LOS ANGELES UNIFIED SCHOOL DISTRICT

SCHOOL CONSTRUCTION BOND CITIZENS' OVERSIGHT COMMITTEE

To: School Construction Bond Citizens' Oversight Committee Members

Re: Current Status of Existing Facilities Active Earthquake Fault Zone Study Plan

Date: February 23, 2005

EXECUTIVE SUMMARY

In recent public statements the Superintendent announced preliminary conclusions of an ongoing study of existing facilities in respect to identified-and-previously-unidentified active earthquake faults.

Six schools were identified for further study and/or proposed remediation — including replacement and vacation of existing school buildings. There is no identified funding stream for such remediation and indeed – though the further study is undoubtedly justified and possible action seems prudent – there appears to be no legislative mandate in existing law for the action proposed.

A: BACKGROUND

The discovery of a previously unidentified earthquake fault at the Belmont Learning Center site in September, 2002 and the January 2003 seismic study of the Belmont LC site was a wake-up call for LAUSD. The Superintendent directed a district wide survey of all existing LAUSD schools to determine if any existing school buildings are located on known active faults.

Superintendent Romer announced at a Meeting of the Focus on Achievement Council (an advisory

group of parents and educators from across the district) on January 13, 2005 that the study was nearly complete and that six schools appeared to be impacted.

Briefings were held with Board Members and a series of memos with preliminary findings was circulated to the Board, senior staff and the Bond Oversight Committee on February 4.

On February 10, Superintendent 2005 Romer and Board Member Marlene Canter held a press conference and circulated a press release at University High School, announcing the proposed mitigation at University High School and that further studies were underway - or would soon be undertaken at five other schools.

B: ACTION TO DATE: University High School

This survey first began in earnest at University High School because a seismic study initiated in 1997 by the federal government identified a previously unknown but active fault (The Santa Monica Fault) at the Veterans Administration in Brentwood. There was a reasonable presumption that this fault might extend onto the nearby University HS campus.

The District contracted with a geological engineering firm and site studies - including trenching and boring - confirmed the fault runs under the campus with potential impact upon a number of portable bungalows, the music building and the gymnasium.

Further studies identified that the music building might suffer substantial damage in a "most probable" earthquake and that the gymnasium would suffer some damage but would remain standing allowing occupants to safely evacuate in case of a temblor. Further studies predicted the likelihood of such a seismic event occurring in the next four years (the projected time to construct a new building) at .5% (one-half of one percent).

The District now proposes:

1. To relocate the affected bungalows away from the fault line.
2. To vacate the music building and not use it for student or staff housing. This process is currently underway.
3. To build a new music building.
4. To continue to use the gymnasium and build a new one, eventually demolishing the current one.

The Superintendent will propose to the Bond Oversight Committee and the School Board that funding for the above come from the Core Facilities allotment of Measure R — allocated into the first priority as this is a safety issue.

C: ACTION TO DATE: Other Campuses

Facilities Staff identified the most current map of known active seismic faults in the area ("The Alquist-Priolo Survey") and - using a GIS (Global Information Survey - a mapping system incorporating satellite mapping with known survey data) overlay of existing LAUSD schools determined which schools appeared at first blush to be potentially impacted.

Further study and consultation with experts in the field narrowed the list of potentially impacted schools to six:

University High School (reported above) and its neighbor Brockton Elementary School, located on the Santa Monica Fault in Local District 3 in Marlene Canter's Board District and Oceola Elementary, Harding Elementary, Burbank Middle and San Pasqual Elementary located on various Alquist-Priolo mapped faults throughout LAUSD. Osceola and Harding Elementaries are located on the Mission Hills/Wells and Sylmar faults in the foothills of Northeast San Fernando Valley, in Local District 1 in Julie Korenstein's Board District.

Burbank Middle School and San Pasqual Elementary School are located on the Raymond fault in Highland Park in Northeast Los Angeles in Local District 4 in David Tokofsky's Board District.

Further studies are currently underway and trenching and/or boring tests will occur this summer at the five schools. It is the general belief at this time that in the worst case (all impacted buildings requiring replacement) that the cost impact to the District's building program would be $85-115 million. At this time it is believed that only one school (Harding) presents a site where rebuilding might potentially require complete abandonment of the site and construction on new land at enlarging one or more other schools currently in the planning phase.

D: SAFETY:

The issue of student and staff safety is and must always be paramount in the District's mission.

1. No representation is made that the buildings impacted are in any way unsafe or inadequate. All six schools are in compliance with all known laws, federal, state or local, re: school construction and/or occupancy. To the best of anyone's knowledge all were built to the then current standards of structural safety mandated by the state's building standards for schools, including the Field Act.
2. The earthquake faults involved were all identified and mapped following construction of the schools identified.
3. All studies done to date have been at the District's initiative. There is no current legislation requiring, mandating or funding the studies the district has undertaken. There is no funding stream identified to date to fund or even the partially defray the cost of reconstruction and remediation being proposed.

CONCLUSION:

The District and the Superintendent are to be commended in pursuing this subject.

If one follows to the logical conclusion on presumed danger at the University HS site – a .5% likelihood of a quake in four years becomes 9.5% over 75 years – an unacceptable threshold of risk in school buildings with a presumed seventy-five year life!

Care must be taken to inform the public, including public officials and especially the parents and surrounding communities of potentially impacted schools. Every effort must be made to assure all that

the most prudent and safe route to solution is being undertaken. The parent community especially needs to be informed by means other than the public media!

The costs incurred in these studies (and in remediating the hazard if hazard is demonstrated to exist) was not contemplated in the current school construction and modernization bonds, BB, K or R. This unanticipated burden would impact the Existing Facilities Modernization portion of the bonds, a mission that many already feel is underfunded and overburdened with recent expense transferred from COPs and other budgetary strategies to relieve the General Fund.

Laying off these costs to the Core Facilities "pot" will mean that projects those funds were intended for and addressed in the bond language (completing campuses that lack food service, auditoria, multipurpose rooms, gymnasia, libraries, etc.) will not be spent as the voters were promised.

It is recommended that the District aggressively pursue other funding streams, including lobbying Sacramento and Washington for special funding. FEMA (Federal Emergency Management Administration) funding would flow to the District after a disastrous earthquake — perhaps preventative or corrective relief can be promoted under FEMA? This problem of "finding faults" cannot be unique to LAUSD; other major urban school districts (San Francisco, San Jose, San Diego, Portland, Seattle, etc.) may soon feel the challenge.

If the Board of Education decides it cannot wait until the next school bond to address this need it must at least guarantee now to 'pay back and make good' these bonds for this unanticipated expense from the future bond.

ATTACHMENT A: Extracts from: SANTA MONICA TRANSIT PARKWAY PLAN
March 28, 2002 - City of Los Angeles W.O. E6000627 File 99-091

2.4 Faulting

Faults are classified as active, potentially active or inactive. A fault is considered active if geologic evidence indicates that fault plane displacement has occurred within the past 11,000 years. A potentially active fault has not exhibited displacement within the past 11,000 years but has been active since the beginning of the Pleistocene Epoch, approximately two million years before the present. Inactive faults have not exhibited displacement within the past two million years.

2.4.2 Santa Monica Fault

Recent geomorphic analysis and fault trench studies performed by Dolan et al., 2000, and Dolan and Seih, 1994, have shown the Santa Monica fault to be recurrently active during the late Quaternary and probably Holocene. Geomorphic studies combined with subsurface exploration allowed more detailed geologic mapping of the fault trace through the northern portion of the Los Angeles Basin (Figure 3). The reported fault trace appears to trend through the Ohio Street/405 Freeway southerly bridge abutment.

Paleoseismologic trenches excavated at the Veterans Administration Building, about 300 meters west of the Ohio Street /405 Freeway bridge, reveal the presence of displaced paleosoils which record surface ruptures within the last 50,000 years. The fault appears to have both a thrust component, expressed as a scarp across late Quaternary alluvium, and a strike-slip component. The strike-slip, which is apparently partitioned on near-vertical faults distributed in the hanging wall of the thrust, may be greater than the dip-slope. Dolan et al., 2000, report that a recent earthquake event probably occurred on this section of the Santa Monica fault between ca. 1 and 3 ka. It is speculated that should rupture occur on this fault, in combination with rupture along other faults along the southern boundary of the Transverse Ranges, such as the Hollywood and Point Dume faults, that a very large earthquake (Mw >=7.0) might occur. Review of regressions of moment-magnitude versus rupture area and average displacement indicate that rupture of the entire 40-km-length of the Santa Monica fault could have an associated average displacement of ~1.1 – 2.0 m (Dolan and others, 2000).

2.5 Ground Surface Rupture

Ground surface rupture is typically associated with faults designated as active. Fault activity is based on historic records of recent earthquakes and displacement within Holocene materials.

Ground surface rupture is a direct result of fault plane displacement and is considered to occur generally along existing faults, according to the current geotechnical and seismological standards of practice.

The Santa Monica Fault is considered to be active. Although this fault is not currently zoned as an Alquist Priolo Fault zone, it is considered active and should movement occur on the fault there could be associated surface ground rupture and deformation. While much of the surface deformation associated with the next earthquake event on this fault is expected to be in the form of monoclinal folding, some shearing is also anticipated. It is not possible to fully predict where such shearing might intersect the street without additional fault trenching, however it is reasonable to

expect that surface displacement will occur along portions of the street should this section of the Santa Monica Fault rupture.

ATTACHMENT B: U.S. Geological Survey

Open-File Report 01-111

Seismic Images and Fault Relations of the Santa Monica Thrust Fault, West Los Angeles, California

By R. D. Catchings, G. Gandhok, M. R. Goldman, and D. Okaya

INTRODUCTION

In May 1997, the US Geological Survey (USGS) and the University of Southern California (USC) acquired high-resolution seismic reflection and refraction images on the grounds of the Wadsworth Veterans Administration Hospital (WVAH) in the city of Los Angeles (Fig. 1a,b). The objective of the seismic survey was to better understand the near-surface geometry and faulting characteristics of the Santa Monica fault zone. In this report, we present seismic images, an interpretation of those images, and a comparison of our results with results from studies by Dolan and Pratt (1997), Pratt et al. (1998) and Gibbs et al. (2000).

The Santa Monica fault is one of the several northeast-southwest-trending, north-dipping, reverse faults that extend through the Los Angeles metropolitan area (Fig. 1a). Through much of area, the Santa Monica fault trends subparallel to the Hollywood fault, but the two faults apparently join into a single fault zone to the southwest and to the northeast (Dolan et al., 1995). The Santa Monica and Hollywood faults may be part of a larger fault system that extends from the Pacific Ocean to the Transverse Ranges. Crook et al. (1983) refer to this fault system as the Malibu Coast-Santa Monica-Raymond-Cucamonga fault system. They suggest that these faults have not formed a contiguous zone since the Pleistocene and conclude that each of the faults should be treated as a separate fault with respect to seismic hazards. However, Dolan et al. (1995) suggest that the Hollywood and Santa Monica faults are capable of generating Mw 6.8 and Mw 7.0 earthquakes, respectively. Thus, regardless of whether the overall fault system is connected and capable of rupturing in one event, individually, each of the faults presents a sizable earthquake hazard to the Los Angeles metropolitan area. If, however, these faults are connected, and they were to rupture along a continuous fault rupture, the resulting hazard would be even greater.

Although the Santa Monica fault represents a hazard to millions of people, its lateral extent and rupture history are not well known, due largely to limited knowledge of the fault location, geometry, and relationship to other faults. The Santa Monica fault has been obscured at the surface by alluvium and urbanization. For example, Dolan et al. (1995) could find only one 200-m-long stretch of the Santa Monica fault that was not covered by either streets or buildings. Of the 19-km length onshore section of the Santa Monica fault, its apparent location has been delineated largely on the basis of geomorphic features and oil-well drilling. Seismic imaging efforts, in combination with other investigative methods, may be the best approach in locating and understanding the Santa Monica fault in the Los Angeles region.

This investigation and another recent seismic imaging investigation (Pratt et al., 1998) were undertaken to resolve the near-surface location, fault geometry, and faulting relations associated with the Santa Monica fault.

Download the 34-page report as a PDF document (17.7 MB) @
http://geopubs.wr.usgs.gov/open-file/of01-111/of01-111.pdf