TO: HONORABLE CITY COUNCIL
FROM: CITY MANAGER
DEPARTMENT: PLANNING &
COMMUNITY ENVIRONMENT

DATE: May 15, 2006
CMR: 227-06

SUBJECT: APARTMENT BUILDINGS WITH “SOFT” STORIES

This is an informational report and no Council action is required.

BACKGROUND

Multistory wood framed apartment, condominium, or motel buildings with open front first-story parking are commonly referred to as soft story structures. The parking area often has shear walls on three sides with steel columns in front, cantilevering vertically from a concrete foundation. Openings concentrated along one side of a building cause an imbalance that allows the building to twist in addition to shaking from side to side, putting increased stress on the solid walls and weakening the building. A soft story condition can cause the ground story to collapse in a major earthquake. These types of structures have performed poorly in past earthquakes. They were responsible for 7,700 of the 16,000 housing units rendered uninhabitable by the 1989 Loma Prieta earthquake and over 34,000 of the housing units rendered uninhabitable by the 1994 Northridge earthquake. The potential for loss of life is also a reality in that 16 people were killed in the Northridge Meadows apartment complex in 1994.

DISCUSSION

A 2003 report, published by The Collaborative for Disaster Mitigation (CDM) at San Jose State University, includes an inventory of multifamily soft story buildings located in Santa Clara County. Of the 2,630 soft story buildings identified in the report, 130 are located in the City of Palo Alto. These 130 buildings contain 1,263 dwelling units. Specific information, such as the address and owner of the building, is not included in the report.

CDM analyzed the data from the field surveys and presented it in the form of city maps (Attachment A) indicating regions where soft story, multi-family dwellings are clustered. The number of soft story buildings are indicated on each map by the following three groups:

- High Density (more than 30 soft story structures in the region indicated)
• Medium Density (10-29 soft story structures in the region indicated)
• Low Density (less than 10 soft story structures in the region indicated)

A uniform standard for the retrofit of soft story buildings exists in the International Existing Buildings Code (IEBC), Appendix Chapter A4. Retrofitting multi-family buildings with large openings usually involves adding bracing elements, like steel frames or shear walls at the lowest story level, and tying this bracing into the floor(s) above.

While there are currently no jurisdictions that have ordinances mandating retrofit of these structures there are a few cities that have a soft story ordinance. These include:

• City of Burbank – Ordinance sets the standard for retrofit but is a voluntary program. Notification of tenants is not required.
• City of Fremont – Ordinance sets the standard for retrofit and requires the Building Official to record with the County Recorder a notice of “Potentially Hazardous Building”. If the building is retrofitted the Notice is removed.
• City of Berkeley – Berkeley spent six years in the development of a soft story ordinance that was adopted in October of 2005. In phase one of the ordinance, the building owner is notified that they have a potentially hazardous building. The owner is required to notify all current and future tenants. A sign is also required to be posted on the building. A period of 2 years is allotted for the owner to submit a structural analysis to the city, based on IEBC Appendix Chapter A4. Phase two will investigate incentives for retrofitting and possible mandatory triggers. The program budget for fiscal year 2006 is $136,000 which includes 2/3 of an FTE and funds for contract engineering services.

RESOURCE IMPACT

Development of a notification to owners and occupants type of program would begin with a complete inventory of soft story structures including specific addresses and owner information. This inventory would include multi-family as well as commercial/industrial soft story facilities. A similar inventory of unreinforced masonry and high occupancy structures in Palo Alto in 1982 required the use of two contract employees for approximately six months. That inventory resulted in adoption of Palo Alto’s Seismic Hazard Identification Program (PAMC 16.42) in 1986.

Notification to potentially 2,000 tenants of soft story buildings by the City is not practical. Berkeley’s model of requiring the building owner to notify tenants of the potential hazards of soft story buildings is far more effective and insures that future tenants would also be made aware. This, however, would require adoption of an ordinance.

PREPARED BY: _____________________________

FRED HERMAN
Chief Building Official

DEPARTMENT HEAD APPROVAL: _____________________________

STEVE EMSLIE
Director, Planning & Community Environment

CITY MANAGER APPROVAL: _____________________________

EMILY HARRISON
Assistant City Manager