

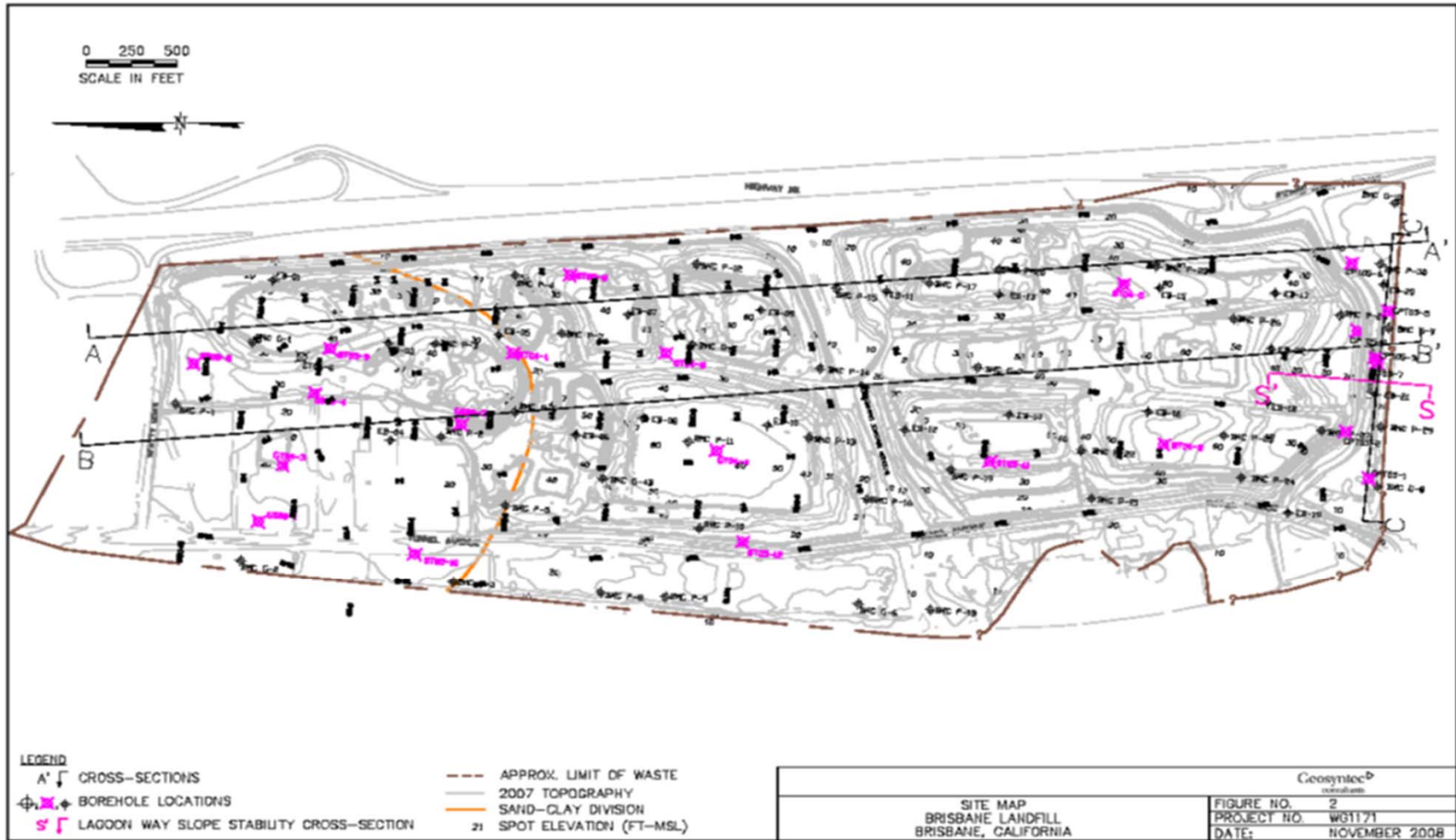
Tom Graf, P.E., GrafCon

GrafCon provides strategic consulting for investigation, remediation, and development of brownfield properties

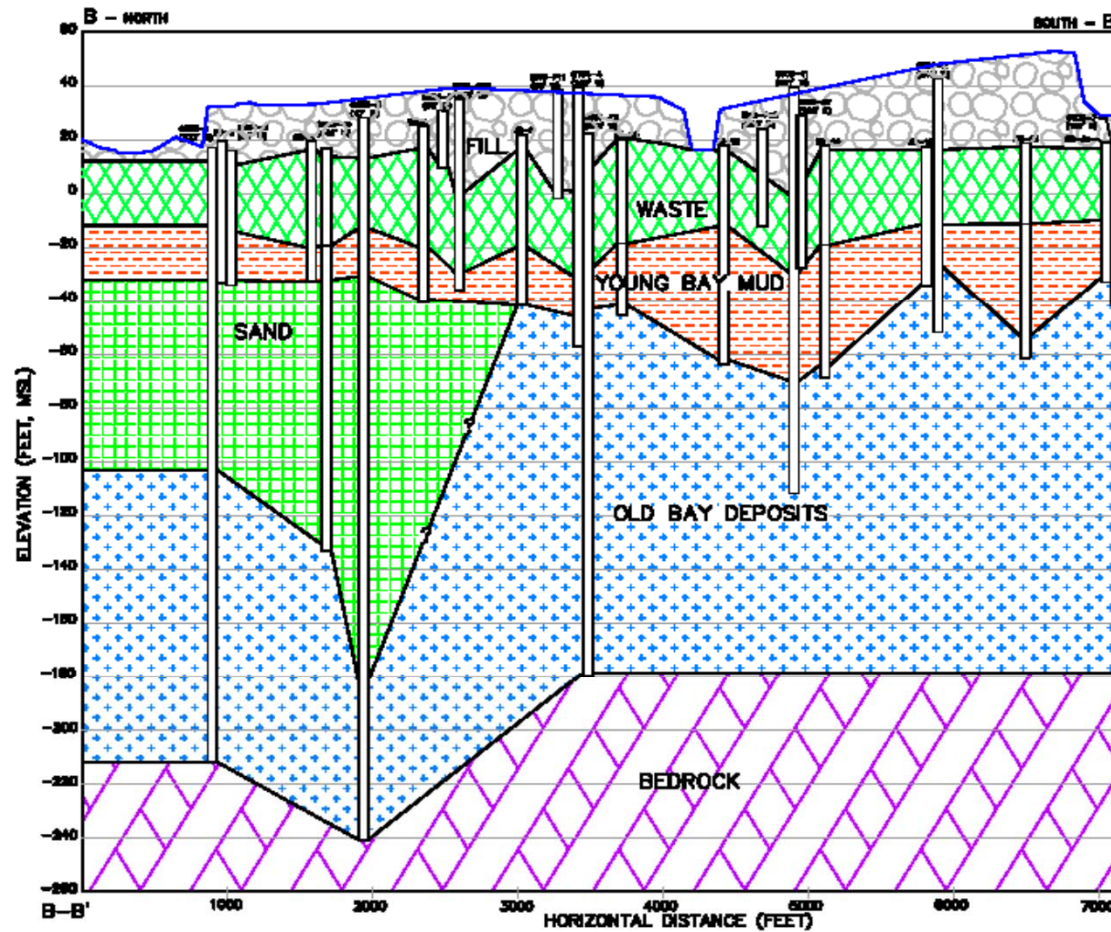
Mr. Graf has over 35 years of project experience with comprehensive expertise in environmental, geotechnical, and foundation engineering. Projects he has provided strategic management of include:








- Strategic consultant and/or manager of environmental investigation and remediation at more than 100 brownfield sites, including the LASC/MOSC plume in Livermore, Mission Bay and Pacific Bell Park in San Francisco, UPC/Sunquest 650-acre property in Brisbane, biotechnology sites in South San Francisco, a 180,00 square foot podium residential development in Palo Alto, and railroad properties in Oakland and Truckee, California.
- Strategic consultant and/or manager of remediation strategies and regulatory negotiation for railyard sites with residual Bunker C fuel, lead arsenate pesticides, and polynuclear aromatic hydrocarbons.
- Principal review for over 200 site assessments including industrial sites up to 400 acres and railway rights-of-way up to 150 miles in length.
- Investigation and/or remediation at seven petroleum pipeline leak locations and six tank farm and pump station sites, including remediation of impacted surface water and wetlands.
- Soil investigations, foundation design studies, grouting design and construction inspection for a wide variety of projects including WMATA Rapid Transit in Washington D.C.; Alyeska Oil Pipeline in Alaska; Bay Area Rapid Transit (BART), Walnut Creek, CA; Sealand facilities, Dutch Harbor, Alaska; Pacific Park Plaza, Emeryville, CA; Holiday Inn, Pleasanton, CA; Alameda Marina Village, Alameda, CA.

LIQUEFACTION



LIQUEFACTION



-  EXISTING AND PROPOSED FILL
-  WASTE
-  YOUNG BAY MUD
-  SAND
-  OLD BAY DEPOSITS (also includes clayey SANDS AND CLAYS)
-  BEDROCK
-  PROPOSED GRADES

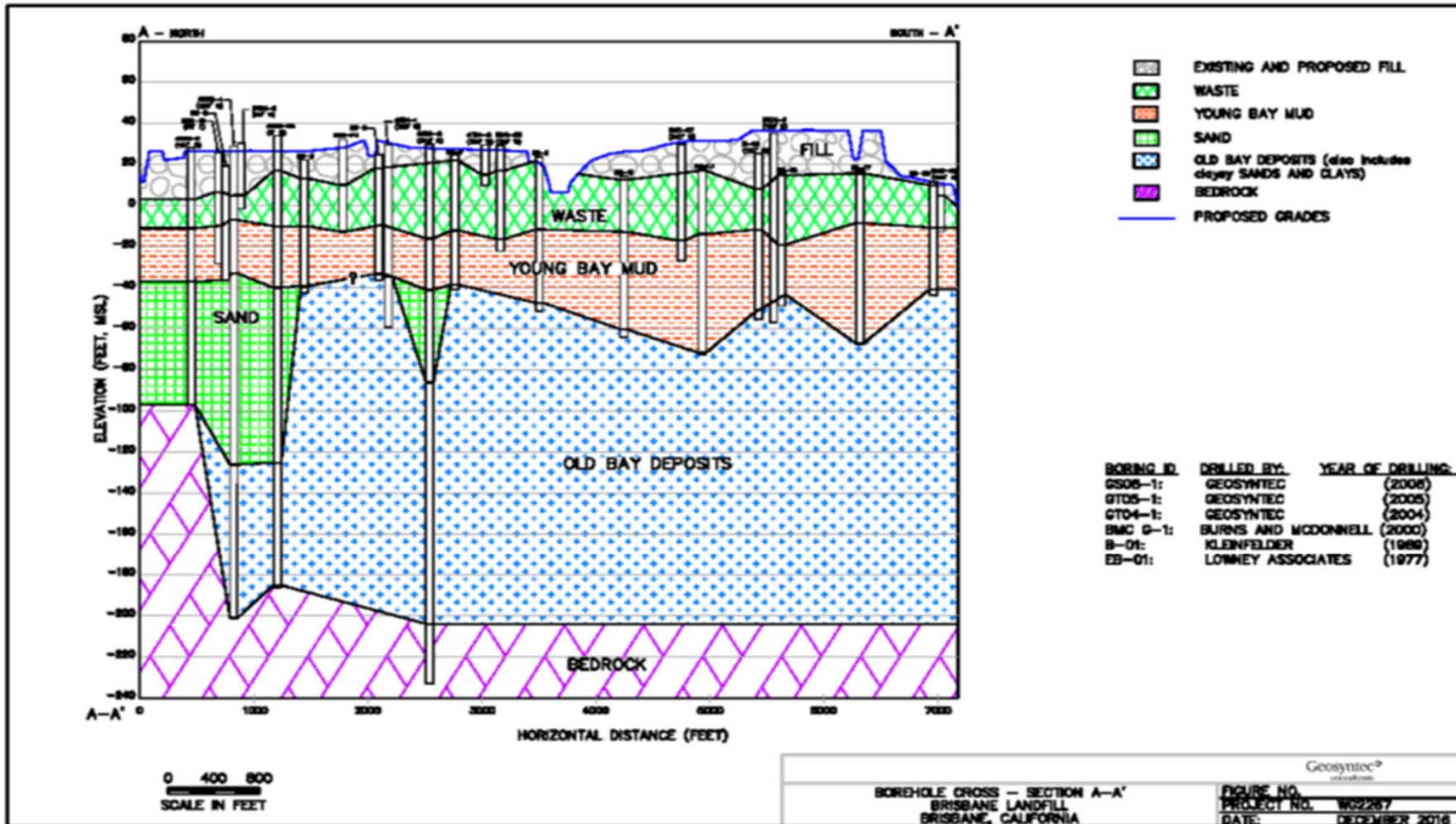
BORING ID	DRILLED BY	YEAR OF DRILLING
GS08-1:	GEOSYNTEC	(2008)
GT05-1:	GEOSYNTEC	(2005)
GT04-1:	GEOSYNTEC	(2004)
BMC G-1:	BURNS AND MCDONNELL	(2000)
B-01:	KLEINFELDER	(1988)
EB-01:	LOWNEY ASSOCIATES	(1977)

0 400 800
SCALE IN FEET

BOREHOLE CROSS - SECTION B-B'
BRISBANE LANDFILL
BRISBANE, CALIFORNIA

Geosyntec®
consultants
FIGURE NO.
PROJECT NO. WG2287
DATE: DECEMBER 2018

LIQUEFACTION



LIQUEFACTION

Typically, the surface manifestations of liquefaction under large earthquakes are sand boils, settlement, and lateral spreading. The sands are relatively dense and deep; therefore, surface manifestations are not expected to occur.

- Sand Boils

Because the sand is at depth below site fill, existing waste, and bay muds, sand boils are not anticipated at the surface.

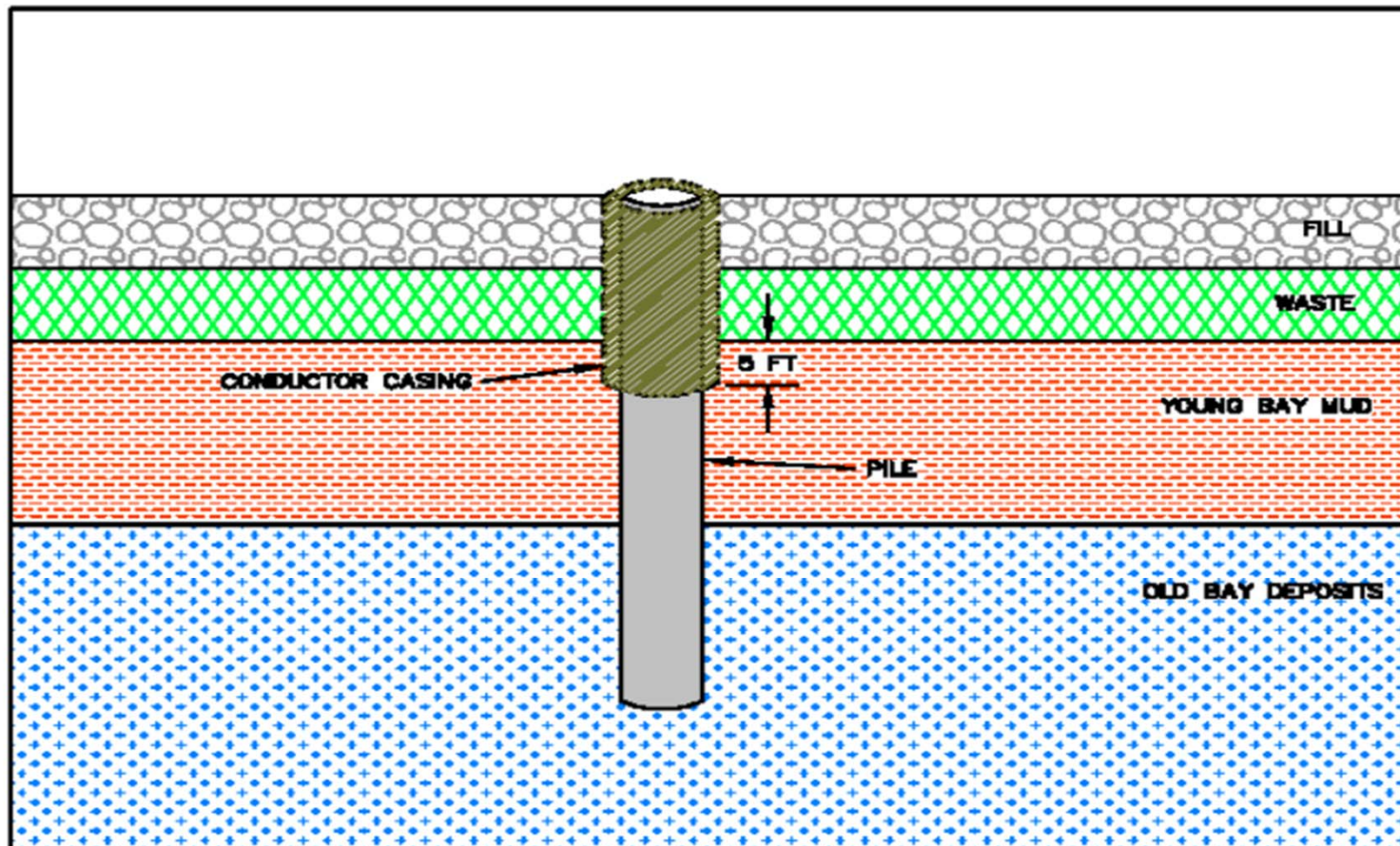
- Settlement

Sands underlying the site fill, existing waste, and bay muds are deep (greater than 60 feet) and relatively dense. Significant settlement is not anticipated at the ground surface due to sand liquefaction.

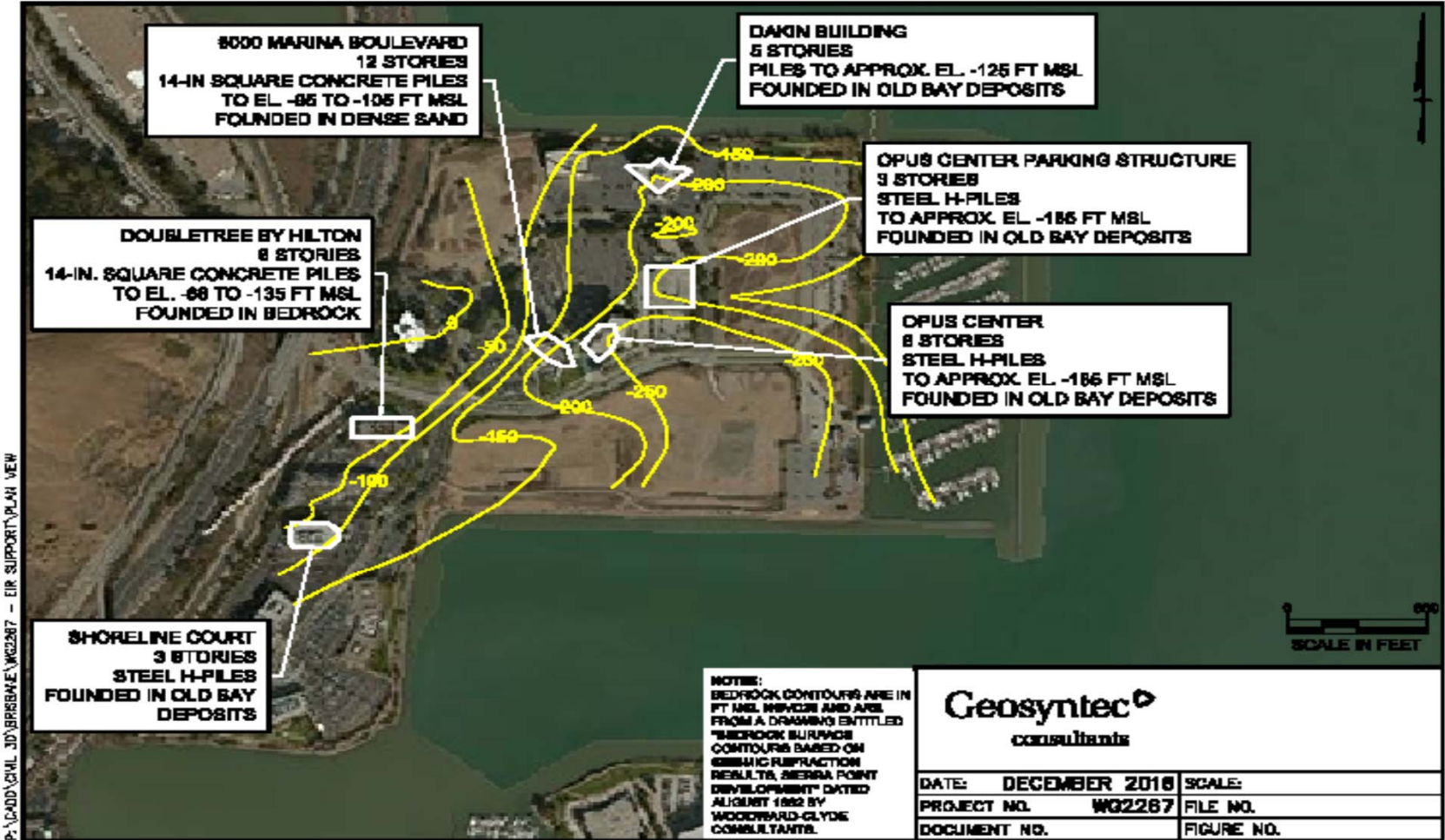
- Lateral Spreading

Because the sands underlying the site are deep, lateral spreading does not appear to be a concern.

PILE INSTALLATION THROUGH WASTE



PILE DESIGN



SHORT AND LONG TERM RISK MANAGEMENT – OU-1 and OU-2

- **Institutional Controls**

1. Site use restrictions
2. Requirement of soil and groundwater management plans during and after site development.

- **Operation and Maintenance Plans**

1. Maintains regulatory oversight post-development
2. Requires annual and post-earthquake site inspections
3. Requires financial assurance

- **Insurance**

SHORT AND LONG TERM RISK MANAGEMENT - LANDFILL

• **Regulatory Oversight**

1. RWQCB and CalRecycle and San Mateo County Health Department (Title 27)
2. BAAQMD
3. Department of Fish and Game and Army Corps of Engineers for wetlands
4. BCDC for development within 100-foot shoreline band

• **Title 27 Regulations**

1. Gas monitoring and venting systems for the life of the development
2. Long-term cap inspection and monitoring/management for leachate

• **Management of Long-Term O&M**

1. Owners association (such as SPEMA and SPOA at Sierra Point) responsible for monitoring, maintenance, and repair
2. Insurance