Self-Realization Fellowship
Richmond Temple

Background

California is earthquake country.[1] Most of us take it for granted. We know we're going to experience seismic events from time to time, and we don't think too much about it. When the earth actually shakes, we're invariably surprised. We hold on, duck and cover. And when it's over, we thank God we got through it alright. We start thinking about all the things we ought to do to get ready for the next time it happens. Sometimes we even do them. Then, we forget about it again.

On a collective basis, Californians have tried to "get ready for the next time it happens" in three main ways. We have beefed up our building codes, imposing higher construction standards. We have made an effort to identify fault lines, prohibiting new construction in areas of the highest risk. And we have heightened our requirements for the disclosure of earthquake risks when properties are bought and sold.

The most comprehensive effort at earthquake legislation in California took place – appropriately enough – right after a major earthquake – specifically, the Sylmar quake of 1971. The Legislature considered a total of 35 different laws the next year, of which many were enacted. A law was passed requiring the inspection of every dam in the state. Seismic standards were strengthened for hospitals and schools. But easily the most far-reaching bill adopted was the Alquist-Priolo Earthquake Fault Zoning Act of 1972.

The A-P Act, as it is often called, required the State Geologist to establish regulatory areas, known as Earthquake Fault Zones, generally about a quarter-mile feet wide, on either side of every surface trace[2] of an active earthquake fault in the State of California. The law then provided that before a city or county could permit any new construction in one of these zones, it had to require the builder to undertake a geologic investigation to demonstrate that the project was not going to be constructed across a surface trace of an active fault. If the geologic investigation discovered a surface trace, no structure for human habitation could be built within 50 feet of it.

The A-P Act was revolutionary when it was enacted, and while it has not doubt accomplished a great deal to reduce potential earthquake damage, it contained a significant exception.

It did not apply to buildings that were constructed before 1972.

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[1] The U.S. Geological Survey (USGS) lists 45 earthquakes "of general historic interest" as having occurred in California in the last decade alone See http://earthquake.usgs.gov/earthquakes/states/historical_state.php

[2] Although earthquake faults are typically represented as lines on a map, in reality they are far more complicated. The fault itself typically lies far beneath the surface. The movement along the fault generates cracks at the surface, These cracks are known as surface traces.

Another feature of the A-P Act, that was unfortunate from the Richmond Temple perspective, is that it took quite a while to implement. Maps had to be prepared and circulated for review among geologists before the Fault Zones could be established. So, even though the law was passed in December of 1972, it didn't actually go into effect until July 31, 1974.[3]

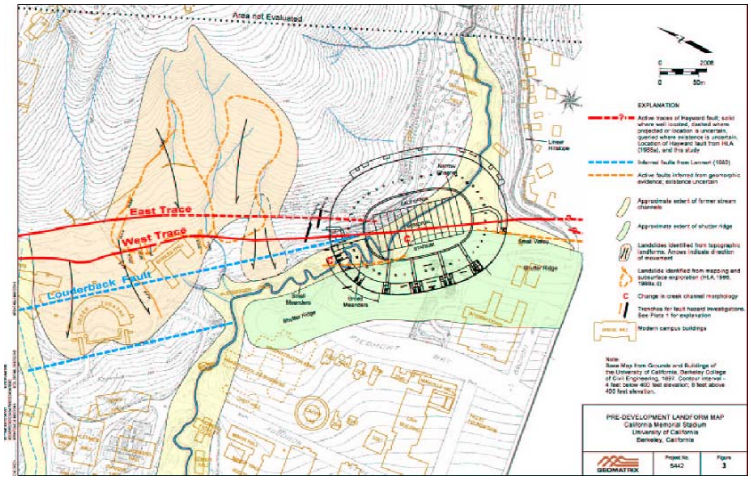
In the meantime, SRF purchased the Richmond Temple from the Northern California Conference of Seventh-Day Adventists. The deed was dated May 14th, 1974.

East Bay Geology

According to the United States Geologic Survey (USGS), there are seven major fault systems in Northern California. One of these is the Hayward. As shown on official maps, the Hayward Fault runs a distance of about 37 miles along the western base of the East Bay hills, from San Pablo Bay in the north to Fremont in the south. There, it connects to the Calaveras Fault, which runs into the San Andreas. North of San Pablo Bay, it connects with the Rodgers Creek Fault, which is often considered part of the same system.

[3] Even if the law had gone into effect sooner, it wasn't until 1998 that the Natural Hazards Disclosure Act was passed, requiring sellers of real property to disclose whether or not the property being sold was located within an Earthquake Fault Zone.

Although less widely known than the San Andreas, the Hayward Fault is dangerous. For one thing, it is the single most urbanized earthquake fault in the United States, running through an area inhabited by 6.8 million people and containing $1.8 trillion in residential and commercial property.[4] Surface traces of the Hayward Fault run under a number of prominent public buildings, perhaps most notably the Berkeley Memorial Stadium.[5]



On October 21, 1868, an earthquake estimated at magnitude 6.8 - 7.0 was generated along the southern portion of the Hayward Fault.[6] According to U. S. Census records, only 260,000 people lived in the Bay Area at the time, and only 10% of them lived along the Hayward Fault. Nevertheless, the damage was substantial. (The Hayward quake was actually referred to as The Great San Francisco Earthquake until 1906, when an even bigger earthquake came along.) The greatest damage was sustained in the farming towns along the fault line, many of which were reduced to rubble. The Alameda County Courthouse was largely destroyed, and nearly every building in the town of Hayward, was wrecked or severely damaged.

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[4] . See generally, *1848 Hayward Earthquake: 140 Year Retrospective* (Risk Management Solutions, 1988) available here: http://www.rms.com/publications/1868_Hayward_Earthquake_Retrospective.pdf. (hereinafter "RETROSPECTIVE")

[5] See, e.g. http://seismo.berkeley.edu/hayward/ucb_campus.html.

[6] *See* USGS, *The Hayward Fault: America's Most Dangerous?* (March 20, 2008), available here: http://www.usgs.gov/newsroom/article.asp?ID=1899.

Damage to the Alameda County Courthouse in San Leandro, California, following the 1868 Hayward Earthquake *(Source: National Information Service for Earthquake Engineering, EERC, University of California, Berkeley)*

Even across the bay in San Francisco, the damage was considerable, especially in downtown areas constructed on fill.[7]

Damage in downtown San Francisco resulting from the 1868 Hayward Earthquake. *(Source: National Information Service for Earthquake Engineering, EERC, University of California, Berkeley)*

Geologists tell us that the average interval between the past five large earthquakes on the Hayward Fault has been 140 years. As indicated, the last major quake occurred in 1868. The 140th anniversary of this earthquake was therefore 1988. According to a USGS

[7] *Id.*

report issued in that year,[8] "scientists are convinced that the Hayward Fault has reached the point where a powerful, damaging quake can be expected at any time."

Experts believe that if an earthquake of similar magnitude to the 1868 Earthquake were to occur along the Hayward Fault today, the results could be catastrophic.[9]

The Richmond Temple

It has been known since the first A-P maps were released that the Richmond Temple lies within the Hayward Earthquake Fault Zone, but these Maps are intended to indicate 2500 foot wide zones within which further geologic study is required; they are not intended to delineate the exact surface trace locations on which building is not permitted.[10]

The fact is, there are sometimes a number of different locations in a given area where a fault has broken through the earth's surface, and these may be separated by several hundred feet or more. The best aerial photographs to locate these surface traces are those taken before modern landscaping and development hid the earth's underlying geological features, and transferring the surface traces from the photographs to modern maps involves a process of interpretation. What's more, the scale of the maps alone (1:24000) means that a line 1/10 of an inch thick, drawn on a map, necessarily indicates an area 200 feet in width.

So, to get back to the Richmond Temple, while the A-P Map for the Richmond Heights area showed a fault line[11] running down Bernhard Avenue past the Temple, that did not necessarily indicate the precise location of the fault, which could have been located anywhere within several hundred feet or more. Finding the precise location of the fault would have required additional geologic work.

Over the years, as the Richmond Temple grew and various construction projects were undertaken, the projects were "grandfathered" under the A-P Act. In other words, since the original structure had been built before 1972, the County never required that geologic studies be undertaken before it would issue building permits for additions and improvements. What's more, to the casual observer, everything seemed fine.

Nevertheless, to those with a trained eye, subtle signs of ground movement began to appear on the site over the years – especially in the areas closest to Bernhard Avenue. Finally, in 2008, after some members expressed concerned about apparent ground

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[8] The report is available here: http://pubs.usgs.gov/fs/2008/3019/fs2008-3019.pdf

[9] The USGS estimates that a major earthquake in this area would result in more than $165 billion in property damage. *See* USGS, *The Hayward Fault: America's Most Dangerous?* (March 20, 2008), available here: http://www.usgs.gov/newsroom/article.asp?ID=1899.

[10] Prior to January 1, 1994, the A-P Act was actually called the "Alquist Priolo Special Studies Zone Act" and "Earthquake Fault Zones" were referred to as "Special Studies Zones."

[11] The terms "fault line" and "surface trace" are here used interchangeably.

movement in the vicinity of the main gas meter, a geotechnical report was ordered by the Planning & Building Department at Mother Center.

The Geology Report

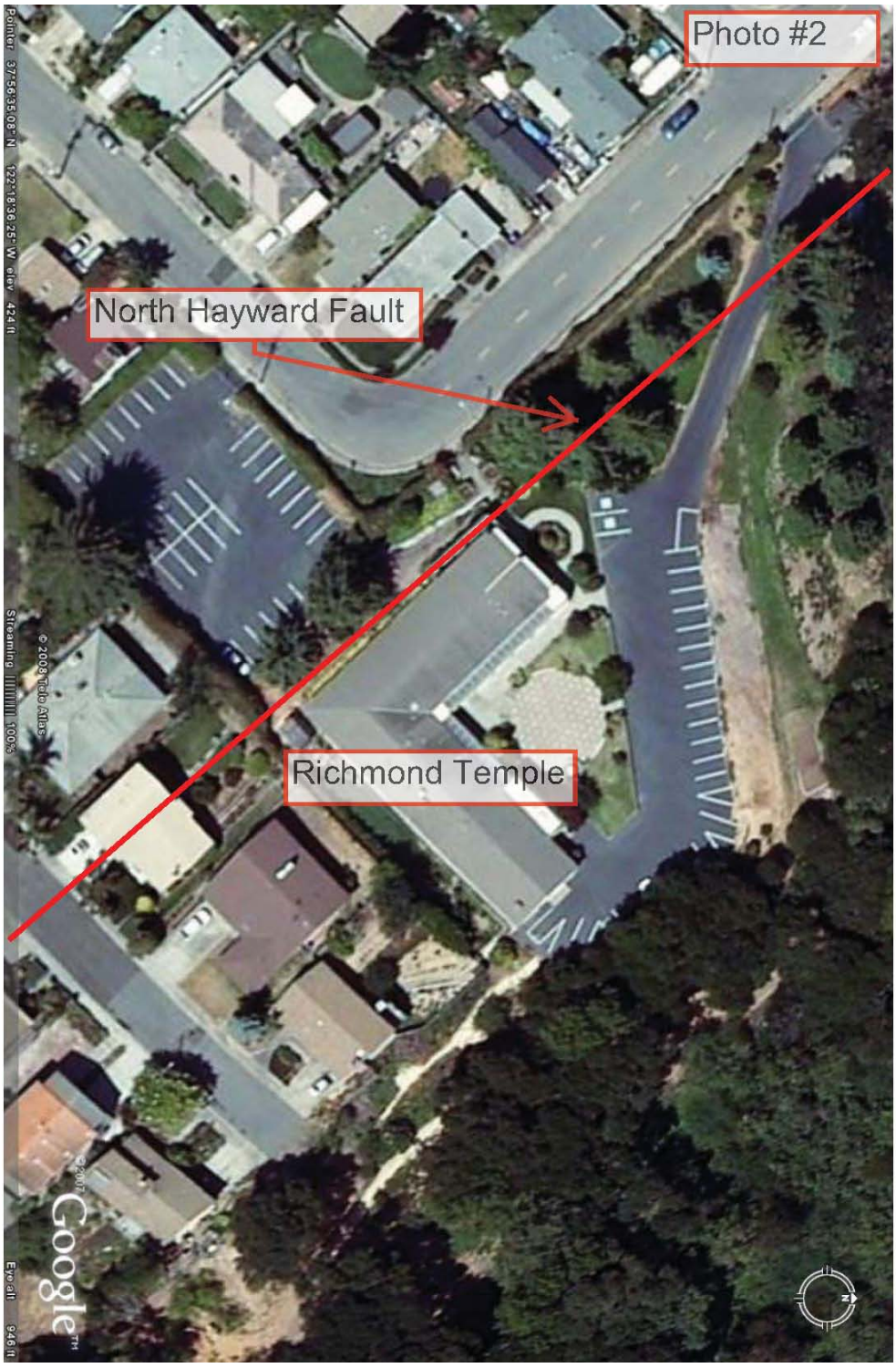
An unusual feature of the Hayward Fault is that it exhibits what is known as “fault creep”. In other words, movement can be seen along its surface traces not only as a result of earthquakes, but continuously, a little bit at a time, year after year. The rate of this so-called “aseismic” movement has been measured at 4-6 mm. per year.

By carefully examining signs of fault creep on and adjacent to the Richmond Temple property, as well as by examining historic photographs of the area, geologists were able to determine that a surface trace of the Hayward Fault runs just adjacent to the Chapel, directly through the Richmond Temple property. [12]

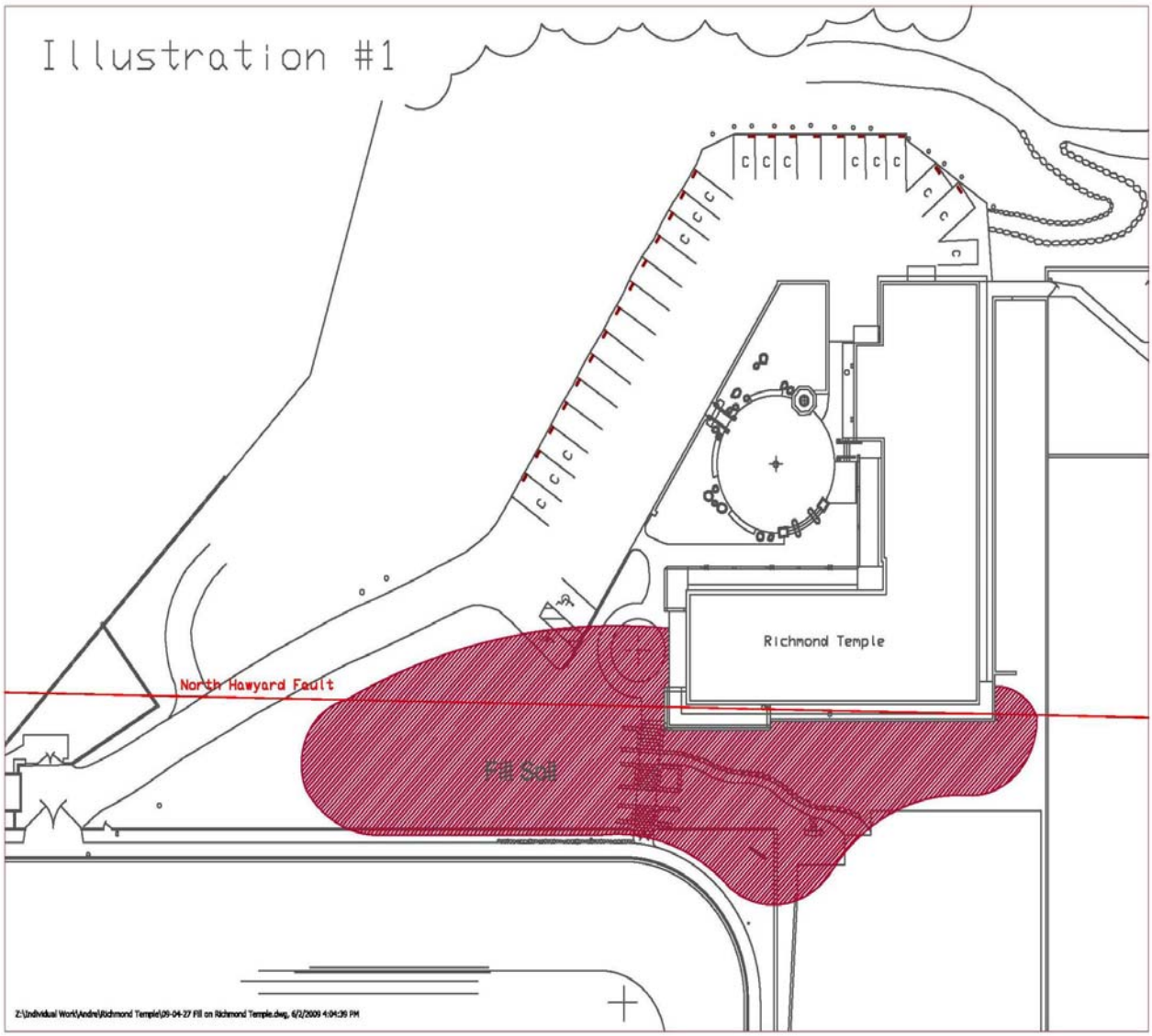
The evidence and the exact location of the fault line are shown in the photographs below.

[12] The complete geological report is available by clicking here.

Images 3-5 show evidence of fault creep, as mentioned in the report and report summary.



Another disturbing finding was the report's conclusion that a portion of the Richmond Temple structure is built, without caissons, on fill soil that was probably not compacted to present day standards (see below).



The combination of its proximity to the fault line and the potentially unstable soil on which a portion of the Temple is constructed, means that the structure is highly unlikely to survive a significant seismic event, in the judgment of the geologists.[13]

The Geology Report: Legal Effects

From the perspective of the A-P Act, the Geology Report does not change anything; because the Temple was originally constructed before 1972, it is not covered by that law. The Temple may continue to be used, and no retrofitting is legally required. The

[13] As noted above, some of the greatest damage during the 1868 quake, occurred in areas that had been built on fill. Un-compacted artificial-fill deposits on the east side of San Francisco Bay also underwent moderate to severe levels of soil liquefaction during the 1989 Loma Prieta earthquake.

property can be maintained and improved; work can still be done and the County will issue permits for the work, the same as before. That does not mean there are no legal, ethical, or practical issues, however.

Of course, no one can predict earthquakes, and for all we know, an earthquake may not occur along the northern portion of the Hayward Fault for many years. From a broad, ethical standpoint, however, that is not the question. Rather, the question is: knowing what we know – that the average interval between large earthquakes along the Hayward Fault has historically been 140 years; that the last major quake occurred in 1868; and that geologists seem to believe a substantial earthquake on the fault is quite likely – what is it reasonable for us to do?

In assessing the issue from a legal standpoint – i.e., SRF's potential liability to those who may be killed or injured in a future earthquake – the issue is largely the same. But there is an additional fact we need to bear in mind. Once an earthquake has occurred, the question of its likelihood will disappear. It will become a historic certainty, and the issue of what it was reasonable for SRF to do or not do will be decided by a jury using 20-20 hindsight. That jury will be looking at the very real fact of human pain and loss, and will be asked to decide an issue of compensation. In those circumstances, SRF's attachment to what has proven to be a dangerous location, or its indecision, or inaction, may seem not only unreasonable, but well neigh incomprehensible.

Possible Long Term Courses of Action

In the long term, there are four possible courses of action.

> *Option 1*. Do nothing;
>
> *Option 2*. Seismically strengthen the Temple structure in its present location
>
> *Option 3*. Rebuild a seismically stronger Temple elsewhere on the property
>
> *Option 4*. Relocate to another site altogether

Option 1. This option does not appear to be a reasonable response to the facts as we know them.

Option 2. Given the proximity of the fault line to the structure and the existence of fill soil beneath the western portion of the existing sanctuary, we have been advised by experts that Option 2 would be extremely expensive and, while such construction might be able to eliminate the loss of life or serious injury in the event of an earthquake, it would probably not be able to save the building. In other words, even if the building was strengthened, it would likely have to be reconstructed after the earthquake was over anyway. What's more, under the Alquist-Priolo law, any renovation involving a cost of fifty percent or more of a building's replacement cost is treated as the construction of a new building. Therefore, if the renovation cost fifty percent or more of the building's replacement cost, the Alquist-Priolo setback requirement would be applied, meaning the construction could not take place within 50 feet of the fault line.

Option 3. This option would require demolition of all or most of the existing structure, and the construction of a new, seismically stronger one. The new structure would have to comply with the A-P Act in all respects, including the setback requirement of 50 feet from the fault line. This would place it at the rear edge of the existing parking lot, near a slope that may itself contain fill. While this would have the benefit of utilizing the existing site, and could be considered a reasonable response to the risk, it would be expensive and, maintain the Temple in close proximity to a known fault.

Option 4. This option is at once the safest and the most drastic. It would require sale of the existing property and a significant investment in the purchase of a new one. Moreover, in connection with any sale of the property, SRF would be required – by ethical considerations and by law – to disclose the contents of the Geology Report prospective buyers. This would almost certainly reduce the purchase price, although it would by no means make the property unmarketable.

At this point the Temple has undertaken a process to determine what to do.