

EXHIBIT H

Rockfall Mitigation Report

May 28, 2024

Aspen Built
1101 Village Road, Suite #LL-1B
Carbondale, CO 81623

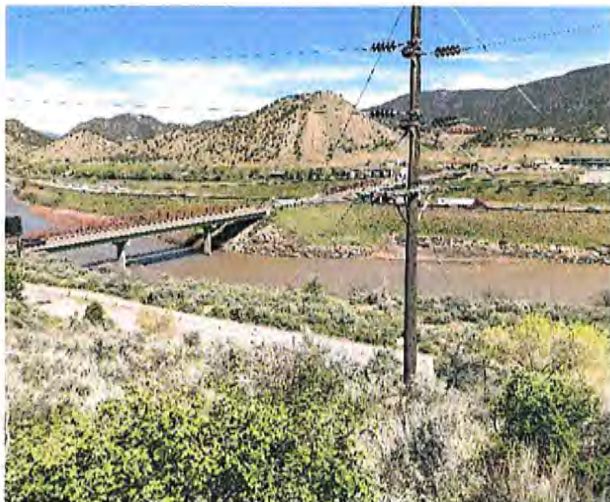
Attention: Abdi Pirzadeh
President and General Manager

Subject: Rockfall Hazard Analysis
Lot 1, Riverside PUD
(a.k.a. 7051 County Road 335)
New Castle, Colorado
Project No. GS06837.000-130

CTL|Thompson, Inc. (CTL|T) has completed a rockfall hazard analysis for Lot 1, Riverside PUD (a.k.a. 7051 County Road 335) in New Castle, Colorado. A hotel and brewery are proposed for the site. Rockfall is a potential hazard for the property. Results from our analysis include estimates of rock velocity, bounce height, and kinetic energy, which can be used by a specialty contractor to design an appropriate rockfall mitigation system. The scope of our rockfall hazard analysis was set forth in our Proposal No. GS-24-0029.

Site Conditions

Lot 1, Riverside PUD is located north of County Road 335 in New Castle, Colorado. A vicinity map with the location of the site is attached as Figure 1. James Kellogg, P.E., of CTL|T performed a site reconnaissance on April 25, 2024. The property is a 5.84-acre parcel that is bordered by the Colorado River at the north and River Park PUD apartments at the east. The west side of the property is adjacent to the bridge over the Colorado River. A gas station and convenience store previously located on the property was deconstructed sometime between 2006 and 2011. Currently, the site is predominantly vegetated with sage. Trees and willows are adjacent to the river. Photographs of the site are below.



West Part of Property



East Part of Property

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[Denver](#), [Fort Collins](#), [Colorado Springs](#), [Glenwood Springs](#), [Pueblo](#), [Summit County](#) – Colorado **150**
[Cheyenne](#), Wyoming and [Bozeman](#), Montana



Rockfall Sources

The Grand Hogback is south of the county road. The ridge of the hogback is approximately 950 to 1,000 feet above the subject site. Slopes on the north flank of the hogback range from grades of about 80 to 95 percent (about 39 to 44 degrees). Ground surface at the base of the hogback slopes down (north) toward the road at grades between 30 and 40 percent (about 17 to 21 degrees). The hogback slope is incised with numerous drainage channels separated by steep-sided ridges. Vegetation is predominantly sage and grasses with scattered, pinon, juniper, and thickets of oak brush. Photographs of the hogback above the site are below.



Hogback above East Part of Property



Hogback above West Part of Property

Geologic mapping by the US Geological Survey (USGS) titled, "Revised Preliminary Geologic Map of the New Castle Quadrangle, Garfield County, Colorado", by R.B. Scott and R.R. Shroba (dated 1997) indicate the Grand Hogback above (south of) the subject site is predominantly composed of sandstone bedrock of the Williams Fork Formation. Prominent outcrops of the sandstone are along the ridgetop. An unnamed band of sandstone outcrops along the mid-slope of the hogback flank. These outcrops are the source of rockfall boulders that could affect the subject site. Photographs that show the source rock are below.



Sandstone Outcrops and Fallen Boulders



Ridge Outcrops and Lower Sandstone Band



Typical Rockfall Boulders

We noted numerous boulders from rockfall that had stopped between the base of the hogback and the county road. The maximum dimension of most of these rocks was about 6 feet. Some larger boulders with long dimensions of 12 to 18 feet were present near the base of the hogback. We observed several boulders on the subject property that appear to be the result of rockfall. The maximum dimension of rocks on the site was about 6 feet. Photographs that show typical boulders likely to affect the subject property are below.



Rockfall Boulders south of County Road



Rockfall Boulders on Subject Parcel

Rockfall Analysis Approach

CTLJT evaluated the potential rockfall hazard for Lot 1, Riverside PUD using Colorado Rockfall Simulation Program (CRSP) 2004 developed by the Colorado School of Mines. We analyzed the four slope sections (A-A' through D-D') shown on the attached Figure 2. The program requires input regarding slope geometry and slope material properties, as well as coefficients to determine rock energy loss upon impact. It is also important to estimate the size, shape, and weight of rocks that would comprise a potential rockfall event.

Our site observations indicate the rockfall boulders are generally rectangular prisms with subangular faces. Due to the constraints of CRSP, we analyzed the rocks as spherical boulders. This is conservative because a spherical shape represents the “worst-case” because a sphere comprises the most mass for a given radius. Our analysis assumed a rock unit weight of density of 165 lb/ft³, which is typical for hard sandstone bedrock. We evaluated rocks with diameters of 4 ft, 6 ft, 8 ft, and 10 ft.

The CRSP program simulates “rolling” of rocks of the specified size and shape down the modeled slope geometries at each section. Parameters that must be entered for the slope sections include estimates of surface roughness, as well as tangential and normal coefficients, which allow estimates of rock trajectory and energy loss upon impacts as the rocks bounce while rolling down the slopes. The analysis ultimately predicts the number of rocks that would pass designated analysis points. It also provides estimates of rock velocities, bounce heights, and kinetic energy of the rocks at these points.



CTL|T set two analysis points for each of our four slope sections. We modeled a potential rockfall mitigation structure consisting of a 3-foot high earthen berm at the north side of the bike path, which is at the north side of the county road. We modeled the berm with a base width of 6 feet such that the upslope and downslope faces of the berm would have slopes of 1 H to 1 V (horizontal to vertical). Analysis Point 1 for each section was set at the base of the upslope (south) face of the berm. Analysis Point 2 was set at the base of the downslope face of the berm.

Rockfall Analysis Results

CTL|T utilized the CRSP program to simulate rolling of 100 rocks down each of the four modeled slope sections. Our simulations evaluated 4 ft, 6 ft, 8 ft, and 10 ft boulders. Our analysis assumed rocks starting at a velocity of 1 ft/sec upon separation from the source rock at the outcrops. Results of our analysis are summarized on the attached Table 1

The first data set for each slope section indicates the rock velocities, bounce heights, and kinetic energy at Analysis Point 1. The second data set is for Analysis Point 2. As indicated on the Table, a significant number of rocks were predicted to reach the base of the rockfall berm below slope sections A-A', B-B', and C-C'. The analysis showed none of these rocks passing the berm. Our analysis indicated that no rocks would reach the rockfall berm below slope section D-D'.

Opinions and Recommendations

Based on the analysis results, CTL|T judges that all of Lot 1, Riverside PUD is at risk from potential rockfall. The highest risk of rockfall appears to be within the central and west parts of the property. The greatest rock velocities, bounce heights, and kinetic energy would be below slope section A-A'. Mitigation of rockfall hazard is required for safe development of the subject parcel.

Our analysis indicates that a 3-feet high earthen berm with upslope and downslope faces of 1H to 1V would prevent these rocks from travelling further to the north on the subject property. Other mitigation systems can be considered, provided they are capable of absorbing the calculated maximum kinetic energies summarized on Table 1. We can provide additional assistance to the design-build contractor, if requested.

Site constraints will impact the design and construction of the rockfall mitigation system. The designer of the rockfall mitigation system must determine if the hazard is sufficiently eliminated to delineate or remove any build restrictions. Rockfall mitigation should be designed using the values provided on the table, including an adequate factor of safety.

Limitations

The analysis methods, opinions, and recommendations in this letter are based upon consideration of many factors including, but not limited to, site topography, geologic conditions, and the proposed site development. We believe our analysis was performed in a manner consistent with that level of care and skill ordinarily used by geotechnical engineers practicing in this area at this time. No warranty, express or implied, is made.



CTL|T is available to discuss the contents of this letter. Please contact us if you have questions or need additional information.

CTL|THOMPSON, INC.

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Reviewed by:

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0 1,000 2,000
SCALE: 1" = 2,000'

NOTE: SATELLITE IMAGE FROM GOOGLE MAPS
(DATED JUNE 2023)





0 1,000 2,000
SCALE: 1" = 500'

NOTE: TOPOGRAPHY FROM CALTOPO

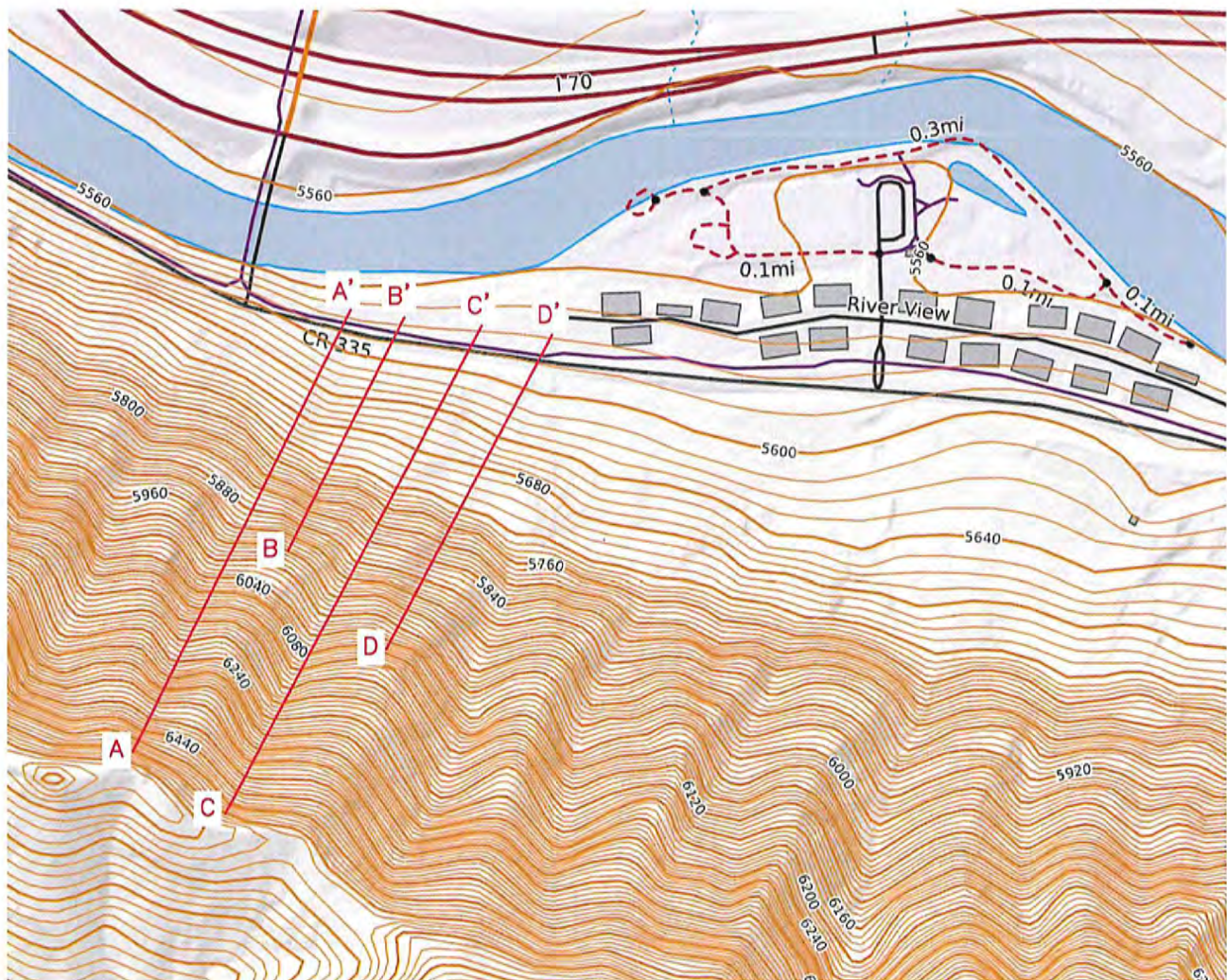


Table 1
Results of Rockfall Analysis

| Section: A-A' Section Length: 1360 ft Rock Density : 165 lb/ft ³ Analysis Point 1: X=1320 (south side of 3-ft high berm) No. of Rocks Simulated: 100 | | | | | | | |
|---|--------------------|------------------|--------------------------------|----------------------------|--------------------------------|------------------------------------|--|
| Rock Shape | Rock Diameter (ft) | Rock Weight (lb) | Maximum Rock Velocity (ft/sec) | Maximum Bounce Height (ft) | Maximum Kinetic Energy (ft-lb) | Total Rocks Passing Analysis Point | |
| spherical | 4 | 5,529 | 18.61 | 1.31 | 41,494 | 95 | |
| spherical | 6 | 18,661 | 19.38 | 1.1 | 143,817 | 92 | |
| spherical | 8 | 44,234 | 19.58 | 1.09 | 360,821 | 94 | |
| spherical | 10 | 85,394 | 18.96 | 1.05 | 655,970 | 91 | |

| Section: A-A' Section Length: 1360 ft Rock Density : 165 lb/ft ³ Analysis Point 2: X=1330 (north side of 3-ft high berm) No. of Rocks Simulated: 100 | | | | | | | |
|---|--------------------|------------------|--------------------------------|----------------------------|--------------------------------|------------------------------------|--|
| Rock Shape | Rock Diameter (ft) | Rock Weight (lb) | Maximum Rock Velocity (ft/sec) | Maximum Bounce Height (ft) | Maximum Kinetic Energy (ft-lb) | Total Rocks Passing Analysis Point | |
| spherical | 4 | 5,529 | NP | NP | NP | 0 | |
| spherical | 6 | 18,661 | NP | NP | NP | 0 | |
| spherical | 8 | 44,234 | NP | NP | NP | 0 | |
| spherical | 10 | 85,394 | NP | NP | NP | 0 | |

| Section: B-B' Section Length: 765 ft Rock Density : 165 lb/ft ³ Analysis Point 1: X=670 (south side of 3-ft high berm) No. of Rocks Simulated: 100 | | | | | | | |
|---|--------------------|------------------|---------------------------|----------------------------|--------------------------------|------------------------------------|--|
| Rock Shape | Rock Diameter (ft) | Rock Weight (lb) | Maximum Velocity (ft/sec) | Maximum Bounce Height (ft) | Maximum Kinetic Energy (ft-lb) | Total Rocks Passing Analysis Point | |
| spherical | 4 | 5,529 | 13.02 | 0.93 | 20,126 | 54 | |
| spherical | 6 | 18,661 | 12.85 | 0.86 | 65,814 | 58 | |
| spherical | 8 | 44,234 | 15.71 | 0.82 | 89,804 | 56 | |
| spherical | 10 | 85,394 | 13.82 | 1.15 | 360,213 | 57 | |

| Section: B-B' Section Length: 765 ft Rock Density : 165 lb/ft ³ Analysis Point 2: X=680 (north side of 3-ft high berm) No. of Rocks Simulated: 100 | | | | | | | |
|---|--------------------|------------------|---------------------------|----------------------------|--------------------------------|------------------------------------|--|
| Rock Shape | Rock Diameter (ft) | Rock Weight (lb) | Maximum Velocity (ft/sec) | Maximum Bounce Height (ft) | Maximum Kinetic Energy (ft-lb) | Total Rocks Passing Analysis Point | |
| spherical | 4 | 5,529 | NP | NP | NP | 0 | |
| spherical | 6 | 18,661 | NP | NP | NP | 0 | |
| spherical | 8 | 44,234 | NP | NP | NP | 0 | |
| spherical | 10 | 85,394 | NP | NP | NP | 0 | |

*NP indicates no rocks passing analysis point.

| Section: C-C' Section Length: 1555 ft Rock Density : 165 lb/ft3 Analysis Point 1: X=1445 (south side of 3-ft high berm) No. of Rocks Simulated: 100 | | | | | | | |
|---|--------------------|------------------|---------------------------|----------------------------|--------------------------------|------------------------------------|--|
| Rock Shape | Rock Diameter (ft) | Rock Weight (lb) | Maximum Velocity (ft/sec) | Maximum Bounce Height (ft) | Maximum Kinetic Energy (ft-lb) | Total Rocks Passing Analysis Point | |
| spherical | 4 | 5,529 | 14.05 | 0.71 | 23,485 | 25 | |
| spherical | 6 | 18,661 | 15.19 | 0.79 | 93,736 | 22 | |
| spherical | 8 | 44,234 | 14.97 | 0.51 | 212,933 | 23 | |
| spherical | 10 | 85,394 | 14.87 | 0.61 | 415,809 | 23 | |

| Section: C-C' Section Length: 1555 ft Rock Density : 165 lb/ft3 Analysis Point 2: X=1455 (north side of 3-ft high berm) No. of Rocks Simulated: 100 | | | | | | | |
|---|--------------------|------------------|---------------------------|----------------------------|--------------------------------|------------------------------------|--|
| Rock Shape | Rock Diameter (ft) | Rock Weight (lb) | Maximum Velocity (ft/sec) | Maximum Bounce Height (ft) | Maximum Kinetic Energy (ft-lb) | Total Rocks Passing Analysis Point | |
| spherical | 4 | 5,529 | NP | NP | NP | 0 | |
| spherical | 6 | 18,661 | NP | NP | NP | 0 | |
| spherical | 8 | 44,234 | NP | NP | NP | 0 | |
| spherical | 10 | 85,394 | NP | NP | NP | 0 | |

| Section: D-D' Section Length: 980 ft Rock Density : 165 lb/ft3 Analysis Point 1: X=920 (south side of 3-ft high berm) No. of Rocks Simulated: 100 | | | | | | | |
|---|--------------------|------------------|---------------------------|----------------------------|--------------------------------|------------------------------------|--|
| Rock Shape | Rock Diameter (ft) | Rock Weight (lb) | Maximum Velocity (ft/sec) | Maximum Bounce Height (ft) | Maximum Kinetic Energy (ft-lb) | Total Rocks Passing Analysis Point | |
| spherical | 3 | 5,529 | NP | NP | NP | 0 | |
| spherical | 3 | 18,661 | NP | NP | NP | 0 | |
| spherical | 6 | 44,234 | NP | NP | NP | 0 | |
| spherical | 6 | 85,394 | NP | NP | NP | 0 | |

| Section: D-D' Section Length: 980 ft Rock Density : 165 lb/ft3 Analysis Point 2: X=930 (north side of 3-ft high berm) No. of Rocks Simulated: 100 | | | | | | | |
|---|--------------------|------------------|---------------------------|----------------------------|--------------------------------|------------------------------------|--|
| Rock Shape | Rock Diameter (ft) | Rock Weight (lb) | Maximum Velocity (ft/sec) | Maximum Bounce Height (ft) | Maximum Kinetic Energy (ft-lb) | Total Rocks Passing Analysis Point | |
| spherical | 3 | 5,529 | NP | NP | NP | 0 | |
| spherical | 3 | 18,661 | NP | NP | NP | 0 | |
| spherical | 6 | 44,234 | NP | NP | NP | 0 | |
| spherical | 6 | 85,394 | NP | NP | NP | 0 | |

*NP indicates no rocks passing analysis point.