

CITY & COUNTY OF DENVER COMMUNITY PLANNING & DEVELOPMENT BUILDING PERMIT POLICY		
Subject: <b>Denver Energy Code Compliance for Tapered Insulation</b>		
Approved: <b>Eric Browning, PE, Chief Building Official</b>		Drafted by: <b>Morrison, Et al.</b>
Number: <b>DEC C402.2.1.1 &amp; DEC 402.2.1.2</b>	Prior Version: <b>None</b> Revision Date: <b>February 6, 2024</b>	Page: <b>1 of 3</b>

**Reference:** 2022 Denver Energy Code (DEC) Sections C402.2.1.1 and C402.2.1.2

**Scope:** This is a policy for identifying roof insulation R-values and thickness in construction drawing permit sets and during inspection for tapered, above-deck insulation on commercial and multifamily buildings.

**Policy:**

For prescriptive and performance compliance paths, insulation shall be identified in the construction drawing permit set in accordance with one of the two options below:

Option 1. If the R-value of the minimum insulation thickness at the low points of any roof is used to demonstrate compliance, the insulation thickness at the low points of above-deck insulation and the R-value shall be identified.

Option 2. If the R-value of the minimum insulation thickness at the low points are less than the value used to demonstrate compliance:

1. Per section C402.2.1.2, the minimum thickness of the above-deck roof insulation at its lowest point, gutter edge, roof drain, or scupper shall not be less than 1 inch, AND
2. For as many different insulation volumes that are used to describe the sloped insulation roofing system, identify parameters similar to:
  - a. Figures 1 and 2 for one- and two-way roof slopes and/or
  - b. Figures 3 and 4 for symmetrical four-way roof slopes and/or
  - c. Figure 5 for all other sloped roof insulation systems, with the volumetric average thickness calculated in accordance with the following equation:

$$Volumetric\ Average\ Thickness = LP + \frac{2}{3}(HP - LP)$$

*Where*

*LP = Lowest Point is insulation system minimum thickness*  
*HP = Highest Point is insulation system maximum thickness*

Note that insulation used for roof features for drainage in limited areas shall not contribute to the R-value for compliance.

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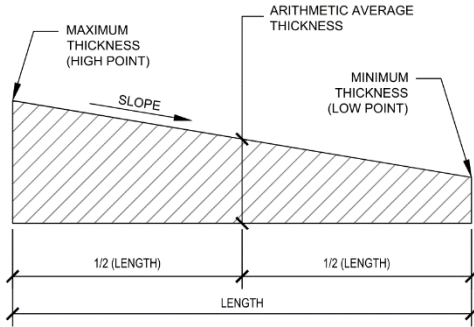
**Drafted by: Morrison, Et al.**

**Number: DEC C402.2.1.1  
& DEC 402.2.1.2**

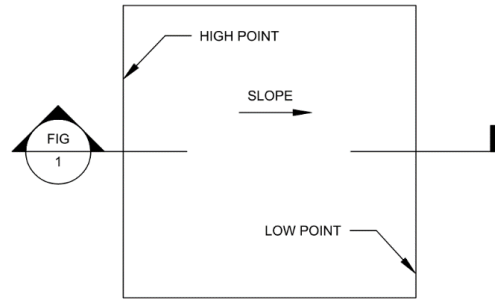
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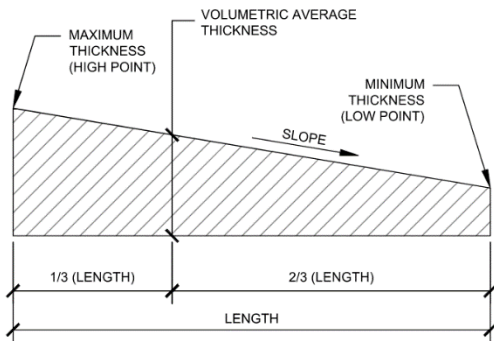
**FIGURE 1:  
Roof Section**



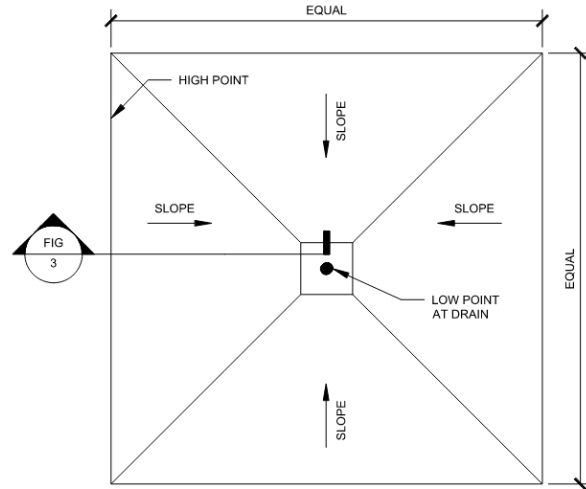
**FIGURE 2:  
Roof Plan**



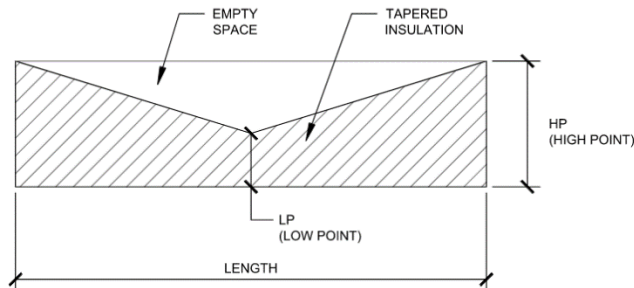
**FIGURE 3:  
Roof Section**



**FIGURE 4:  
Roof Plan**



**FIGURE 5:  
Roof Section**



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3. Specification and details for Option 2 shall include the following:
  - i. The minimum insulation thicknesses and R-values are shown on drawings and the low point locations are identified on the roof plan.
  - ii. The maximum insulation thicknesses and R-values are shown on drawings and the high point locations are identified on the roof plan.
  - iii. The average R-value of each insulation volume used to demonstrate compliance shall be shown on drawings. Calculations shall be provided if requested.
  - iv. A table of roof insulation areas similar to Figure 6 that includes low point, high point, average thickness, and material R-value-per-inch shall be provided.

**FIGURE 6**

<b>ROOF AREA</b>	<b>INSULATION HIGH POINT (inches)</b>	<b>INSULATION LOW POINT (inches)</b>	<b>INSULATION AVERAGE THICKNESS (inches)</b>	<b>INSULATION MATERIAL R-VALUE PER INCH</b>
AREA 1				
AREA 2				
AREA 3				

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