

## ***Background Of The Field Act***

The Field Act has its genesis in the 6.3 magnitude Long Beach earthquake of March 10, 1933. In that earthquake, more than 230 school buildings were either destroyed, suffered major damage, or were judged unsafe to occupy. The buildings had been poorly designed and were not constructed to resist earthquake forces. Fortunately, it was 5:55 a.m. on a Friday evening, and schools were closed. It was lost on no one that a disaster had been averted by fewer than four hours.

Governor James Rolph, Jr. and the Legislature responded quickly by enacting the Field Act (named after Assembly member Don C. Field), which required earthquake-resistant design and construction of all public schools. It was enacted on April 10, 1933, exactly 30 days after the earthquake. It has since governed the planning, design, and construction of billions of dollars of public school (K-14) building investments.

Implementation of the Field Act is a complex interrelationship with dispersed responsibilities between state departments and agencies, school districts, local government building departments, the educational community, and the construction industry.

In 2006, Assembly Bill 127 (AB127) was passed, giving Community Colleges the option of choosing to design and construct under local building departments or under the Field Act.

This report evaluates the effectiveness of the Field Act, how it is administered, and the advisability for community college construction oversight to come under the jurisdiction of local building departments under AB 127.



**Figure 1** Jefferson Junior High School damage after the 6.4 magnitude 1933 Long Beach earthquake.

## ***Field Act Requirements***

The Field Act (Education Code §§17280-17317 and 80030-81149) is built on four major principles:

- Seismic design standards
- Plan review
- Construction inspections
- Special tests

More specifically, the Field Act requires:

- The Division of the State Architect must write design standards for public schools.
- Public school building construction plans must be prepared by qualified California-licensed structural engineers and architects.
- Designs and plans must be checked by DSA for compliance with the Field Act before contracts for construction can be awarded.
- Qualified inspectors, independent of the architecture and engineering contractors and hired directly by the school districts, must continuously inspect construction and verify compliance with the approved plans.
- Responsible architects and/or structural engineers must observe the construction periodically. Changes to plans (if necessary) must be prepared by the responsible architects and/or structural engineers and are subject to approval by DSA.
- Special tests, if needed, must be ordered by DSA and performed by certified testing laboratories.
- Architects, engineers, inspectors, and contractors must file reports, under penalty of perjury, that verify that actual construction complies with approved plans.

## ***Public Hearings Held***

In 2006, the Alfred E. Alquist Seismic Safety Commission (Commission) conducted four public hearings to hear testimony from interested parties regarding the Field Act. These hearings sought to:

- Determine how effective the Field Act is in protecting California's school buildings and schoolchildren.
- Look into how the Field Act is enforced in regional DSA offices.
- Hear and address complaints that the DSA review process is too lengthy.
- Determine whether community colleges or any other public school should be exempt from the Field Act.
- Find ways to improve the Field Act and its implementation.

Issues raised during public hearings included:

- Delays due to the length of time required by the Division of the State Architect (DSA) review processes.

- Inconsistency of interpretations of codes/regulations by the different DSA offices statewide.
- Increased costs due to the requirements of the Field Act.
- Increased costs due to delays in plan approvals and to the consistently skyrocketing costs of construction and materials.
- Discrepancies between technical accuracy of plan reviews and the interpretations of design professionals.

The Seismic Safety Commission took public testimony regarding these issues and what the Department of the State Architect is doing to respond to them. A list of those who gave testimony before the Commission is on page 3 of this report.

### ***Performance Of Public Schools Under The Field Act***

Since 1940, school buildings constructed under the Field Act have performed extremely well in earthquakes. No Field Act building has either partially or completely collapsed, no school children have been killed or injured in Field Act-compliant buildings. ***(1998 EERI Forum: Manage Field Act at State Level)***

Nearby, however, commercial buildings suffered collapse and heavy damage. For example after the 1989 Loma Prieta earthquake the Marina Middle and John Swett schools, both located in San Francisco's heavily damaged Marina District, were used as emergency shelters and disaster assistance centers.

The Northridge earthquake (1994) caused the California State University System's (CSUS) Northridge campus to suffer an estimated \$750 million in damage, and needed rebuilding. Two community colleges in the San Fernando Valley, Pierce and Mission Colleges, of similar age and type of construction to the Northridge campus, were subject to very similar shaking in that earthquake, but had only \$5 million and no damage respectively. In addition **there was no partial or complete collapse of any public school in this event.**

Similarly, the Landers Elementary School experienced only minor damage during the Landers earthquake (1992) and was capable for reuse almost immediately while several homes nearby were greatly damaged. It should be noted that Landers Elementary School is located less than one-half mile from the fault that generated the major (7.3 magnitude) earthquake that resulted in 12 feet of horizontal surface rupture that continued for about 45 miles.



**Figure 2** Marina District Apartment building damage during the 6.9 magnitude 1989 Loma Prieta earthquake. Two nearby public schools were not damaged and were used as emergency shelters.



**Figure 3** California State University Northridge parking structure built in the early 1990s collapsed after the 6.7 magnitude 1994 Northridge earthquake.



**Figure 4** Landers Elementary School with minor non-structural damage and immediate reuse after the 7.3 magnitude 1992 Landers earthquake. There has been no partial or full collapse of any public school building constructed to the requirements of the Field Act since 1933.