



City of Issaquah

Development Services Department
 PO Box 1307, Issaquah, WA 98027-1307
 425/837-3094 Fax: 425/837-3089

Project Title: Bergsma Property Peer Review		Documents Reviewed : <ul style="list-style-type: none"> Critical Areas Evaluation and Geotechnical Engineering Report, Bergsma Property Southeast Newport Way and 17th Avenue Northwest Issaquah, Washington, The Riley Group, Inc. December 7, 2017 			Permit Number :				
Date Received: January 4, 2018		Reviewed By: Amec Foster Wheeler Todd Wentworth, PE, LG; Konrad Moeller, LEG		Phone: 425-368-1000		Date: January 24, 2018		Sheet 1 of 12	
Com #	Report Sec.	Reviewer's Comment – R=Required / P=Presumed / C=Consider			Third Party Review – A=Agreed / NA=Not Agreed / C=Consider				
1	Section 4.4	Monitoring wells were installed in B-201 and B-202, but no well completion records are provided. Provide on the boring logs or in the text the depth and geologic unit in which the wells were screened. Also, provide any other GW measurements that have been made.			R				A
2	Section 4.4	The boring logs show water levels at 16' in B-201 and 7 feet in B-202. Please include the date of the water level measurement.			R				A
3	Section 4.4	We suggest that the location of streams and springs be shown on a site plan. Streams are noted draining wetlands on-site, please state if you think are they perennial or intermittent. Are the streams fed by the wetlands or springs or both? The answer is important as it also relates to the critical areas designation on the slopes, particular if springs are present.			R				A
4	Section 4.4	The description of the North stream states that it starts in a wetland near the center of the site near lot 31. The area adjacent to Lot 31 is a steep slope at the head of a			R				A



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		shallow ravine. If the wetland is located in the ravine on the slope then it seems logical that the source of the water is a spring. Please provide clarification on the origin of the water in the North Ravine and its implications on site development plans if spring fed.							
5	Section 4.5	This section states that liquefaction risk is minimal due in part to a “deep groundwater table”. This statement is not substantiated by groundwater descriptions in Section 4.4 or on boring logs. Please correct or clarify the statement justifying the conclusion that seismic liquefaction risk is low.			R				A
6	Section 4.6	This section is intend to address the City's requirement for a Critical Areas Study, <i>Section 18.10.410</i> which requires the applicant to submit a CAS that includes all critical areas defined in the chapter, including abandoned coal mines, erosion, landslide, seismic and steep slope hazards. Even if some of these hazards are not present at the site, they should be included in the CAS section and their absence substantiated.			R				A, C



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		<p>The paragraph states that the site meets criteria for landslide and steep slope hazards. There is a requirement in the code to include a site plan showing the location of <u>all critical slopes on the project site</u>, (landslide and steep slopes) at a specified scale and contour interval. Please include a site plan meeting this requirement.</p> <p>The report notes that only 40% or greater slopes are landslide hazards. Note that the definition of Landslide Hazard Area in <i>18.10.390 Definitions</i> includes other slope areas; for example any area of the site that is underlain by Mass Wasting Deposits (as described in Section 4.2 on the west portion of the property) would meet the definition of Landslide Hazard regardless of slope steepness. Other definitions also seem to apply to sloping portions of the site. Existing landslides discussed in the report on adjacent parcels (Westside Reservoir Landslide, Goode Place Landslide) should also be shown on the critical areas site plan.</p>			<p>As another example, it appears that there are other slopes on the site that are landslide hazards due to impermeable soils and springs</p>				



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7	Section 4.6.1	<p>It is not clear what area of the site the geologic field reconnaissance was performed. It did not appear to include the west portion of the site where mass wasting deposits are mapped. The CAS is required to address the entire project site. Since the west portion is intended for open space you might consider discussing this and showing the boundaries on the site plan and providing justification why site development plans will not impact the critical areas located there.</p> <p>The sentence "<i>No additional seeps or springs were observed</i>" implies that some were observed. Please clarify where the springs or seeps are located or re-word this sentence to state that no springs or seeps are present. (see comments for Section 4.4 above)</p>			R	Consider adding a site plan displaying significant surface features and noting where specific observations were made during the site reconnaissance.				A, C
8	Section 4.6.1	This section contains the statement " <i>slopes appear to be stable in current configuration and conditions with the exception of the previous mining activity</i> ". This statement lacks specificity and is vague. For example, does it include the western parcel slopes that are			R	Consider designating specific slopes on a site plan and then describing each of them.				A, C



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		mapped as mass wasting deposits? It also seems to imply that the mine cut slopes are unstable? If so, do the buffers and setback recommendations in Section 4.6.4 apply to the mine cut slopes? We recommend that more detail be included in this section or other sections to provide specificity to statements on the site slope stability.					
9	Section 4.6.2	<p>We agree with including a summary of information about nearby landslides. Golder provided the City with copies of historical reports for the Westside Reservoir Landslide that are available for your review. The sections for the Goode Place and Westside Reservoir landslides should be revised and include a discussion of how the geology of those landslide relates to the project site and what if any mitigations are being considered to prevent similar instability at Bergsma.</p> <p>Include a discussion of the following references in your literature review:</p>			R		A



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		Washington Department of Natural Resources, online geohazard database; Tiger Watershed, Landslide Hazard Zonation Project, King County Washington, Walsh & Sirikhan, August 2007 (The landslide hazard mapping done for this report includes the Bergsma Site); a review and interpretation of available LiDAR imaging								
10	Section 4.6.3	Global stability of the slope will be governed by the weakest soil unit present in the slope. Laboratory tests indicate friction angle for the lean clay of 18 or 22 degrees (peak strength) but 22 degrees was used in the stability analyses. Also, in our opinion, it is probably appropriate to use the residual friction angle instead of the peak value, given the previous instability around the Westside Reservoir immediately adjacent to the site.			R	It also important to be very cautious with cohesion. For long term static stability, cohesion should not be used for granular soils and a low value should be used for the clay.				A, C
11	Section 4.6.3	Several of the SLIDE run figures do not indicate what shear strength parameters were used for the various soil soil units. Please include this information on each slide run figure. Furthermore, it appears that the water table is not			R					A



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		included in analyses of the post-construction condition. Please provide calculations with the water table included.							
12	Section 4.6.3	In the "Construction – Static" and "Post-Construction – Seismic" SLIDE runs, horizontal supporting forces are modeled. It is unclear what these forces represent. Please explain why these forces are included in the model.			R				A
13	Section 4.6.4	Consider changing the title of this section to "buffers and setbacks". Building setbacks, by code, cannot be changed (15 feet minimum), the 50' wide minimum buffer from the crest and toe of steep slopes and landslide hazards may be reduced if the geotechnical engineer provides adequate justification to City officials to support a reduction. The procedure for assessing critical site slopes for appropriate buffers is generally as follows: Map all steep slope and landslide hazard areas on the site in accordance with definitions for such slopes in CMC (distinguish between steep slopes and landslide hazard			C				A



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		<p>areas on map because development standards are different for each slope type). Next, apply the minimum 50' buffers to the top toe and sides of each hazard area. If buffer reductions are needed to accommodate the site development proposal, each of those areas should be evaluated for specific reductions. <u>A blanket buffer reduction recommendation for all site slopes is not appropriate.</u> Each specific slope area should be evaluated independently. For each representative section of critical slopes, a topographic and geologic section should be prepared and stability analysis of the pre and post-development slope conditions should be completed. Based on results of the analysis, the engineer should provide justification for a buffer reduction from top or toe of slope. Justification means that the applicant must in accordance with <i>Section 18.10.580, A, 2</i> demonstrate that <i>"the reduction will not reduce the level of protection to the proposed development and the critical area as provided by the fifty (50) foot buffer"</i>.</p>				



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		For example; the engineer could run a stability analysis of the existing site conditions for the crest or toe of a representative steep slope or landslide hazard area cross section to determine existing slope FS, and then modify the cross section to reflect the proposed grading conditions (particularly in the reduced buffer area) and re-run the stability analysis. If the analysis results show no net decrease in slope stability in the proposed grading condition compared to the existing condition then one could use that information (and additional mitigations if needed) to provide adequate justification that the reduced buffer offers the same protection as the minimum 50' buffer.							
14	Section 4.6.4	Section 4.6.4 recommends a buffer reduction from 50' to 10' for all areas of 40% slopes. As noted in previous comment a blanket buffer reduction statement is not appropriate. Please provide the buffer reduction justification discussed above. For example, does this reduction apply to the top and toe of all 40% site			R	A			



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		<p>slopes? Explain how it applies to the following areas: landslide hazard slopes and steep slope areas; western parcel slopes mapped as Mass Wasting Deposits; toe of the slope below or adjacent to the Westside Reservoir landslide; Cut slopes in the abandoned gravel mine along Newport Way.</p> <p>Explain how this recommendation would apply to the entrance access road which is proposed to be located through in the middle of a steep slope. Consider including a discussion of how the provisions of Section 18.10.560 <i>Landslide hazard areas – Protection mechanisms and permitted alterations</i> permits the alteration of a critical area and what mitigations will be used to maintain slope stability for the proposed entry road grading.</p>								
15	Section 4.6.4	The report states that <i>“the proposed development area is located in areas of slopes with inclinations of 10% to 25%...”</i> However, Lots 50-57 appear to be located			R	A				



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		above a 40% slope. This may be relic text from the August 2017 report that did not include these lots. Please revise.							
16	Section 5.2.5	It is not clear in this text if the native silty and clayey soils are recommended for use as structural fill. Please clarify. There appears to be a large quantity of structural fill needed at and below lots 50 to 57. Are silty and clayey soils intended to be used to fill this area? Table 5 in the report appears to indicate the answer is no. Please clarify and consider how the fill type used may impact the stability analysis for this area.			R	A			
17	Section 5.2.7	Include recommendations for handling, storage and conveyance of stormwater during construction as it relates to sloped critical areas. All site development is being done across or at the crest of steep slopes. Proper management of construction stormwater runoff will be critical at this site.			R	A			



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18	Section 5.4	The earth pressure diagrams are unclear and difficult to follow. For example, some dimensions for the no-load zone conflict with each other, and symbols are used which are not defined. Please properly label all dimensions and ensure that consistent labels are being used for each dimension throughout the diagram.			R	For final design, consider providing earth pressure diagrams for specific wall locations that are easier to interpret because specific dimensions/values can be provided.				A, C