

Carlson Geotechnical

A Division of Carlson Testing, Inc.
Phone: (503) 601-8250
Fax: (503) 601-8254

Bend Office (541) 330-9155
Eugene Office (541) 345-0289
Salem Office (503) 589-1252
Tigard Office (503) 684-3460



Field Observation Report

CGT Project No.: G2005320
Permit No.: N/A

Project:	Elm Street Property	Date:	June 4, 2020
Address:	SE Elm Street & Hillcrest Drive, Oregon	Report Date:	July 24, 2020
Purpose:	Perform Geotechnical Reconnaissance	Staff:	Brad Wilcox, P.E., G.E.
Area of Site:	Entire Site	Weather:	Mostly Sunny, ~75°F
Requested By:	Nicholas Green of City of John Day (client)	Arrival/Departure:	10:00 a.m. / 11:05 a.m.

Site Observations

I arrived on-site at 10:00 a.m. and met with our client, Nick Green of City of John Day, and personnel of City of John Day Public Works. Today's visit was scheduled to perform a geotechnical reconnaissance of the project site, with specific attention made to the conditions of an existing boulder retaining wall and site slopes. Photographs taken during my reconnaissance of the site are shown on the attached Figure 1. Weather conditions during my reconnaissance were sunny and warm. During this meeting:

- Boulder Retaining Wall:** I observed a boulder retaining wall was present along the north and northwest margins of the site. Photographs 3 and 5 through 8 on the attached Figure 1 show conditions of the retaining wall.
 - The retaining wall was up to about 18 feet (+/-) in height, consisted of variably sized, subangular basalt boulders, and exhibited a relatively level soil-covered backslope. The size of the boulders ranged from about 1 to 5 feet in diameter (approximate), with the diameter generally decreasing towards its top. No tension cracks were observed within the backfill area along the top of the retaining wall.
 - The retaining wall exhibited a visually-estimated batter ranging from about ½H:1V (horizontal:vertical) to 1H:1V, with shallower batter present within the central, taller portion of the wall alignment.
 - Along the west leg of the retaining wall, soil and sparse vegetation (grasses) were present in between the boulders. No cobbles were present in between the boulders, resulting in sizeable voids in between them.
 - Below (downslope of) the retaining wall, the site was predominantly grass-covered and descended in the same general direction of the wall batter. No active erosion or other signs of instability was noted along the base of the retaining wall.
- Site Topography (above the retaining wall):** The site exhibited a terraced topography and contained two prominent benches (leveled surfaces) with slopes above each of them. Additional details follow:
 - The lower bench was bounded by the existing boulder retaining wall (described above) on its north and west sides, an apparent cut slope on its south side, and offsite property and the public street intersection on its east side. This bench appeared to have been created by a combination of cuts and fills, with fills present along its north margin (near the referenced wall) and cuts apparent at its south margin. The lower bench was surfaced with soils and sparse vegetation (grasses). Photographs 1 through 4 and 9 on the attached Figure 1 show conditions within the lower bench.
 - The cut slope along the south margin of the lower bench, designated as Cut Slope #1, exhibited relatively steep gradients, visually estimated to range from about 1H:1V to ¼H:1V. The slope was visually estimated up to about 8 feet in height. The cut slope material consisted predominantly of fractured basalt bedrock with rooted soils near the top of the cut. In a few locations, there were loose materials at the base of the cut (apparent talus). Photographs 3 and 9 on the attached Figure 1 show conditions along this cut slope.
 - Near the east site entrance, an unimproved soil-covered road trended up the hillside towards a second (upper) bench. This bench was surfaced with soils and sparse grasses, was smaller in footprint compared with the lower bench, and appeared to have been created by a combination of cuts and fills. A second cut slope, designated as Cut Slope #2, was present along the south side of this bench and exhibited similar gradients as Cut Slope #1. Photograph 12 on the attached Figure 1 show conditions along this cut slope. The extent of fill materials on the second bench was difficult to ascertain, but was anticipated to be present in the northwestern portion of the bench. Photographs 10 through 12 on the attached Figure 1 show conditions within the upper bench.
 - In between the lower and upper bench, the site generally descended in a planar manner to the north and was surfaced with grasses and a few coniferous trees. The referenced roadway appeared to have been created mostly via cut into the hillside.
 - Above (south of) the upper bench, the site ascended relatively steeply and was vegetated with grasses and several trees towards the south property line and City-owned property beyond. Two buildings were present on the City-owned property and reportedly house active reservoirs. The north sides of the buildings were setback

about 30 to 40 feet from the descending slope on the subject site. No tension cracks were observed within the leveled area on the City's property.

- f. No groundwater seepage or areas of ponded water were present on the site during today's walkthrough.

Discussion

Following the site walkthrough, the following was discussed with Mr. Green with regard to items observed during the reconnaissance.

- **Boulder Retaining Wall:** During today's visit, I did not see any indicators of local or global instability of the subject retaining wall. With that said, I indicated that the long-term performance of the boulder retaining wall could not be determined unless geotechnical investigation and analyses were performed. Based principally on visual inspection and experience with designing boulder retaining walls, I indicated that a likely outcome of such investigation and analyses, if performed, would be that stability factors would likely below industry standards. This judgment is based on the height of the retaining wall, apparent lack of embedment of the lowest row of boulders into the slope, less than ideal placement of boulders (i.e. the boulders exhibited variable contact between them and in some cases, exhibited sizeable voids), and other factors. Reliance on the retaining wall and/or its associated backfill for structural support of new buildings, pavements, or other structural features, if such development is considered, is not recommended unless a geotechnical investigation is conducted by a geotechnical engineer or certified engineering geologist.
- **Cut Slopes:** As indicated above, I observed two prominent cut slopes were present at the site. During today's visit, I did not see any indicators of imminent failures of the cut slopes present at the site. Apparent talus was present in areas along the lower cut slope, suggesting some erosion has occurred since the cut slope was created. I indicated to Nick that stabilization of the cut slopes (e.g. trimming them back, buttressing, or installing retaining walls) was advisable to provide assurance of long-term stability and reduce the potential of erosion/slumping.
- **Fill Materials:** As indicated above, it was apparent that fill material(s) were placed behind the referenced boulder retaining wall and at least a portion of the upper bench at the site. To the best of our knowledge, there are no records detailing the placement and compaction of existing fill material(s) at the site. I indicated to Nick that geotechnical investigation and testing of the fill materials could be performed to refine the lateral and vertical extent and relative compaction of the existing fill material(s), if desired.
- **Off-Site Buildings (upslope of site):** As indicated above, two City-owned buildings were present above (south of) the subject site. Based on visual inspection and recognition of the setback of the buildings from the upper cut slope (Cut Slope #2), I indicated that the risk of the nearby cut slope affecting those buildings appeared relatively low at this current time. Notwithstanding the preceding, stabilization of the cut slopes is recommended as described above to provide assurance of long-term stability.

Limitations & Closure

This site evaluation consisted of visual examinations of exposed conditions along the face of the existing boulder wall and site slopes. Accordingly, the limitations of the site evaluation must be recognized. An exploration of subsurface conditions at depth was not conducted for this evaluation. An investigation to explore subsurface conditions at depth using soil borings or excavations could be conducted at additional cost to the owner to further define the risk of unforeseen, adverse geological/geotechnical issues on this site.

We have prepared this report for use by the City of John Day. The opinions and recommendations contained within this report are not intended to be, nor should they be construed as, a warranty of subsurface conditions, but are forwarded to assist in the planning process.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with the generally accepted practices in this area at the time this report was prepared. No warranty or other conditions, expressed or implied, should be understood.

Please contact us if there are any questions regarding this report.



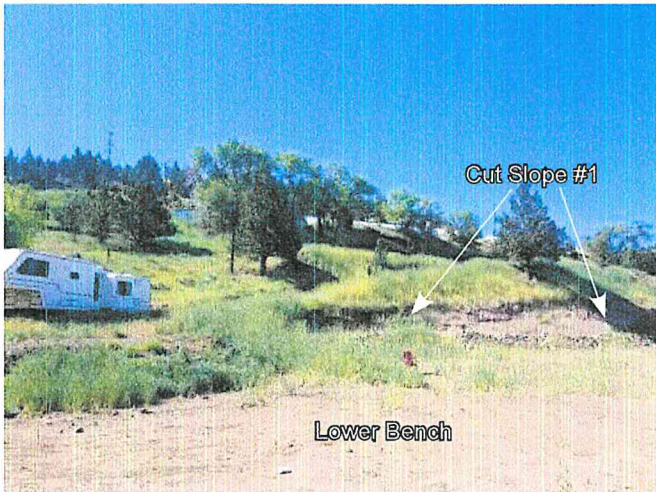
Brad M. Wilcox, P.E., G.E.
Principal Geotechnical Engineer
bwilcox@carlsonesting.com

*Elm Street Property
John Day, Oregon
CGT Project Number G2005315
June 4, 2020*

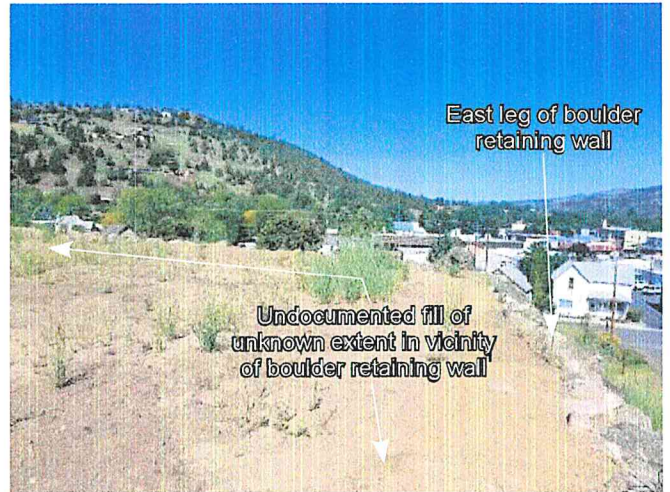
Note: The observations of existing conditions at the time of our site visit were based solely on visual methods. Our reports pertain to the locations observed at the time of our visit only. Information contained herein is not to be reproduced, except in full, without prior authorization from this office. The information contained in this report is provided subject to all terms and conditions of CGT's General Conditions in effect at the time this report is prepared. No party other than those to whom CGT has distributed this report shall be entitled to use or rely upon the information contained in this document.

ATTACHMENTS: Site Photographs, Figure 1 (3 pages)

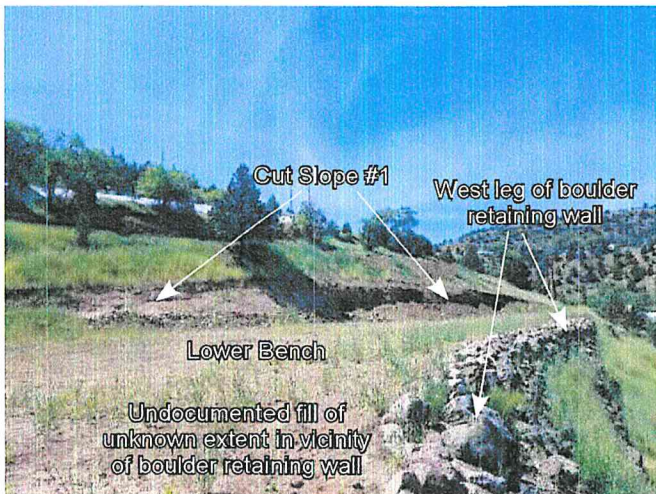
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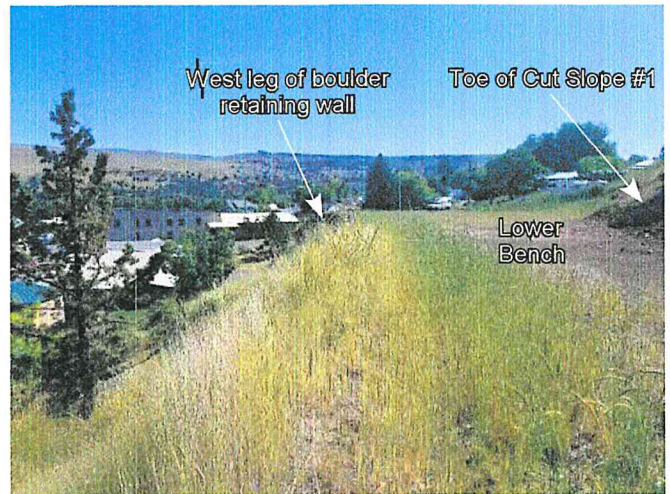
Photograph 1: Looking south from a point near the NE corner of the site.



Photograph 2: Looking west along northeast margin of site.



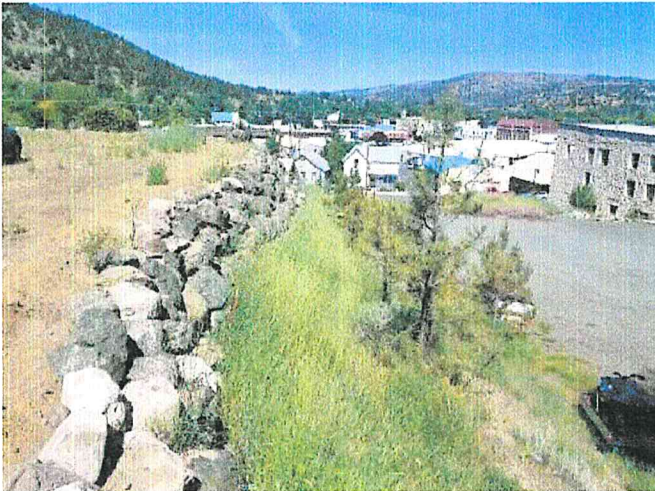
Photograph 3: Looking southwest from a point near the corner of the existing boulder retaining wall.



Photograph 4: Looking northeast from a point near the west end of the site (lower bench).



Photographs were taken at the time of our fieldwork on June 4, 2020.



Photograph 5: Looking west along east leg of boulder retaining wall.



Photograph 6: Looking east along east leg of boulder retaining wall.



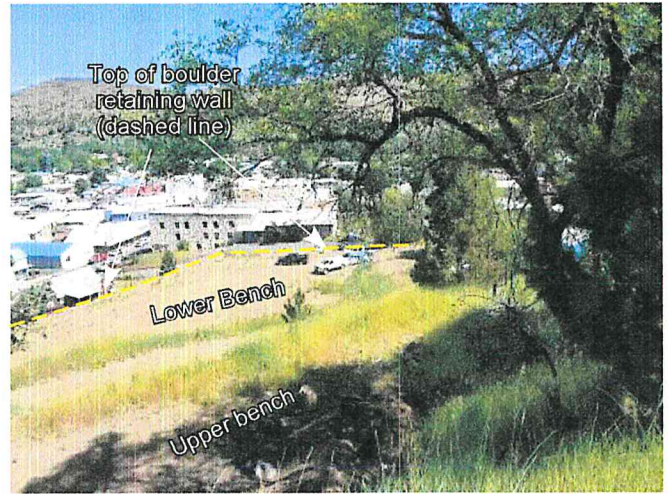
Photograph 7: Looking southwest along base of west leg of boulder retaining wall.



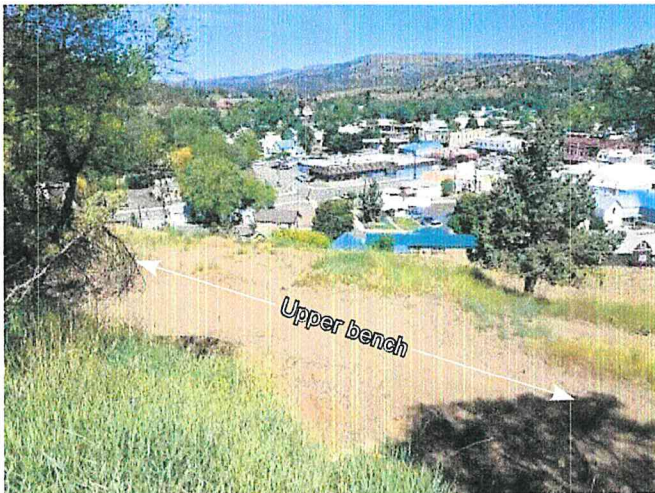
Photograph 8: Looking northeast along west leg of boulder retaining wall.



Photograph 9: Looking east at cut slope present at south side of lower bench of site.



Photograph 10: Looking northeast from a point near the top of the upper cut slope (near City owned buildings)



Photograph 11: Looking northwest from a point near the top of the upper cut slope (near City owned buildings)



Photograph 12: Looking west from a point near the east end of the upper bench of site.