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August 8, 2017

Summit Mountain Holding Group, LLC
3632 North Wolf Creek Drive
Eden, Utah 84310
Attn: Mr. Scott Clements

IGES Project No. 01628-018

RE: **Foundation Soils Observation**
Horizon Neighborhood – Unit 26
Summit Powder Mountain
Weber County, Utah

Ref: IGES, 2016, Geotechnical & Geologic Hazard Investigation, Horizon Neighbourhood Development, Summit Powder Mountain Resort, Weber County, Utah: IGES Project No. 01628-013, dated August 3, 2016.

Mr. Clements,

As requested, IGES performed an observation of the foundation excavation for Unit 26 within the Horizon Neighborhood of the Summit Powder Mountain Resort located in Weber County, Utah. A geotechnical report was previously completed by IGES in 2016, referenced above. The purpose of our foundation excavation observation was to look for soil conditions that might adversely impact the foundations of the home (i.e., collapsible soils, undocumented fill, loose/soft soil, debris, frozen soil, ponded water, etc.) and to assess compliance with recommendations presented in the geotechnical investigation; key recommendations are summarized as follows:

- Bedrock/soil or fill/native transition zones are not allowed. If differing earth materials are exposed in the footing excavations, then the footings should be deepened such that all footings bear on the same earth materials (e.g., all footings bear on the same type of bedrock). Alternatively, the building pad may be over-excavated a minimum of 2 feet below the bottom of proposed footings and replaced with structural fill, such that the footings bear entirely on a uniform fill blanket (note that the bottom of footing must still be below the depth of observed surficial soils).
- All conventional foundations exposed to the full effects of frost should be established at a minimum depth of 42 inches below the lowest adjacent final grade. Interior footings, not subjected to the full effects of frost (i.e., *a continuously heated structure*), may be established at higher elevations, however, a minimum depth of embedment of 12 inches is recommended for confinement purposes.

Observations

At the time of our site visit on July 27, 2017 the foundation excavation was essentially complete Based on our observations, the foundation subgrade, and all of the excavation walls, exposed engineered backfill. Where exposed, the engineered fill consists of backfilled native material with clasts larger than 1 foot removed; the engineered fill had been compacted to 95% maximum dry

density and at or slightly above optimum moisture content of Modified Proctor (ASTM D1557), observed by IGES and tested by our sub-contractor, Terracon. The fill material generally consists of lean sandy clay with gravel. The new home has foundations with three elevation changes (three tiers). All three tiers were tested using a Nuclear Density Gauge to determine in situ density and moisture content. Based on laboratory testing, the soils utilized in this area have a maximum dry density of 121.9 pcf and an optimum moisture content of 12%. The upper tier tested at dry density 115 pcf (94.3%) and had a moisture content of 12%. The middle tier tested at dry density 116 pcf (95.2%) and 16% moisture content. The lower tier tested at dry density 120 pcf (98.4%) and 16.5% moisture content. The foundation subgrade appeared competent and suitable to support the anticipated building loads on all tiers, although seepage on the middle and bottom tiers may present difficulty with the constructability of footings. No undocumented fill, potentially collapsible soils or excessive loose material was observed at the bottom of the excavation.

Conclusions and Recommendations

Based on our observations, the foundation subgrade has been prepared in substantial compliance with the recommendations presented in the geotechnical report (IGES, 2016) and the foundation subgrade is suitable for the construction of the footings at this time.

To reiterate pertinent recommendations presented in the referenced report, all exterior footings should be embedded a minimum of 42 inches below nearest adjacent finish grade. During construction of the foundations, any loose material or debris that falls into the excavation should be removed or compacted in-place prior to constructing the footings. As recommended in the referenced geotechnical report, where basement levels are planned, foundation drains should be installed around below-ground foundations (e.g., basement walls) to minimize the potential for flooding from shallow groundwater, which may be present at various times during the year, particularly spring run-off.

As a part of good construction practice, we recommend the following be implemented to reduce the risk of excessive settlement of the surrounding foundation backfill soils:

- Backfill around foundations should consist of native soils placed in maximum 12-inch loose lifts compacted to approximately 90 to 94 percent of the maximum dry density and at, or slightly above, optimum moisture content, in accordance with the Modified Proctor (ASTM D1557). Compacting by means of injecting water or “jetting” is not recommended.
- Roof runoff devices should be installed to collect and discharge all roof runoff a minimum of 10 feet from foundation elements or beyond the limits of the foundation backfill, whichever distance is greater.
- The ground surface within 10 feet of the foundations should be sloped to drain away from the structure with a minimum fall of 6 inches.
- All irrigation lines and valves should be placed a minimum of 5 feet from the foundations; only hand watering or drip irrigation should be used within 5 feet of the foundations. Irrigation valves must be placed outside of the basement backfill zone.

We recommend that the homeowner and all future homeowners be made aware of the contents of the geotechnical report, this excavation observation letter, and any other documentation of soil conditions at this site.

Limitations

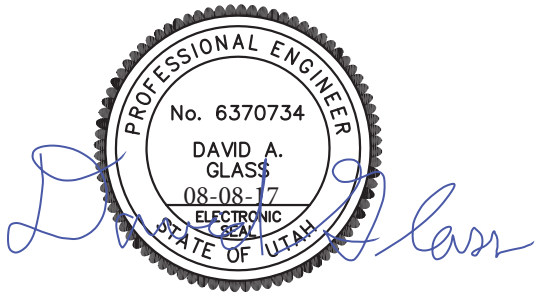
IGES responsibilities did not include any supervision or direction of the contractor's work or the contractor's personnel or subcontractors. IGES does not guarantee the contractor's work, nor do our services relieve the contractor or his subcontractors of their responsibility if defects are subsequently discovered in their work. The conclusions in this letter are based on limited observations and represent our engineering opinion as to the contractor's compliance with the referenced geotechnical report. The observations for the above referenced building lot are limited to the issues specifically mentioned in this letter and site conditions most recently observed by IGES as described in this letter.

This letter addresses the soils observed in the foundation excavation for the proposed residence only. Soil underlying sidewalks, driveways, and other flatwork were not observed and are outside this scope of work.

Closure

We appreciate the opportunity to be of service on this project – if you have any questions, please contact the undersigned at 801-748-4044.

Respectfully submitted,
IGES, Inc.



David A. Glass, P.E.
Senior Geotechnical Engineer

Attachment: Plate 1 – Excavation Observation Photos

Photos taken on July 27, 2017

IGES®

Project Number 01628-018

Horizon Neighborhood – Unit 26
Summit Powder Mountain Resort
Weber County, Utah

EXCAVATION OBSERVATION PHOTOS

Plate

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