

# MEMORANDUM



DATE: October 10, 2023

TO: City of Lone Tree

CC: Roshana Floyd, Jennifer Drybread, Jacob James

FROM: Kristofer K. Wiest, P.E.

SUBJECT: Ridgeway Couplet – Snow Storage Basis of Design

The design team (Merrick & Company, KTG Architecture, and Century Communities) has reviewed the snow storage required for the proposed Ridgeway Couplet development. The City of Lone Tree Municipal Code requires adequate snow storage be provided. However, it does not specify a specific method for calculating the required storage volume. Based on the developer's prior experience in the City of Lone Tree with a similar project, the approach outline below was utilized to determine if adequate snow storage has been provided.

The basis of design is dependent upon several variables: snow moisture content, snowfall depth, height of storage and compaction of stored snow. Based on these variables, two approaches were used in the analysis. Both approaches assume that only the drive lanes within the parking deck are taken into account when calculating volumes.

The first approach was to utilize a snow compaction rate of 20% with an average snowfall depth of 4", to represent a typical snowfall event that would necessitate snow removal. Required storage volumes for this approach are shown below.

Location	Area (ft <sup>2</sup> )	Calculation	Required Storage (ft <sup>3</sup> )
Parking Deck	27,000	27000 x 0.33 x 0.8	7,128
East Private Drive	1,000	1000 x 0.33 x 0.8	264
West Private Drive	10,300	10300 x 0.33 x 0.8	2,719

The second approach was to utilize a compaction rate of 80% with a maximum depth of snow of 12". Required storage volumes for this approach are shown below.

Location	Area (ft <sup>2</sup> )	Calculation	Required Storage (ft <sup>3</sup> )
Parking Deck	27,000	27000 x 1 x 0.2	5,400
East Drive	1,000	1000 x 1 x 0.2	200
West Private Drive	10,300	10300 x 1 x 0.2	2,060

Averaging the two snowstorm approaches resulted in the following volumes that were used to verify the area provided was sufficient.

Location	Average Volume (ft <sup>3</sup> )
Parking Deck	6,264
East Drive	232
West Private Drive	2,390

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Based on the averaged design snow storage volumes, the areas were checked to verify the required volumes could be provided. Based on similar projects, it was assumed that on average, snow could be stacked 5-ft in height. The following table summarizes the required and provided snow storage volumes.

Location	Required Storage Area (ft <sup>2</sup> )	Storage Area Provided (ft <sup>2</sup> )	Storage Required (ft <sup>3</sup> )	Storage Provided (ft <sup>3</sup> )
Parking Deck	1,253	1,517	6,264	7,585
East Drive	46	50	232	250
West Private Drive	478	480	2,390	2,400

Based on the above table, the parking deck for the site can provide sufficient snow storage for the proposed development. If there are any questions or if any additional information is needed, please let us know.

Respectfully  
**Merrick & Company**

Kristofer K. Wiest, P.E.

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