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December 4, 2023

Overlook Point, LLC
P.O. Box
Eden, Utah 84310
Attn: Mr. Ryan Byrne

IGES Project No. 04434-002

RE: **Construction Observations**
Powder Point Subdivision Rockeries
Summit Powder Mountain Resort
Weber County, Utah

Ryan,

As requested, IGES has conducted periodic observations during construction of the three rockeries located at the western extents of the Powder Point Subdivision located in the greater Summit Powder Mountain Resort, Weber County, Utah. We understand that the Contractor (Geneva) and the project civil engineer (Talisman) utilized the generalized *Rockery Construction Guidelines* submittal prepared by IGES, dated May 8, 2013 (IGES, 2013), which consists of a generalized design document intended to address rockery design for a limited range of rockery geometries. The construction observations were performed to assess compliance with the referenced design submittal. The following paragraphs discuss our observations during construction of the rockeries.

Observations

The subject rockeries are located at the western extents of the project area and consists of a single-tier rockery located south of Meridian Avenue and a two-tier rockery located south of the proposed common driveway that will access the residential lots (just below where the driveway ties into Meridian Avenue). The rockeries are shown in plan-view on the sheet titled "Grading Plan", Sheet C300, prepared by Talisman, revision date September 13, 2023. IGES visited the site seven times between September 29 and November 13, 2023, to observe the rockeries at various stages of construction. The construction observations were performed to assess compliance with the Rockery Construction Guidelines (IGES, 2013) and the current *standard of care* for rockery construction and design. Attached to this letter are the construction observation reports documenting our observations.

Conclusions & Recommendations

Based on the observations completed by IGES, the rockeries have been constructed in general accordance with the Rockery Construction Guidelines (IGES, 2013) with respect to rock size, rock type, embedment, spacing, drainage components, and stacking.

Adequate compaction is critical to the long-term performance of rockeries and helps to limit the amount of movement experienced within the fill mass. The current *standard of care* for rockery construction generally requires that compaction testing be performed on the lifts being placed throughout construction of the rockery to assess whether the fill is placed at 95 percent of the *maximum dry density* (ASTM D1557). IGES was not retained to provide compaction testing during construction and was not provided with compaction testing results. Accordingly, IGES is not able to comment on the compactive effort at the site, including the potential movement of the fill soils in the future. IGES was not retained to observe/document the subgrade preparation behind the rockery.

We understand that additional fill was placed on the hillside below the bottom rockery tier to create the minimum 8-foot-wide bench as stipulated in the IGES (2013) design guidelines. IGES completed a Supplemental Geotechnical and Geologic Hazard Study and Grading Plan Review dated September 25, 2023. (IGES, 2023). The referenced letter provides recommendations for keyways and benching of fill slopes constructed on natural slopes. Based on conversations with the contractor we understand these recommendations were followed, however, IGES was not asked to observe the keyway, benching or fill placement, nor was a grading plan depicting this scenario provided to IGES for our review. Therefore, IGES cannot comment on the fill placed in front of and below the rockeries.

Long-term Maintenance

Rockeries are vulnerable to erosion and hydrostatic pressures immediately after installation but prior to the placement of landscaping/finishing elements (e.g., low-permeable soil). To minimize the risk of damage to the rockeries during additional site work, all surface drainage should be directed away from the rockeries. These precautions should be taken immediately until the final site drainage and landscaping elements are established and completed.

We recommend that the specified minimum embedment shown in IGES (2013) along the toe of the rockery be maintained throughout its life. Adequate embedment depth is an important component of any rockery as it anchors the bottom boulder into place and reduces erosion potential below the rockery. During any future maintenance and landscaping at the site, the owner and/or any contractor should not operate heavy machinery within 3 feet of the back of the rockeries.

Additionally, care should be taken so no extreme conditions occur above or near the rockeries, such as broken water lines or irrigation lines, groundwater seeps, excessive irrigation, etc. Irrigation directly above or behind the rockeries should be minimized or eliminated. We do not recommend pressurized irrigation lines be placed directly above or behind the rockeries at any time.

Storing snow on top of, or directly behind the rockeries is not recommended; storing snow on or behind the rockeries may increase the risk of excessive erosion and/or damage to the rockeries.

Limitations

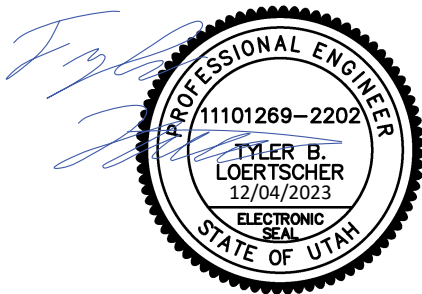
The findings and conclusions presented in this letter are based on limited observations and represent our engineering opinion as to the contractor's compliance with the rockery design document (IGES, 2013) and subsequent submittals (IGES, 2023). IGES does not guarantee the contractor's work, nor do our services relieve the contractor or his subcontractors of their responsibility if defects are subsequently discovered in their work. IGES' responsibilities did not include any supervision or direction of the work of the contractor or the contractor's personnel or subcontractors. Furthermore, IGES was not engaged to assess certain aspects of grading; items such as keyways, benching, clearing/grubbing, and fill placement (e.g. meeting compaction criteria) were not assessed by IGES, thus documentation of these grading aspects of the project are the purview of others.

This letter was prepared in accordance with the generally accepted standard of practice at the time the letter was written. No warranty, expressed or implied, is made.

We appreciate the opportunity to provide you with our services. If you have any questions, please contact the undersigned at your convenience (801) 748-4044.

Respectfully Submitted,
IGES, Inc.

Reviewed By:



A handwritten signature in blue ink that reads "David Glass".

Tyler B. Loertscher, P.E.
Project Engineer

David A. Glass, P.E.
Senior Engineer

Attachments: Construction Observation Report

Reference:

IGES, Inc., 2013, *Rockery Construction Guidelines, Powder Mountain Resort, Weber County, Utah*, IGES Project No. 01628-005, dated May 8, 2013.

IGES, Inc., 2023, *Supplemental Geotechnical & Geologic Hazard Study and Grading Plan Review, Powder Point Subdivision, Summit Powder Mountain Resort, Weber County, Utah*, IGES Project No. 04434-001, dated September 25, 2023.



Construction Observation Report

Project: Powder Point
Project Number: 04434-002
Project Location: Powder Mountain, Utah
Client: Overlook Point, LLC

9-29-2023, CO #1

Notes:

The single tier rockery had been constructed up to 3 boulder courses tall for approximately 50 linear feet. The base course of boulders had been set for an additional 75 linear feet. Behind the boulders the contractor was placing a zone of fabric wrapped gravel. A drainpipe was observed at the base of the gravel drainage zone and was daylighting at the rockery ends. The rockery had a batter of at least 1H:2V and the boulders were set with good rock to rock contact. The boulders observed met the minimum required dimensions.

Photos:



A handwritten signature in blue ink, reading "Tyler B. Loertscher".

Tyler B. Loertscher, P.E.



Construction Observation Report

Project: Powder Point
Project Number: 04434-002
Project Location: Powder Mountain, Utah
Client: Overlook Point, LLC

10-3-2023, CO #2

Notes:

The single tier rockery had been constructed up to 3 boulder courses tall for approximately 50 linear feet. Up to 2 boulder courses tall for an additional 50 linear feet. And the base course of boulders had been set for an additional 50 linear feet. Behind the boulders the contractor was placing a zone of fabric wrapped gravel. A drainpipe was observed at the base of the gravel drainage zone and was daylighting at the rockery ends. The rockery had a batter of at least 1H:2V and the boulders were set with good rock to rock contact. The boulders observed met the minimum required dimensions.

Photos:



A handwritten signature in blue ink, appearing to read 'Tyler B. Loertscher'.

Tyler B. Loertscher, P.E.



Construction Observation Report

Project: Powder Point
Project Number: 04434-002
Project Location: Powder Mountain, Utah
Client: Overlook Point, LLC

10-12-2023, CO #3

Notes:

All boulders had been placed the single tier rockery. The rockery was constructed up to 4 boulder courses tall and was approximately 8 feet tall. Behind the boulders the contractor was placing a zone of fabric wrapped gravel. A drainpipe was observed at the base of the gravel drainage zone and was daylighting at the rockery ends. The rockery had a batter of at least 1H:2V and the boulders were set with good rock to rock contact. The boulders observed met the minimum required dimensions.

Photos:



A handwritten signature in blue ink, reading 'Tyler B. Loertscher'.

Tyler B. Loertscher, P.E.



Construction Observation Report

Project: Powder Point
Project Number: 04434-002
Project Location: Powder Mountain, Utah
Client: Overlook Point, LLC

10-18-2023, CO #4

Notes:

The bottom rockery tier of the two-tiered system had been constructed up to 4 boulder courses tall for approximately 50 linear feet. Behind the boulders the contractor was placing a zone of fabric wrapped gravel. A drainpipe was observed at the base of the gravel drainage zone and was daylighting at the rockery ends. The rockery had a batter of at least 1H:2V and the boulders were set with good rock to rock contact. The boulders observed met the minimum required dimensions.

Photos:



A handwritten signature in blue ink, reading "Tyler B. Loertscher".

Tyler B. Loertscher, P.E.



Construction Observation Report

Project: Powder Point
Project Number: 04434-002
Project Location: Powder Mountain, Utah
Client: Overlook Point, LLC

10-25-2023, CO #5

Notes:

All boulders had been placed for the bottom rockery tier; the upper rockery tier had been constructed up to 3 boulder courses tall with the base course of boulders set across the entire rockery alignment. The bench width was measured to be at least 8 feet. Non-woven geotextile fabric was observed behind the back of the boulders. A drainpipe was observed daylighting at the rockery ends. The rockery had a batter of at least 1H:2V and the boulders were set with good rock to rock contact. The boulders observed met the minimum required dimensions.

Photos:



A handwritten signature in blue ink, reading "Tyler B. Loertscher".

Tyler B. Loertscher, P.E.



Construction Observation Report

Project: Powder Point
Project Number: 04434-002
Project Location: Powder Mountain, Utah
Client: Overlook Point, LLC

11-1-2023, CO #6

Notes:

All boulders had been placed for the upper rockery tier. Non-woven geotextile fabric was observed behind the back of the boulders. Near the west end of the upper rockery tier there were several boulders that were not stacked with good rock to rock contact. the boulders were sitting on the backfill material behind the rockery. IGES recommended this area be restacked to have better rock to rock contact.

Photos:



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Tyler B. Loertscher, P.E.



Construction Observation Report

Project: Powder Point
Project Number: 04434-002
Project Location: Powder Mountain, Utah
Client: Overlook Point, LLC

11-13-2023, CO #7

Notes:

The west end of the upper rockery tier had to be reconstructed to have better rock to rock contact between the boulder courses. Non-woven geotextile fabric was observed behind the back of the boulders. A drainpipe was observed daylighting at the rockery ends. The rockery had a batter of at least 1H:2V.

Photos:



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Tyler B. Loertscher, P.E.