

2 May 2013
Project 770602501

Ms. Alison Hobbs
SSA Landscape Architects, Inc.
303 Potrero Street, Suite 40-C
Santa Cruz, California 95060

Subject: Supplemental Geotechnical Recommendations
Morse Park
Sunnyvale, California

Dear Ms. Hobbs:

This letter provides supplemental geotechnical recommendations for the proposed Morse Park in Sunnyvale, California. We previously prepared a geotechnical investigation report for the project dated 26 August 2011. Based on our latest conversation with the project structural engineer, we understand several retaining walls will be part of the park design.

1.0 RETAINING WALLS

Prior to installation of the retaining walls, the site should be open cut at a slope or temporarily shored. It is the responsibility of the contractor to determine the excavation slopes; however, we recommend that they should be no steeper than 1.5:1 (horizontal:vertical).

We understand import soil will be used to backfill behind the retaining walls. We recommend import soil be select fill, defined as soil that is non-corrosive, free of organic matter, smaller than three inches in greatest dimension, has a liquid limit less than 40 and a plasticity index less than 12, and is approved by the geotechnical engineer. The on-site fill does not meet the requirements of select fill and should not be used as wall backfill. Backfill should be placed in layers less than 8 inches thick prior to compaction, and compacted to at least 90 percent relative compaction. Light compaction equipment should be used within 5 feet of the walls.

Below-grade walls should be designed to resist lateral pressures imposed by the adjacent soil and any surcharge loads. Because the site is in a seismically active area, the design should also be checked for seismic conditions. Under seismic loading conditions, there will be an added seismic increment that should be added to active earth pressures (Sitar et al. 2012¹). We used the procedures outlined in Sitar et al. (2012) to compute the seismic active pressure and used the DE ground motion level. For cantilever walls retaining level backfill (native or import), we recommend designing the walls for the earth pressures presented on Table 1.

¹ Sitar, N., E.G. Cahill and J.R. Cahill (2012). "Seismically Induced Lateral Earth Pressures on Retaining Structures and Basement Walls."

TABLE 1
Retaining Wall Pressures

	Select Fill ¹		
	Active Pressure	At-Rest Pressure	Seismic Pressure
Above Groundwater ²	35 pcf ³	55 pcf	50 pcf
Below Groundwater	80 pcf	90 pcf	85 pcf

- Note:
1. Select fill is defined as soil that is non-corrosive, free of organic matter, smaller than three inches in greatest dimension, has a liquid limit less than 40 and a plasticity index less than 12.
 2. The lateral earth pressures recommended for the sections above the water table are applicable to walls that are backdrained to prevent the buildup of hydrostatic pressure.
 3. pcf = pounds per cubic foot

Where traffic is expected within a distance equal to the height of the walls, the walls should be designed for an additional uniform lateral pressure of 100 psf to be applied over the entire height of the walls or 10 feet, whichever is less.

As discussed above, the lateral earth pressures recommended for the sections above the water table are applicable to walls that are backdrained to prevent the buildup of hydrostatic pressure. One acceptable method for backdraining the wall is to place a prefabricated drainage panel against the back of the wall. The drainage panel should extend down to a four-inch-diameter perforated PVC collector pipe at the base of the walls. The pipe should be surrounded on all sides by at least four inches of Caltrans Class 2 permeable material (see Caltrans Standard Specifications Section 68-1.025) or wrapped in filter fabric (Mirafi 140N or equivalent). We should check the manufacturer's specifications regarding the proposed prefabricated drainage panel material to verify it is appropriate for its intended use. The pipe should be connected to a suitable discharge point. As an alternative to using prefabricated drainage panel, the wall may be drained using Caltrans Class 2 permeable material (Caltrans Standard Specifications Section 68-1.025) or clean drain rock wrapped in a geotextile filter fabric (Mirafi 140N or equivalent). The gravel drain should be at least 12 inches wide and should extend up the back of the wall to about 2 feet below the ground surface; the upper 2 feet should be covered with a clay cap to reduce infiltration of surface water. A four-inch-diameter perforated PVC collector pipe should be placed within the gravel blanket near the base of the wall to drain the water to a suitable discharge. The pipe should be surrounded on all sides by at least four inches of Caltrans Class 2 permeable material or drain rock.

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Project Number: 770602501*

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Page 3 of 3*

The footings of the retaining walls should be designed using the same design values as the building footings presented in Section 8.2.1 in our geotechnical investigation report. For the footings for Gabion walls, frictional resistance may be computed using a base friction of 0.5. For the concrete footings, frictional resistance may be computed using a base friction of 0.3. The base friction values include a factor of safety of about 1.5 and may be used in combination with the passive resistance without reduction.

If you have any questions, please call. Thank you.

Sincerely yours,
TREADWELL & ROLLO, A LANGAN COMPANY



Serena T. Jang
Senior Project Manager

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