WILBUR ENGINEERING, INC.

150 East 9 St., Suite 201 • Durango CO 81301
(970) 247-1488 • chris@mearsandwilbur.com

June 11, 2020

Dayson Johnson
Whisper Ridge Mountain Holdings, LLC
4776 East 2600 N
Eden, UT 84310
via email

RE: Avalanche Hazard Assessment and Mapping Report
Whisper Ridge Village Phase 0
Weber County, Utah

Dear Mr. Johnson:

This letter describes our avalanche hazard assessment and mapping for the subject site. Specifically, this assessment is for the purpose of evaluating cabin and yurt sites and ski lift terminals. The planned cabins, yurts and ski lift are shown on Site Plans prepared by Langvardt Design Group dated April 2020.

Snow avalanches require two elements:

1. An adequate snow supply, and
2. Terrain favorable for the release of significant volumes of snow due to gravity.

The site location ranges in elevation from about 7650 to 8950 feet and receives sufficient snowfall to meet the snow supply requirement. Therefore, this study focuses on the terrain factors that produce avalanche, including steepness, curvature, aspect and potential for wind transport and deposition of snow.

Methods

We evaluated the terrain using the following methods.

1. We created a digital elevation model of the terrain analyses using a 2-foot contour map derived from LiDAR data. (Figure 1).
2. We used the DEM to create a slope angle map to identify areas steep enough to produce avalanches. Figure 2 shows the slope map.
3. We used the DEM to create an aspect map to evaluate potential for wind-loading and solar gain. Figure 3 shows the aspect map.
4. We evaluated vegetation using aerial images. Vegetation patterns can indicate possible past avalanche activity.
5. We combined the information from the above steps to create an Avalanche Influence Zone Map (Figure 5). This map shows areas where avalanches may be possible based on this desktop assessment.

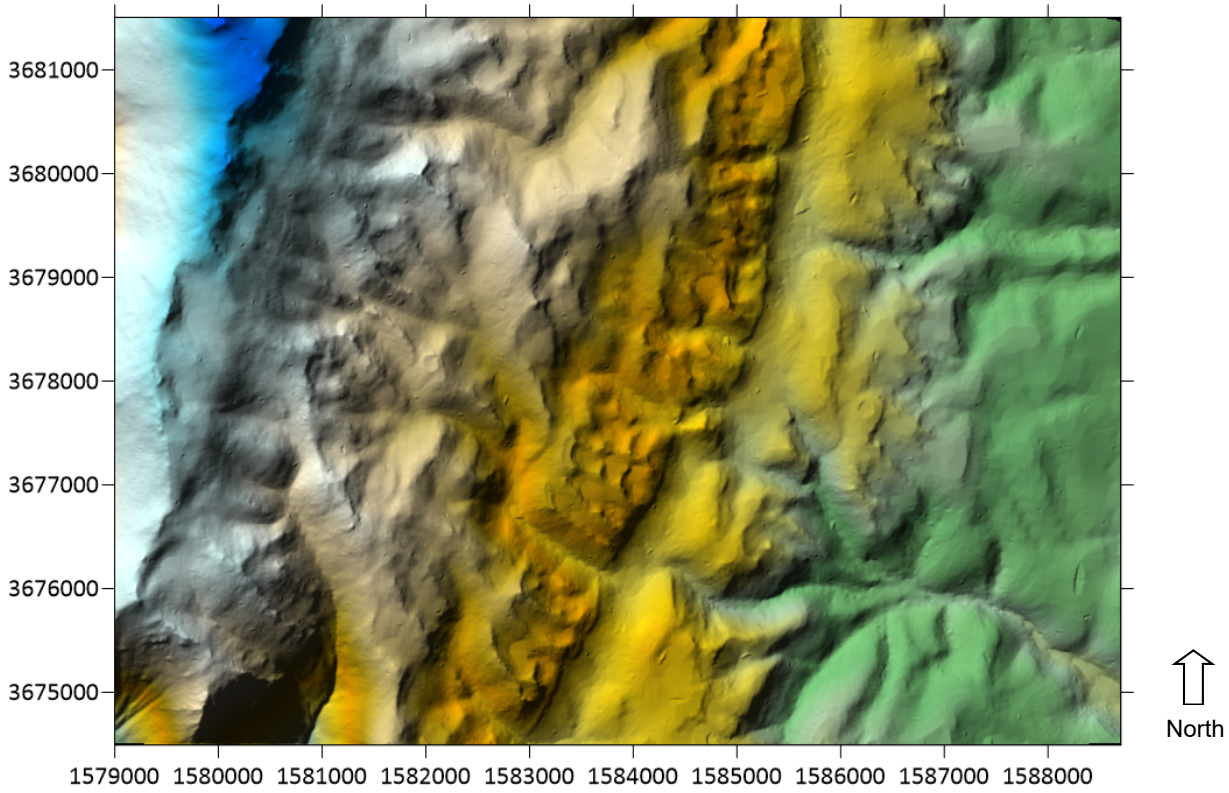


Figure 1 – Color Relief Map from DEM

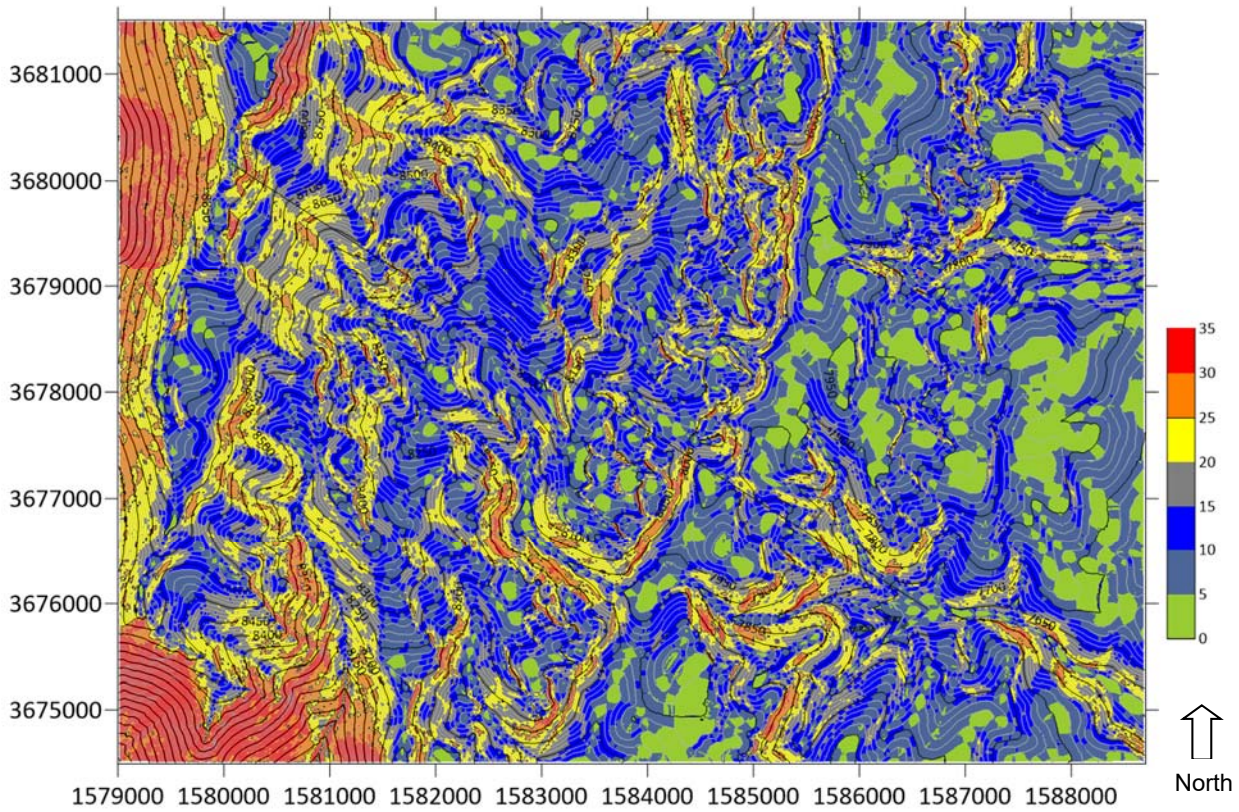


Figure 2 –Slope Map showing planned Ski Lift

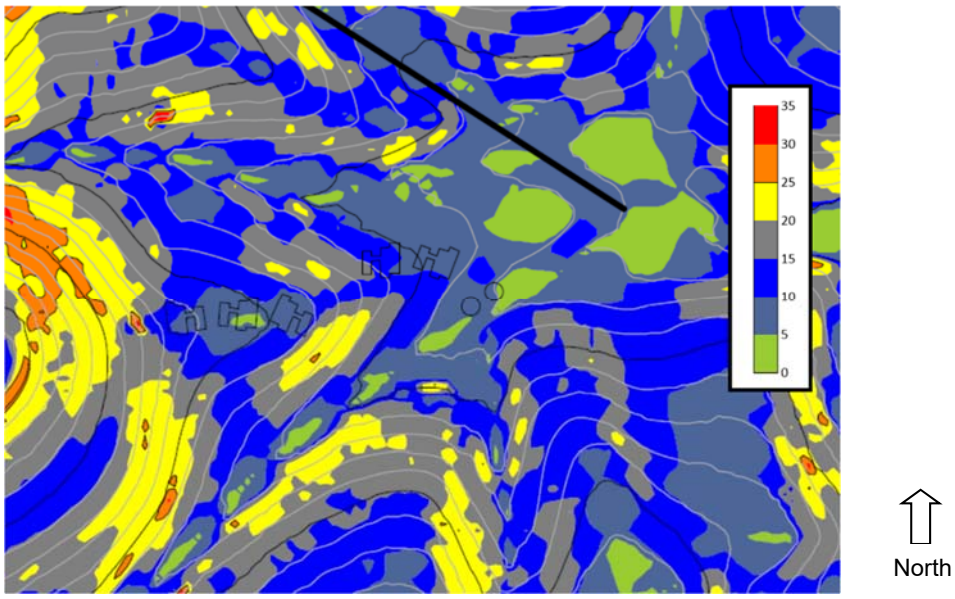


Figure 3 – Slope Map showing planned Cabins & Yurts

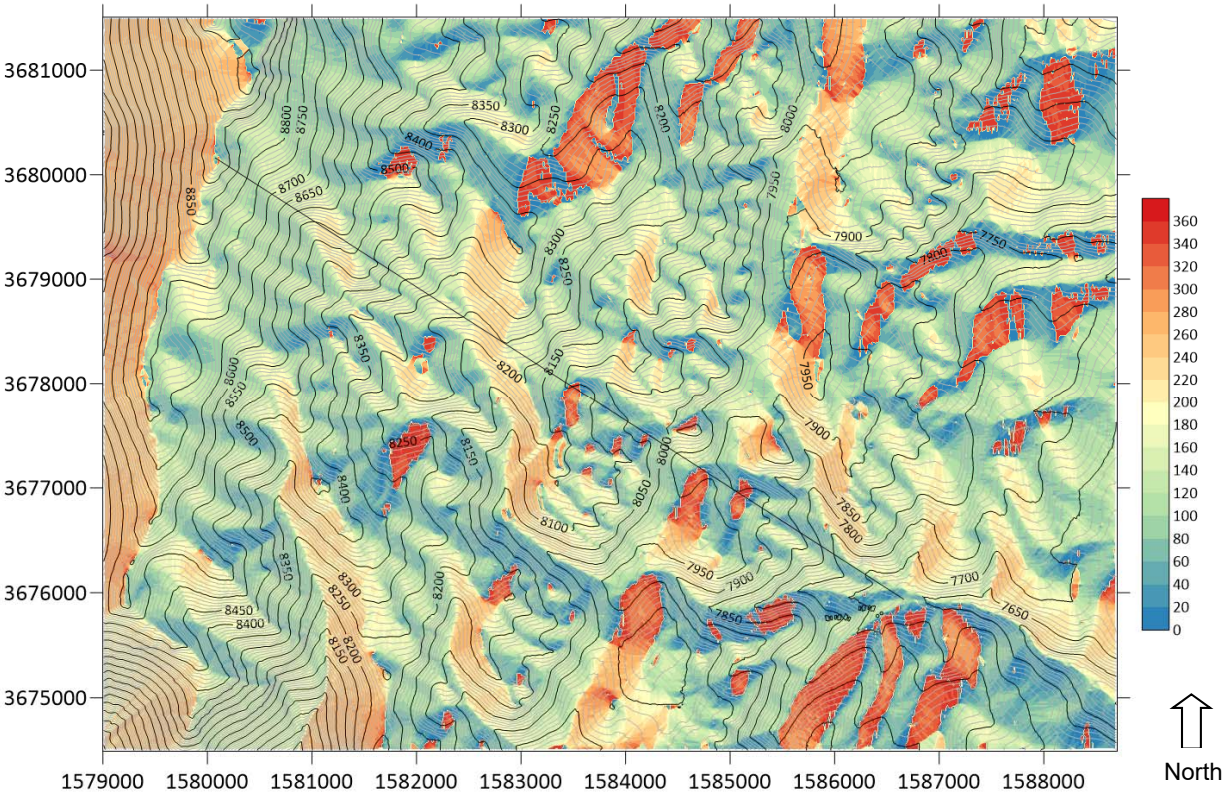
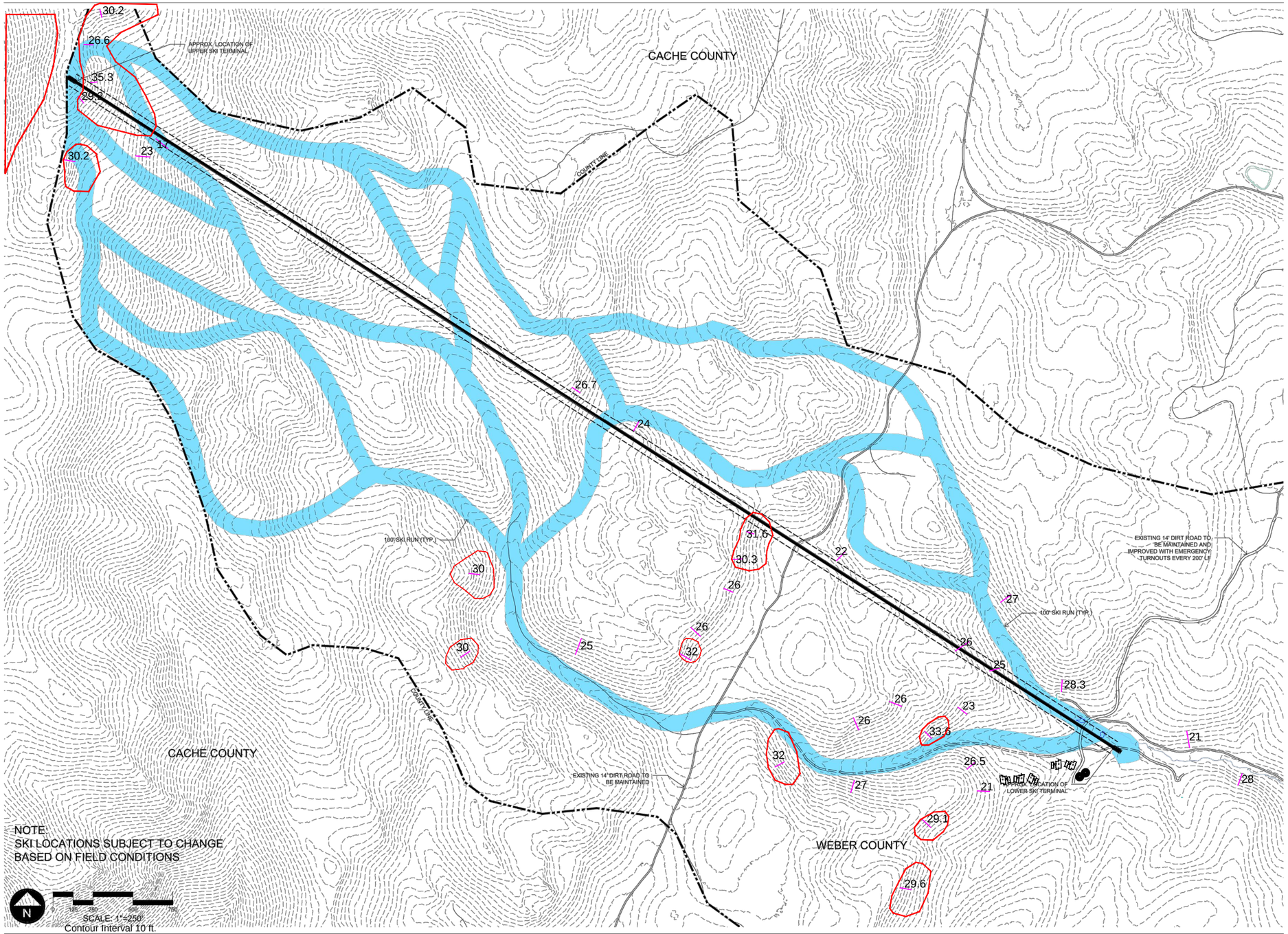


Figure 4 – Aspect Map

Figure 5

Avalanche Influence Zone Map



WHISPER RIDGE
VILLAGE PHASE 0 - CUP
WEBER COUNTY, UT

DATE:	APRIL 2020
PROJECT:	000.0000.145
DRAWN BY:	TK
REVIEW BY:	TK
VERSION:	
REVISIONS:	

SHEET TITLE: SKI PLAN

SHEET NUMBER: L1.5

Notes:

1. Avalanche influence zones are defined as areas where snow avalanches with an average return period of 300-years or less may occur.

2. Avalanche mapping is intended only for the evaluation of cabins sites, yurt sites and the planned ski lift.

3. Mapping is based on LiDAR-derived topography provided by the client.

3. Base map by Langvardt Design Group.

LEGEND

Avalanche Influence Zone

28 Local slope angle (deg.)

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Discussion

Most avalanches start on slopes between 30-degrees and 50-degrees. However, under very unstable snow conditions, avalanches can start on 28-degree slopes. Also, wind loading can transport and deposit snow on slopes less than 30-degrees and create slabs, pillows or cornices that can release and form avalanches. This situation may occur on the lee side of ridge tops near the planned upper ski lift terminal. The terminal location shown on the site plan lies outside of the Avalanche Influence Zone.

Findings and Conclusions

Based on our analysis and the methods described above, we conclude the following:

1. The planned cabin and yurt sites are not exposed to avalanche hazards.
2. The planned ski lift terminals are not exposed to avalanche hazards.
3. Figure 5 shows *Avalanche Influence Zones*, defined as areas of terrain that have characteristics, including steepness and shape that might produce snow avalanche hazards. If any of the *Avalanche Influence Zones* shown on Figure 5 are sites for permanent structures or infrastructure, we recommend a more detailed avalanche hazard assessment, including field observations.

I trust that this letter and map provide the information that you need at this time. I appreciate the opportunity to provide avalanche hazard assessment services. Please contact me if you have any questions or concerns.

Sincerely,
Wilbur Engineering, Inc.

Chris Wilbur, P.E.