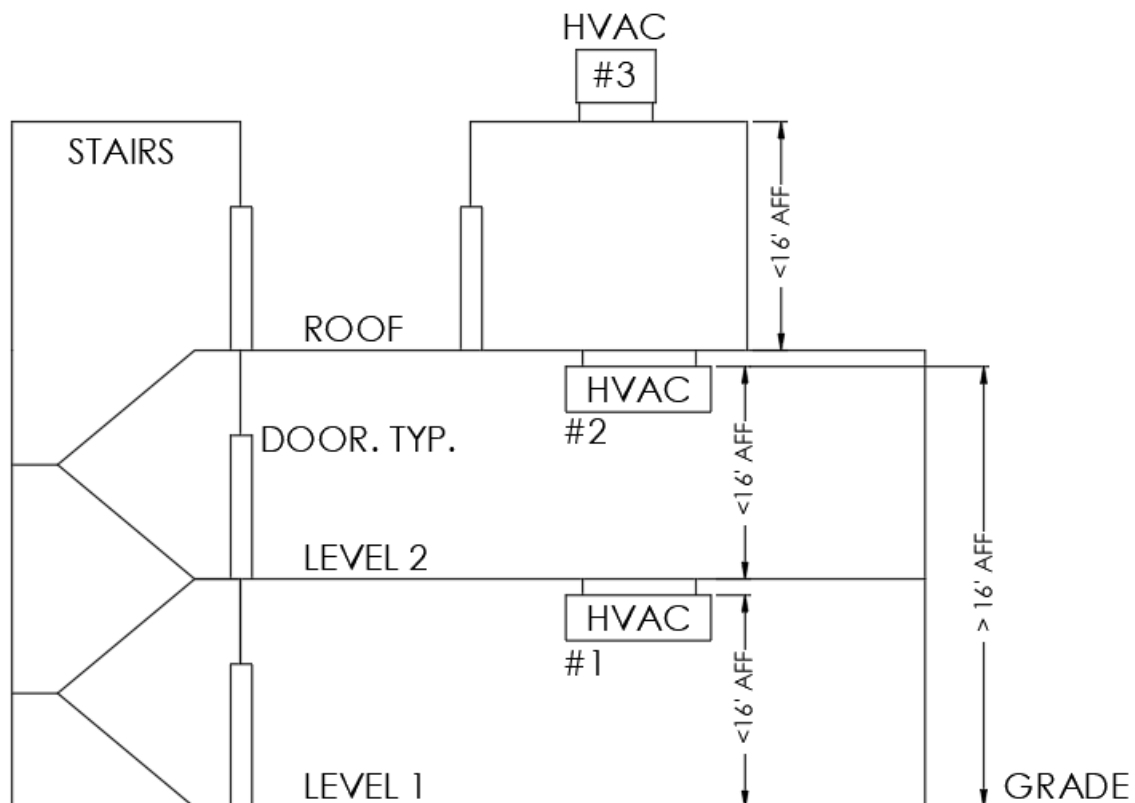
Specifically, what is the interpretation of the word "**climb**" and does that include use of a building code compliant egress stair towers and similar. Also, when should "**grade**" be considered in applying the 16 foot limit, and when should "**finished floor**" be considered in applying the 16 foot limit.

**OFFICE OF STATE FIRE MARSHAL**



In the figure following three HVAC units are shown. Based on the above code section:

- HVAC Unit #1 would NOT require a permanent access ladder since the unit is less than 16' above both grade and the finished floor.
- However, HVAC Unit #2 would require a permanent ladder as the unit is less than 16' above finished floor but MORE than 16' above grade (note the code section says "higher than 16 feet above grade **OR** finished floor" and one of the two conditions are triggered.)
- Similarly, HVAC Unit #3 would also require a permanent ladder as it too is more than 16' above grade.



I do not believe the intent of the code was to ban the use of portable ladders when servicing equipment less than 16' above the finished floor or to require the installation of permanent ladders to service the same. It is obviously a common practice for maintenance personnel to use portable ladders to service above ceiling equipment on all floors of a building. Thus, I would argue that the word "**climb**" should NOT include using a code compliant stair, ramp, or similar.

Similarly, if HVAC unit #2 can be served using the stair tower and a portable ladder (without violating the "**Climbing**" limit of the code, I see no reason why HVAC Unit #3 (also less than 16' above the roof level) cannot be serviced using a portable ladder as well (assuming other conditions of 306.5 are met).

The commentary on Section 306.5 of the 2015 International Mechanical Code offers the following:  
*"The requirements of this section concern the safety of maintenance and inspection personnel... The first*



*sentence establishes 16 feet above grade as the maximum height that personnel will have to **climb** on a portable ladder”.*

Given the above and that the code provides no limit on the length of permanent ladders I have to conclude that the word “**climb**” refers ONLY to the distance traveled on a portable ladder and that any elevation gained by use of code compliant stairs, ramps or similar should not be counted against the 16 foot limit.

After reviewing the NC Mechanical Code, IMC and associated commentary it appears the intent of 306.5 (as a means of ensuring a reasonable level of safety for maintenance and inspection personnel) is to:

- Ensure no one must cover a vertical distance of greater than 16’ by solely a portable ladder. Be that extending from grade to a roof edge, or from a finished floor (or stair accessible roof) to elevated equipment.
- Ensure no one must carry a portable ladder up another form of ladder or lift a portable ladder onto a roof top or elevated surface.

Additionally, I am not aware of anything in the code that deems the carrying of portable ladders up stair towers to reach a finished floor or roof level an unacceptable hazard per se.

Please let me know if you would like to discuss this matter further. In the end, I hope by having a formal interpretation of “**climb**” and “**grade or finished floor**” will see more consistent enforcement of the intent of 306.5 and that building owners will not bare the financial and aesthetic cost of unnecessary permanent ladders where stair towers or similar building elements facilitate a safe use of portable ladders for equipment access.

Thank you.”

**Remarks:**

Attachment A is comprised of the request for formal interpretation as well as all supporting information submitted with the request.

**Code Analysis:** 2018 North Carolina Mechanical Code (NCMC), Section 306.5 requires permanent interior or exterior means of access to equipment or appliances that require periodic maintenance when the equipment or appliances requiring periodic maintenance are located 16 feet above grade or finished floor.

....

**306.5 Equipment and appliances on roofs or elevated structures.** Where *equipment* or appliances requiring periodic maintenance are installed on, located on, or suspended from an elevated structure or the roof of a building such that personnel will have to climb higher than 16 feet (4877 mm) above grade or finished floor to access such equipment or appliances, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent

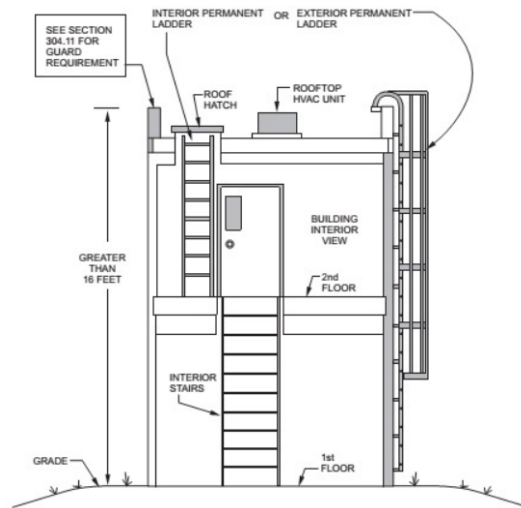


slope). Such access shall not require the use of portable ladders. Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.

**Exception:** Where permanent means of access is technically infeasible, wall-mounted equipment and appliance maintenance, replacement and repairs that are over 16 feet can be serviced by motorized equipment *upon approval*. The owner/tenant shall provide a maintenance service and cleaning schedule contract that shall be renewed annually.

.....

**Conclusions:** The 16-foot maximum climbing height is measured from grade or finished floor, as illustrated in the figure below. Grade is the ground level where persons primarily enter and exit the building. Finished floor is the floor closest to grade where persons primarily enter and exit the building. Permanent interior or exterior provisions for access such ladders, platforms, stairways and elevators shall be used to satisfy the intent of this code section by providing permanent access to the floor(s) or roof where equipment and appliances requiring periodic maintenance are located. In the figure below, the intent of the code in providing permanent access to the appliance on the roof is satisfied in two ways; two sets of interior permanent ladders; or one exterior permanent ladder.



Portable ladders shall not be used to provide permanent or temporary access in full or in part(s) to the roof or floor(s) above where equipment or appliances requiring periodic maintenance are installed on, located on, or suspended from an elevated structure or the roof of a building if the maximum climbing height exceeds 16 feet from grade or finished floor.

The intent of the section is not to prohibit the use of portable ladders inside or outside the building for equipment or appliances requiring periodic maintenance that are less than 16-foot maximum climbing height from grade or finished floor. The intent of the section is also not to prohibit the use of portable ladders inside or outside the building for direct access to the equipment or appliances requiring periodic maintenance that are less than 16 feet from the floor or roof directly beneath the equipment or appliances as long as permanent means of access is provided from grade or finished floor to the floor or roof where the equipment and appliances are located when the maximum climbing height exceeds 16 feet.



**OFFICE OF STATE  
FIRE MARSHAL**  
NC DEPARTMENT OF INSURANCE

Sincerely,

David Rittlinger, PE, LEED AP  
Division Chief – Codes & Interpretations  
North Carolina Office of State Fire Marshal

cc: Nathan Childs, NCDOJ, counsel for NC Building Code Council, [nchilds@ncdoj.gov](mailto:nchilds@ncdoj.gov)  
Nicki Shaffer, NCDOJ, counsel for NC Residential Code Council, [wshaffer@ncdoj.gov](mailto:wshaffer@ncdoj.gov)  
Pak Yip, NCOSFM, Chief Code Consultant, [pak.yip@ncdoj.gov](mailto:pak.yip@ncdoj.gov)





**ATTACHMENT A**

(see attached pdf)





**APPENDIX E  
APPEALS  
NORTH CAROLINA  
BUILDING CODE COUNCIL**

325 North Salisbury Street, Room 5\_44  
Raleigh, North Carolina 27603  
(919) 647-0019

APPEAL TO NCDOI/NCBCC

Hearing Date \_\_\_\_/\_\_\_\_/\_\_\_\_

GS 153A-374, GS 160A-434

Formal Interpretation by NCDOI

Appeal of Local Decision to NCDOI \_\_\_\_\_

GS 143-140, GS 143-141

Appeal of Local Decision to NCBCC \_\_\_\_\_

Appeal of NCDOI Decision to NCBCC \_\_\_\_\_

APPELLANT Zack Tomlin, PE PHONE (919) 341-4242  
REPRESENTING Barton Associates Inc (BAI engineering, PLLC)  
ADDRESS 708 ST. MARK'S ST  
CITY Raleigh STATE NC ZIP 27607  
E-MAIL ZLT@BA-inc.com FAX  - - -

North Carolina State Building Code, Volume 2018 Mech - Section 306.5

REQUEST ONE:  Formal Interpretation by NCDOI  Appeal of Local Decision to NCBCC  
 Appeal of Local Decision to NCDOI  Appeal of NCDOI Decision to NCBCC

Type or print. Include all background information as required by the referenced General Statutes and the attached policies. Attach additional supporting information.

*Please see attached letter +  
informal interpretation email chain.*

REASON: *Inconsistent code enforcement, unnecessary  
construction cost.*

Signature *ZLT* DATE: 5/16/24 APPEAL TO NCDOI/NCBCC FORM 3/14/17



May 16, 2024

Mr. David Rittlinger, PE  
**NCOSFM**  
1202 Mail Service Center  
Raleigh, NC 27699-120

RE: NC Mechanical Code Section 306.5  
Access to Rooftop and Suspended Elevated Equipment

Dear Mr. Rittlinger

The purpose of this letter is to request a formal interpretation of NC Mechanical Code Section 306.5 from the 2018 edition.

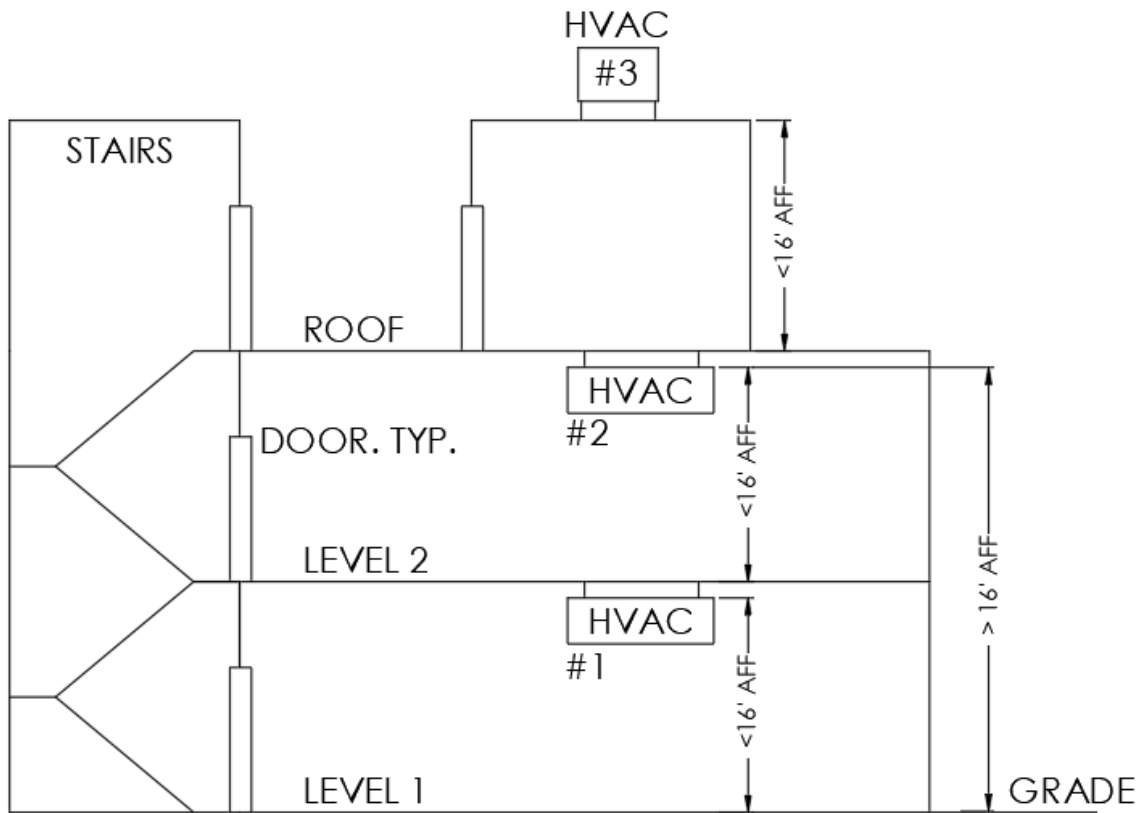
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Specifically, what is the interpretation of the word “**climb**” and does that include use of a building code compliant egress stair towers and similar. Also, when should “**grade**” be considered in applying the 16 foot limit, and when should “**finished floor**” be considered in applying the 16 foot limit.

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*“The requirements of this section concern the safety of maintenance and inspection personnel... The first sentence establishes 16 feet above grade as the maximum height that personnel will have to climb on a portable ladder”.*

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Thank you.



Respectfully,

A handwritten signature in black ink, appearing to read "Zack L. Tomlin".

Zack L. Tomlin, PE  
**BAI Engineering, PLLC**  
NC Lic#: P-2760

5-16-2024

## Zack Tomlin

---

**From:** David Gorman <david@lock7.com>  
**Sent:** Monday, May 13, 2024 1:46 PM  
**To:** Joe Hatcher; Ted Van Dyk; Chris Dupré; Corey Bates; Zack Tomlin  
**Subject:** Fwd: [External] Fwd: Roof Ladder Question- 306.5  
**Attachments:** image002.png

CAUTION: This email originated from outside your organization. Exercise caution when opening attachments or clicking links, especially from unknown senders.

See below, not the answer we wanted

----- Forwarded message -----

**From:** Whalen, Kathryn <[kathryn.whelen@ncdoj.gov](mailto:kathryn.whelen@ncdoj.gov)>  
**Date:** Mon, May 13, 2024 at 1:44 PM  
**Subject:** RE: [External] Fwd: Roof Ladder Question- 306.5  
**To:** [david@lock7.com](mailto:david@lock7.com) <[david@lock7.com](mailto:david@lock7.com)>

Good afternoon Dave,

The intent of NCMC Section 306.5 is that a permanent means of access is provided when equipment or appliances requiring periodic maintenance are installed in an elevated location that requires personnel to climb higher than 16'. Per that section, the access cannot require the use of portable ladders and access to any permanent ladders utilized shall be provided at all times. A service person starts their climb to the appliance at grade or at the finished floor they enter the building on. The interior and exterior options for equipment access in Section 306.5 are equivalent alternative options that can be utilized to comply with this section, and as such must meet the same requirements, including the prohibition on using portable ladders as part of the means of access. The picture that was included in the below email from the 2015 IMC commentary illustrates that intent: the building is taller than 16', and it shows that the interior access option is utilizing both stairs and a permanent ladder to meet the Section 306.5 requirement.

The "finished floor" and "suspended from" are intended to address situations where equipment or appliances which require permanent means of access are suspended from the side of a building or installed within interior spaces over 16ft in elevation.

NCMC Section 306.5 is provided below for reference:

**306.5 Equipment and appliances on roofs or elevated structures.** Where equipment or appliances requiring periodic maintenance are installed on, located on, or suspended from an elevated structure or the roof of a building such that personnel will have to climb higher than 16 feet (4877 mm) above grade or finished floor to access such equipment or appliances, **an interior or exterior means of access shall be provided.** Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope). **Such access shall not require the use of portable ladders.** Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.

Please let me know if you have any further questions, and thank you for your time,

**Kate Whalen, P.E.**

**Chief Mechanical and Fuel Gas Code Consultant**



North Carolina

Office of State Fire Marshal

1202 Mail Service Center

Raleigh, NC 27699-1202

919.647.0033

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**From:** David Gorman <[david@lock7.com](mailto:david@lock7.com)>  
**Sent:** Friday, May 10, 2024 10:28 AM  
**To:** Whalen, Kathryn <[kathryn.whalen@ncdoi.gov](mailto:kathryn.whalen@ncdoi.gov)>  
**Subject:** [External] Fwd: Roof Ladder Question- 306.5

You don't often get email from [david@lock7.com](mailto:david@lock7.com). [Learn why this is important](#)

**CAUTION:** External email. Do not click links or open attachments unless verified. Report suspicious emails with the Report Message button located on your Outlook menu bar on the Home tab.

----- Forwarded message -----

From: **Flowers, Dick** <[Dick.Flowers@raleighnc.gov](mailto:Dick.Flowers@raleighnc.gov)>  
Date: Fri, May 10, 2024 at 8:33 AM  
Subject: RE: Roof Ladder Question- 306.5  
To: David Gorman <[david@lock7.com](mailto:david@lock7.com)>  
Cc: Buckley, Thomas <[Thomas.Buckley@raleighnc.gov](mailto:Thomas.Buckley@raleighnc.gov)>

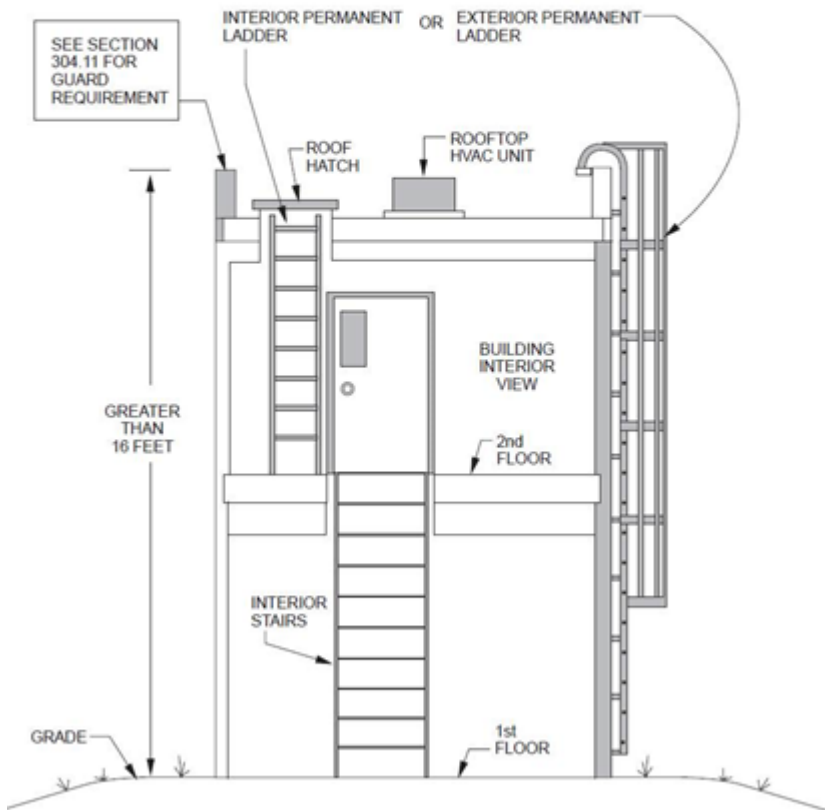
Good morning David,

Code is pretty clear on this on requiring permanent means of access, when it says that portable ladders are not allowed.

Here is a copy of the mechanical code commentary on this situation. If other jurisdictions are interpreting this differently,

then you may want to reach out to DOI for an interpretation to clear this up

What the 16-foot maximum climbing height means is that buildings (with appliances or equipment on the roof) that are over one story in height will need permanent ladders, stairways or a combination thereof, installed.



306.5 Equipment and appliances on roofs or elevated structures. Where equipment or appliances requiring periodic maintenance are installed on, located on, or suspended from an elevated structure or the roof of a building such that personnel will have to climb higher than 16 feet (4877 mm) above grade or finished floor to access such equipment or appliances, an interior or exterior means of access shall be provided. Such access shall not require climbing over obstructions greater than 30 inches (762 mm) in height or walking on roofs having a slope greater than 4 units vertical in 12 units horizontal (33-percent slope). **Such access shall not require the use of portable ladders.** Where access involves climbing over parapet walls, the height shall be measured to the top of the parapet wall.

**Dick Flowers**

Chief Mechanical Inspector

**City of Raleigh**

**Planning and Development Department**

**Building and Safety Division**

One Exchange Plaza, suite 501

P.O. Box 590

Raleigh NC 27602-0590

Office: 919-996-2449

Cell: 919-278-6187

[Dick.flowers@raleighnc.gov](mailto:Dick.flowers@raleighnc.gov)

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**From:** David Gorman <[david@lock7.com](mailto:david@lock7.com)>  
**Sent:** Friday, May 10, 2024 7:43 AM  
**To:** Flowers, Dick <[Dick.Flowers@raleighnc.gov](mailto:Dick.Flowers@raleighnc.gov)>  
**Subject:** Re: Roof Ladder Question- 306.5

Here's a photo better showing the condition. Thanks



Top of parap

R  
Elevator



Fin  
fl

On Thu, May 9, 2024 at 7:21 PM David Gorman <[david@lock7.com](mailto:david@lock7.com)> wrote:

Inspector Flowers-

Hope all is well. A question came up today on a mechanical inspection with Tommy at our 615 Peace project and I was hoping to get your input. I believe you are the right contact to assist but please correct me if I'm wrong.

Tommy felt we needed permanent ladders to access our rooftop mechanical units because we are more than 16' from the grade at entry to the building. The building is four stories. However, we're only 11' from the adjacent finished floor, as the units sit on penthouses above the accessible roof level (the elevator goes to the roof). In all the other jurisdictions we've worked in, the AHJ has read the code to read that permanent ladders are not required in this situation. Might you be able to clarify for us?

Thanks  
Dave

--

**David Gorman, Principal**

**Lock7 Development**

**Office: 202-922-6540**

**[david@lock7.com](mailto:david@lock7.com)**





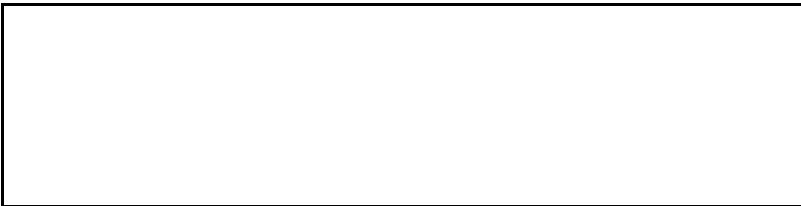
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**David Gorman, Principal**

**Lock7 Development**

**Office: 202-922-6540**

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**David Gorman, Principal**

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--

**David Gorman, Principal**  
**Lock7 Development**  
**Office: 202-922-6540**  
[david@lock7.com](mailto:david@lock7.com)

