HAMILTON
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May 30, 2016
Project No. 15-2035

Trump National Golf Course
1 Trump National Drive
Rancho Palos Verdes, CA 90275

Attention: Ms. Lili Amini, General Manager

Subject: Geotechnical Reconnaissance No. 2, Pedestrian Bridge No. 10, Trump National Golf Course, La Rotunda Canyon, Rancho Palos Verdes, California.

Reference: Hamilton & Associates, Inc. (2015), Geotechnical Reconnaissance, Pedestrian Bridge No. 10, Trump National Golf Course, La Rotunda Canyon, Rancho Palos Verdes, California, Project No. 15-2035, dated December 20, 2015.

Dear Ms. Amini:

Presented herewith is H&A's second geotechnical assessment of Pedestrian Bridge No. 10 at the La Rotunda Canyon crossing at Trump National Golf Course (TNGC). The location of the bridge is shown on Figure 1, below.

Figure 1 Arial View of Pedestrian Bridge No. 10.

BACKGROUND

The subject pedestrian bridge is located at Trump National Golf Course within the City of Rancho Palos Verdes, California. The pedestrian bridge crosses La Rotunda Canyon just prior to a steep drop-off at the bluff face and outlet to the Pacific Ocean. H&A understands that the bridge abutments are supported by approximately 21 feet deep caissons, embedded approximately 10 feet into bedrock. A representative cross section of the bridge crossing and canyon erosional profile is provided on Plate 1. A sewer line was constructed below the canyon bottom in the 1950's and crosses the canyon, just upstream and parallel to the bridge crossing. Approximately 14 years ago, a storm drain outlet (Line H) for a new development was constructed just north (upstream) of the bridge and buried sewer crossing, increasing concentrated storm water flow in the canyon and causing continued and severe erosion of the canyon floor and the sidewalls at a rapid rate and downstream (where landslides are occurring) of this project. Emergency repair to protect the sewer line was performed by the Sanitation Districts 14 years ago, and again in conjunction with TNGC in 2015, which included placing protective reinforced concrete on a section of the canyon bottom to encase the sewer and replace washed away soil and bedrock. However, continued erosion from concentrated storm water is causing severe erosion of the canyon including soil and bedrock that support the pedestrian bridge abutment.

GEOTECHNCAL OBSERVATIONS

Site observations were performed by Converse Consultants in April 1999 and again following heavy storms in March 2000. A plot showing the amount of observed canyon erosion at that time is provided on the Bridge Cross Section, Plate 1. In November 2013, December 2015, and May 2016 representatives from H&A performed field reconnaissance and updated the canyon erosional profile as shown on Plate 1. Some typical surficial raveling of the canyon walls during rain storms is ongoing and a common phenomenon in the region. However, immediately adjacent and downstream of the pedestrian bridge, dormant and active landslides are evident. These occur on both canyon walls and are to a large degree responsible for the widening of La Rotunda Canyon near the shoreline south of the study site. Based solely on geologic mapping, these landslides likely stem from erosion and undercutting of weathered bedrock by natural and anthropic La Rotunda Canyon outflow during storms, and from marine wave-cutting at the shoreline. In November 2013 and December 2015 tension cracks were noted adjacent to the pedestrian bridge (Figures 2 and 3), thus indicating incipient slip on some segments of the canyon walls; in the past 6 months these cracks have widened as anticipated. Severe erosion and land sliding is widening the canyon. Since reconnaissance 17 years ago in 1999 by Converse Consultants, the canyon profile immediately under the pedestrian bridge has widened and deepened approximately 10 feet and 15 feet, respectively. Erosion has occurred at an average rate of 1 foot per year, however the canyon bottom was observed to erode more than 5 feet during a large storm event in 2000. During the past 6 months, the canyon profile below the bridge has deepened approximately 1 foot and widened approximately 3 feet, as shown on Plate 1.

Figure 2 December 2015 Tension cracks at head of landslides adjacent to east bridge abutment.

Figure 3 December 2015 Tension cracks on slope adjacent to west bridge abutment.

Figure 4 - May 2016 Continued Canyon Bedrock Scour beyond Emergency Repair Area.

Figure 5 - May 2016 Continued Canyon Wall Cracking and Erosion

CONCLUSIONS

Presented herewith is H&A's preliminary geotechnical assessment of Pedestrian Bridge No. 10 at the La Rotunda Canyon crossing at Trump National Golf Course (TNGC). Our work is based on observation and measurement of canyon erosion relative to the bridge abutments; neither geotechnical subsurface exploration nor analysis has been performed at this time. Structural evaluation of the bridge is being performed by others.

A color-tagged system is typically used to classify severity of damage or the overall condition of a structure. The exact definition for each color may be different at local levels. Tagging is performed by government building officials or, occasionally during disasters, by engineers deputized by the building official. Natural disasters such as earthquakes, floods and mudslides are among the most common causes of a structure being red-, yellow- or green-tagged. Usually, after such incidents, the local government body responsible for enforcing the building safety code examines the affected structures and tags them as appropriate. A 'red-tagged' structure has been severely damaged to the degree that the structure is too dangerous to inhabit. Similarly, a structure is 'yellow-tagged' if it has been moderately damaged to the degree that its habitability is limited (only during the day, for example). A 'green-tagged' structure may mean the structure is either undamaged or has suffered slight damage, although differences exist at local levels when to use a green tag. As a precaution, the City recently requested that the bridge be closed to pedestrian traffic.

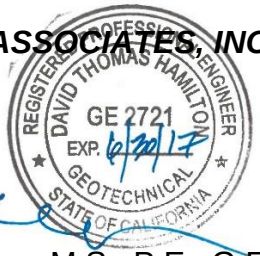
From a Geotechnical Viewpoint, the subject pedestrian bridge would be considered 'green', however the bridge is in eminent risk from continued deepening and widening of the canyon especially with the anticipated 'El Nino' storm flow. This firm recommends periodic reexamination of the canyon and bridge particularly following earthquakes, floods and landslides.

The condition should be further evaluated with consideration for a canyon drainage improvement project to control concentrated storm water flows from up canyon developments and ease the canyon erosional process to a more natural state. The existing 'emergency' canyon bottom drainage project completed in 2015 appears to be effective for the improved area. One possibility for drainage improvement would be to continue the existing canyon bottom protection slightly upstream to directly capture and convey water from Strom Drain Outlet H; and even more importantly extend the bottom protection well downstream of the pedestrian bridge. However, there are a number of other possible improvements, such as a buried storm drain pipe, etc…

We thank you for the opportunity of working with you. If there are any questions, please do not hesitate to contact the undersigned. We look forward to assisting you during further evaluations, as necessary.

Respectfully submitted,

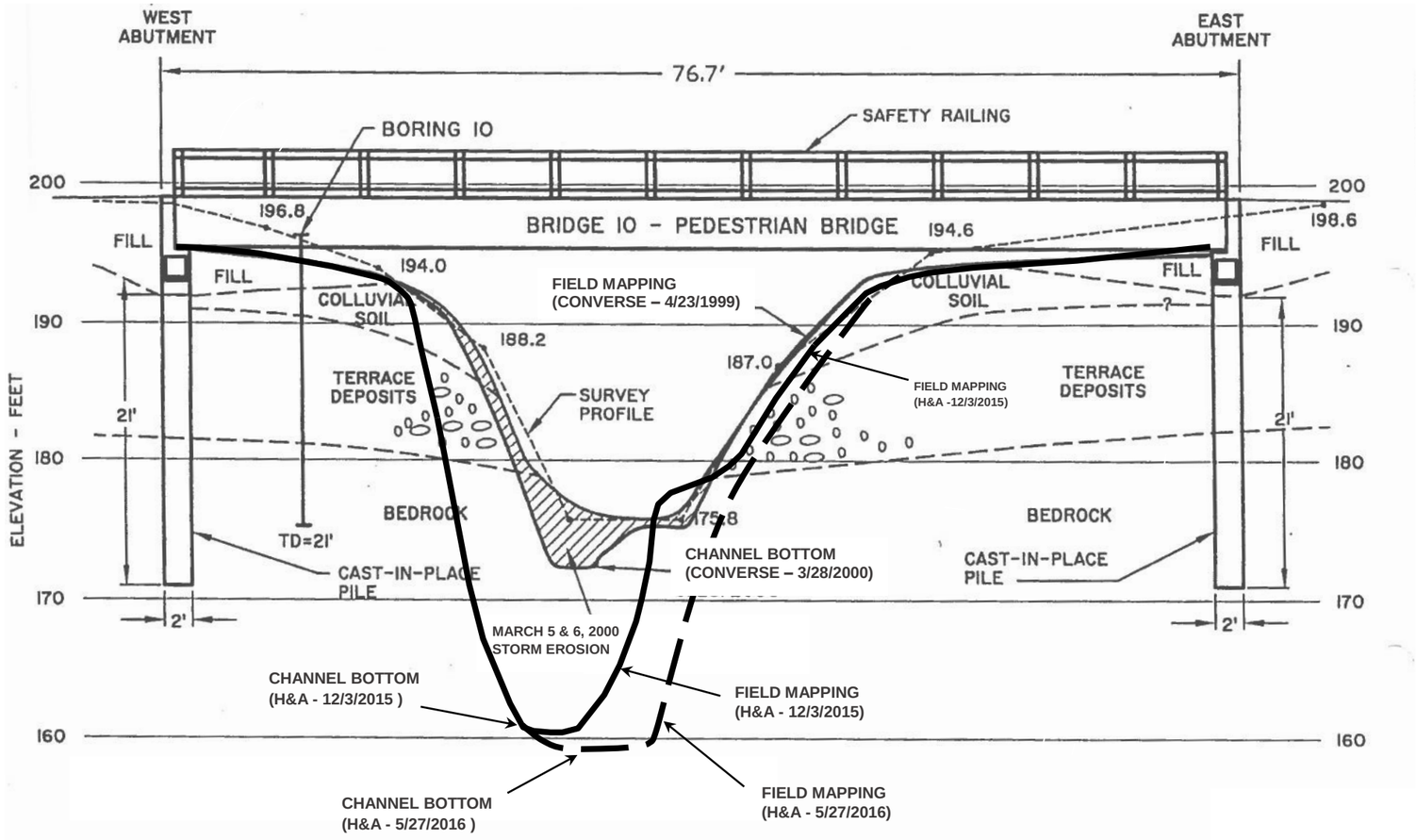
HAMILTON & ASSOCIATES, INC.



David T. Hamilton, M.S., P.E., G.E.
Principal Geotechnical Engineer

Attachment: Plate 1 – Pedestrian Bridge Cross Section

Cross Section
Pedestrian Bridge No. 10



- **CROSS SECTION PROFILE FACING UP THE CANYON**
- **MEASUREMENTS TAKEN FROM TOP OF BRIDGE DECK ON THE NORTH SIDE**

PEDESTRIAN BRIDGE
TRUMP NATIONAL GOLF COURSE
LA ROTUNDA CANYON CROSSING
RANCHO PALOS VERDES, CA

NORTH

APPROX SCALE: 1" = 10'

Based on Geologic Cross Section Profile by:
Converse Consultants
Project No. 97-31-297-01
Date: (3/20/2000)

PROJECT: TNGC - La Rotunda Canyon Crossing

UPDATED MAY 2016

PROJECT NO: 15-2035

Hamilton & Associates

PLATE 1