Progress Initiators

- 1933 Long Beach Earthquake
  - Field Act, passed by on April 10, 1933.
- 1940 El Centro earthquake
  - Recorded ground motion
- 1971 San Fernando earthquake
  - Modern building design provisions
  - Ductile moment frame
- 1994 Northridge earthquake
  - Seismic rehabilitation of older buildings
Northridge – New RC Buildings

- Gravity Systems
- Floor Diaphragms
ACI 318 Changes

21.13 — Members not designated as part of the seismic-force-resisting system

21.13.1 — Scope

Requirements of 21.13 apply to frame members not designated as part of the seismic-force-resisting system in structures assigned to SDC D, E, and F.

21.11.3 — Seismic load path (Diaphragms)

21.11.3.1 — All diaphragms and their connections shall be proportioned and detailed to provide for a complete transfer of forces to collector elements and to the vertical elements of the seismic-force-resisting system.
Existing (Older) RC Buildings

- Observed poor performance
  - Bullock’s Department Store - Northridge
- Poor performance & substantial risk (loss of life)
- Magnitude of the problem
  - Gravity systems in newer buildings (< 1997)
  - Buildings constructed prior to the mid-1970’s
Hospital (Acute Care) Facilities

Seismic Safety Act

California

Number of Buildings

Year Built

00-15 14 39 70 35 87 413 626 348 430 551
16-25 1387
26-33
34-39
40-49
50-59
60-69
70-73
74-79
80-90

www.northridge20.org
Consequences of Collapse

- Christchurch Earthquake of Feb 2011
  - 185 deaths (half from one RC building collapse)

CTV (1986)

PGC (1963), Pyne Gould (1963)
Today’s Session: Older RC Buildings

Part I
- Retrofit projects in the Los Angeles area
- Five presentations (SB-1953, four firms)
- Application/Evolution of FEMA 273/356 and ASCE 41

Part II
- Forward looking - Future risk reduction
- Concrete Coalition, NEES Grand Challenge
- Applied Technology Project 78

Part III
- Panel Discussion
Panel Discussion

- A key outcome of the Symposium is to develop a White Paper summarizing recommended next steps to achieve regional (LA) and California state-wide earthquake resilience drawn from the meeting topics and discussion.

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