



GEOTECHNICAL & ENVIRONMENTAL ENGINEERING — CONSTRUCTION TESTING & INSPECTION

May 28, 2013

TES#: 22741.002

Mr. Garth Pecchenino
Fremming, Parson & Pecchenino Consulting Civil Engineering
2816 Park Avenue
Merced, California 95348

SUBJECT: Supplement No. 1 to Geotechnical Investigation Report

PROJECT: Proposed McNamara Park Renovation
K and 11th Streets
Merced, California

Dear Mr. Pecchenino:

In accordance with your request, **TECHNICON** prepared this supplement to summarize geotechnical design recommendations as discussed with Mr. Scott Zaayer of Quad Knopf (Turf Field Designer) and Mr. Garth Pecchenino of Fremming, Parson & Pecchenino Consulting Civil Engineering. The supplemental recommendations area in connection with the synthetic turf fields associated with the renovation of McNamara Park located on the south side of the intersection of K and 11th Streets, in Merced, California. **TECHNICON** prepared a Geotechnical Investigation Report (GIR) for the renovation of McNamara Park (reference file TES # 22741.001, dated February 5, 2013).

SUPPLEMENTAL RECOMMENDATIONS

The following supplemental design recommendations are in connection with the design of the synthetic turf fields and are meant to clarify and supplement the recommendations contained in the GIR:

Synthetic Field – Select Import Fill

1. The ground surface elevation at the location of the proposed synthetic field is low and requires import fill to achieve the design field grade. The Project Plans indicate the synthetic turf will be placed on a 2-inch thick drainage layer overlying a layer of non-permeable geotextile fabric overlying 3 inches of Class 2 Aggregate Base all overlying 6 inches of granular import fill.
2. The select import fill is required to be of good quality granular material that provides a relatively high R-value for support of occasional light weight maintenance equipment. Recommended requirements for imported soil to be used as engineered fill below the synthetic turf field, as well as applicable test procedures to verify material suitability are provided on Table 1. All imported fill materials to be used for select fill should be sampled and tested by a representative of the project Geotechnical Engineer prior to being transported to the site.

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**TABLE 1
 SELECT GRANULAR IMPORT FILL CRITERIA**

Gradation (ASTM C136)		
Sieve Size	Percent Passing	
76 mm (3-inch)	100	
19 mm (¾-inch)	80 – 100	
No. 4	40 – 100	
No. 200	10 – 25	
Expansion Index (ASTM D4829)	Plasticity (ASTM D4318)	
	Liquid Limit	Plasticity Index
< 20	< 30	< 9
Resistance Value – CTM No. 301		
50 Min.		

- Prior to importing fill to the proposed synthetic fields, the construction area should be stripped of vegetation and all earthwork performed in accordance with Section 5 of the GIR. Table 5.3-3 of the GIR provides the recommended moisture conditioning and compaction of native and import subgrade soil below the field. The import granular soil is assumed to be non-expansive (PI < 9 and, or EI < 20) and therefore, should be compacted to 95 percent relative compaction.

Synthetic Field – Drainage Trench

- Plans call for the construction of a drainage trench lined with a non-permeable geotextile fabric to minimize destabilizing the field and other improvement areas. The perforated drain pipe will be installed within the trench and the trench backfilled with Class 2 Permeable Material per Caltrans Standard Specifications 68-1.025. Caltrans Class 2 Permeable Material is suitable for the proposed trench drain construction. It is recommended that the perforated drain line be installed as low as possible to the trench bottom and the drain holes oriented in a horizontal direction.
- Compact granular materials that do not exhibit a well-defined moisture-density curve to at least 85 percent relative density (ASTM D4253 and D4254) beneath the synthetic field, hardscape, and structures/foundations, and to at least 75 percent relative density (ASTM D4253 and D4254) for all other areas.

Synthetic Field Perimeter Curb

- The field perimeter curb should be a minimum of 12 inches thick and reinforced with one #4 bar near the top and one #4 bar near the bottom (2 bars total). Due to expansive soils conditions, the curb should be imbedded a minimum of 12 inches below the lowest adjacent grade where abutted by hardscape and increased to 18 inches below the lowest adjacent grade otherwise.

Exterior Slabs-on-Grade (Sidewalks)

- Exterior slabs-on-grade (sidewalks) may be supported on native subgrade or granular import (refer to Table 1) prepared in accordance with Sections 5, 6.3.1, and 6.3.3 of the GIR for building slabs-on-grade. Table 5.3-2 of the GIR provides the recommended

moisture conditioning and compaction of native and import subgrade soil below buildings. Granular import soil is non-expansive ($PI < 9$ and, or $EI < 20$) and therefore, should be compacted to 90 percent relative compaction below sidewalk areas.

2. Due to the presence of expansive soils, the minimum reinforcement of sidewalks shall be in conformance with the recommendations in Section 6.3.3 of the GIR for Interior Concrete Slabs-on-Grade, which recommends reinforcement consist of #3 bars at 24 inches on center in both principle directions, or equivalent. If the native expansive soils are replaced with a minimum of 6 inches granular import soil (refer to Table 1 above), reinforcement may be reduced to #3 bars at 30 inches on center in both principle directions, or equivalent. The reinforcement of sidewalks should be tied to the reinforcement of abutting curbs and mow strips if all poured monolithically. If sidewalks are poured separately from adjacent fixed structures, curbs, mow strips, existing sidewalks, etc. dowels (#3 or #4 bars) could be installed at a minimum spacing of 48 inches on center to minimize differential movement due to expansive soils. The dowels should be epoxied into the existing concrete in lieu of using a slip connection.
3. Due to the presence of expansive soils, sidewalks adjacent to landscape areas should be provided with turned down edges, such as mow strips extending a minimum of 6 inches below the adjacent grade. The moisture content in landscape areas adjacent to sidewalks should be maintained at, or above optimum during construction to a distance of 3 feet beyond sidewalk to minimize moisture loss from occurring below the sidewalks. Turned down edges are not considered necessary for sidewalks abutting curbs or other hardscape.

CLOSING

TECHNICON appreciates the opportunity to provide geotechnical engineering services to the Fremming, Parson & Pecchenino Consulting Civil Engineering during the design phase of this project. We trust this information meets your current needs. If there are any questions concerning the information presented in this report, please contact this office at your convenience.

Respectfully submitted,
TECHNICON ENGINEERING SERVICES, INC.


Stephen P. Plauson, PE, GE
Geotechnical Engineering Manager

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