

# MATRIX MARINE, LLC

*The Official Newsletter of Matrix Marine, LLC*



## Soft Story

*by Behruz Vahdani. Managing Member*

A Soft Story building is a structure with multi-story levels in which the lower level has large openings for garages, storefronts, or windows that make them more likely to sustain damage in a major earthquake.

The 1989 Loma Prieta and 1994 Northridge earthquakes were responsible for the collapse of nearly half of all homes that became uninhabitable in California.

Soft-story buildings often house a substantial number of residents. In order not to displace the residents for possible collapse of these buildings during earthquakes, many cities started to place ordinances for identifying the numbers, locations, conditions of these seismically vulnerable buildings ...

**HERE'S WHAT YOU  
SHOULD KNOW:**

- Soft Story
- Innovative Design Approach



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## Innovative Design Approach

Matrix Marine, LLC can address all your concerns about different methods of design by utilizing a new design approach to strengthen your building for Soft Story.

The above picture represents Soft Story strengthening by WrapAround frame using patented design by RetroFit frame at a fraction of the regular construction cost.

In this method, we eliminated the shoring and new concrete pad foundations which are used in regular steel moment frame design. Utilizing the existing foundation which expedites the time of construction and reduces the cost.

*Matrix Marine, LLC & Matrix Seismic Group Corp. can evaluate the structural conditions of your Non-Ductile, UMB, Soft Story buildings in a timely manor .*

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and proposed mandatory retrofitting programs based on the number of stories, number of units and the age of the buildings.

Soft story building is a wood frame building which may sustain significant damage in the event of earthquake, such as partial collapse, lean to the side, movement of foundation, or separation of structure.

Earthquake engineering is a branch of engineering that designs and analyzes structures against these seismic activities, such as buildings and bridges, to make such structures more resistant to earthquakes.

An earthquake retrofit solution aims to construct structures that will not be damaged in minor shaking and will avoid serious damage or collapse in a major earthquake.

A properly engineered structure does not necessarily have to be extremely strong or expensive. It has to be properly designed to withstand the seismic effects while sustaining an acceptable level of damage based on the latest building codes.

The cost of retrofitting will be substantially less with innovative design, engineering experience, based on Design Build projects.