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October 7, 2019

Zoning Board of Appeals
City of Cincinnati
805 Central Avenue, Suite 500
Cincinnati, Ohio 45202

Re: Expert Report – Lee A. Knuppel & Associates, Inc. dated October 4, 2019

Zoning Board of Appeals Case No. Z-4047-2019
Permit Approval No. 2019P02474 – for Retaining Wall
14 Grandin Lane, Cincinnati, Ohio 45208
HS Hillside Overlay District

Dear Members of the Zoning Board of Appeals:

This letter is to provide you with the updated Expert Report prepared by Lee A. Knuppel & Associates, Inc. dated October 4, 2019. The report documents the most recent the site inspection and results of the two test trenches. The inspection and results are a step in the permitting process prior to the construction of the retaining wall. The report further supports and defends the decision for the approval of Building Permit No. 2019P02474 and the approval of the final Plans issued to Rily Properties, LLC, our clients, for the construction of a retaining wall at 14 Grandin Lane, Cincinnati, Ohio 45208.

Based upon the reasoned consideration of the materials by the Zoning Plans Examiner and as supplemented by the new report from Lee A. Knuppel & Associates, Inc. dated October 4, 2019, the Building Permit No. 2019P02474 was properly issued pursuant to the jurisdiction and authority of the Building and Inspections Department of the City of Cincinnati.

Therefore, the Owner, Rily Properties, LLC, respectfully requests that the approval of Building Permit No. 2019P02474 be affirmed.

Sincerely,
KEITH & ASSOCIATES, PLLC

By: _____
Ann B. Miller, Esq.

ABM/jgj/enclosure
cc: Ronald T. Bates via email
Randall K. Lasley via email
Mark Pottebaum via email
C. Francis Barrett via email

Lee A. Knuppel & Associates, Inc.

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Proj. # : **2018-072**
Date: **10/04/2018**
Rev.: 10/03/2019

Redknot Homes
7723 Tylers Place Blvd., #137
West Chester, Ohio 45069

Attn: Mr. Mark Pottebaum

Re: Geotechnical site assessment for 14 Grandin Lane, Cincinnati, Ohio.

The subject site was inspected by personnel from Lee A. Knuppel and Associates, Inc. (LKA), on October 2, 2018 per your request. At the time of the site inspection the site consisted of 1 lot with an existing structure (house) located on it. Prior to the inspection, the proposed plans and published geotechnical reports of the area were reviewed. **Figure 1**, attached, shows the site survey and proposed improvements.

The site is located on a south facing hillside sloping from the north to south, with Whitman Court to the south and Grandin Lane to the north of the lot. Maximum relief from the north property line to the south property line is approximately 70 feet.

According to the USDA Soil Survey of Hamilton County Ohio, the following agricultural soil associations can be found on the property:

- Eden-Urban Land Complex (EeD), 15 to 25 percent slopes

This complex consists of a moderately steep, well drained Eden soil and Urban land. It is on hillsides and uplands. Areas of this complex range from 10 to 100 acres in size and contain about 60 percent Eden silty clay loam and 30 percent Urban land. The areas of Eden soil and the areas of Urban land are so intricately mixed, or so small, that it is not practical to separate them at the scale used in mapping.

Typically, the Eden soil has a surface layer of very dark grayish brown, friable silty clay loam about 5 inches thick. The subsoil is about 23 inches thick. The upper part of the subsoil is light olive brown, friable silty clay loam; and the middle and lower parts are yellowish brown and light olive brown flaggy clay. Light gray interbedded limestone and calcareous shale bedrock is at a depth of about 36 inches. In some small areas the surface layer is very dark brown flaggy silty clay loam, and in other areas it is silt loam. In some places the soil has been radically

altered. Some of the low areas have been filled or leveled during construction; and other small areas have been cut, built up, or smoothed. In a few areas the soil is relatively deep to bedrock.

Included in mapping, and making up about 10 percent of most areas, are narrow strips of Switzerland soils on the upper part of slopes and small areas of severely eroded soils. The severely eroded soils typically have a surface layer of olive brown calcareous clay or silty clay and commonly are shallow to bedrock. Permeability is slow in the Eden soil. Root development is mainly restricted to the 20- to 40-inche-thick zone above the shale and limestone bedrock. The available water capacity is low. Runoff is very rapid. The slope, erosion hazard, moderate depth to bedrock, and high clay content of the subsoil severely limit the use of soil for flowers and vegetables. The subsoil material which is exposed in the included areas, that have been cut and filled, has very poor tilth.

Our evaluation of the above items is presented below:

Two other geotechnical companies have reviewed and investigated the soils on this site; The H.C. Nutting Company in 2002, and Thelen Associates in 2010/2011. Their services were to evaluate the existing foundations of the house and the general site characteristics of the lot for future development.

The site inspection and the recent (10/2/19) excavation of two test trenches, along the proposed wall alignment, confirmed the above soil conditions and the depth to bedrock as 36 inches, see trench logs below:

TT-1	TT-2
0-25" Silty Clay w/ rock fragments	0-30" Silty Clay w/rock fragments
25"- 30" weathered Shale	30"-35" weathered Shale
30" Limestone and Shale bedrock	35" Limestone and Shale bedrock

The hillsides that are not landscaped are moderately eroded and show minor signs of soil creep. Soil creep is a common condition for slopes in this area and is primarily related to the saturated soil freezing and the soil being forced upward perpendicular to the slope and then let down vertically by thawing. This process moves the soil downslope and accounts for any tilted fences, or bowed trees on the property.

Based on our inspection of the site and slopes, bedrock should be relatively shallow and the overburden soils are erodible and subject to soil creep and surface slumping (shallow slides). There is no surface expression (tension cracks, scarps or toe bulges) of deep seated sliding or other anomalies that would be indicative of soil related issues that may impact the development.

Engineering Opinion:

It is our opinion that the soil and bedrock encountered, and the existing slopes will provide the necessary support for the intended private property development.

Recommendations:

1. In order to maintain stable slopes all cuts and fills shall be no steeper than 1V to 3H. Upon completion of the grading, the slopes will have to be seeded and maintained until sufficient grass cover has developed to prevent soil erosion.
2. Re-grading of the site shall be done in such a way that will minimize erosion and wherever feasible natural vegetation shall be retained and supplemented.
3. Any area which has the potential to direct water offsite will be controlled with silt fence, and other appropriate erosion control measures.
4. The ground surface shall be stripped, within the limits of any proposed fills, of all organic and other unsuitable material.
5. All fill shall be placed in lifts not exceeding 8" loose thickness and compacted to a minimum density of 95% standard proctor.
6. Any fill placed against the existing hillside or new embankment slopes shall be benched into the slope to stiff natural soil or bedrock using an 8" max. vertical cut face.
7. The proposed retaining wall footings and/or structure footings shall be founded on the limestone and shale bedrock, and those along the downslope sides shall be embedded at least 2 feet into the rock. If the full structure is founded within the limestone and shale bedrock the downslope footings will not need to be embedded. All footing excavations shall be inspected by a registered geotechnical engineer to ensure there adequacy, and consistency.
8. Should any of the walls be supporting the overburden material rather than shale and limestone, it shall be designed to resist an at-rest earth pressure (EFP=55 to 60 psf).

9. A geotechnical engineer is required to perform field construction observations and testing to verify compliance with the plans and specifications.

We appreciate this opportunity to provide engineering services. Should you need further assistance, please feel free to call.

Lee A. Knuppel and Associates, Inc.

Lee A. Knuppel, P.E.