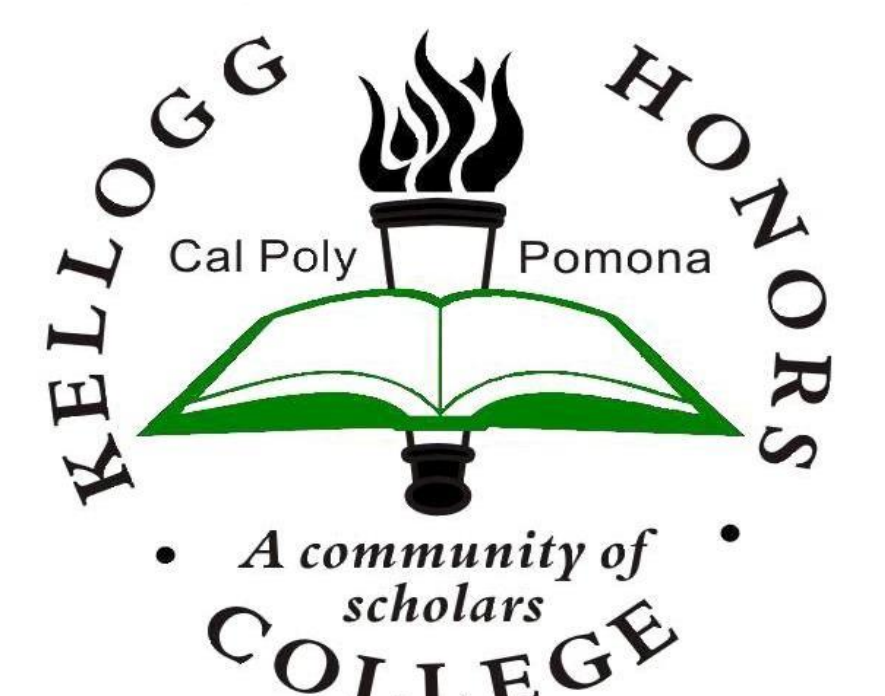


Case Study of Millennium Hollywood



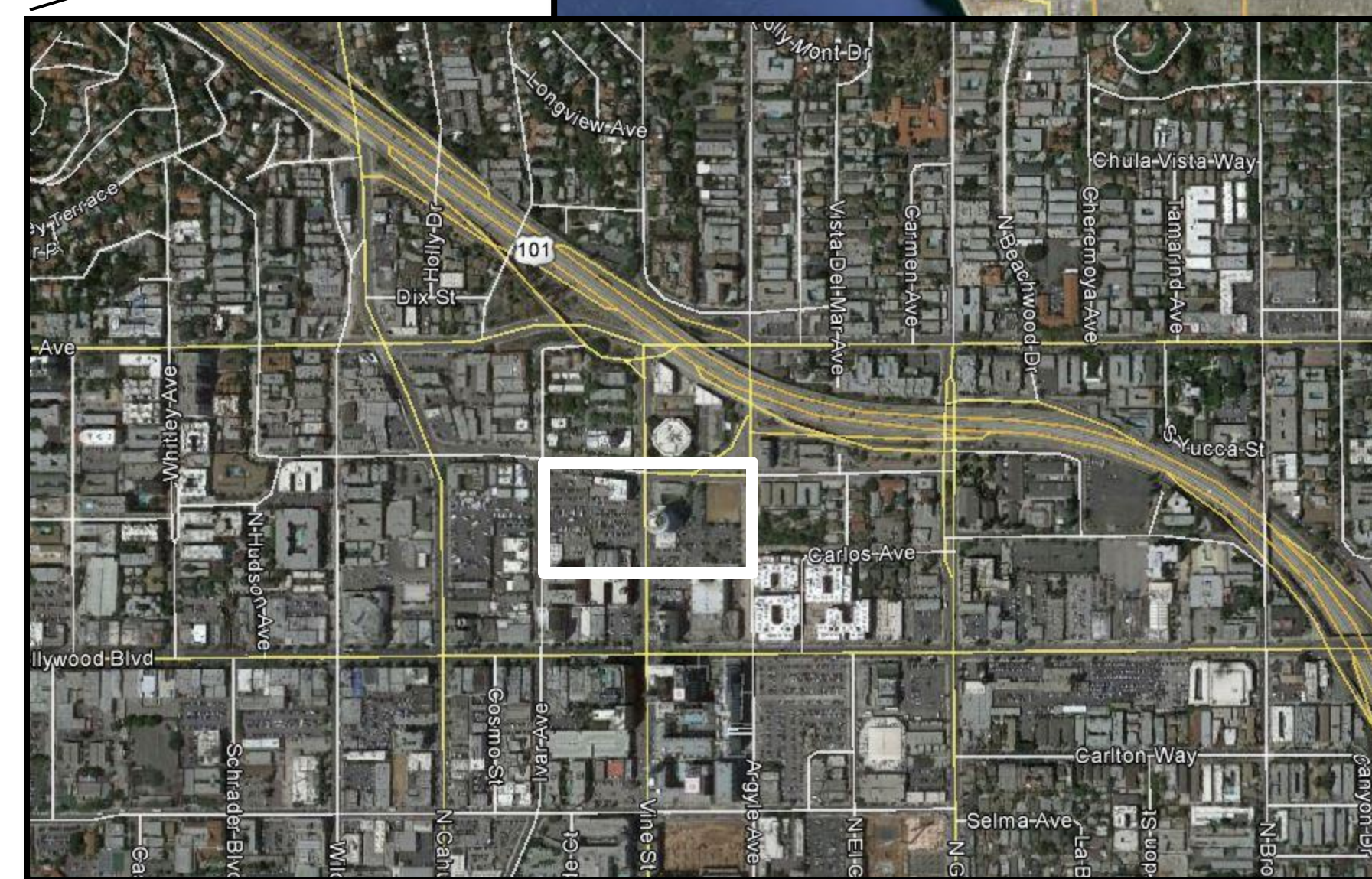
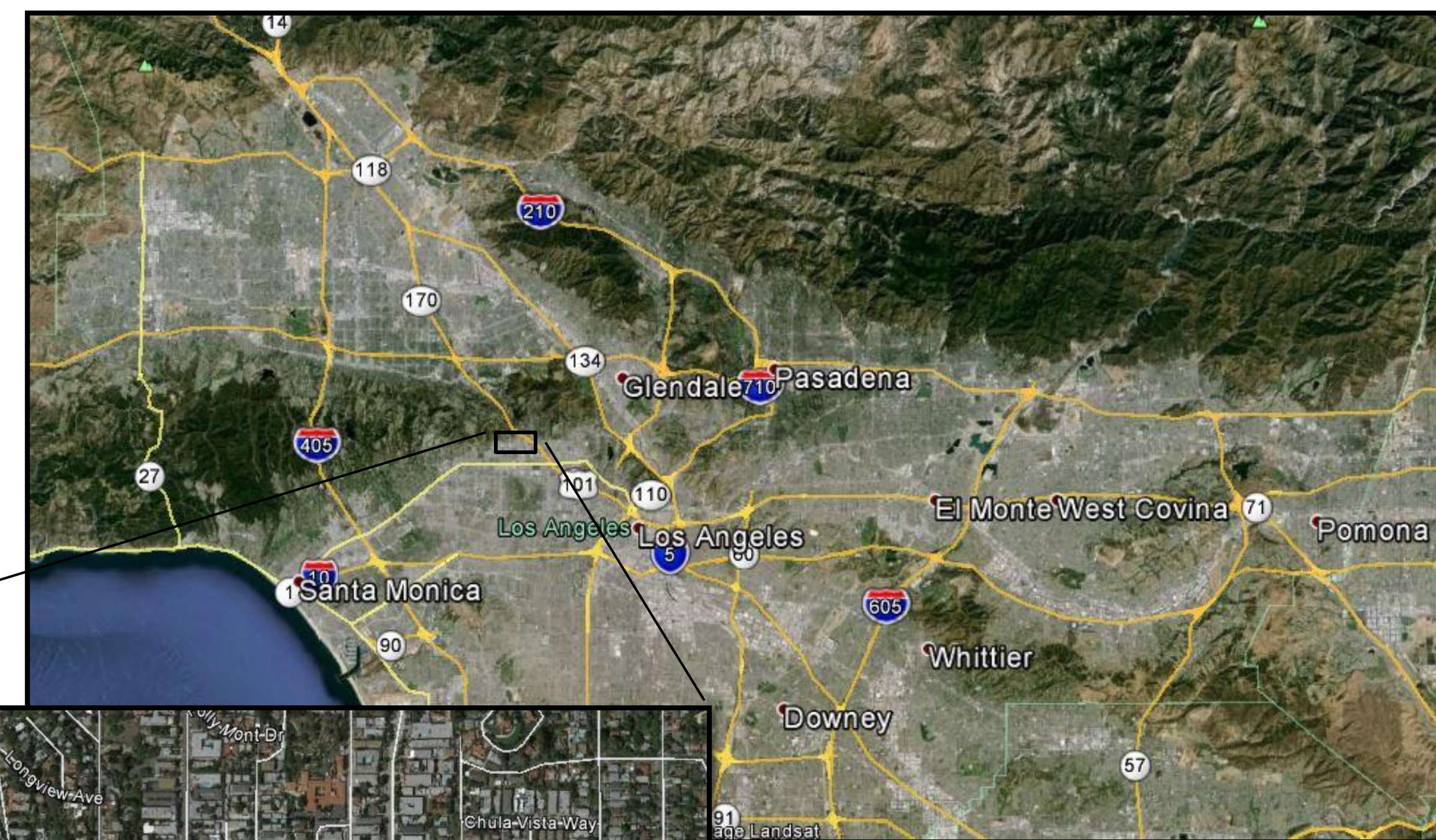
David Owens, Civil Engineering

Mentor: Dr. Ernest Roumelis

Kellogg Honors College Capstone Project

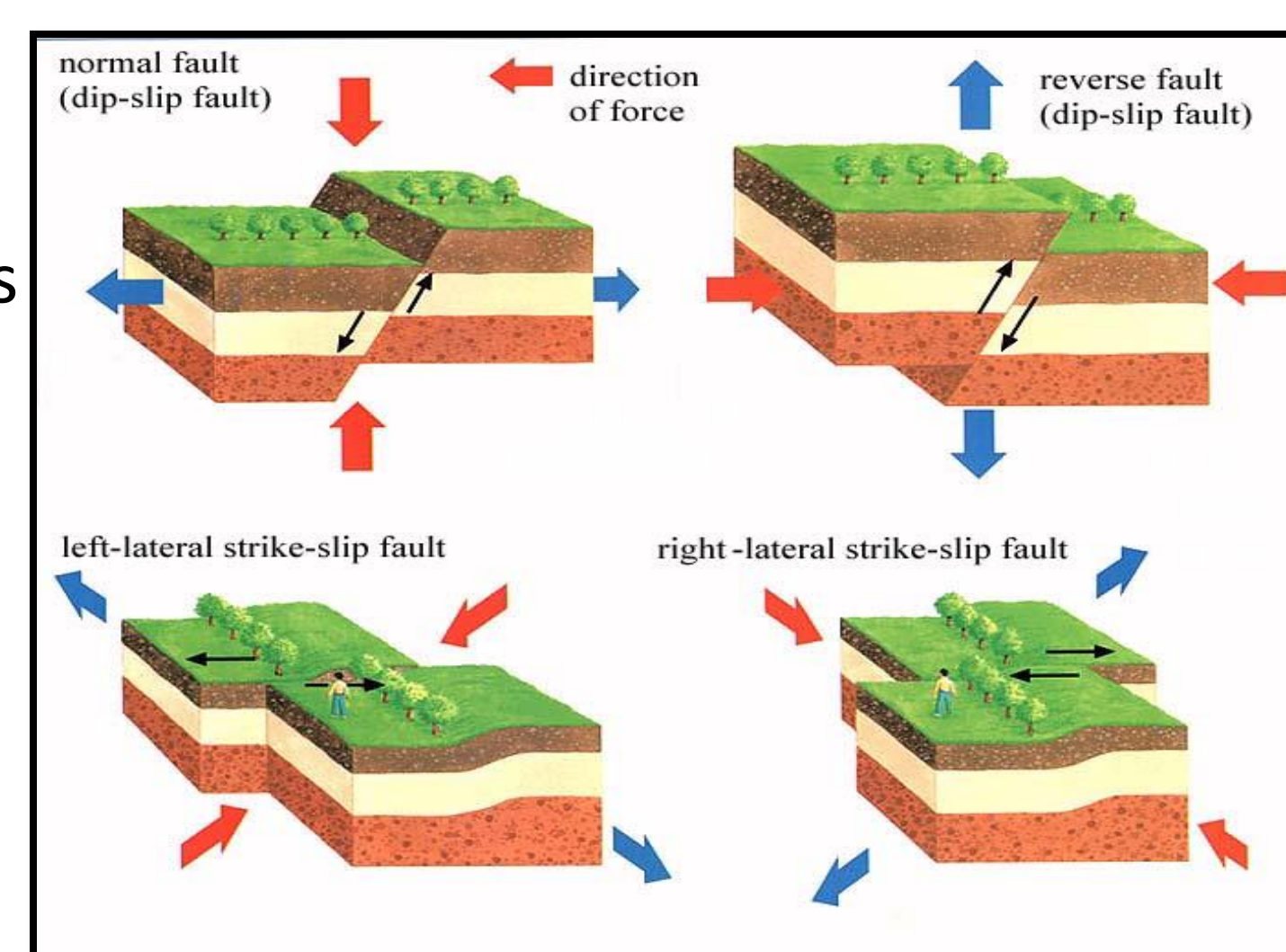
Overview

- 1680 Vine St. Los Angeles, CA 90028
- Adjacent to & across from Capitol Records
- Mixed use developments on 4.5 acres
- Met swift resistance from community groups
- Biggest concern is the Hollywood Fault
- Fear about earthquake safety & fault location



Earthquake Faults

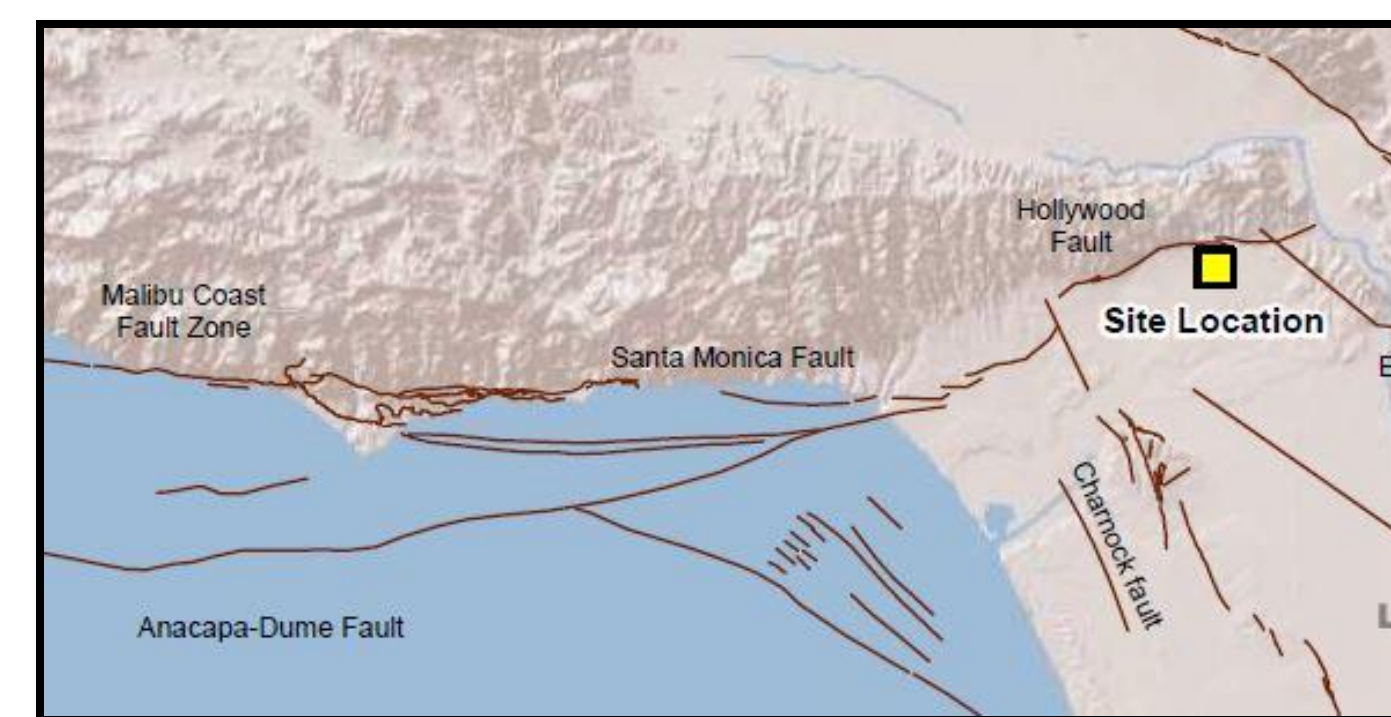
- Fractures in the Earth's crust
- Stress builds as tectonic plates slide by each other
- Faults slip when too much stress builds up, called earthquakes
- During earthquakes, stress is released and the ground moves until a new equilibrium has been reached
- Slippage usually happens below ground, but sometimes extends to the surface (surface rupture)



- Surface rupture differs from earthquake ground shaking because it causes a permanent change in ground conditions
- The two components are designed for separately
- Ground shaking is much easier to design for

Hollywood Fault

• North-dipping fault with reverse & left-lateral strike-slip motion

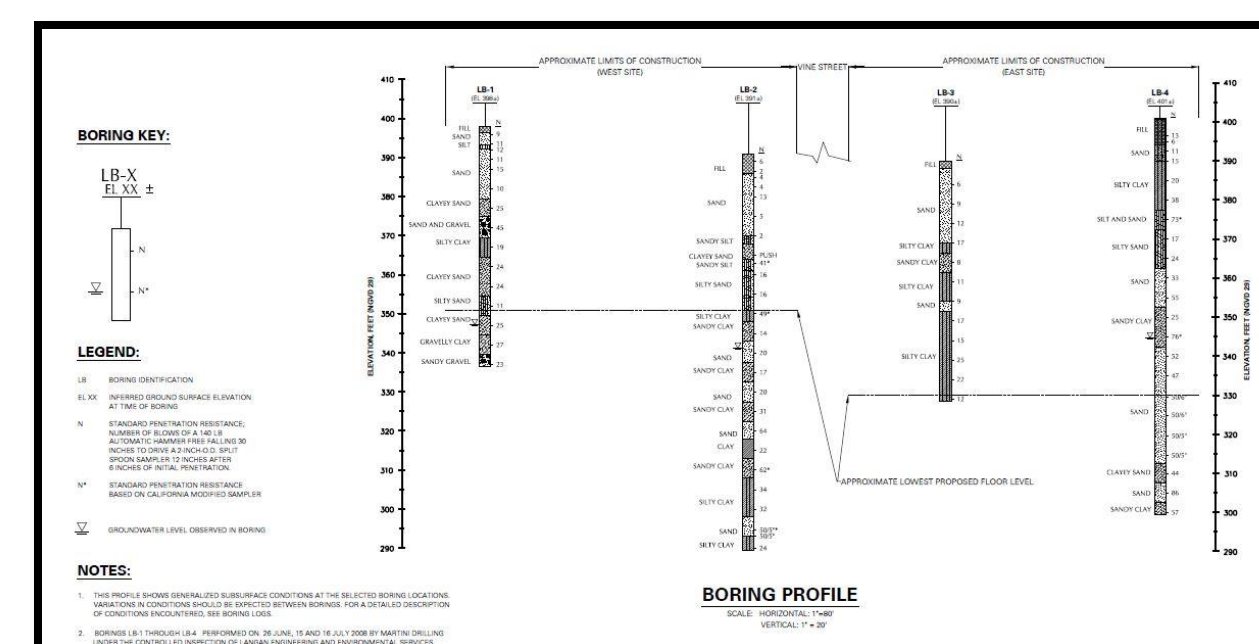
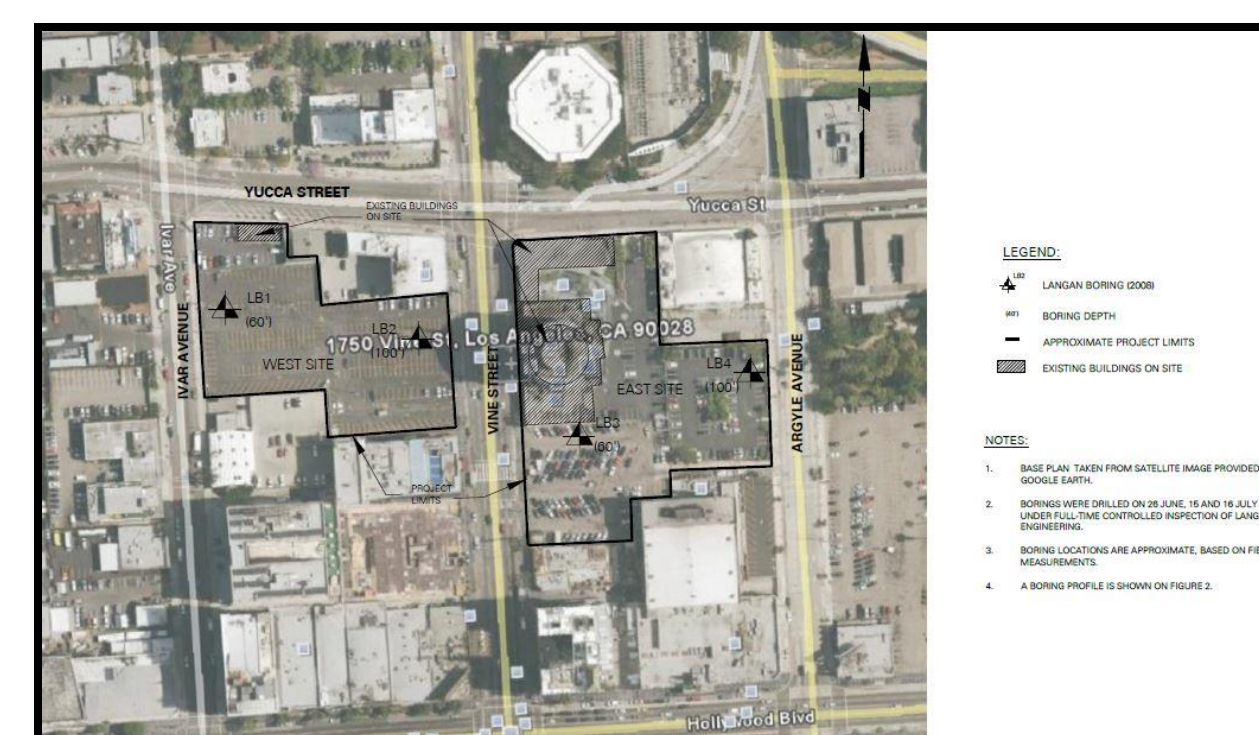


- Part of a three-fault system (Hollywood-Santa Monica-Anacapa Dume)
- System ruptures together & completely
- Strong quakes during rupture, usually 6.9-7.0
- Surface rupture every 8000 years, last was likely 2000 years ago



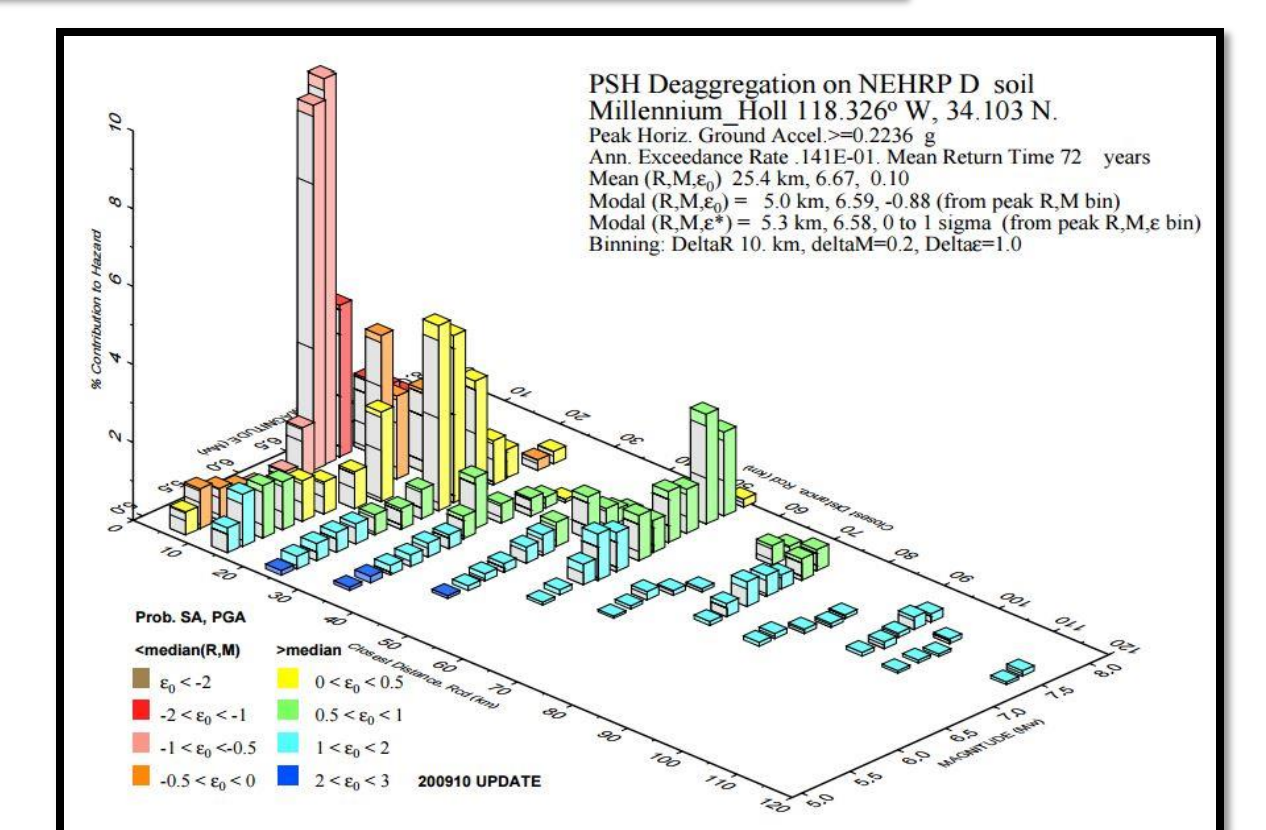
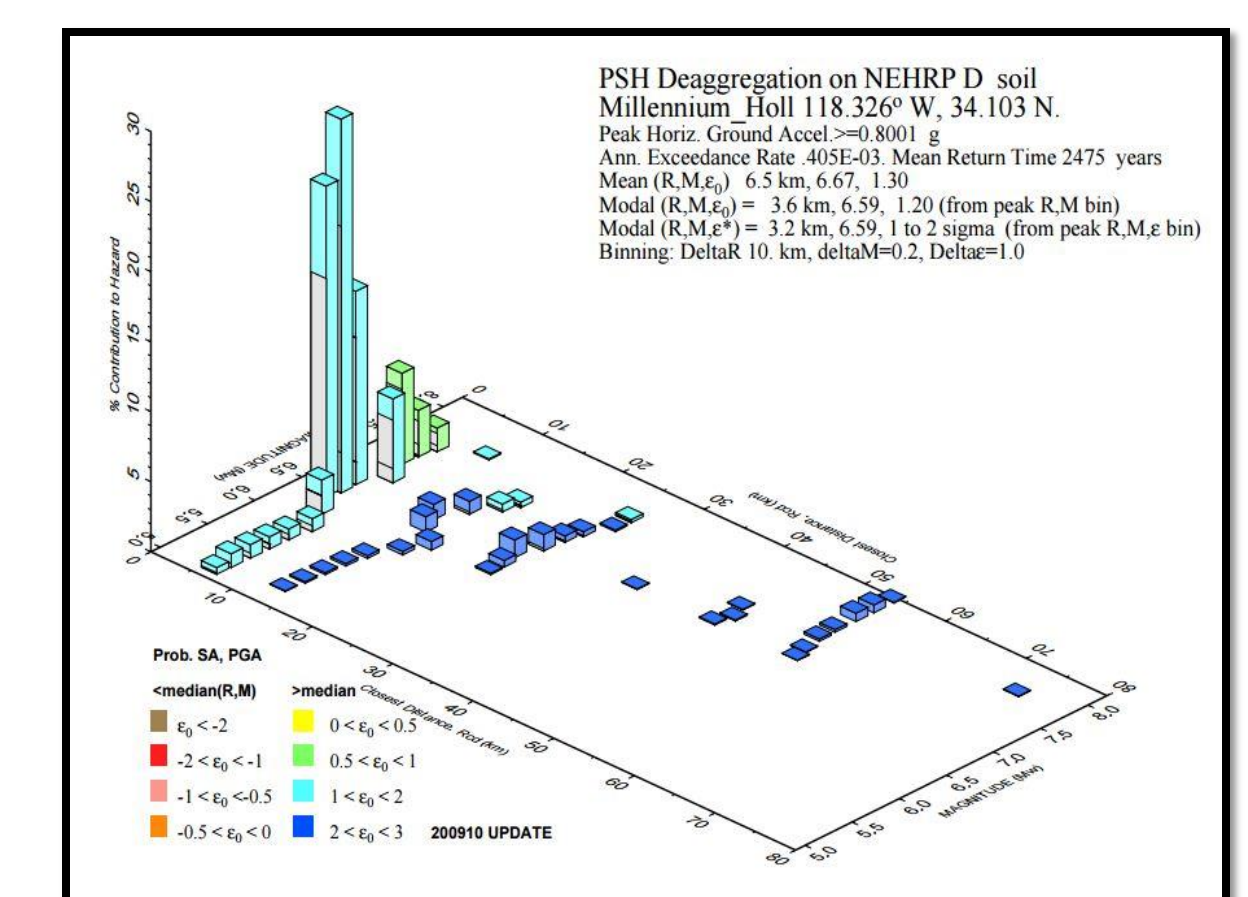
Millennium Hollywood Site

- DEIR (Draft Environmental Impact Report)
- Includes geotechnical studies of subsurface soil conditions (borings, trenches)
- Langan & Associates studies show no proof of earthquake fault within construction site



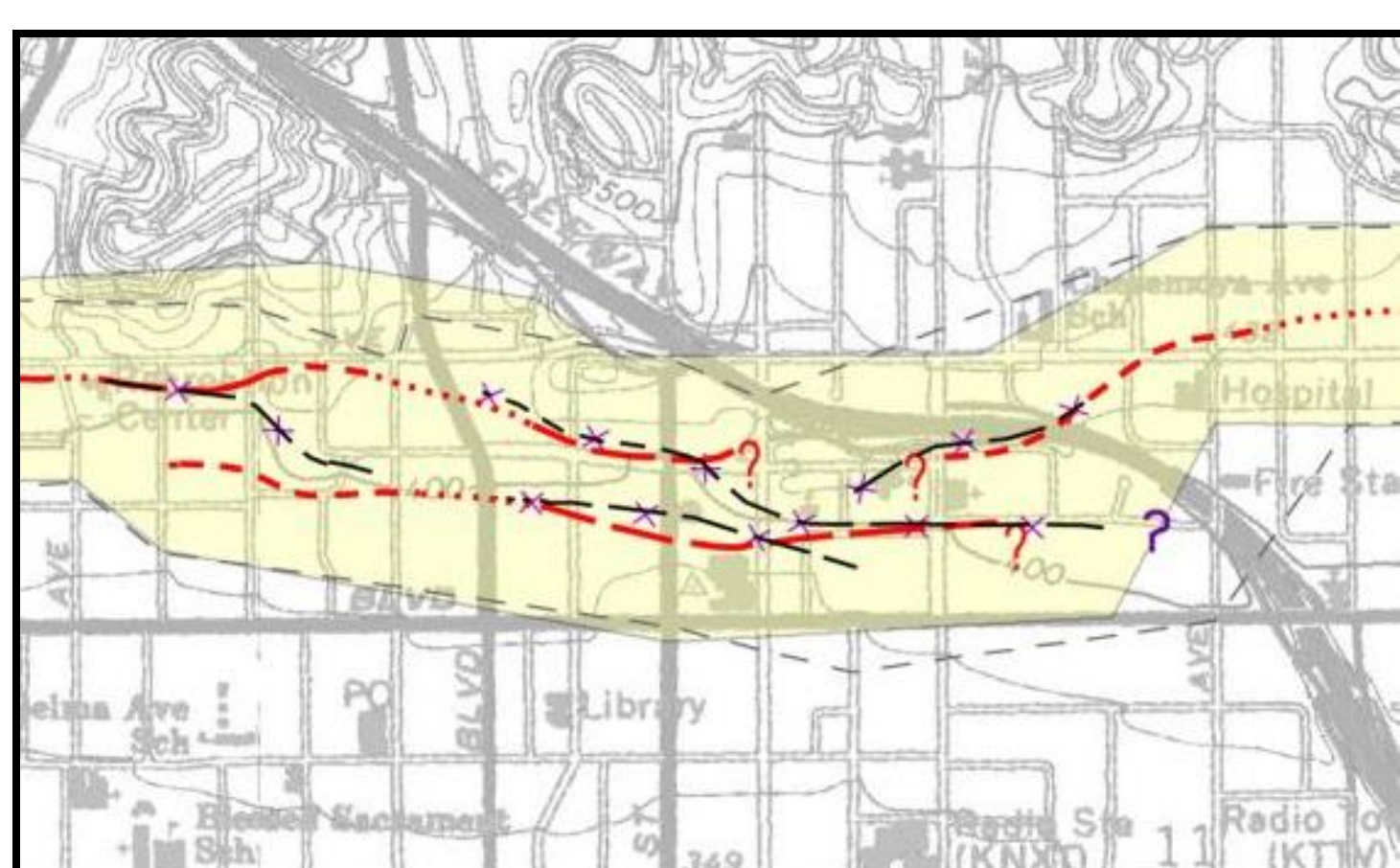
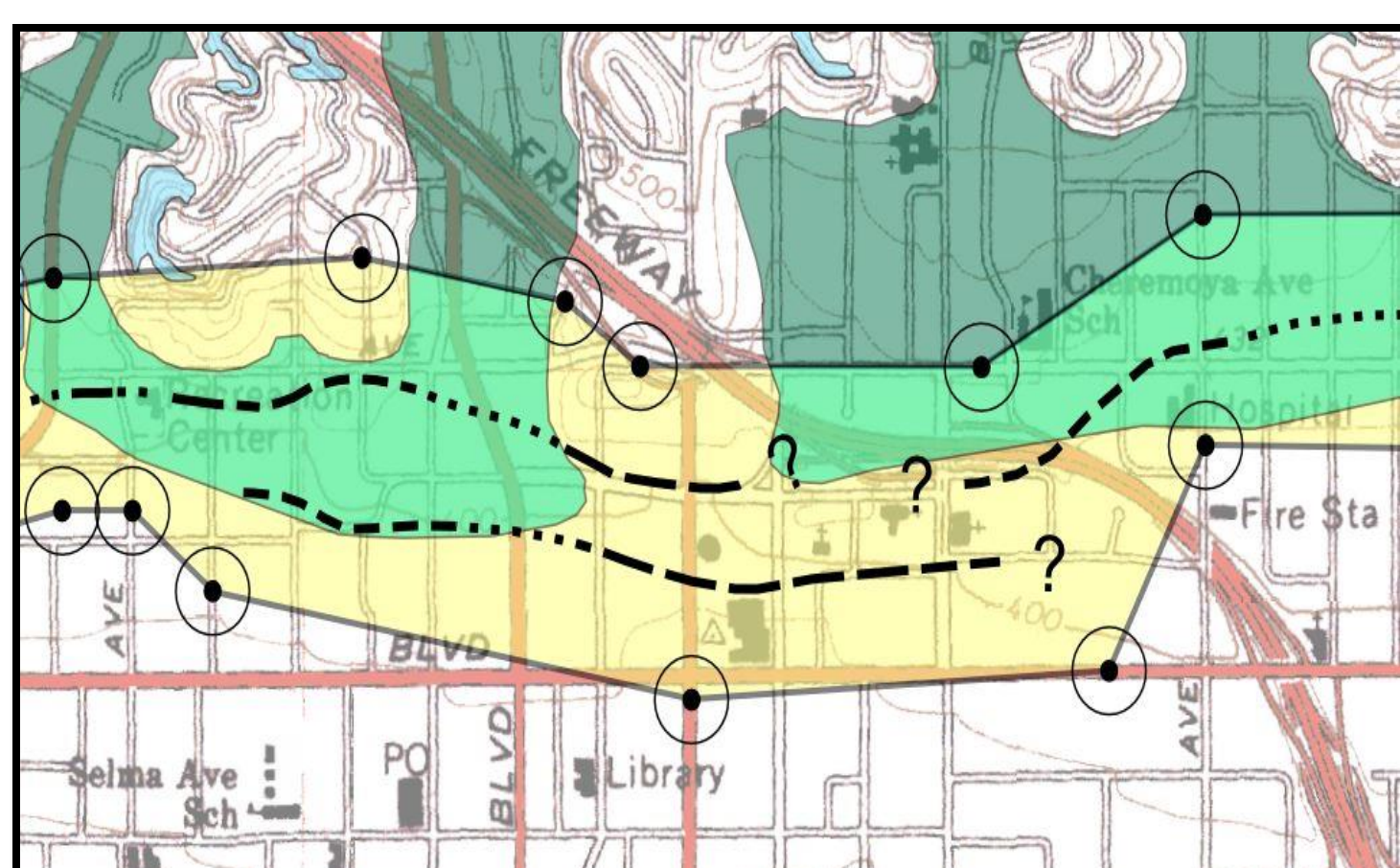
Attenuation & Deaggregation

- Deaggregation: comparative risk of a single event with respect to the total risk of all possible events
- Hollywood fault is just one out of hundreds of faults in the Southern California area
- Risk is expressed in percentages
- USGS deag. charts elaborate these risks



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- Multiple geotechnical studies from Hollywood area combined
- CGS interpreted data to update its official earthquake fault map
- This map is the law when considering fault location & other hazards such as soil liquefaction and landsliding



Comparative Safety & Ethics

- Many popular Hollywood buildings built pre-1933
- Long Beach earthquake
- Before then, codes only covered wind loads, not earthquake loads on structures
- Pantages Theater, Pacific Theater, Hollywood Plaza...
- Unreinforced masonry construction is the most deadly form of construction worldwide
- New construction will bring people to work and live in safer buildings



Conclusion

- Concern is not unwarranted
- Earthquakes can be deadly
- Ground motion is easier and safer to design for than surface rupture
- Hollywood fault surface ruptures every 8000 years, last was 2000 years ago
- Langan borings & trenching show no proof of fault crossing the site
- Official, updated CGS maps reflect these results
- Overall, total risk from Hollywood fault is fairly low
- Newer, safer building projects should be encouraged
- Millennium Hollywood should be allowed to continue construction

