

MEMORANDUM



To: City of Lone Tree

From: JR Engineering

Date: 3/3/2023

Subject: Snow Storage Design for Lokal Townhomes at Ridgegate Site Improvement Plan

JR Engineering has provided the required snow storage area for the Lokal Townhomes at Ridgegate Site Improvement Plan (SIP). Because the City of Lone Tree does not have a design standards for snow storage design areas, JR Engineering has provided calculations for the snow storage areas based on the average and maximum snowfall depths.

In order to get volume for the snow storage areas, the average and maximum snow fall depths were used. The average snowfall depth used is 4" and the maximum snow depth used was 12". For the average snow fall depth, the snow compaction that is used will be 20% (with 80% remaining). The maximum compaction for the maximum snow depth would be 80% (with 20% remaining).

The table below provides the calculations for the average snowfall of 4" and 20% compaction.

Area (SF)	Calculations (SF)	Storage (CF.)
54118	$54118 \text{ SF} \times (4/12) \text{ F} \times 0.8$	14431.47

The table below provides the calculations for the average snowfall of 12" and 80% compaction.

Area (SF)	Calculations (SF)	Storage (CF.)
54118	$54118 \text{ SF} \times (12/12) \text{ F} \times 0.2$	10823.60

The table below provides the calculations for the average snowfall.

Average (CF.)	Storage (CF.)
$(14431.47 \text{ CF.} + 10823.60 \text{ CF.})/2$	12627.53

Knowing the total volume of snowfall for the site, the required storage can now be determined. Required storage volume was determined for each storage area based on its paved area.

Total Paved Area (SF)	Total Volume (CF)	Volume/Area
54118	12627.53	0.23

Height was calculated using the volume equation for a trapezoidal prism:

$$V = \frac{(b_1 + b_2) * h * l}{2}$$

$$h = \frac{2 * V}{(b_1 + b_2) * l}$$

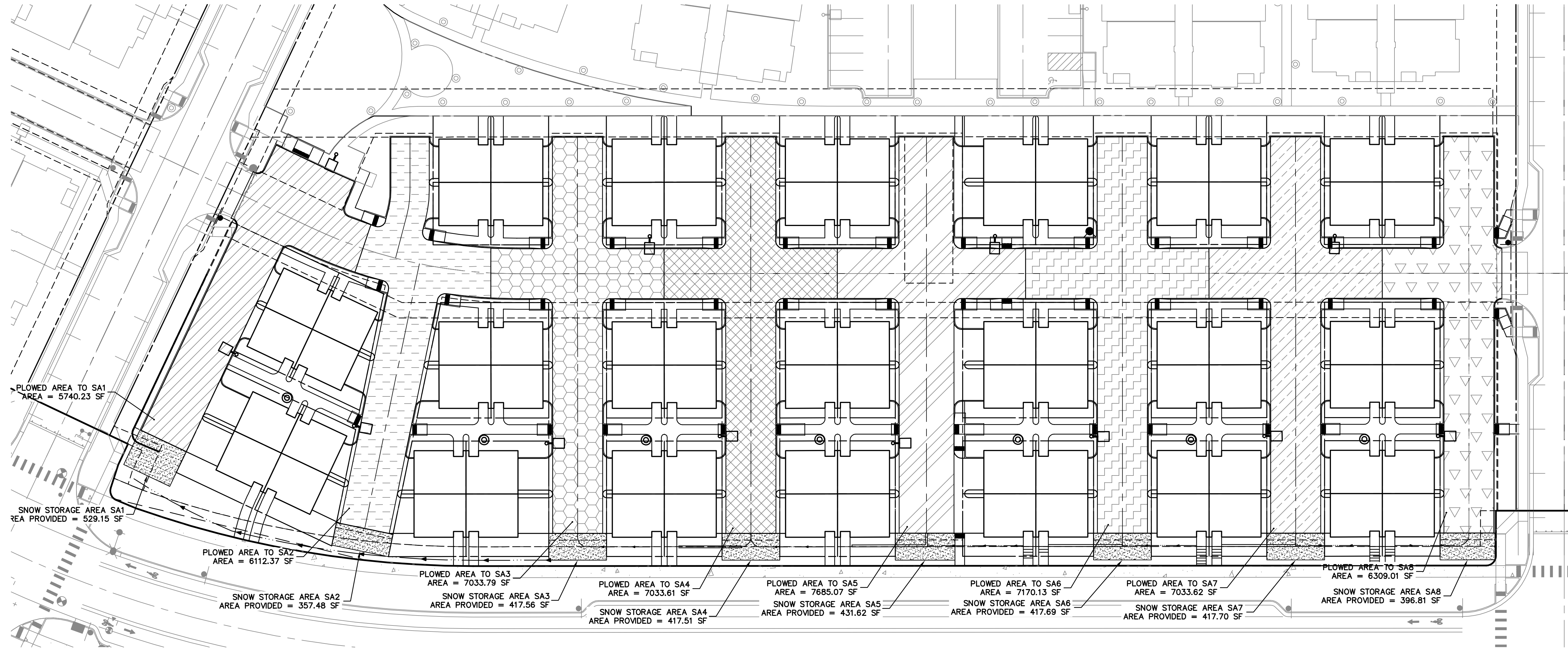
The table below provides the summary of the calculations.

Location	Paved Area (SF.)	Storage Provided (SF.)	Trapezoidal Calculations	Storage (CF.)
SA1	5740.23	530	b1=10, b2=20, l=26.5, h=3.37	1339.39
SA2	6112.37	355.2	b1=6, b2=11.84, l=30, h=5.33	1426.22
SA3	7033.79	417.6	b1=7, b2=13.92, l=30, h=5.23	1641.22
SA4	7033.61	417.6	b1=7, b2=13.92, l=30, h=5.23	1641.18
SA5	7685.07	431.52	b1=7, b2=13.92, l=31, h=5.53	1793.18
SA6	7170.13	417.6	b1=7, b2=13.92, l=30, h=5.33	1673.03
SA7	7033.62	417.6	b1=7, b2=13.92, l=30, h=5.23	1641.18
SA8	6309.01	396.72	b1=7, b2=13.92, l=28.5, h=4.94	1472.10
TOTAL:	54117.83	3383.84		12627.49

As shown by these calculations, the provided snow storage areas are adequate for the Lokal Townhomes at Ridgeway site.

LYRIC TOWNHOMES AT RIDGEGATE SIP

A PORTION OF THE RIDGEGATE PLANNED DEVELOPMENT DISTRICT, EAST SIDE PROPERTY
 A PART OF SECTION 14, SECTION 22, SECTION 23, AND SECTION 24, TOWNSHIP 6 SOUTH, RANGE 67 WEST
 OF THE 6TH P.M., CITY OF LONE TREE, COUNTY OF DOUGLAS, STATE OF COLORADO
SNOW STORAGE AREAS



4" Snowfall

Area (SF)	Calculations (SF)	Storage (CF.)
54118	54118 SF x (4/12) F x 0.8	14431.46667

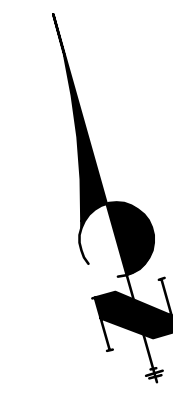
12" Snowfall

Area (SF)	Calculations (SF)	Storage (CF.)
54118	54118 SF x (12/12) F x 0.2	10823.6

Average

Average (CF.)	Storage (CF.)
(14431.47 CF. + 10823.60 CF.)/2	12627.53

Location	Paved Area (SF.)	Storage Provided (SF.)	Trapezoidal Calculations	Storage (CF.)
SA1	5740.23	530	b1=10, b2=20, l=26.5, h=3.37	1339.39
SA2	6112.37	355.2	b1=6, b2=11.84, l=30, h=5.33	1426.22
SA3	7033.79	417.6	b1=7, b2=13.92, l=30, h=5.23	1641.22
SA4	7033.61	417.6	b1=7, b2=13.92, l=30, h=5.23	1641.18
SA5	7685.07	431.52	b1=7, b2=13.92, l=31, h=5.53	1793.18
SA6	7170.13	417.6	b1=7, b2=13.92, l=30, h=5.33	1673.03
SA7	7033.62	417.6	b1=7, b2=13.92, l=30, h=5.23	1641.18
SA8	6309.01	396.72	b1=7, b2=13.92, l=28.5, h=4.94	1472.10
TOTAL:	54117.83	3383.84		12627.49



30 15 0 30 60
 ORIGINAL SCALE: 1" = 30'

SNOW STORAGE EXHIBIT
 LOKAL TOWNHOMES AT RIDGEGATE
 JOB NO. 1595011
 3/3/2023
 SHEET 1 OF 1



Centennial 303-740-9393 • Colorado Springs 719-593-2593
 Fort Collins 970-491-9888 • www.jrengineering.com

X:\1595011\Drawings\Presentations\1595011_Snow Storage Exhibit.dwg, 24x36 Title Landscape, 2/22/2023 2:53:41 PM, PC