



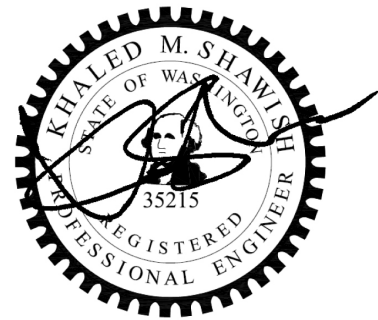
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MEMORANDUM

DATE: March 22, 2016
TO: Mr. Arne Hedeem – Hedeem & Caditz, PLLC
FROM: Khaled M. Shawish, P.E.
Lee S. Bellah, LG
RE: Whispering Ridge Ground Movement
5050 Whispering Ridge Road and Vicinity
Chelan County, Washington
NGA File No. 947916



Exp. July 28, 2017

Introduction

This memorandum documents our initial observations and preliminary opinions regarding the recently observed ground movement at and in the vicinity of the residential property located at 5050 Whispering Ridge Road (Davis property) in the Wenatchee area of Chelan County, Washington. We have been retained on February 5, 2016 by the Seattle law firm of Hedeem & Caditz, PLLC to provide our opinions regarding issues associated with observed earth movement on the Davis property as it may relate to PUD owned utilities within Whispering Ridge Drive, located above the Davis property. We understand that the property owners of 5050 Whispering Ridge Drive, Mr. James Davis and Mrs. Barbara Davis, have filed a complaint against the PUD and other parties, alleging that PUD has failed to adequately maintain a water main located within Whispering Ridge Drive above the Davis property, resulting in a break in the line and the ensuing earth subsidence, and significant damage to the Davis home and property.

We have previously prepared a geotechnical report, and a letter for the Whispering Ridge Development located directly above the Davis property (Whispering Ridge Drive is the main access road into this development and the failures in the water line are located within this road). We prepared a Geotechnical Report titled “Preliminary Geotechnical Engineering Evaluation Black/Bondo Lots – Whispering Ridge Development – Chelan County, Washington,” dated June 9, 2004. We were retained at a later date, and

supplied a supplemental letter titled “Supplemental Geotechnical Engineering Letter – Whispering Ridge Lot 30 – Wenatchee, Washington,” dated October 31, 2005. The report and supplemental geotechnical letter were prepared for Mr. Paul Bondo.

At the time of Nelson Geotechnical Associates’ preliminary geotechnical report (June 9, 2004), the site was mostly undeveloped with a paved road (Whispering Ridge Drive) constructed to access 19 residential lots, four of which had been developed at that time. The overall area is situated on a west-facing slope that was identified by us as part of an ancient landslide. Test Pit explorations within the development encountered ancient landslide debris and chronic groundwater seepage. At the time of our initial evaluation, some road subsidence had occurred in the southern portion of the site. Our initial geotechnical evaluation encompassed the undeveloped lots 2, 4, 6, 7, 9, and 28 through 33. We concluded that certain portions of the development were unstable and recommended that further studies be completed to better evaluate instability concerns within the roadway and the unstable areas. We were never contacted by any entity to conduct any further studies on this site since our involvement in 2005 until PUD hired us for this current task.

Since our most recent involvement with this site, we have observed significant ground movement and distress within the property at 5050 Whispering Ridge Road and within the properties and roadway immediately upslope and to the east of the subject property, including the orchard property above the road. We were informed that Chelan County PUD owned utilities (electricity and water) have been shut off as a result of the observed ground movement. We were also informed that neighboring residences both below and above the observed ground movement have been notified and/or evacuated due to the potential threat of a catastrophic landslide.

Recent Explorations and Instrumentation Installations

Between the dates of March 7 to March 11, 2016, we performed nine drilled borings using a track-mounted drill rig within the Davis’s property, the neighboring property to the east and within the property immediately east of Whispering Ridge Road, as shown on the Site Plan attached to this memorandum as Figure 1. Slope inclinometer instrumentation was installed within Borings 1, 3, 4, 5, and 7. Piezometer groundwater monitoring wells were installed within Borings 2, 8 and 9. We have since obtained baseline readings of the inclinometers on March 14, 2016. However, the inclinometer casings within Boring 3 and 4 were not able to be fully read due to the casings likely being sheared or severely bent as a result of the ongoing ground movement. We were only able to read the upper approximately 15 feet of the casings within Borings 3 and 4. We then returned to the site on March 17, 2016 to perform follow-up readings of

the inclinometer casings. Within the 3-day period, the inclinometer in Boring 5 indicated approximately one inch of movement in the downhill western direction beginning at approximately 30 feet. The inclinometer in Boring 7 indicated approximately 0.5-inches of movement in the downhill direction.

Recent Surficial Observations

On Tuesday March 8, 2016 we walked the Davis Property and observed that the detached shop was continuing to experience significant distress and movement. We were also able to observe surficial tension cracks extending in an west-east direction immediately south of Boring 3 along the approximate southern extents of the movement area. Similar surficial tension cracks were also observed near the existing detached garage in the gravel surfacing also extending in a west-east direction and propagating upslope to the east. On Wednesday March 9, 2016, we observed an approximately one and one-half foot by three foot deep sinkhole that had developed along the northwest corner of the Davis Residence. We also observed numerous other tension cracks around the Davis property on March 9, 2016 that were not observed prior. On Monday March 14, 2016, we were generally unable to observe the surficial ground surface within most of the Davis property and within the overall slide area due to snow cover; however, we did observe some significant settlement and deformation of the pavement surfacing within Whispering Ridge Road along the northern extents of the observed ground movement at that time. We also observed that the ground surface soils appeared to be pulling away from the western side of the Davis Residence foundation creating large voids between the soils and the foundation. On Tuesday March 15, 2016, we were notified by neighbors located within the Whispering Ridge community that significant ground movement had been observed within the orchard area immediately east of Whispering Ridge Drive. We also understand that a portion of the water main within this area had also broken. On Thursday March 17, 2016 we returned to the site and observes additional surficial tension cracks within the properties to the south of the Davis Property and to the west of Whispering Ridge Drive. We also observed that the ground surface was bulging within this area in some locations and that the upper slide scarp has extended well into the orchard. The current approximate extents of the slide are shown on the attached figure. After consultation with us, Chelan County PUD made the decision to shut off the water supply line and power lines within this area due to potential severe hazards associated with the continued earth subsidence.

Preliminary Opinions and Recommendations

Based on our readings of the installed instrumentation and the observed severe distress and ground movement within this area, it is our opinion that shutting off the water main lines and power to the affected residences was needed to reduce the potential impact to the utilities and public health and safety from the

continued and worsening earth movement. It is also our opinion that the earth mass within this area is continuing to move and could experience an abrupt and catastrophic failure at any time, especially during or shortly after periods of heavy rainfall, snow melt, and/or as a result of seismic activity. Such failure would likely impact the residences, properties, roadways and associated utilities within and in the vicinity of the landslide. Such failure could also severely impact properties and residences downslope and to the west of the observed ground movement area.

On the short term, we recommend that the Davis's residence and the residence located at 5160 Whispering Ridge Road not be occupied until further notice. We also recommend that other residences in the immediate vicinity of the ground movement area, and especially down slope of the slide, be vacated due to the potential of sudden and abrupt ground movement that may reach these properties. We recommend that this remain in effect until the overall area can be further analyzed and understood and remedy measures implemented before these residences be occupied again. We understand that Chelan County is currently working with another geotechnical engineering firm to further assess the slide area and ramifications to affected properties.

Based on conversations with Chelan County PUD, we understand that it may be feasible to temporarily restore water and electricity services to the residences above the slide area. Any temporary installations should be well outside any observed movement areas and should incorporate adequate safety measures to withstand distress from sudden and abrupt movement outside of the observed movement area. We will continue to monitor the slide and update our recommendations as warranted. We will issue additional reports once more data is collected and thoroughly analyzed.

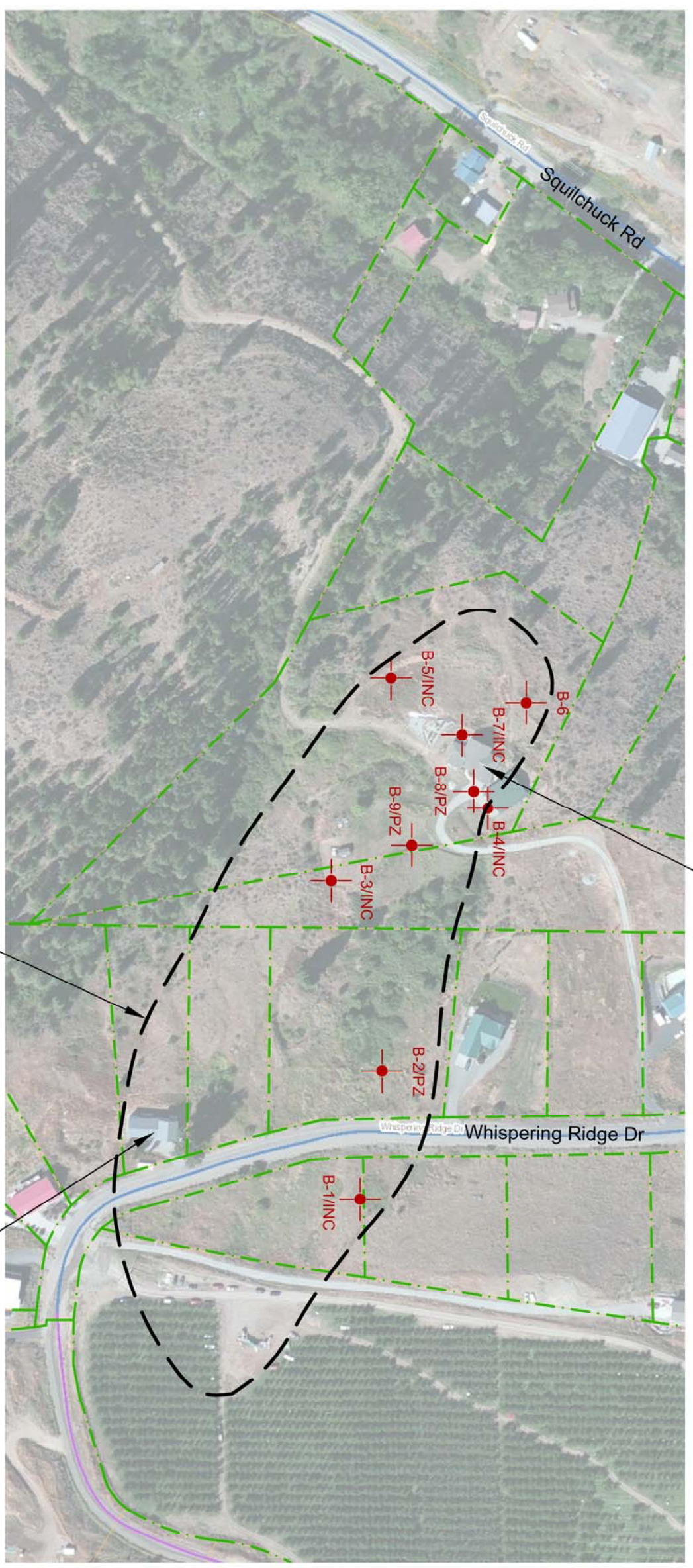
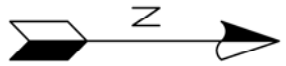
We trust this memorandum should satisfy your needs at this time. Please contact us if you have any questions or require additional services.

O-O-O

Attachment: Site Plan

Schematic Site Plan

N:\2016 NGA Project Folders\0 2016 Eastern Washington Projects\947916 5050 Whispering Ridge Residence\Drafting\Schematic_SP2.dwg

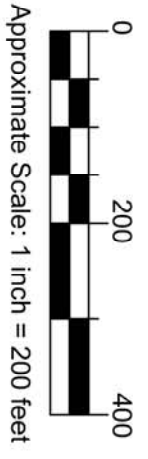


LEGEND

- Property line
- B-1
Number and approximate location of boring
- B-1/INC
Number and approximate location of boring with inclinometer
- B-1/PZ
Number and approximate location of boring with piezometer

Approximate extents of earth subsidence (as of March 22, 2016)

5160 Whispering Ridge Rd



Reference: Site Plan based on field measurements, observations, and aerial photo review.

Project Number	5050 Whispering Ridge Schematic Site Plan	NELSON GEOTECHNICAL ASSOCIATES, INC. GEOTECHNICAL ENGINEERS & GEOLOGISTS <small>17311-135th Ave. NE, A-500 Woodinville, WA 98072 (425) 486-1669 / Fax 481-2510</small>	No.	Date	Revision	By	CK
947916			1	3/16/16	Original	DPN	MEB
Figure 1		<small>Snohomish County (425) 337-1669 Wenatchee/Chelan (509) 665-7696 www.nelsongeotech.com</small>					