

16-5028-006  
July 15, 2022

Daniel A. Pennington, PE  
Town Engineer/Manager of Physical Services  
Town of Glastonbury  
2155 Main Street  
Glastonbury, CT 06033

**Re: Slope Stability Peer Review of 1199 Manchester Road Development**

Dear Mr. Pennington:

Tighe & Bond has conducted a peer review of slope development reports prepared by Dr. Clarence Welti, PE (Welti) in accordance with our agreement dated June 23, 2022. In support of our review, Tighe & Bond was provided the following documents:

- 1199 Manchester Rd\_6.15.22 Supplement.pdf
- Manchester\_Rd\_1199\_Traffic\_Report\_Extracted.pdf
- Manchester\_Road\_1199\_Site\_Plans\_Revised\_06092022.pdf
- Welti\_1996.pdf
- Welti\_Extracted.pdf

The focus of our review was to provide our professional opinion related to the stability of the cut slope for the proposed residential development. The following sections summarize our review.

## **Project Understanding**

According to the provided drawings and reports, the applicant is proposing a 74-unit multi-family residential development at 1199 Manchester Road on the southwest corner of Hebron Avenue (Route 94) and Manchester Road (Route 83) in the Town of Glastonbury. Access to the site will be provided via a full access driveway on Hebron Avenue, approximately 250 feet west of the Hebron Avenue and Manchester Road intersection, and a full access driveway on Manchester Road, approximately 275 feet south of the intersection. Development of the site will require an approximately 2Horizontal to 1Vertical (2H:1V) cut slope to the west and south of the proposed building from approximately Elevation 405 feet to Elevation 372 feet. A retaining wall is proposed from approximately Elevation 373 feet at the top of the wall to approximately Elevation 362 feet. The proposed Finished Floor Elevation of the building is Elevation 364.5 feet.

## **Slope Stability**

Based on our review of the subsurface exploration (boring B-2A), the soils from the top of the slope to about Elevation 375 feet consist of medium dense to dense sand and gravels. Below Elevation 375 feet, the soils consist of silty sands to the boring termination at approximately Elevation 352 feet. Groundwater was encountered in boring B-2A at Elevation 354 feet, which is well below the proposed cut into the hillside.

In his reports, Dr. Welti provides slope stability analysis based on the slope geometry and the results of the subsurface conditions. Based on the test boring data, unit weights between 120 to 125 pounds per cubic foot with an internal angle of friction between 34 to 36 degrees was



used. Based on these soil parameters and 2H:1V slope, the slope stability factor of safety was estimated to be 1.4.

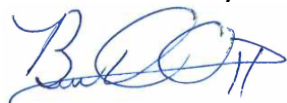
Tighe & Bond reviewed the subsurface data, and based upon commonly used correlations, it is our opinion that the soil parameters used by Dr. Welti are reasonable. Using these soil parameters, Tighe & Bond analyzed three cross sections of the proposed 2H:1V slope using Rocscience Inc. Slide2 Modeler. The analyses were based on a slope not subject to seepage within the slope. Also, the analyses considered adequate stability behind the proposed retaining walls. Based on these assumptions and parameters, a minimum factor of safety of 1.4 was also estimated.

In his reports, Dr. Welti also stressed the importance of storm water collection and erosion protection for the long-term stability of the slope. The recommendations found in the documents include collection of stormwater at the top of the slope thus limiting recharge into the slope leading to seepage along the slope and hydro-seeding as a means of erosion control. We agree with these overall recommendations for stormwater and erosion control and believe it is important that these requirements be attained as the slope is constructed. It is our understanding that the proposed grading at the top of the slope will pitch away from the slope to the west and south, thus allowing runoff to drain away from the proposed 2H:1V slope. Furthermore, a reverse bench is shown on the proposed drainage approximately midway down the proposed 2H:1V slope. It is our opinion that the proposed grading and the reverse bench meets the intent of the above recommendations.

We hope that this letter satisfies your needs. If the Town has any questions related to our review, please feel free to contact me at (203) 610-9061 or [BOpp@tighebond.com](mailto:BOpp@tighebond.com).

Sincerely,

**TIGHE & BOND, INC.**



Brian D. Opp, PE  
Principal Engineer