Geological History of the Transbay Site

TJPA
TRANSBAY JOINT POWERS AUTHORITY

The Transbay excavation is a geological time machine! In order to build the new Transbay Transit Center, the site is being excavated to a depth of 55-65 feet. During construction of the new Transbay Transit Center, the Transbay Joint Powers Authority (TJPA) has uncovered evidence of San Francisco's geological history and early settlement. Each deeper soil layer is older than the last with the deepest being almost 100,000 years old.

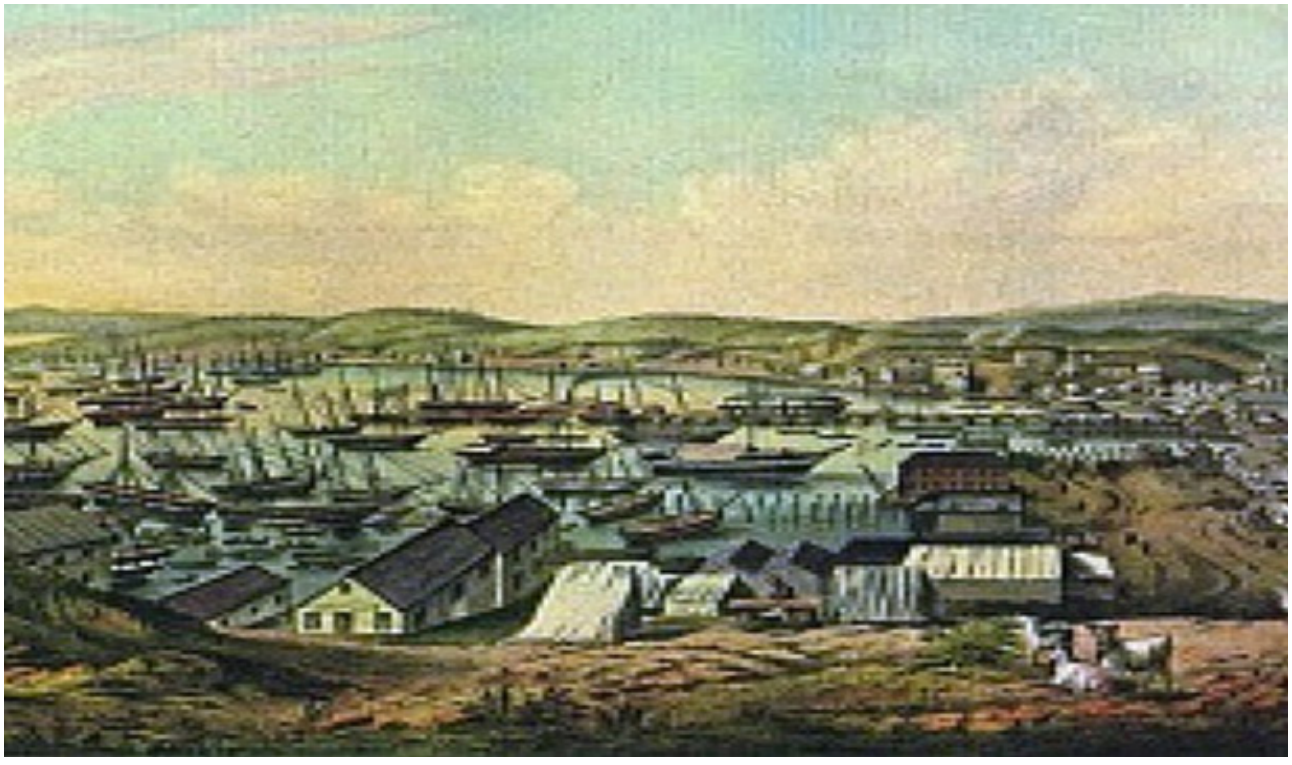
1906 Earthquake debris (Present day to 1906) Street Level to 10 feet deep

San Francisco rose from the ashes of the 1906 earthquake. The rebuild was impressive, resulting in the Golden Gate Bridge (1937), the Bay Bridge (1936) and the opening of the former Transbay Terminal (1939). As part of the recovery effort, debris was used to fill in the South of Market area to current street level, including the area where the former Transbay Terminal was built.

Gold Rush 49er Artifacts (1849 to 1906) ~10 feet to ~15 feet deep

After the Gold Rush, San Francisco had grown to the edge of Yerba Buena Cove (the waterfront was then just east of First Street). As the population continued growing, the lower part of the city advanced on piers into the Bay. Materials found in this area included the old foundations and privies used by residents and businesses in the new "Boomtown" that had emerged.

San Francisco Harbor Circa 1850



Dune Sand (less than 12,000 years old) ~15 to 20 feet deep

Back in the 1800s San Francisco was mostly sand dunes. Early photographs and a 1852/53 Coast Survey show a 60 foot tall sand dune along Howard Street between First and Second Streets. As the city quickly grew, city streets such as Market and Mission were extended eastward onto piers into Yerba Buena Cove. Sand from the dunes was used to fill in the mud flats and coves that were prevalent along the waterfront and, over time, filled in the areas under the piers where the tides of the bay had once ebbed and flowed beneath new buildings and wharves. Eventually, the dunes and sand hills were flattened, the bay was filled, and the wharves became the streets you drive on today.

Bay Mud (less than 12,000 years old) ~15 to 50+ feet deep

Beneath that layer of dune sand we find the bay mud layer. This soil layer was deposited in Yerba Buena Cove by silts and clay particles settling out from San Francisco Bay. Bay mud extends to depths of 50+ feet and represent deposits from the 1800's to about 12,000 years ago, which is very similar to what we see today in coves or marsh areas throughout the Bay Area.

Marine Sands (~8,000 to 15,000 years old) ~35 to 65 feet deep

Beneath the bay mud layer are marine sands. These sands represent the transitional period between the last ice age and the interglacial age 8,000 to 15,000 years ago.

Colma Sands (~12,000 to 110,000 years old) ~35 to 110 feet deep

Prior to marine sands was Colma Sand. Colma Sand is found at the base of the excavation and is typically yellowish and orange-brown. This sand was deposited during the last ice age, approximately 12,000 to 100,000 years ago. At this time, the bay was a dry valley with rivers flowing out through the Golden Gate and into the Pacific Ocean. The coast line was approximately where the Farallon Islands are today.

Old Bay Clay (more than 100,000 years old) ~110 feet deep

Finally, we reach the Old Bay Clay, which is greenish-blue. This material is roughly 100,000 to 130,000 years old and was deposited prior to the last ice-age approximately 100,000 years ago. At that time, the ocean filled San Francisco Bay making it similar to what we see today.