RETRACING THE EVENTS OF THE
1906 EARTHQUAKE AND FIRE
ALONG THE OLD BAY MARGINS IN
DOWNTOWN SAN FRANCISCO

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Front piece. Subsidence area: the photograph of the loft located 278-280 Clara Street was taken in February 1989. The former garage and entrance door can be seen below street level. The building was badly damaged due to ground shaking in the 1989 earthquake. Like many other buildings in the subsidence area, this structure has been renovated in recent years.
OVERVIEW OF FIELD TRIP

The field trip covers three short walks through downtown San Francisco focusing on the events that occurred in the aftermath of the 1906 earthquake. The first walk is in the South of Market area located on artificially filled ground of the old Mission Bay marshland. The second walk follows the path of the fire as it spread out of the South of Market area on to Market Street. The third walk is along Montgomery Street, located on the old shoreline of Yerba Buena Cove, and follows the progress of the fire as it crossed Market Street northward into the Financial District. The wetlands bordering the bay were prime real estate, and by 1906 about a sixth of the city buildings were located on this artificial filled land. The highest concentration of damage to buildings by ground shaking and liquefaction caused by the earthquake occurred here. Throughout this area, water, sewer and gas lines were ruptured, and it was the location of most of the 52 fires that flared up in the city after the earthquake. The main objective of the field trip is to evaluate the lessons we have learned from building on poorly engineered ground within a major metropolitan center in a seismically active area.

EARLY HISTORY

The settlement of Yerba Buena was established in the 1830s along the margin of a sheltered cove in San Francisco Bay. The port attracted settlers, and by 1847 the population had gradually increased to almost 500. Early maps drawn of the town showed the streets crisscrossing the marsh and sand dunes on the bay margins (Fig.1). The discovery of gold in 1848 brought about a large influx of fortune seekers. In the 1850s, the best real estate in the city was around the wharfs on the bay. Water lots, parcels located along the shore, between high and low tide, were in great demand and fetched a high price. In order to reclaim the land, huge quantities of sand were removed from the dunes flanking the shore. The most accessible source of fill was from a belt of sand dunes that started near present day Second Street and extended westward to the Civic Center. The sand was removed using steam-driven shovels known locally as “steam paddies”, and dumped into Yerba Buena Cove and the Mission marshland.

The low-lying marsh in the vicinity of Mission Street between Third and First streets, was known as Happy Valley, and to the south was Pleasant Valley (J.R. Smith, 2005). Rincon Hill, composed of Franciscan sandstone and shale bedrock, rose above the dunes (Fig 2). In the late 1850s, Rincon Hill and South Park were very desirable residential parts of the city (Dobie 1933 and Shumate 1988). This changed in 1869 when Second Street was extended by excavating a cut through Rincon Hill. The wealthy residents moved and the South of Market area went into decline. It soon became the site of working class boarding houses, laundries, foundries, and other business premises.

A large part of the structures in the residential areas, surrounding the commercial downtown center, were constructed of wood. These wooden buildings were very prone to fire, and the city had experienced five major fires by 1851. In these early days, the city did not own or maintain its municipal water supply but residences and businesses received their water from local wells and springs. A private company, the Spring Valley Water Company, was formed in the 1860s in order to improve and provide an adequate water source. The company constructed three large reservoir facilities in the hills of San Mateo County and set down large pipe conduits to bring this water into distributing reservoirs at Lake Merced and several other elevated places around the city. An intricate network of water pipes from the distributing reservoirs was linked to homes and businesses throughout the city (Schussler, 1906). In October 1905, the National Board of Fire Underwriters condemned San Francisco for its unpreparedness to fight a major conflagration.

THE EARTHQUAKE STRIKES:
Day break on Wednesday, 18 April 1906

The 1900 census for San Francisco and the Great Voter Register recorded that over 450,000 persons lived in the city. The South of Market area was second only to Chinatown in population density. The 7.8 moment magnitude earthquake struck at 5:12 a.m. on Wednesday, 18 April 1906, with an epicenter a few miles west of San Francisco off the entrance to the Golden Gate. Bronson (1959), Sutherland (1959), Thomas and Witts (1971), Hansen and Condon (1989), Barker (1998), Jeffers (2003), Fradkin (2005), D.Smith (2005), and Winchester (2005) and others have dramatically described the destruction of the city by the earthquake and fire.

The tremor was felt strongly throughout the city, but the damage and death toll were greatest on the filled land in the South of Market area. Filled areas on the north side of Market Street were also badly damaged, including the Produce District on Washington Street and the Fish Market located on Merchant
Figure 1. Approximate location of the old shoreline and creeks in San Francisco. Numbers indicate the location of stops along the walk.
Figure 2. Geologic map of Downtown San Francisco (after Schlocker 1974). Numbers indicate locations of stops. Arrows show route of walking tour.
Street (Fig. 3). In the worst hit areas there was often evidence of liquefaction. Buildings were shifted off their foundations, many tilted at odd angles. Others collapsed, trapping hundreds in the lower floors of the wreckage. Debris on the streets made it difficult for vehicles to move around freely, and roads and sidewalks were buckled and fissured. Water mains and sewer lines were ruptured and spilled their contents over the streets. Electric lines were down, and broken gas lines also posed a major hazard as fires erupted in numerous locations.

Buildings in other parts of the city were severely shaken but often only lightly damaged, although cornices and walls of some of the structures cracked or collapsed into the street. It has been estimated that 90% of the chimneys in the city needed repair after the tremor. The areas with least amount of damage were generally located on the hills where Franciscan bedrock is at or close to the surface, and where residences were of wood frame construction. Fewer people were killed or seriously injured in these areas, and most gathered into the street as the aftershocks continued to rattle the buildings. Three aftershocks occurred within the first hour at 5:18, 5:25 and 5:42 a.m. The largest aftershock of the day occurred at 8:14 a.m. Small tremors continued into the evening and kept the residents in a constant state of alert.

The destruction of City Hall by the earthquake left Mayor Schmitz, and other municipal leaders, without a command center. The mayor, early that morning, relocated his administration to the Hall of Justice in Portsmouth Square on the north side of Market Street. One crucial member of his staff, however, was absent. Fire Chief Dennis Sullivan had been fatally injured in his apartment on the third floor of Engine House No. 3 located on Bush Street near Kearney. His leadership was sorely missed as operations designed to control the spread of fire failed, and the city was doomed to destruction (D. Smith, 2005).

Another key person who played a major role in the events associated with the earthquake and fire was General Funston, acting commander of the Army’s Pacific Division. His dawn inspection of the downtown area, immediately following the tremor, indicated the likelihood of a major disaster, and the need for the authorities to maintain law and order. He sent word to Fort Mason and the Presidio ordering troops into the downtown area to assist the police in preventing looting and to evacuate residents from districts threatened by the fire. General Funston set up his headquarters in the Phelan Building, at Market and O’Farrell, not realizing the fire was rapidly spreading and would soon threaten this street (Fig. 3). Troops from Fort Mason arrived on Market Street around 7 a.m., and an hour later, soldiers from the Presidio were in the downtown area. Other troops were to arrive by ferry at the foot of Market Street later that morning.

All public transport ceased to operate, and downed telephone lines made it difficult for the public and authorities to assess the extent of the destruction. Communication and coordination between the administrative units was also difficult. Telegraph service was, however, maintained during the first morning and was able to alert the rest of the world that a major earthquake had struck San Francisco.

The downtown was doomed by mid morning when a new fire threat arose immediately west of the Civic Center (Fig. 3). This blaze has been named the “Ham and Eggs” fire by historians. It originated at 395 Hayes Street, near the intersection with Gough, about three blocks from the Civic Center (Hansen and Condon 1989). Residents in the building attempted to cook breakfast on a damaged stove. Firemen arrived quickly at the scene and normally would have contained the blaze. However, there was no water supply in the area, and the fire soon spread fanned by the westerly breezes. It swept eastward through the Civic Center, crossed Market Street around Ninth Street, and joined up with the South of Market area fires. When it became clear later that morning that the fires were gaining in intensity, a valient attempt was made to contain the fire to the south of Market Street. Mayor Schmitz ordered the dynamiting of buildings in the immediate path of the fire. His other choice was to clear a perimeter to serve as a fire break some distance away from the fire zone (D. Smith, 2005). He hoped that his decision would cause less damage to the city and contain the fires along the existing broad avenues such as Van Ness Avenue and Market Street. Dynamiting began on Eighth Street and then moved down Market to Third Street to protect the Palace Hotel and the Mint. Unfortunately, these efforts failed because of the lack of water and the poor use of explosives by inexperienced hands. By the afternoon, the fire crossed Market into the Financial District. Much of the city was eventually destroyed, as the blaze gradually burned through the downtown over the next three days (Fig. 3).

Figure 3. Map of San Francisco showing the areas destroyed by the 3 days of fire following the 18 April 1906, earthquake. Numbers indicate locations of stops. Arrows show route of walking tour.
WALK ONE - SOUTH OF MARKET AND THE SUBSIDENCE AREA

Significance of the walk: South of Market area is located on the old Mission Bay marshland (Fig. 1). Underlying fills have proven to be extremely unstable when severely shaken during a strong tremor and have often resulted in differential settlement and lateral spreading of the ground. Liquefaction potential is also high because the water table is very close to the surface. Sixth Street has been described as “ground zero” for the 1906 earthquake because it was the site of the greatest devastation and the origin of many of the fires in the downtown area (Hansen and Condon 1989). The greatest loss of life occurred in this sector. This walk will reconstruct the events that took place along Sixth Street in the early morning of 18 April 1906.

The walk will continue into the nearby side streets to observe the results of settlement of post 1906 buildings located on poorly engineered artificially filled ground. There is no doubt that the building subsidence has been a problem from the outset as the city expanded into this area in the 1860s. All the earlier wooden buildings were destroyed in 1906, but they were quickly replaced after the earthquake and fire. Many of the bay window homes from the reconstruction period are preserved today in the side streets in the South of Market area. These older homes are settling on the filled ground and they are being replaced with newer structures as the area under goes redevelopment. Damage from the Loma Prieta earthquake in 1989 accelerated the removal of many of these buildings.

Accessibility: South of Market area is easily accessible by all the public transport systems servicing downtown. The nearest Metro and Bay Area Rapid Transit (BART) Station is located at Powell and Market Streets. The Golden Gate Transit bus stop is located near Fifth and Mission. The AC Transit bus terminus is at the Transbay Terminal near First and Mission some five or so blocks away from the Moscone Center. Public parking is available at the Fifth and Mission garage. Restrooms are few and far between in the South of Market, and it is a real challenge to find one open to the public. Restrooms are located at the Fifth and Mission garage. Facilities in the Chevron gas station on Sixth and Harrison and the Jiffy Lube at Seventh and Howard Streets may be available on request.

STOP 1: SIXTH AND HOWARD STREETS.

Directions from Civic Center BART to Stop 1:
The walk starts at Civic Center BART station at the intersection of Hyde, Eighth and Market Streets. Walk southeast on Eighth Street to Howard, turn left to the intersection of Howard and Sixth Streets.
Figure 5. Stop 1 of the walk. Looking south at the intersection of Sixth and Howard today. The one-way street at lower right is Natoma Street. The burnt and vacant apartment building in the lower left of the photograph, with the decoration of household appliances and furniture, is often referred to by the locals as the “Earthquake House”. In 1906, three boarding houses stood in the block between Natoma and Howard Streets. They all collapsed with a high loss of life.

Stop Description

Bedrock contour maps show that a Pleistocene valley over 280 feet (90 m) deep underlies the South of Market area (Schlocker 1974). This valley has been filled with Pleistocene and Holocene deposits composed of fluvial and dune sand and bay mud. Sand dunes covered the areas around the Civic Center. The artificially filled marshland of old Mission Bay extends inland to Market and Eighth Streets and eastward through the center of the South of Market area. (Fig. 2).

The intersection of Sixth and Howard Streets has changed little since 1906 although important renovations are planned. In 1906, the South of Market area was home to a large immigrant and transient population. The buildings in the area were predominantly two to three-storied wood frame hotels, rooming houses, factories and small businesses (Figs. 4 and 5). Larger five-story boarding houses occupied corner lots, and many of them had up to 300 rooms for rent to workers and their families. On the main thoroughfares, such as Sixth Street, the lower floors of the buildings were often converted into eating houses, laundries or grocery stores.

Three boarding houses occupied the block on the northwest side of Sixth Street between Howard and Natoma. On the corner was the five-story Brunswick House, and toward Market Street were the Ohio and the Lormor. Across on the southwest corner of Natoma Street was the Nevada House (Hansen and Condon, 1989; and D. Smith, 2005). Most residents were asleep in the boarding houses and cheap hotels that lined these streets. Lights were on in some rooms as early risers were preparing to set out for work. Many of the eating-houses and bakeries had their stoves turned on as they prepared for the busy day ahead.

Suddenly, at 5:12 a.m. the ground started shaking violently, and buildings began to topple and collapse. The streets were buckled and filled with debris. Lights were extinguished, and in the darkness people were calling for help. Many were trapped in the buildings. Brunswick House had collapsed into the street as the neighboring boarding houses toppled sideways into it. The total death toll in this intersection alone has been estimated to be between 150 to 300 persons. At least 23 of the 46 residents in the Nevada House died. Further up Sixth Street between Mission and Market, the Portland House had collapsed trapping many residents. Little was left of the lodging houses but piles of debris. People worked desperately trying to rescue those inside until fire and smoke drove them from the street. The exact death toll will never be known since little time was available to count the dead before the area had to be evacuated as fires quickly spread through the South of Market area.

STOP 2: INTERSECTION AT SIXTH AND FOLSOM STREETS

GPS coordinates: Northeast corner of Sixth and Folsom is 37° 6.72"N, 122° 0.24"W.

Directions to stop 2: From stop 1 walk a short block southeast on Sixth Street to the intersection with Tehama Street. A short detour is recommended en route to stop 2 to see the changes to buildings on Tehama Street as result of damage from the 1989 earthquake. The Anglo Hotel was located on the southeast corner of this intersection and it was red tagged after the tremor along with other adjacent buildings. The buildings on the south side of Tehama have now been replaced with modern ones. The only structure remaining near this section is located at 481 Tehama and it is easily recognized since it is out of line with the other buildings (Fig. 6). From Tehama continue along Sixth Street to the intersection with Folsom.

Stop Description:

This intersection with Folsom was a depression within the Mission Bay marsh that was known locally as Pioche's Lake. It was later artificially filled for housing.
Figure 6. Photograph taken in December 1975 showing the south side of Tehama looking toward the intersection with Sixth Street near Stop 1. The Anglo Hotel, is located at the corner of the intersection. The three buildings in the center of the photograph are out of alignment due to subsidence.

The scenes that took place at the previous stop were repeated all over the South of Market area. After the earthquake, lightly clad residents poured out into the debris-covered streets and attempted to locate family and neighbors in the darkness. Smoke filled the air as small fires began to erupt. Fire had broken out down the street at Nicholas Prost’s bakery on Sixth Street between Folsom and Harrison. Smoke from another large fire could be seen burning in the direction of Seventh Street. Girard House on the northwest corner of Seventh and Howard had collapsed, and a fire started from the stove of the downstairs restaurant.

Engine No. 6 was housed close by on Sixth Street between Folsom and Shipley. The firehouse was badly damaged and the horses used to haul their equipment were lost when they bolted out into the street. Unfortunately, the nearby fire hydrants at Sixth and Shipley and Sixth and Folsom were all ruptured, as were the sewer lines on Fourth and Sixth Streets. Fire Captain Charles Cullen, in his official report, described the dilemma when he was forced to divide his team into two groups, one to attempt to fight the fires and the other to do search and rescue. Their first rescue was in wrecked homes on either side of the firehouse where they were able to cut their way in to free those trapped inside. They next moved to the Corona House on the northwest corner of Sixth and Folsom and rescued a man and woman in the wreckage. The Fire Captain estimated that some 40 residents had died that morning in the Corona House.

Engine No. 6 covered their heads with wet sacking, and hauled the equipment along Folsom Street. They stopped to check hydrants for water until they finally arrived at Fifth Street. Here they were able to locate a small supply of water in a sewer and, for a short time, they fought the blaze. They soon had to abandon their hoses as the fire crossed Fifth and Folsom, but they hauled their engine to safety ahead of the blazing inferno. As in the case of all of the fire crews, they remained on duty for the next 55 hours.

A similar account was given by the crew of Engine No. 19 which was stationed on Market near Tenth Street. Their firehouse was also badly damaged, and the horses bolted into the street. They were fortunate to recapture their horses, and they drove to Harrison and Sixth Street trying all the hydrants along the way. They located a small supply of water from a hydrant on Sixth Street between Folsom and Howard that had been overlooked by the crew of Engine No. 6. They fought the fires until the supply dried up. With fires raging all around they were called away to fight yet another hot spot at Hayes and Gough Streets where the “Ham and Eggs” fire had started to burn later in the morning (Fig. 3).

STOP 3: SUBSIDENCE AREA

GPS Coordinates:
- Shipley and Sixth intersection is 37° 46.79” N and 122° 24.30” W.
- Intersection of Langton and Harrison is 37° 46.51” N and 122° 24.42” W.
- Intersection of Moss and Howard is 37° 46.68” N and 122° 24.53” W.
Directions: This location is not a single stop but is a walk looping around the many side streets in the subsidence area. The route is shown on Figs 2 and 3. From Stop 2 at the intersection of Sixth and Folsom, walk half a block southeast on Sixth Street to the narrow side alley of Shipley Street, turn left (northeast) and continue to the intersection with Fifth Street.

Stop Description:
The subsidence area is bounded by Fifth Street on the east and Eighth Street on the west, Mission to the north and Bluxome streets to south. The walk includes many small side streets such as Jessie, Minna, Natoma, Tehama, Clementina, Shipley, Russ, Harriett, Ringold, Moss, Langton and Dore. An area of subsidence is also found in Hayes Valley; located north of Market and west of the Civic Center (Fig. 2). Both of these areas of subsidence are situated on the artificial filled ground of the old Mission Bay marsh. Another subsidence area is located in the made ground of old Laguna de Manantial in the Mission District. Buildings in this part of the city were badly damaged in 1906 including the Valencia Hotel at 718 Valencia, between Eighteenth and Nineteenth Streets, where at least 20 persons died in the wreckage (Hansen and Condon, 1989). Good examples of building subsidence in this part of the Mission District can be seen on Lexington and San Carlos Streets. The South of Market area, however, will be the focus of this walk.

Buildings throughout the filled area of the South of Market were severely damaged in the April 18, 1906 earthquake due to ground shaking. The extent of the damage from this event was not fully documented in the Lawson Report mainly because fire quickly engulfed the district within the first few hours following the earthquake. Very few photographs recorded the nature of the damage but hundreds of graphic eyewitness accounts exist. A residential section of Dore Street, close to the Bay, did survive the fire and photographs of the damaged buildings along the street appeared in the Lawson (1908) report and are reproduced in Youd and Hoose (1978). It is clear from this photographic evidence, eyewitness accounts and building records that the South of Market area was extensively damaged in the 1906 earthquake. The South of Market area was quickly rebuilt in the years following the tremor. The area retained its mixed industrial and residential nature with small business establishments and rooming houses reoccupying the district. A study of these post-1906 buildings set among the modern redevelopment of the area, reveal an interesting record.

Additional information on the seismic risks in this area was documented in 1989 since the South of Market area was again extensively damaged in the Loma Prieta earthquake. The pattern and nature of damage from this event was similar to that in 1906. In recent years, many of these damaged buildings were removed or renovated but many older structures still remain. Using a resource of historic photographs and building records, this field trip will investigate the likely damage that could be sustained in the South of Market area during the next large earthquake in the San Francisco Bay region.

Wahrhaftig (1966 and 1984), Steinbrugge (1969), Youd and Hoose (1978), Sullivan and Galehouse (1990 and 1991) and Sullivan (2006) have previously published some of details of the buildings in this area. All of the older buildings in the subsidence area date back to the reconstruction period following the 1906 earthquake. The district has retained most of its character over the years with numerous two to three story rooming houses, apartments, small stores and businesses. Obvious signs of subsidence along the side streets are the abandoned garages and doorways three feet or more below the present street level (Fig. 8). Because of the continuing subsidence, main roads and utilities have had to be raised periodically in order to maintain them at “official” grade level. Side alleys were raised at less frequent intervals, and often are not level with the main streets, but meet with a slope at the intersection. Some of the buildings have been deformed by differential settling and are no longer upright but lean toward a neighboring structure. Inside these buildings, doors and windows are warped, walls are cracked, and floors are not level. A recent boom in the real estate market in San Francisco has led to repair and renovation of many of these older building. (Fig. 9) As a result, some of the better examples have been replaced or renovated so that they no longer preserve the evidence of subsidence.

Shipley Street: The subsidence walk starts at the intersection of Sixth and Shipley. Walk northeast on Shipley for one block to intersection with Fifth Street.

The newly built loft that backs on to 254 Shipley illustrates the changes occurring in the area; this structure is very modern, with a glass exterior façade. The best examples of the effects of subsidence on older buildings can be seen at 277, 274, 258, 241-243 and 229-231 Shipley. There are many vacant lots along Shipley Street since many older structures were removed over the years.
Figure 8. Subsidence area: 278-280 Clara Street the house is boarded up but the former garage and entrance door can be seen below street level. The photograph was taken in February 1969.

Figure 9. Subsidence area: view of 278-280 Clara Street following renovation after the 1989 earthquake. Many other buildings in the subsidence area have been rebuild or renovated in recent years.

Clara Street: At the intersection with Fifth Street turn right (southeast) to Clara. Continue to walk southwest down Clara back to Sixth Street.

Clara Street has changed markedly in recent years because many structures were seriously damaged in the 1989 earthquake and replaced with modern buildings. Other structures have under gone major renovations and several lots that were previously vacant now contain high priced lofts. Buildings with former garages and entrances below street level can be seen at 241 and 261 Clara. 274-276 Clara shows a typical style of building renovation of this area where the original location of the garage door is replaced with sub-basement windows. The most photographed house in the subsidence area was located at 278-280 Clara Street (Figs. 8 and 9). It was one of homes along this street that was red tagged in 1989 and rebuilt following the tremor. The modern loft at 281 Clara was recently constructed on the site of a fenced-in vacant lot that had eventually returned to its original marsh-like setting (Fig. 10).

Figure 10. Subsidence area: the vacant lot at 281 Clara Street that had been fenced off for many years and the site had returned to its original marsh setting. This photograph was taken in 1976. A new building has been recently erected on this site.

Langton Street: At Clara and Sixth turn left (southeast) on to Harrison. Turn right (southwest) at intersection to walk on the north side of Harrison passing Harriett, Columbia Square (the location of a refugee camp in 1906) and Sherman Street to Seventh Street. Continue on Seventh to Langton. Turn right (northwest) and walk the two blocks of Langton.

A good example of a building in the subsidence area can be found on this mural-lined street at 182 Langton

Figure 11. Subsidence area: many of the apartments along Langton Street have entry ways below street level. This example is located at 134-136 Langton.
where the former doorway of the sunken garage has been bricked up. The row of houses numbered 144-142,140-138,136-134 132-130 Langton all have stepped down entrances (Fig. 11). Subsidence features are also present at 122-120 and 73 Langton. The apartment building at 62-52 Langton was one of the many structures damaged in the 1989 earthquake. Stop at the People’s Garden on the southwest corner with Howard Street. Originally, this was an empty lot and a drug hangout. The local residents petitioned to have the site converted to a community garden.

Across the street at the intersection of Langton and Howard are examples of tilted buildings at 1122 and 1118 Howard. These buildings also sustained damage in the 1989 earthquake.

**Moss Street:** Turn right (northeast) on Howard crossing Seventh Street, and turn right (southeast) down Moss Street for one block to intersection with Folsom.

Moss Street occupies a depression between Harrison and Folsom (Fig. 12). The main roads have been paved to maintain grade so that there is a distinct elevation drop entering both ends of Moss Street.

![Figure 12](image)

*Figure 12.* Subsidence area: view of Moss Street from Harrison. Note the grade change at the cross walk down into the side street of Moss.

Examples of sunken buildings are best seen at 10,14, 25 and 64-62 Moss. The loft apartment at 68-72 Moss had many cracks above the garages from the 1989 earthquake and these can still be made out in the stucco (Figs 13 and 14). Several lots are vacant along this street. To illustrate the real estate boom taking place in the city, in the summer of 2005, a two unit building at 10 Moss, built in 1907, was listed for sale at $899,000.

![Figure 13](image)

*Figure 13:* Subsidence area: view of the damage to the apartment at 68-72 Moss Street following the 1989 Loma Prieta earthquake.

![Figure 14](image)

*Figure 14.* Subsidence area: view of the apartment located at 68-72 Moss Street. The photograph was taken in the summer 2005 and damage from the Loma Prieta earthquake is still visible in the stucco.

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**Russ Street:** Exit Moss and turn left (northeast) on Folsom to Russ Street. Walk northwest on the one and a half blocks of Russ, crossing Howard, to Natoma.

Settlement affecting homes can be best seen at 155-157 and 134-132 Russ.

**Natoma Street:** Turn left (southwest) on the 500 block of Natoma, cross Seventh Street. Walk mid way along the 600 block of Natoma, and turn back, to retrace your steps to Seventh Street.

Natoma Street has the finest collection of post 1906 bay window homes which were so widespread in the subsidence area before redevelopment (Fig. 15). Most of them show clear evidence of settlement. The best examples are in the 500 block of this street at 554-552, 556-558, 565-567 Natoma. Crossing Seventh Street,
the 600 block has numerous homes with entry ways and garages below street level, they include 617-619, 618, 620-622, 621, 623, 624, 632-634, 636-638, 642, 645-647, 649 and 657-659 Natoma Street. At 623 Natoma, the lower floor entry is barely visible at street level (Fig. 16). Retrace your steps to the intersection of Seventh and Natoma Streets. This intersection shows a marked change of grade from side alley to the main thoroughfare. The side alley has not been maintained at the “official” street level (Fig. 17).
available on weekends along many streets in the South of Market area. Public restrooms are available in the garages on Fifth and Mission. There are coin operated public toilets on Market Street. Restroom facilities are also available in Embarcadero Centers 1, 2, and 3.

**Directions.** On Seventh Street turn left (northwest) crossing Mission to Market. Cross over Market to the northwest side and turn right (northeast) toward the Ferry Building.

**Walk description – This walk is among the historical buildings along Market Street**

Before commercial development, dunes were as high as 80 feet (26m) in the vicinity of Market Street. Sand carried by the westerly winds from the coastal dune belt continuously blew through the area, and made life unpleasant at times. Market Street started as a residential street with modest homes and wooden boardwalks. As the city grew, the character of Market Street changed from residential to commercial. Stores, banks, hotels and business offices began to be located here in the 1860s. The 1868 earthquake had, to some degree, alerted city developers that high-rise buildings had to be solidly built using the iron or new steel framing design. The street was finally paved with cobblestones in 1880, and the next year cable cars began to replace the old horse-drawn trolleys. The Civic Center was located at the upper end of Market in 1870, on the site of Yerba Buena Cemetery, one of 14 cemeteries located in the city. Because of the development of the Civic Center, thousands of graves had to be relocated. Old City Hall was situated at Larkin and McAllister, the site today of the Asian Art Museum. It had just been completed before the earthquake at a cost of $6 million (Bronson 1959).

The threat of fire was always foremost on the minds of city authorities. These concerns were well founded since the Baldwin Hotel, in downtown San Francisco, went up in flames in 1898. As a result, many buildings, such as the Palace Hotel and the Mint, had their own water wells and cistern system to alleviate the fire danger. In 1906, there were 52 major brick and stone buildings present in downtown San Francisco. The tallest was the 18-story Call building. San Francisco was in the middle of a building boom, and seven new buildings were under construction when the tremor struck. It had become the major port and commercial center on the West Coast.

Waldhorn and Woodbridge (1978), Corbett (1979), Woodridge and Woodridge (1982) and Richard (2002) detailed the structural design of the older buildings in the downtown area. They were not built to resist earthquakes, but had great strength and rigidity since they were designed to resist strong winds. Their massive exterior walls were generally made up of unreinforced masonry. Only 6 of the 52 major buildings in the downtown were so completely destroyed that it was not possible to rebuild them.

Continue on from the subsidence walk, at the northeast corner of Seventh and Mission Streets is the Post Office (1905), now the Sixth Circuit Court of Appeals building. Cross over to the north side of Market, at One Jones, is the Rocklin granite faced Hibernia Bank building (1892) which is undergoing renovation in 2005. Three blocks down Market, at the busy Powell Street intersection, is the James Flood building (1904) at 870 Market (Fig. 18). This was the site of the Baldwin Hotel from 1877-1898. Across the street is the Old Emporium (1896) at 835-865 Market. This was the original site of St. Ignatius College
STOP 4: LOTTA'S FOUNTAIN

Directions: Lotta's Fountain is located at the intersection of Market, Montgomery and Post Streets.

GPS coordinates: Lotta's Fountain is at 37° 47.25"N and 122° 24.19"W.

Stop Description:
Lotta's Fountain was built in 1875 on the edge of the sand dunes that covered Market Street (Fig. 3). This drinking fountain (now dry) was located in the hub of the downtown district at the busiest intersection in the city. Third Street was the through street out of town to the Peninsula, and many major buildings of the city were located close by. This intersection was known as "Newspaper Angle", since the offices of the major newspapers of the city were located here. On either side of Lotta's Fountain are the old Citizens Savings building (1902) at 700 Market and the Old Chronicle building (1889) at 690 Market. Across the street at 703 Market is the site of the old Call building (1898). The Hearst building at 5 Third Street and the nearby Monadnock building at 685 Market did not survive the earthquake and fire but were rebuilt after 1906.

New Montgomery Street was originally planned as a major boulevard connecting Market Street with the south bay. As a result, two major hotels were built at the intersection. On the west corner, at 55 New Montgomery, was the deluxe Palace Hotel; when built in 1875, it was considered to be the finest hotel on the West Coast. Across the street, on the east side of New Montgomery, at the time of the earthquake, was the very ornate, 400 room Grand Hotel, completed in 1870. The extension of New Montgomery never took place and it has remained only two blocks long. The Palace Hotel was rebuilt in 1909 but the Grand Hotel was never reconstructed.

Lotta's Fountain was always a popular meeting place in the city, and shortly after the earthquake, people gathered there seeking news of family and friends. There was little reason for them to be concerned since the area was not in any immediate danger, although smoke and fire was evident from the South of Market area. The largest fire in the area was the one near St. Patrick's Church on Jessie Street, where the San Francisco Gas and Electric Company had its station (Fig. 3). As the morning progressed, however, fire began to move through the buildings on the south side of Market Street. The Call, Monadnock and Examiner buildings were doomed by noon (Fig. 19). Also in ruin was the nearby Grand Opera House on Mission Street where Caruso had performed the night before. The Palace Hotel became the scene of a great struggle to prevent the fire from taking hold on the north side of Market Street. When constructing the hotel, a large cistern was installed in the basement to provide a water supply in case of fire. As a result, great efforts were made throughout the morning to save the Palace Hotel in order to have access to its water supply. The firefighters, however, diverted increasing amounts of water to other nearby buildings, and the hotel started to burn.

Lotta's Fountain is a now a National Historic Landmark. It was a gift to the city by Lotta Crabtree, a very popular actress and singer, who was born and raised in San Francisco. It is here at 5:12 a.m. each year, on the anniversary of the 1906 earthquake, that citizens gather with the survivors to remember the events of 1906. In 2005, only six earthquake survivors attended the ceremony. The largest gathering at this site took place on Christmas Eve in 1910, when the renowned opera singer Luisa Tetrazzini gave a concert to thousands of residents who had assembled to mark the rebirth of San Francisco.
STOP 5: OLD SHORELINE MARKER AT THE MECHANICS MONUMENT (DONAHUE STATUE)

**Directions:** From Lotta's Fountain continue two blocks northeast on Market Street to the Mechanics Monument at the intersection of Bush and Battery Streets.

**GPS coordinates:** Mechanics Monument is located at 37° 47.47”N and 122° 23.96” W.

**Stop Description:**

A metal plaque denoting the location of the old shoreline of Yerba Buena Cove in 1848 is embedded in the sidewalk on the west side of the Mechanics Monument. The bronze statue was placed here in 1894 to honor Peter Donahue, an early industrialist of the city. Willis Polk designed the granite base, and James Tilden was the sculptor.

The six blocks of buildings from here to the Ferry building are on filled land (Fig. 3). As a result, in 1855 the tidal mud flats began to be filled and protected from erosion by construction of a sea wall that extended over 3 miles (5 km) from Fort Mason along the present-day Embarcadero. In the South of Market area, construction in 1867 of a railroad causeway, the Long Bridge, helped to silt up Mission Bay.

The events of the 1906 earthquake are significant at this site because it provides an insight into the performance of high-rise structures on artificial fill during a major earthquake. Many fires originated in the warehouses and other structures along Third, Minna, Howard, Fremont, and Steuart Streets in this bay front district. One of the first reported fires was in a laundry on Howard and Hawthorne Streets, just one block northeast from the current Moscone Convention Center. Engine No. 4 was located across the street from this fire, but there was no water in any of the hydrants. Fireboats were able to protect the waterfront at the foot of Market. These South of Market fires soon merged together as a major blaze and eventually joined up with the fires from Sixth and Howard Streets. Large numbers of refugees had assembled at the Ferry building but were forced to flee as the fires surrounded the ferry terminus. For a time it was no longer possible to evacuate refugees by boat. Later that morning, the fires crossed Market Street and moved along Montgomery Street (Figs 19 and 20).

**WALK THREE: MONTGOMERY STREET TO JACKSON SQUARE**

**Significance of the walk:** The route along Montgomery Street follows the old shoreline of Yerba Buena Cove (Fig. 1). This street was the main thoroughfare in the Financial District in 1906. The walk follows the progress of the fire as it swept along Montgomery Street into the Financial District and Chinatown during the afternoon of 18 April. Portsmouth Square, located on the shore of Yerba Buena Cove, was the site of the original settlement established in the 1830s. Jackson Square is one of the few parts of the downtown area to survive the earthquake and fire.

**Accessibility:** Public transportation information listed in the Market Street walk is also applicable for this segment of the field trip. In addition, the California Street cable car line intersects Montgomery Street. Limited parking is available at St. Mary’s Square garage on California Street between Kearny and Grant. Also within walking distance is Portsmouth Square garage, with an entrance on Kearney between Clay and Washington, and the Sutter-Stockton Streets garage, one block northeast of Union Square. Free on-street parking is available Sundays in the Financial...
District. Restroom facilities are, once more, hard to find but are available at St. Mary's Square and Portsmouth Square garages.

**Directions:** The walk continues from the Mechanics Monument up Bush Street for two blocks to Montgomery Street. Cross to the north side of Montgomery, and turn right (north) to its intersection with Commercial Street. Turn left (west) on Commercial to Kearney Street. Turn right (north) on Kearney to Clay Street and Portsmouth Square.

**Walk Description:**

Gentry (1962), Delehanty (1989), Richards (2001, 2002), and others have described in some detail the historic waterfront setting of Montgomery Street. The old shoreline location can still be discerned by the abrupt increase in grade on the east-west streets as they cross Montgomery. The change in gradient represents the transition from marsh to dunes that blanketed the Franciscan bedrock hills to the west (Fig. 2).

In the 1850s, this street was lined with wood shacks, warehouses, retail stores, eating places and rooming houses (Fig. 21). Wooden wharfs stretched across the mud flats into the bay (Fardon 1999). The area west of Montgomery is a graveyard of old abandoned ships from this period, and as many as 47 have been discovered during excavations (J.R. Smith, 2005). Montgomery Street emerged from the mud flats to become the Wall Street of the West. By the 1870s, it was part of the prosperous Financial District and contained some of the notable buildings of the city.

**Intersection Montgomery and Bush:** The first couple of blocks south along Montgomery Street, between Market and Bush streets, were the locations of some small three and four storied hotels built in the early 1860s (J.R. Smith 2005). By the turn of the last century, they had passed their prime with the construction of larger and more deluxe hotels on Market Street and Union Square. On the west side of Montgomery Street was the Lick Hotel, opened in 1862; it occupied most of the two blocks between Bush and Post Streets. This hotel suffered some minor damage in the 1865 earthquake. Across the east side of Montgomery, between Bush and Sutter streets, was the 4-story Occidental Hotel, completed in 1869. Another nearby hotel was the Russ House which filled the entire block between Bush to Pine on the west side of Montgomery Street. The Russ House, like all the other wooden structures in the area, burned to the ground in 1906 and was replaced later by today's 31-story Russ building. On the northeast corner of Montgomery and Bush was Platte's Hall which for 30 years had been the venue for concerts, lectures, political rallies and sporting events. It was replaced in 1891 by the present day Mills building at 220 Montgomery Street. The Mills building was gutted by the fire in 1906, reconstructed in 1908, and later enlarged in the 1930s to include 21-storied Mills Tower.

**Intersection Montgomery and Pine:** At the beginning of last century, the buildings north of the Montgomery and Bush intersection became grander and larger as the hotels and retail stores gave way to banks, steamship companies and other business establishments. The Nevada Bank (1875-1906) stood at the northwest corner of Montgomery and Pine. Although the structure was destroyed, the vault survived in the ruins and about $3 million dollars in gold was recovered. This section of Montgomery is still crowded with banks and financial institutions.

**Intersection of Montgomery and California:** The Kohl building (1901), located at 400 Montgomery Street, on the northeast corner of the intersection with California Street, is one of only a few pre-1906 buildings on this street to survive to the present day. Next door, at 420 Montgomery Street, is the Wells Fargo History Museum which is open free of charge to the public. Down the street, at 465 California, at the corner with Leidesdorff Street is the Merchant
Exchange building. Built in 1903 and designed by Willis Polk, it was reconstructed after the earthquake. It was an important commercial center, and news of arriving ships was transmitted from the lookout tower on the roof to the merchants in the hall below. Wahrhaftig (1966) described the stone used in this building and in many other buildings in the Financial District.

Two blocks up the hill from Montgomery Street, at the intersection of California Street and Grant Avenue is Old St. Mary’s Church. This brick gothic building was constructed in 1854. As in the case of many of these early brick buildings, the brick and ironwork was brought around the Horn from the East Coast. The granite blocks are from China. It was the first Catholic cathedral in the West United States and at the time was located close to the administrative center of the city. As the city grew away from this area, it became incorporated into Chinatown and became surrounded by brothels and opium dens. As a warning to the local residents, the clergy posted a sign below the church clock that read, “Son, observe the time and fly from evil”. The building was gutted in the fire but later reconstructed. Today the church still bears the same message.

**Intersection of Montgomery and Sacramento Streets:** A great deal of early San Francisco history is recorded at this intersection. At the southwest corner in the 1840s was a small creek that was utilized by the local Native Americans as a site for a sweathouse. On the northwest corner was the warehouse of Jacob Leese, an early resident of Yerba Buena. He used the warehouse from 1838-1841 to store cattle hides and other goods. Later, it became the trading post for the Hudson Bay Company from 1841-1846.

**Intersection of Montgomery with Commercial Streets:** Commercial Street, at first glance looks like one of the many narrow side streets in the city, but from this intersection it is possible to see that the street has a unique location. Looking eastward to the Bay, Commercial Street lines up with the Ferry Building at the foot of Market. This street was built to lead into the Long or Central Wharf, the largest wharf in the city. The old US Treasury Building (Pacific Heritage Museum) erected in 1875 is located at 608 Commercial Street.

**STOP 6: PORTSMOUTH SQUARE**

**Directions:** Portsmouth Square is located on Kearny between Clay and Washington streets.

**GPS coordinates:** Portsmouth Square is located at 37° 47.68”N and 122° 24.31”W.

**Stop Description:**

Portsmouth Square was the location of the first settlement of Yerba Buena. A partially hidden plaque at 825 Grant Avenue marks the site of the first residence in the settlement, belonging to William A. Richardson (Fig. 22). The town was planned around a Spanish Colonial plaza that was initially named Calle de la Fundacion. In 1846 Captain Montgomery anchored the naval sloop USS Portsmouth in the Bay. He raised he American flag in the plaza, and this event gave the square its present name. In 1847, the year before the discovery of gold, a visit to the town center would have revealed 20 to 30 buildings of various kinds scattered around the plaza. The first public school in California was opened there on 3 April 1848. As the city grew, Portsmouth Square remained the administrative center until the late 1870s, when the business district gradually moved south to the new Financial District and west to Market Street.

Residents in Chinatown were abruptly awakened in the early morning of 18 April. Most of the buildings along Grant Avenue survived the tremor with moderate damage, since it is located close to Franciscan bedrock that outcrops on Nob Hill (Fig. 2). As news reached the residents in the late morning of the fire crossing Market Street, they began to pack as much of their belongings as they could carry or drag. Most were reluctant to leave, but by early afternoon it was clear that Chinatown could not be saved. They slowly left the area with most of them heading to the Presidio.

**Figure 22.** Chinatown: the location of the first permanent structure in Yerba Buena. A partially hidden plaque, adjacent to the entry way at 825 Grant Avenue, marks the site in 1835 of the residence of William A. Richardson.
Destruction of City Hall by the earthquake forced the administrative center to relocate, and Mayor Schmitz chose the Hall of Justice in Portsmouth Square as his command center. A gathering of prominent citizens was called to this site at 3:00 that afternoon (D. Smith 2005). At the meeting, a Committee of 50 citizens was established to help in the disaster. Even as the group met, Portsmouth Square was being threatened by fire. The meeting ended when the area was engulfed in smoke. Those gathered in the area could clearly hear the sound of dynamite explosions from nearby Leidesdorff Street, as an attempt was made to save Portsmouth Square. Dynamite supplies were by now exhausted, and the military began to resort to black powder. The use of explosives by inexperienced personnel caused sparks from the black powder explosions to spread the fire into Chinatown. Mayor Schmitz relocated his command post to Nob Hill as Portsmouth Square and Chinatown began to burn in the late afternoon and on into night.

STOP 7: JACKSON SQUARE

GPS Coordinates: Entrance to Jackson Square is at 37° 47.85"N and 122°24.19"W.

Directions: Walk down Clay Street on the south side of Portsmouth Square crossing Kearney to Montgomery Street. Walk north on Montgomery to the intersection with Washington and Columbus. This intersection marks the beginning of the Jackson Square Historic District established in 1971. This district covers a four-block area dissected by Montgomery Street. Pacific Street on the northern perimeter was the district known as the Barbary Coast.

Stop Description:

The old shoreline continued along Montgomery Street to Jackson Street. This intersection was the site of a creek entering Yerba Buena Cove, and a wooden bridge was constructed in 1844 linking Clark’s Point with the town. The Montgomery Street grade increases abruptly, between Jackson and Pacific Streets, to mark the beginning of Clark’s Point at the northern end of Yerba Buena Cove. Clark’s Point was the site of the Broadway or Pacific wharf, the first one constructed out into the bay. Pacific Street is also the beginning of the infamous Barbary Coast District.

The Jackson Square Historic District starts at the intersection of Montgomery, Columbus and Washington Streets (Fig. 23). Columbus Avenue is another street that cuts diagonally across the grid pattern. It was designed to provide easy access from the northern docks to the city’s business district. Streets maps in 1906 show Columbus Avenue as Montgomery Avenue. Its name was changed in 1909, along with many other streets, after the city completed its redevelopment following the earthquake. Jackson Square contains the oldest commercial buildings in the city. These structures survived, by good fortune, the three days that fires raged through the city. Jackson Square was threatened by fires that at first advanced from Market Street and then later from North Beach.

700 block of Montgomery Street: This block contains several pre-1906 buildings. Most are located on the foundations of older buildings that were destroyed in the fire of 1851 which gutted this area. At the northeast corner of the intersection, at 700 Montgomery, is the Columbus Savings Bank, built in 1905. The old Langerman’s/Belli building, at 722-724 Montgomery Street, was built in 1853 and is presently undergoing a major renovation. The Genella building at 728 Montgomery was erected in the early 1850s on the site of an 1849 building. The Golden Era building at 730-732 Montgomery dates back to 1852.

400 block of Jackson Street: This block of Jackson Street is lined with two- and three-story warehouses, stores, and banks of the Gold Rush era. These old commercial buildings are characterized by having thick, unreinforced brick walls, large heavy doors, and vaulted windows with sturdy iron shutters. Their
design was an important reason that they survived the fire. Delehanty (1995) and Richards (2002) described in detail a historic walk along Jackson Street. On the north side of the street, between Montgomery and Balance Streets, are clusters of buildings from the 1850s. They have a much plainer design than the more elaborate Italianate buildings of the 1860s period that dominate the south side of Jackson Street. The important buildings on this side of Jackson Street include the Lucas Turner & Co. Bank at the northeast corner of Montgomery and Jackson Streets. The historical plaque indicates that it was built in 1853-54, 435-441 Jackson. The three-storied Hotaling Whiskey Warehouse, built in 1866, is on the corner at 451-455 Jackson and is recognized by its cast iron façade and tall upper windows. Around the corner, at 38-40 Hotaling Place, were the horse stables for the whiskey company. A meandering set of bricks, inset into the roadway on this service alley, depicts the location of the old shoreline (Fig. 24).

It is believed that the location of this whiskey warehouse may have played an important role in the preservation of the pre-1906 buildings along this street and the nearby Appraisers’ building or Custom’s House at 630 Sansome. On the first day, when fires raged through the area from Market Street, the Army was persuaded not to dynamite the building in case the barrels of volatile liquor were to explode and threaten to destroy other structures. The area was again threatened on the second day when the fire spread in from North Beach (Fig. 3). This time, a Naval relief unit saved the area by running a mile-long hose from the waterfront over Telegraph Hill toward Jackson Square (Hansen and Condon, 1989). Jackson Square was again in the fire path for a third time when the blaze swept from down from Telegraph Hill to the north and approached this area. It appeared likely that this island of buildings would finally be gutted, but once more providence stepped in. The wind changed direction, and Jackson Square and its whiskey distillery survived. This led to the popular query attributed to a local wit Charles K. Field, who responded to those who preached that the demise of the City was the result of its wickedness by writing, “If, as some say, God spanked the town for being over-frisky, why did He burn the churches down and spare Hotaling’s Whiskey?”

CONCLUSION

This field trip follows the events that happened on the first day of Wednesday, 18 April, 1906 by walking the route of the old bay margins from the Mission Bay marshland, skirting Rincon Point, to Yerba Buena Cove and ending near Clark’s Point at the foot of Telegraph Hill (Fig. 1). There is little doubt that this land, recovered from the Bay, was the site of greatest damage to structures from ground shaking, and was the origin of most of the fires. This fact has sometimes been over looked because of the widespread destruction from the fire that followed the tremor.
As darkness fell that first day, the lowlying area around the old bay margin had been destroyed with exception of Jackson Square. It was now the turn of the residents living close to bedrock on the slopes of Nob Hill, Russian Hill, and Telegraph Hill to witness the next stage in the destruction of the city (Fig. 3). Those living in these areas had believed, at first, that they would survive the worse of the disaster. They felt fortunate to have their homes still standing after the earthquake, and their residences were well beyond the fire zone. However, conditions deteriorated rapidly in the afternoon. Martial law was imposed throughout the city. No one entered or left the perimeter without permission. Over 250,000 people became homeless, and many fled by ferry across the Bay, or were camped in Golden Gate Park, or other open spaces. The fires were eventually brought under control by dawn on Saturday 21 April 1906.

It has been estimated that about 4.7 square miles or 508 blocks of the city were destroyed, containing some 28,188 homes (Fradkin 2005). The fire razed all wooden structures in its path, and only the façade of steel-framed and masonary buildings stood amid the ruins. (Fig. 25) The city set about the process of burying the dead, feeding and housing the homeless, and repairing its infrastructure as aid poured in from many parts of the world. The exact death toll from the earthquake will most likely never be known particularly because large numbers of the dead were unaccounted for in the path of the fire. It is clear that the official number given in 1907 of 478 persons is grossly incorrect. Gladys Hansen, the former city librarian, has estimated the number at more than 3,400 dead, and recently the Board of Supervisors has agreed to do a recount in order to obtain a more accurate number.

The city rapidly rose out of the debris after the disaster. Six thousand buildings had been completed by the summer of 1907, and three thousand others were under construction. The decision was made to rebuild as quickly as possible and not take advantage of the newly proposed Burnham Plan. This plan had been formulated prior to 1906, and was commissioned to enrich the city with grander boulevards and parks. It was ironic, therefore, that nature had presented the city with a unique opportunity to undertake a complete redesign of the downtown area. The opportunity was passed over as the city moved forward, as quickly as possible, with reconstruction.

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