

# Cornerstone Outlook

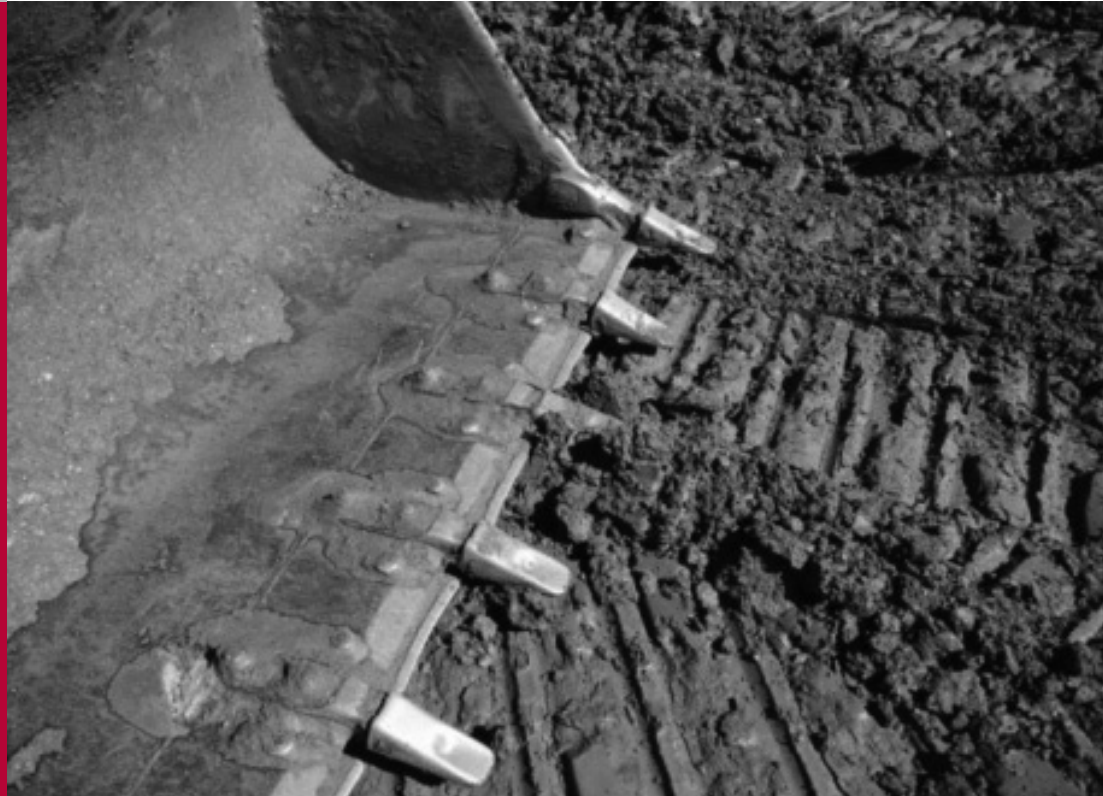
ISSUE ONE / SEPTEMBER 2010

## About Cornerstone

Cornerstone Earth Group integrates geotechnical engineering, engineering geology, seismology and environmental services to facilitate cost-effective site selection and design of structures. Our technical capabilities and construction and remediation expertise allow us to develop creative but practical solutions to meet your project requirements.

.....  
*Cornerstone Outlook* is published quarterly by Cornerstone Earth Group to provide our clients with up-to-date information in the geotechnical and environmental engineering fields.

## Environmental and Geotechnical Obstacles to Importing and Exporting Fill



## Overview

Developers and contractors are faced with ever increasing challenges when importing or exporting soil to or from an infill or Brownfield site. The potential liability associated with the use of contaminated fill material on your site could have significant unanticipated cost impacts to your project. Currently, there are no established standards or regulations that address environmental or geotechnical requirements for import/export fill material. If undocumented fill is imported to a site and fails to meet minimum site requirements, implications are high, including construction delays, costly landfill disposal fees, environmental regulatory agency involvement, property deed restrictions, and/or disclosure requirements. Cornerstone can assist

you in evaluating import/export fill sources.

## Environmental Obstacles

To minimize the possibility of introducing contaminated fill onto a site, fill sources should be thoroughly evaluated by an environmental professional. Two key aspects of the evaluation process are: 1) documentation of the source history and location(s) from where the fill was taken and 2) appropriate laboratory testing of the material. Oftentimes property owners and their general contractors and construction managers rely solely on limited chemical soil data without historical source information. Fill from properties known to be contaminated or that contained facilities that used, stored and/or

generated hazardous materials may not be appropriate sources.

When evaluating an import/export fill source, site history commonly is documented in a Phase I Environmental Site Assessment (ESA) and possibly a Phase II Investigation. The Phase I ESA should include a conclusion section that presents the environmental professional's opinion of the potential for site contamination. Often, there are additional investigations that were needed to address questions and concerns raised during the Phase I ESA process. A Phase II Investigation is performed to sample for and to ascertain the presence of specific contaminants at a site. These documents should be provided during the evaluation process.

If fill documentation is not available or inadequate, chemical testing of fill material must be performed. Sampling frequency should be based on the Department of Toxic Substances Control (DTSC) guidance document titled "Information Advisory on Clean Imported Fill Material" dated October 2001.

Appropriate environmental screening criteria established by local, state, and federal agencies must be compared against the analytical results. The most commonly used screening criteria are the California Human Health Screening Levels (CHHSLs) developed by the California Environmental Protection Agency (CalEPA) (CalEPA, 2005 and 2009). Additional screening levels may be required to evaluate potential soil impacts for chemicals detected but for which CHHSLs are not available. These screening levels may include Regional Screening Levels (RSLs) and Environmental Screening Levels (ESLs) established by the U.S. EPA (USEPA, 2009) and San Francisco Bay Regional Water Quality Control Board (RWQCB, 2008), respectively. ESLs typically are used in the event that CHHSLs and RSLs are not established or if the RWQCB is the lead agency. In addition, naturally occurring background concentrations of metals in soil may exceed their respective CHHSLs. CalEPA generally does not require cleanup of soil to below background concentrations. Thus, the metals results should also be compared to regional background levels.

Lastly, we recommend that your environmental professional document the above information in a brief letter, summarizing the site history, fill source, and any analytical testing performed. The letter should provide the environmental professional's opinion on the suitability for reuse of the fill and be stamped by an appropriately licensed professional.

### Geotechnical Obstacles and Site Recycling

The geotechnical requirements for soil to be imported are typically relatively simple, as long as the environmental screening requirements are met. Imported soil for use as engineered fill is often required to have a relatively low expansion potential, typically defined as having a plasticity index of 15 or less, and should generally be free of oversize material (larger than 2½ inches), debris (e.g. glass, metal, etc.), and organics.

Ideally, a project will re-use as much on-site material as possible to balance the site and reduce the amount of import or export of materials. This is particularly true of redevelopment sites where material recycling can greatly reduce the export of demolition materials, and by re-using the existing on-site materials, greatly reduce the import of new raw materials. This reduction in export and import can add up to significant cost savings on a project. For redevelopment sites, recycled crushed concrete, asphalt and aggregate base can easily be incorporated into new development use in driveway and parking areas, exterior flatwork areas, utility backfill, drainage trenches, and as non-expansive fills.

Native soils in the Bay Area are typically clayey and not suitable as non-expansive fill. They are also difficult to work with during winter grading and can become wet and unstable. We understand that grading during the winter can typically add 10 to 20 percent or more to grading costs due to wet weather conditions. Chemical treatment (e.g. lime or cement treatment) can be used to modify the clay's characteristics so that it can be reused on-site as non-expansive fill or to provide better winter grading conditions, reducing project costs. If native soils are treated to provide winter access in drive aisles and parking areas, the increased strength of the soils can be used to reduce permanent pavement sections, resulting in additional cost savings.

Cornerstone Earth Group is accustomed to working with project developers to identify and take advantage of potential import/export and recycling opportunities. For more information on screening materials for import or material recycling, please contact **Kurt M. Soenen, P.E., Principal Engineer at (408) 245-4600 x110 or [ksoenen@cornerstoneearth.com](mailto:ksoenen@cornerstoneearth.com) and/or C. Barry Butler, P.E., G.E., Principal Engineer at x102 or [bbutler@cornerstoneearth.com](mailto:bbutler@cornerstoneearth.com).**

**David J. Powers & Associates** and the **City of San Jose** selected Cornerstone to assist in the preparation of the E.I.R. for the Envision San Jose 2040 General Plan Update. Due to our local knowledge and expertise, Cornerstone was selected to prepare Current Conditions Reports identifying existing geologic, geotechnical, and environmental conditions within the City of San Jose and environmental and geological development constraints.

On behalf of **Dupont Fabros Technology**, Cornerstone is providing geotechnical and environmental services for the development of a 360,000-square-foot, one-story, high-bay, steel-framed data center facility with an electrical substation and asphalt concrete parking located between Mathew Street and Reed Streets in Santa Clara.

**Federal Realty Investment Trust** is constructing a mixed-use development at Santana Row in San Jose; the development will include a concrete podium structure with one-level below grade parking and four levels of wood-framed residences. The homes will be available for sale in Fall 2011. Cornerstone worked closely with **Barry Swenson Builder** and the project architect, **Ankrom Moisan**, to expedite submittal/RFI reviews and to obtain responsive approvals. In addition, due to the presence of pesticides detected in soil at Santana Row, Cornerstone coordinated with DTSC to obtain unrestricted use of the site.

**Trumark Companies** retained Cornerstone to perform geologic hazard, geotechnical and environmental investigations for a 16-acre commercial site planned for redevelopment with 94 single-family homes. Although the site had a complex site development history and was located within State and City seismic hazard zones for the Shannon Fault and liquefaction, the project received Geologic Hazard Clearance from the City of San Jose without comment or additional work needed.

Cornerstone's principal group has completed over 50 projects district wide for the **College of San Mateo**. Our latest project is the new College of San Mateo Building 10N; it includes a split-level, three- to four-story, 140,000-square-foot building. The new building will centralize critical student services, faculty offices, and the new Integrative Learning Center (ILC). The building is supported on conventional spread footings with tie-down anchors.

Ron L. Helm, C.E.G.  
[rhelm@cornerstoneearth.com](mailto:rhelm@cornerstoneearth.com)