



Association of Environmental & Engineering Geologists San Francisco Section

ANNOUNCING THE AEG SAN FRANCISCO SECTION
AND SAN FRANCISCO GEO-INSTITUTE
NOVEMBER 2011 JOINT MEETING

Building on Ancient Soils Immediately Adjacent to Active Faults

And an Extra Feature:

The Ten assumptions of Science and the Demise of Cosmogony

Glenn Borchardt, PhD, Progressive Science Institute and
Michael Dwyer, Private Consultant

MEETING DETAILS

Restaurant

Sinbad's
Pier 2 Embarcadero Street
San Francisco, CA

[Map](#)

Date and Time

Thursday, November 10, 2011
6:00 pm—Social Hour and Sign-in
7:00 pm—Dinner
8:00 pm—Presentation

Cost: \$50 Members and Non-Members; \$20 for Students

Menu

- | | |
|---------------------|--------------------|
| ☉ Salmon Florentine | ☉ Chicken Picatta |
| ☉ Snapper | ☉ Shrimp Louis |
| ☉ London Broil | ☉ Vegetarian Pasta |

Reservations*: To RSVP, please fill out the online form at
<http://www.acteva.com/booking.cfm?bevalD=224111> by **10 PM, Wednesday, November 9th**

Driving Directions: From the Bay Bridge, take the Fremont Street Exit and the Folsom Street Ramp. Go left (east) on Folsom Street, then left (north) onto the Embarcadero (Herb Caen Way). The driveway for Sinbad's is on the right, south of the historic Ferry Building. Please watch out for the pedestrians and cyclists when turning into the driveway. Thank you.

BART Directions: Exit the Embarcadero Station; walk up Market Street toward the Ferry Building (less than ½ a mile toward the Bay and to the east). Cross Embarcadero and Sinbad's is located next to the Alameda ferry pier on the south side the historic Ferry Building.

Parking: \$4 valet parking is available or there are meters located on nearby side streets.

*Please RSVP in advance. Walk-ins are welcome, but not guaranteed. No shows will be charged.

See next page for abstract and speaker biographies.

Building on Ancient Soils Immediately Adjacent to Active Faults

Glenn Borchardt, PhD (Speaker)

Progressive Science Institute

Dr. Glenn Borchardt spent over 30 years in the California Geological Survey as a geochemist and earthquake hazard specialist, with emphasis on the science of soil tectonics, in which the age of soils are estimated for use in assessing seismic hazard due to ground rupture. Dr. Borchardt is currently Principal Soil Scientist at Soil Tectonics and Director of the Progressive Science Institute in Berkeley.

Michael Dwyer, CEG

Private Consultant

Michael Dwyer has 47 years of professional engineering geologic experience in both the private and public sectors. His practice includes a broad range of geologic investigations/studies for individual sites, existing/proposed mines, geothermal facilities, large tracts of lands, and dam sites. He specializes in geologic/seismic hazard evaluations, site feasibility evaluations, preparation of mine reclamation plans, environmental assessment, and regional geo-planning. In this capacity, he has directly participated in and supervised the completion of over 1,500 investigations, including the preparation of regional aerial photo landslide maps of over 2,000 square miles of central and northern California. He has recent regulatory experience in surface mining and reclamation. He maintains his consulting practice in Santa Rosa.

Abstract –

This presentation will be in two parts: I. How to determine setbacks for avoiding construction in shear zones and II. How to build across secondary traces in active shear zones.

Avoidance: Tectonically undisturbed materials adjacent to active fault traces are defined as "freeboard" soils. Such materials have surface fault rupture (SFR) potentials that are an inverse function of soil age and the activity of the adjacent fault. Surface rupture probability is low for old soils adjacent to extremely active shear zones but relatively high for young soils adjacent to moderately active shear zones. For a soil surface to be ruptured where it has never ruptured before (the "freeboard soil"), the width of the shear zone must increase. This becomes increasingly unlikely as a shear zone matures (>30 events), at which time a setback should not be required. Young freeboard soils require setbacks, which only can be determined from shear zone widths measured through older soils along strike. A minor instance in which setbacks would be required involves the grading of flower structures, which may give a false impression of the expected width of the shear zone. Once primary faults are identified, any secondary faults can be avoided only after the mature width of the shear zone has been determined. No setback is then necessary. When this is not possible, structural mitigation to withstand minor offsets is preferable to an arbitrary setback, which gives little more than a false sense of security.

Building across Secondary Traces: Building restrictions limited the location of a proposed single-family residence in rural western Marin County, California to a linear, narrow, spur ridge top within an Alquist-Priolo (A-P) Zoned branch of the San Andreas fault known as the West Boundary fault.

Detailed logging of four trenches excavated within the zone identified several active to inactive minor secondary faults. The faults have variable senses of displacement separated by narrow intervals of unfaulted ground across a 120-ka terrace forming the ridge top and a lower, nearby 60-ka terrace. Two active strike-slip faults passed through the residential site. These northwest striking features have down-to-the east vertical components of offset of up to 140 cm (56 in). The design of the residence consisted of individual modules that were connected by short, covered passageways. Thus, it was possible to narrowly avoid the active traces by rotating the modules within the limited space available. Because the structure remained extremely close to the active traces and was still confined within the shear zone, we included a mitigative geotechnical design to further minimize the effects of future SFR. We selected conservative event displacements for mitigation of up to 1.2 m (3.9 ft) laterally and 24 cm (9.4 in) vertically. The resulting design included a heavily reinforced 18 to 26-inch thick concrete mat foundation with extensive tie-downs and a base isolation system involving 2 inches of sand, two 15-mil vapor barriers, and one-foot of gravel.

Extra feature:

The Ten Assumptions of Science and the Demise of Cosmogony

The absurdities in current physics and cosmology are founded on indeterministic presuppositions uncovered in this review. Once subconsciously held presuppositions are stated, they become assumptions, objects amenable to study. Each indeterministic assumption has its deterministic opposite. To obtain a logically coherent set of fundamental assumptions, one must include generalized infinity, which is resisted vehemently by the present culture. Nonetheless, the ten deterministic assumptions are: 1. MATERIALISM: The external world exists after the observer does not. 2. CAUSALITY: All effects have an infinite number of material causes. 3. UNCERTAINTY: It is impossible to know everything about anything, but it is possible to know more about anything. 4. INSEPARABILITY: Just as there is no motion without matter, so there is no matter without motion. 5. CONSERVATION: Matter and the motion of matter neither can be created nor destroyed. 6. COMPLEMENTARITY: All things are subject to divergence and convergence from other things. 7. IRREVERSIBILITY: All processes are irreversible. 8. INFINITY: The universe is infinite, both in the microcosmic and macrocosmic directions. 9. RELATIVISM: All things have characteristics that make them similar to all other things as well as characteristics that make them dissimilar to all other things. 10. INTERCONNECTION: All things are interconnected, that is, between any two objects exist other objects that transmit matter and motion. Among the primary conclusions: time is motion, light is motion, the universe is Euclidean, there is a dynamic ether, gravitation is a push, and the "Big Bang Theory" must be replaced by the infinite universe theory.

Thank you for the RSVP! See you on Thursday, November 10th, 2011!