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# *Conserving the historic fabric: a volunteer disaster worker's perspective*

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This discussion is from the perspective of a volunteer disaster worker as he or she goes out into the field after an earthquake and tries to determine if a particular building is dangerous or not.

It is unfortunate with our specialized training today that we have fragmented our common sense. We only react to building codes and laws and fail to keep common sense in mind. We only react to threats of liability. When San Diego was settled and started to grow in the late 19th century, many of the buildings surviving from that period are interesting examples of very different types of construction from different parts of the country. For instance, the San Diego Hardware Company building was exactly the same type of building as was built in Chicago. The owner of the hardware company brought his builder out from Chicago and had the Chicago building replicated. In importing these building practices, many of the immigrant builders did not take into account the potential for seismic activity in the West, and in California particularly.

In the example of the 1906 San Francisco Earthquake and Fire, the potential for seismic activity was known by the builders and many innovative techniques were used. We also have to acknowledge the skills of the people who built the early abodes around the state. In considering the example of the San Francisco City Hall, period photographs taken after the 1906 Earthquake and Fire show that most of the building's structural system was

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constructed of cast iron and that it remained standing. Though the City Hall had lost major portions of its exterior masonry cladding, the building could probably have been repaired and rebuilt. However, the earthquake provided an excuse for the city's leaders to build a new city hall on a new site. Today we are dealing with how to seismic retrofit the current city hall. We have spent six years just coming to terms with how much it will cost to seismically retrofit the building and we will probably spend another six years to complete the project.

After any major earthquake, we have the major public issue of how to properly deal with the refugees and people who have lost access to their homes. In period photographs taken in San Francisco after the 1906 Earthquake and Fire, I wonder if some of the photographs were staged, because it seems to me that the refugees all appear to be rather well dressed, or perhaps people had a better sense of personal style and fashion in San Francisco in those days!

The Orange County Courthouse, in Santa Ana, California, is a spectacular example of how a County Supervisor can have his way. In this case, one of the County Supervisors had just moved to California from Arizona. He used his influence to have the building constructed from Arizona sandstone when most other projects were using native California stones at the time. One of the prominent features of the building was its central tower which appears to be made of sandstone. In the 1933 Earthquake, part of the gable wall over the front entrance fell down onto the front steps. It is interesting to notice that the 'sandstone' tower had survived the earthquake in fine condition and was still standing. I use this to make the point that the engineers of this time were not stupid. The American Society of Civil Engineers had been formed in 1852 and had been working to increase knowledge and standards of practice. The tower was actually made of pressed metal on a stamped sheet metal framework. It looked like it was constructed of sandstone, but it was really a very lightweight element in relative terms and would not pose such a great seismic risk as long as it was well connected to the building's structural system. Unfortunately, within seven days of the 1933 Earthquake, the Orange County Board of Supervisors had ordered the tower to be taken down when it probably did not have to be removed. Another important feature lost was the decorative gable. It was not replaced or restored and it is an example of the loss of character-defining features which we will probably never get back. The loss of such ornamentation is unfortunate especially as these items could not be included in the building's retrofit budget which exceeded US\$32 million.

In downtown commercial buildings in Santa Ana, one observes interesting changes in the character, style and materials used on buildings as a result of past earthquakes. One sees many substitute materials in elements such as cornices. Many of these cornices are actually made of lightweight materials even though they were made to look like stone. In the case of the Santa Ana Earthquake in 1933, many commercial buildings from the late 19th and early 20th centuries had lost pieces of ornamentation. These lost elements were often not restored; rather, they were replaced with Art Deco-style features which were more fashionable at the time. This trend was so striking that today the period of significance for the downtown historic district now includes evidence of the 1933 Earthquake and the remodeling work that was done after it. One finds in the district many earthquake period Art Deco storefronts attached to buildings with more classical or earlier architectural styles visible on the upper floors.

In the case of the 1925 Earthquake in Santa Barbara, a group of leading citizens decided to change the entire architectural style and character of the town. They decided to rebuild the town in the Spanish revival style. They called on experts such as Messrs. Winslow and Weeper. Some of the experts had been representatives who had traveled and promoted the use of Portland cement. The extensive use of the Mission and Spanish revival styles that we now have in Santa Barbara was a trend that could have happened up and down the coast.

The impact of earthquakes is given a great deal of coverage in the media with graphic images portrayed of buildings which have collapsed. The media coverage tends to exacerbate the real dimensions of the event. There have been very serious disasters in many countries, but I really believe that in California there are good engineers, good building codes and good buildings when you compare the number of people killed in earthquakes in California to other countries.

After the Mexico City Earthquake, John Kariotis and I went down to see the aftermath. We saw multi-story buildings that had keeled over. There was one 22-story building which had been built after World War II when structural steel was not available, so box beams were welded up to take the place of the structural steel. Unfortunately, the building was not strong enough to withstand the earthquake, and it collapsed.

However, one saw examples of Spanish Colonial period building with clock towers and constructed of unreinforced masonry which had survived and were standing next to the ruins of a 1950s building which had totally collapsed.

We need to consider the types of earthquakes that happen in California. The important thing to keep in mind is that so many decisions are made within ten days after an earthquake. So many buildings are lost in the short period immediately after an earthquake because of the short time frame and the rush to make decisions. Too many buildings are needlessly demolished in this rushed period of action after an earthquake.

Today we have fragmented our education and training. We need to need to rethink how we have organized our training and education systems. We need to revive the various buildings manuals from the 19th and early 20th centuries to find illustrations of how historic buildings were built in what was considered the best practice of the day.

In historic buildings, we have many structures which are mixtures of different buildings materials such as brick, concrete, metal and wood. We find construction details such as soldier courses and other details in brick work and poured-in-place concrete lintels over windows and doors. We can find buildings with a brick exterior on the facade and terracotta block on the interior and these are completely hiding the structural steel framework of the building. This type of building could be mislabeled an unreinforced masonry building. The practice of the day was for hollow terracotta blocks not to be used as a primary structural system except for one-story buildings. In multi-story buildings, terracotta blocks were used for fireproofing the steel structural system, but too many were torn down needlessly.

After an earthquake, emergency period laws such as the declaration of an 'imminent threat' based on the Public Resources Code Section 5028 are implemented. I have seen examples of this ordinance being used to declare an imminent threat where a brick parapet had already fallen into the street. The building suffered nothing else - not even one broken window.

This was the only grocery store in the town and the building was quickly demolished causing great hardship for the community. This was based on the idea that the building presented some sort of imminent threat when, in fact, whatever threat that had existed had been lost in the first moments of the earthquake when the brick parapet fell over.

In other examples of what could happen to historic buildings in the event of an earthquake, one sees windows frames that are not well connected. In a house in Ferndale, California, the house has fallen over on its cripple wall in several previous earthquakes and each time it has been put back up on a new cripple wall. In some instances, damage to houses is ascribed to the earthquake when the real cause is the lack of proper maintenance. The risk of the collapse of the first story onto the cripple story of the basement is often observed. Many people think that wooden frame buildings are safer in the event of an earthquake, but this is not necessarily true unless the building's structural system is well tied together. Another thing to keep in mind is that many connections in a building's structural system may be hidden from view such as blind fastening on structural trusses.

In many buildings, there are particular points of weakness. In one apartment building, the building had been partially retrofitted. One corner of the building provided the location for the plumbing chase for the kitchens and bathrooms, so that at the bottom there was only one wythe of brick. In the earthquake, this weak point was what gave way and throughout most of the rest of the building there was very little damage. The building was torn down when it could have been repaired.

We are just starting to acknowledge that brick veneers can be very dangerous if they become detached from the supporting plates during the vibrations of the building during an earthquake. Brick veneers need to be carefully anchored into the building's structural system. We recognize that hollow terracotta clay blocks have always been a problem, but many of the block walls have concrete bond beams and anchor bolts which are not visible from the exterior.

With the old Masonic Lodge Building in Fillmore, California, one saw similar problems with collapse in plumbing chase locations. These could have been easily repaired, but what had been the greatest building in Fillmore was lost within seven days after an earthquake through needless demolition.

At the San Diego Mission, there is a structure which is mostly reinforced concrete which was built during the 1930s as a Civilian Conservation Corps public works project. Only one room at the Mission was constructed of adobe, yet it was erroneously labeled as an unreinforced masonry building by the city planning department.

In addition to the issues associated with earthquakes and how we react to them and damaged historic buildings, we also have problems with our reactions to floods. At the Santa Margarita rancho, which was taken over by the Marine Corps for use as Camp Pendleton in 1942, a recent flood damaged one of the original adobe buildings. Luckily, the base commander's wife was an ardent preservationist and the building was restored using the traditional materials and techniques.

As a final word, keep in mind that a disaster is like a disease: the longer it stays, the more difficult it becomes. It becomes like a blind date that won't go away.