

**IGES[®]**

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May 16, 2019

Jessica & Jared Schneider
3387 East 9980 South
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IGES Project No. 02441-005

Subject: Lock+Load Retaining Wall Construction Observation
Schneider Residence
3387 East 9980 South
Sandy, Utah

References: IGES, 2017, Lock+Load and Concrete Retaining Wall Design Package, Schneider Residence, 3387 East 9980 South, Sandy, Utah, Project No. 02441-003, dated June 6, 2017.

As requested, IGES observed the reconstruction of the Lock+Load MSE retaining wall for the Schneider residence located at 3387 East 9980 South in Sandy, Utah. We understand the retaining wall was previously completed and reconstruction was performed to decrease the exposed height of the retaining wall to less than 5 feet within 5 feet of the property line, and to adjust the wall so that it does not extend onto property that was previously identified as having a slope greater than 30 percent.

The observations completed for this wall were performed to assess compliance with the referenced *design package* with respect to the reconstruction, and to assess the original construction to the extent possible. IGES visited the site on April 26, and May 15, 2019. Our observations are summarized in the following paragraphs.

Observations

CO #1 April 26, 2019

At the time of our site visit on April 26, 2019 the contractor had deconstructed the wall to a minimum total height of 6.7 feet (5 Panels) near the eastern property line. The wall had a maximum total height of 10.7 feet (8 Panels) at Station 10+00 where the retaining wall abuts against the home's foundation wall. At the time of our visit the contractor was placing the 6th panel course near Station 10+25. The geogrid observed behind the 6th panel course met the minimum required dimensions shown in the design package and the area between the back of the panel and the back of the counterfort was filled with free draining gravel. Some oversized material (cobbles greater than 6 inches in diameter) were observed in the structural fill that was stockpiled during the retaining wall deconstruction. During our visit IGES verbally recommended that this oversized material be removed from soil that will be used for retaining wall backfill. Starting near Station 10+25 and extending to about Station 10+50 we were informed by the Contractor (Ridgeline Excavating) that up to 5 courses of panels were planned

to be left in place. Several gaps up to ¾-inch wide were observed between the panels in this area, exposing drainage gravel.

After speaking with the Contractor, we understand that a 9th panel course is planned to be placed at Station 10+00. The initial design had a maximum exposed height of 8.8 feet (7 panels with 6 inches of embedment). IGES suggested the client could increase the maximum exposed height to 10.2 feet (8 panels with 6 inches of embedment or 9 panels with 22 inches of embedment) if an additional layer of geogrid was installed.

CO #2 May 15, 2019

At the time of our site visit on May 15, 2019 the reconstruction of the Lock+Load retaining wall had been completed. The wall was split into two tiers between Stations 10+25 and 10+50. The wall was split to ensure the lower tier (which runs along the property line) did not exceed 5 feet exposed height. As recommended during our previous observation on April 26, 2019, the contractor placed material at the toe of the wall near Station 10+00 to maintain a maximum exposed height of less than 10.2 feet. Near Station 10+25 corner Lock+Load panels were used for the outside corner on both tiers. Near Station 10+50 there were additional outside corners on both tiers, however no corner Lock+Load panels were observed. Standard Lock+Load panels appeared to have been adjusted in the field to fit the outside corners in this area. These adjusted panels affected the quality of the running bond of the Lock+Load wall units primarily on the upper tier. The backfill soil behind both tiers had been compacted to within a few inches of the top of the Lock+Load panels. No geogrid or counterforts were observed during our site visit. Gaps between the Lock+Load panels were primarily observed on the lower tier. The gaps were up to ¾-inch wide and the drainage gravel behind the panels was observed at the face of the retaining wall.

Conclusions

Based on our limited observations the retaining wall appears to have been completed in general compliance with the recommendations presented in the referenced *design package* with the exception of the following items:

- Gaps up to ¾-inch wide were observed between several panels. Drainage gravel was observed between these gaps in several locations.
- Rather than using the corner panels for the outside corners near Station 10+50 the standard Lock+Load panels were adjusted in the field. Due to these adjustments the running bond was not continued across the entire wall alignment. This does not comply with the guidance contained in the Lock+Load construction manual.
- The finish landscaping elements have not been installed.

The finished landscaping elements include installing 8 inches minimum of low permeable soil and vegetating or installing hardscape. We recommend that the finished landscaping elements be completed to bring the wall into compliance with the *design package*.

In addition to the observed issues discussed above there are a few items that were not able to be observed during our limited observations since IGES was not present during the installation of these items (primarily during the original construction). To clarify, this does not necessarily

mean the items were not appropriately incorporated into the construction of the wall, it just means the following items were not able to be observed and documented by IGES:

- The geogrid type, length, direction and elevation on the lower 6 panel courses.
- The suitability of the foundation soils below the wall.
- The drainage pipe at the base of the gravel drainage zone.
- The counterfort connection of the outside corners near Station 10+50.

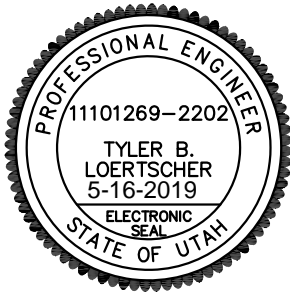
Limitations

The conclusions in this letter are based on limited observations that were completed after construction had been completed and during the partial reconstruction. IGES responsibilities did not include any supervision or direction of the contractor's work or the contractor's personnel or subcontractors. As such, we do not guarantee the contractor's work, nor do our services relieve the contractor or his subcontractors of their responsibility if defects and/or variations from the design package are subsequently discovered in their work.

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

Respectfully Submitted,
IGES, Inc.

Reviewed By:



Tyler B. Loertscher, P.E.
Staff Engineer

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

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

Attachments:

Figure 1 – Lock+Load Retaining Wall Photos



April 26, 2019



April 26, 2019



May 15, 2019



May 15, 2019



May 15, 2019



May 15, 2019

Photos Taken on April 26 and May 15, 2019