

August 30, 2019

Project No. 19080-01

Mr. Glen Powles
Bedford Marketplace, LLC
5780 Fleet Street, Suite 225
Carlsbad, California 92008

Subject: *Preliminary Geotechnical Recommendations Regarding the Updated Mass Grading Plan and Haul Route Study, Phase 2b, Tract No. 36294, Bedford, Corona, California*

References: Hunsaker & Associates, 2019a, Bedford Ranch, Phase 2b, Mass Grading Plan, Study #1 dated August 16, 2019.

_____ 2019b, Remediated Haul Route Study #1, dated August 27, 2019.

Introduction

In accordance with your request, LGC Geotechnical, Inc. has prepared this letter as a geotechnical review of the referenced Bedford Ranch Mass Grading Plan and Remediated Haul Route Study #1 prepared by Hunsaker & Associates (2019a & 2019b) for Phase 2b, Tract No. 36294, Bedford, located in the City of Corona, California. This letter is intended to provide preliminary geotechnical recommendations relative to the referenced plans.

Summary of Geotechnical Recommendations

Based on our knowledge of the subject site and review of the referenced plans (References), it is our opinion that the proposed improvements are feasible from a geotechnical standpoint, provided that the recommendations contained herein are incorporated during site grading and development. A summary of our preliminary geotechnical recommendations are as follows:

- In order to provide a uniform fill thickness below future building pads, it is recommended that the near surface soils be removed (over-excavated) to a minimum depth of 5 feet below finish pad grades and replaced with compacted fill soils. Please note that this recommendation is provided under the assumption that the depicted grades on the mass grading plan (Hunsaker, 2019a) will be within ± 1 -foot of ultimate rough grade pad elevations. This recommendation should be confirmed based on proposed ultimate pad rough grades.
- Stabilization fill keyways will be needed for the southern cut slope and haul route remediation. Keyway widths should be a minimum of 15 feet wide. Keyways should be a minimum of 5 feet deep, determined from the lowest toe-of-slope elevation, and tilted back to the heel a minimum of

2 percent or 1-foot, whichever is greater. Stabilization fill backcuts should be excavated so that at least a minimum 15-foot-wide fill width is maintained for the entire height of the stability fill slope. Backcuts should be excavated at a maximum 1.5:1 (horizontal to vertical) inclination or flatter. Properly outlet backdrains should be constructed along stabilization fill backcuts. Approximate locations of stabilization fill keyways are depicted on the Preliminary Geotechnical Map (Sheet 1).

- The proposed slope associated with the haul route remediation is anticipated to be globally stable as designed. However, select grading should be anticipated in order to obtain soils with shear strength parameters required for global stability (sandy soils with a $\phi \geq 32$ degrees). Onsite soils anticipated to meet this criterion include the alluvial deposits (Qal) and the old alluvial fan deposits (Qoal). Clayey soils should not be used for slope construction.
- The proposed slope associated with the haul route remediation is anticipated to be superficially stable at inclinations of 2:1 (horizontal to vertical) or flatter. Sections of fill slopes depicted at inclinations of 1.5:1 (horizontal to vertical) will require geogrid reinforcement. See Section C-C' (Sheet 1).
- We recommend that proposed 1.5:1 (horizontal to vertical) fill slopes be constructed with geogrid reinforcement. Beginning approximately at the toe of slope, 8-foot lengths of geogrid reinforcement with a minimum Long-Term Design Strength (LTDS) of 500 lbs/ft (Miragrid 2XT or approved equivalent) should be placed horizontally across the entire width of the 1.5:1 (horizontal to vertical) fill slope. The geogrid reinforcement should be placed every 2 feet vertically and be "day-lighted" to the slope face. Manufacturer's recommendations regarding installation of geogrid should be implemented during construction.
- Based on our review of Section D-D' (Sheet 1), a geotechnical setback from the Caltrans property limit is not necessary. However, setbacks in accordance with the California Building Code (CBC) should be applied by the project civil engineer, where applicable.

Closure

Our services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable soils engineers and geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

Should you have any questions regarding this letter, please do not hesitate to contact our office. We appreciate this opportunity to be of service.

Sincerely,

LGC Geotechnical, Inc.



Tim Lawson, GE 2626, CEG 1821
Geotechnical Engineer/Geologist



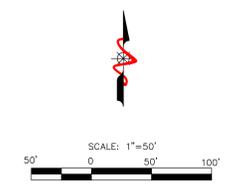
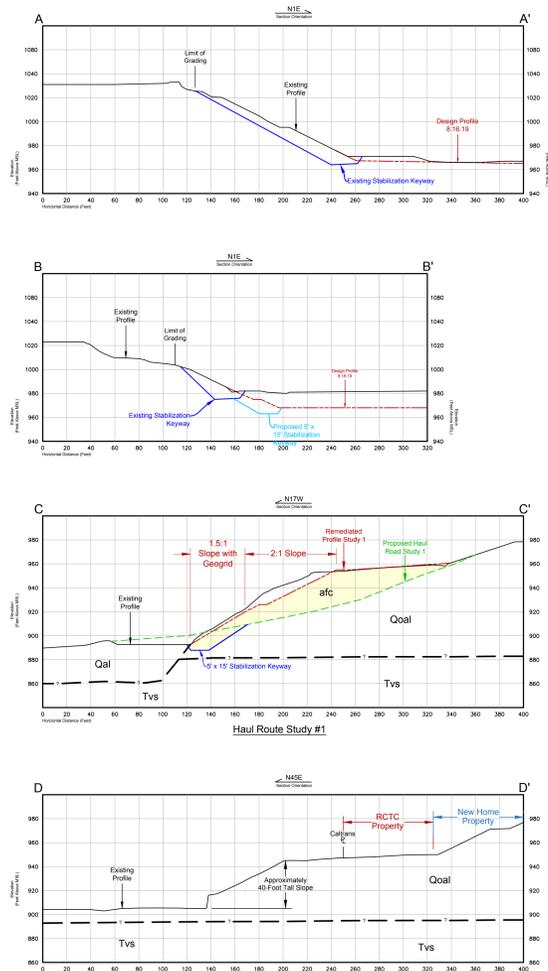
Kevin Dyekman, CEG, 2595
Project Geologist



KAD/TJL/amm

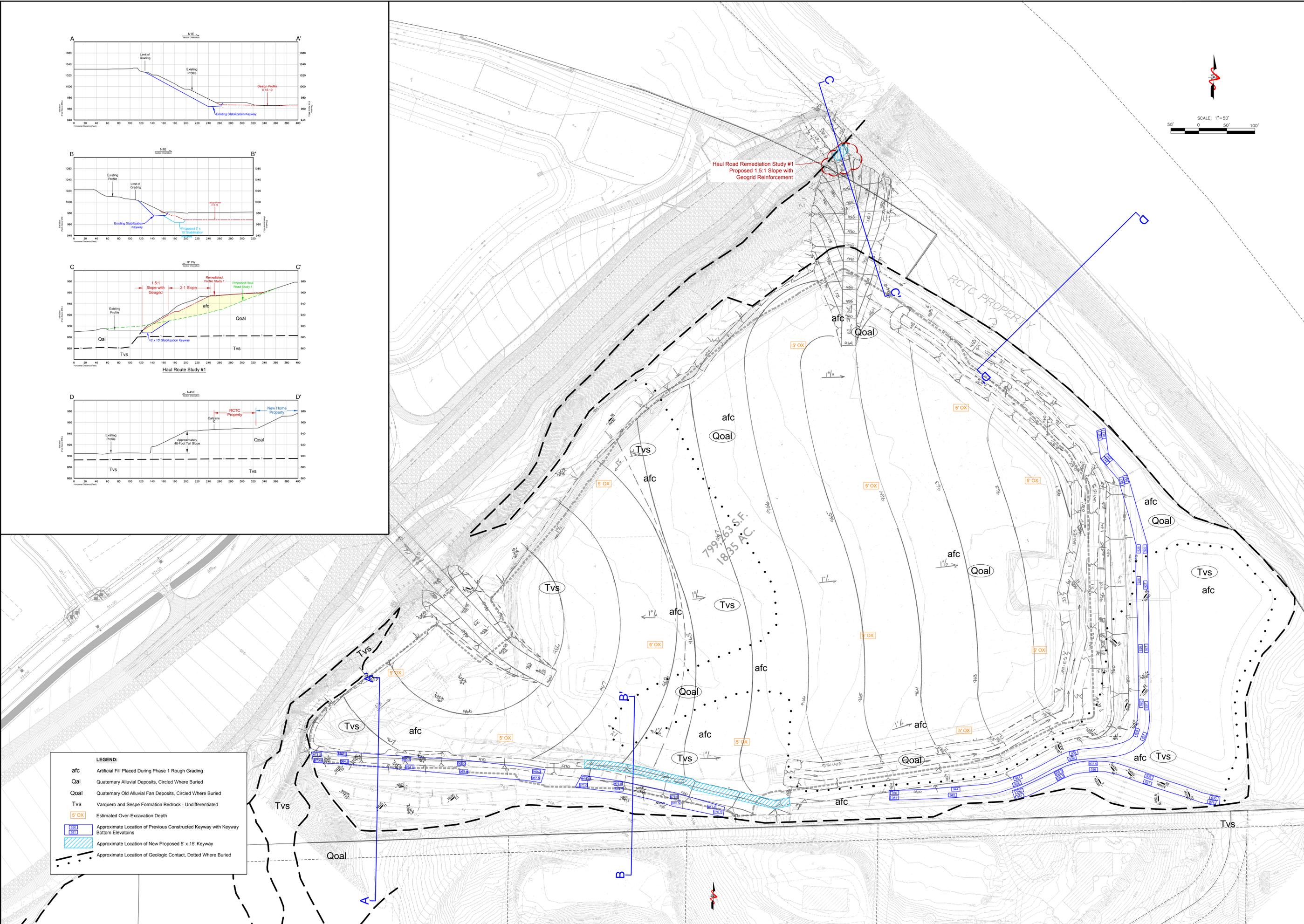
Distribution: (1) Addressee (electronic copy)
(1) Hunsaker and Associates (electronic copy)
Attn: Mr. Joe Wightman

Attachments: Sheet 1 – Preliminary Geotechnical Map



Haul Road Remediation Study #1
Proposed 1.5:1 Slope with
Geogrid Reinforcement

- LEGEND:**
- afc Artificial Fill Placed During Phase 1 Rough Grading
 - Qal Quaternary Alluvial Deposits, Circled Where Buried
 - Qoal Quaternary Old Alluvial Fan Deposits, Circled Where Buried
 - Tvs Varquero and Sespe Formation Bedrock - Undifferentiated
 - 5' OX Estimated Over-Excavation Depth
 - 1922 1923 Approximate Location of Previous Constructed Keyway with Keyway Bottom Elevations
 - Approximate Location of New Proposed 5' x 15' Keyway
 - Approximate Location of Geologic Contact, Dotted Where Buried



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Preliminary Geotechnical Map
Updated Phase 2b Mass Grade Plan and Haul Route Remediation Study #1

PROJECT NAME	Bedford Marketplace
PROJECT NO.	19080-01
ENG. / GEOL.	TJL / KAD
SCALE	1" = 50'
DATE	August 2019