Joe Shoulak Graphics

Informational Graphics
Illustration

Web: www.joeshoulak.com
Email: joe@joeshoulak.com
Ph: (510) 520-6841

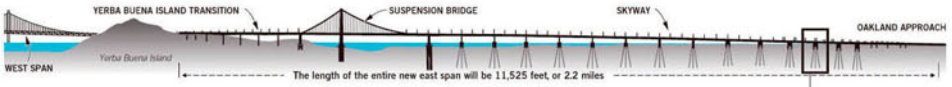
Joe Shoulak Graphics has been creating visual solutions for clients since 1991. An award-winning illustrator, Joe has a knack for boiling down the complex into clear, engaging, and attractive presentations. Informational graphics are a particular specialty.

Joe's work at the San Francisco Chronicle and Examiner earned him nationwide recognition from his peers. As Senior Illustrator at XPLANE in Portland, Oregon, he and his team provided creative solutions for clients including Fortune 500 companies.

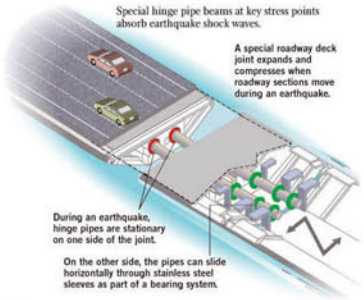
Joe works on a Mac, and is fluent in graphics/illustration software, primarily Adobe Illustrator and Adobe Photoshop. He has a working knowledge of Poser, QuarkXpress, Flash, DreamWeaver and InDesign.

Engineering the new Bay Bridge

In a region where the people are used to the earth moving, they need a bridge that can move with it.
That was the aim of designers who used a variety of techniques to make the new east span as safe as possible in case of a large earthquake.

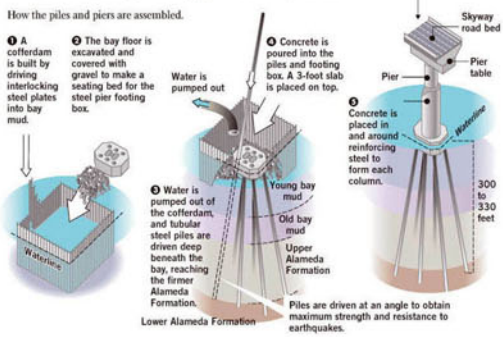


Topped by a flexible roadway ...



... anchored by strong piles and piers ...

How the piles and piers are assembled.



... and supported by a tower that will bend, not break ...

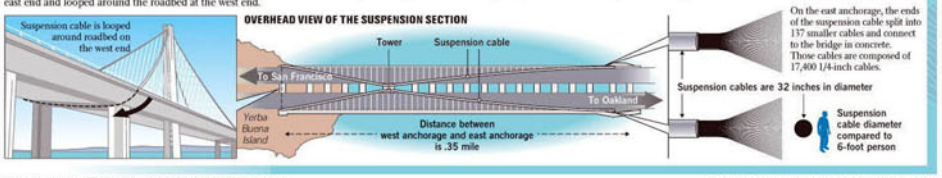
Rising 525 feet above sea level -- same height as the tallest tower on the west span -- its four separate legs are connected by crossbeams, also known as shear links or sacrificial fuses. In the event of a major earthquake, these beams will deform as they absorb earthquake forces, sparing the tower from damage. The crossbeams are designed to be replaced.

SHEAR LINKS

Shear links are made of steel and are engineered to flex during an earthquake.

... the structure will be the largest self-anchored, single-tower suspension bridge in the world

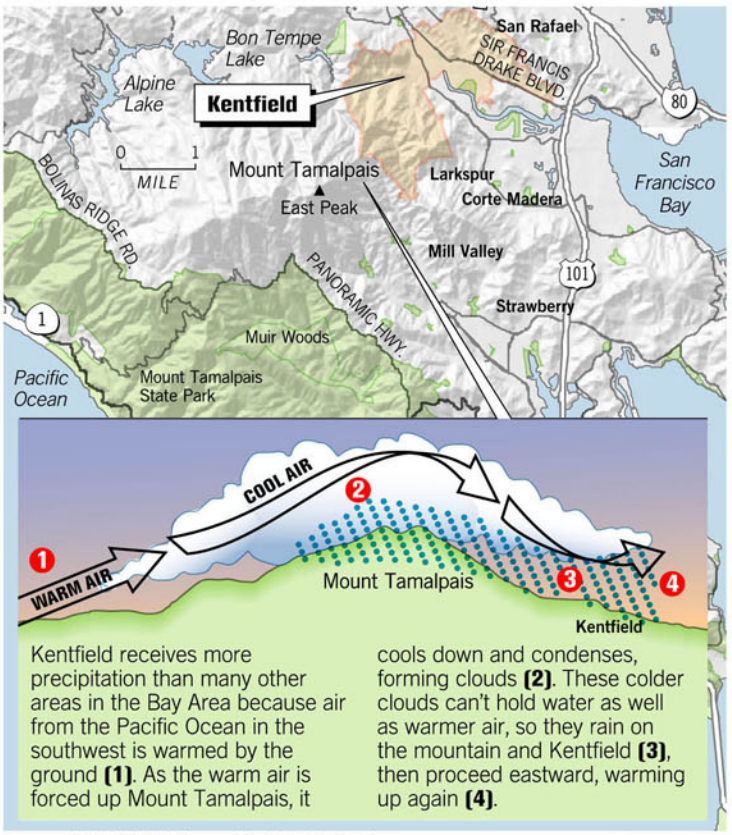
In a self-anchored suspension bridge, the tension in the cables is resisted not by anchorages in the soil but by compression in the deck girder. The suspension cable is anchored to the deck at the east end and looped around the roadbed at the west end.



Source: Caltrans; T.Y. Lin International, Moffatt & Nichol joint venture; www.newbaybridge.org

Joe Shoulak, Todd Trumbull and John Blanchard / The Chronicle

Orographic rainfall



Kentfield receives more precipitation than many other areas in the Bay Area because air from the Pacific Ocean in the southwest is warmed by the ground **(1)**. As the warm air is forced up Mount Tamalpais, it cools down and condenses, forming clouds **(2)**. These colder clouds can't hold water as well as warmer air, so they rain on the mountain and Kentfield **(3)**, then proceed eastward, warming up again **(4)**.

Sources: ESRI, USGS, Geographic Data Technology

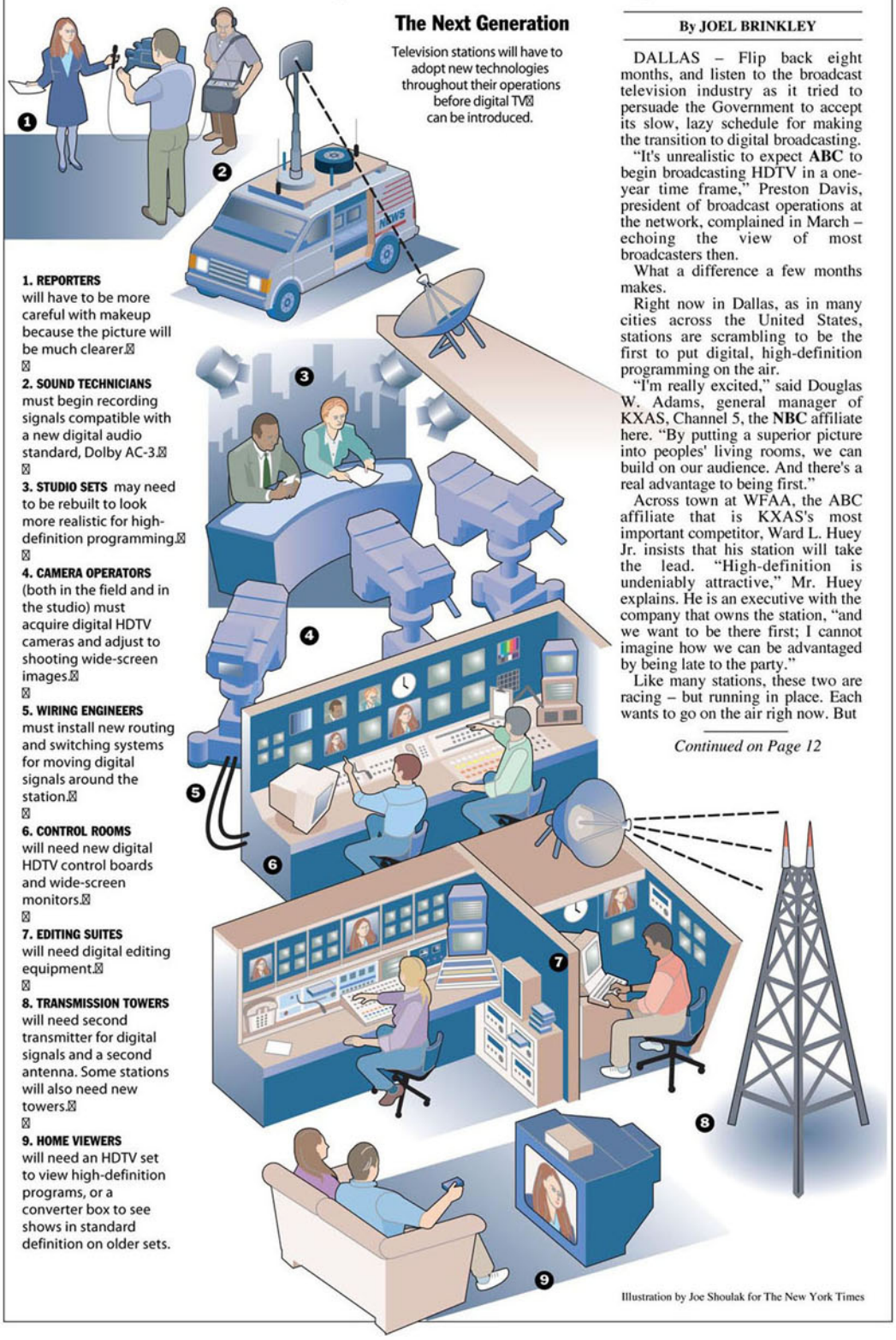
The Chronicle

Getting the Picture

TV Stations Develop New Enthusiasm for Digital Future

The Next Generation

Television stations will have to adopt new technologies throughout their operations before digital TV can be introduced.



1. REPORTERS will have to be more careful with makeup because the picture will be much clearer.

2. SOUND TECHNICIANS must begin recording signals compatible with a new digital audio standard, Dolby AC-3.

3. STUDIO SETS may need to be rebuilt to look more realistic for high-definition programming.

4. CAMERA OPERATORS (both in the field and in the studio) must acquire digital HDTV cameras and adjust to shooting wide-screen images.

5. WIRING ENGINEERS must install new routing and switching systems for moving digital signals around the station.

6. CONTROL ROOMS will need new digital HDTV control boards and wide-screen monitors.

7. EDITING SUITES will need digital editing equipment.

8. TRANSMISSION TOWERS will need second transmitter for digital signals and a second antenna. Some stations will also need new towers.

9. HOME VIEWERS will need an HDTV set to view high-definition programs, or a converter box to see shows in standard definition on older sets.

By JOEL BRINKLEY

DALLAS – Flip back eight months, and listen to the broadcast television industry as it tried to persuade the Government to accept its slow, lazy schedule for making the transition to digital broadcasting.

"It's unrealistic to expect **ABC** to begin broadcasting HDTV in a one-year time frame," Preston Davis, president of broadcast operations at the network, complained in March – echoing the view of most broadcasters then.

What a difference a few months makes.

Right now in Dallas, as in many cities across the United States, stations are scrambling to be the first to put digital, high-definition programming on the air.

"I'm really excited," said Douglas W. Adams, general manager of KXAS, Channel 5, the **NBC** affiliate here. "By putting a superior picture into peoples' living rooms, we can build on our audience. And there's a real advantage to being first."

Across town at WFAA, the ABC affiliate that is KXAS's most important competitor, Ward L. Huey Jr. insists that his station will take the lead. "High-definition is undeniably attractive," Mr. Huey explains. He is an executive with the company that owns the station, "and we want to be there first; I cannot imagine how we can be advantaged by being late to the party."

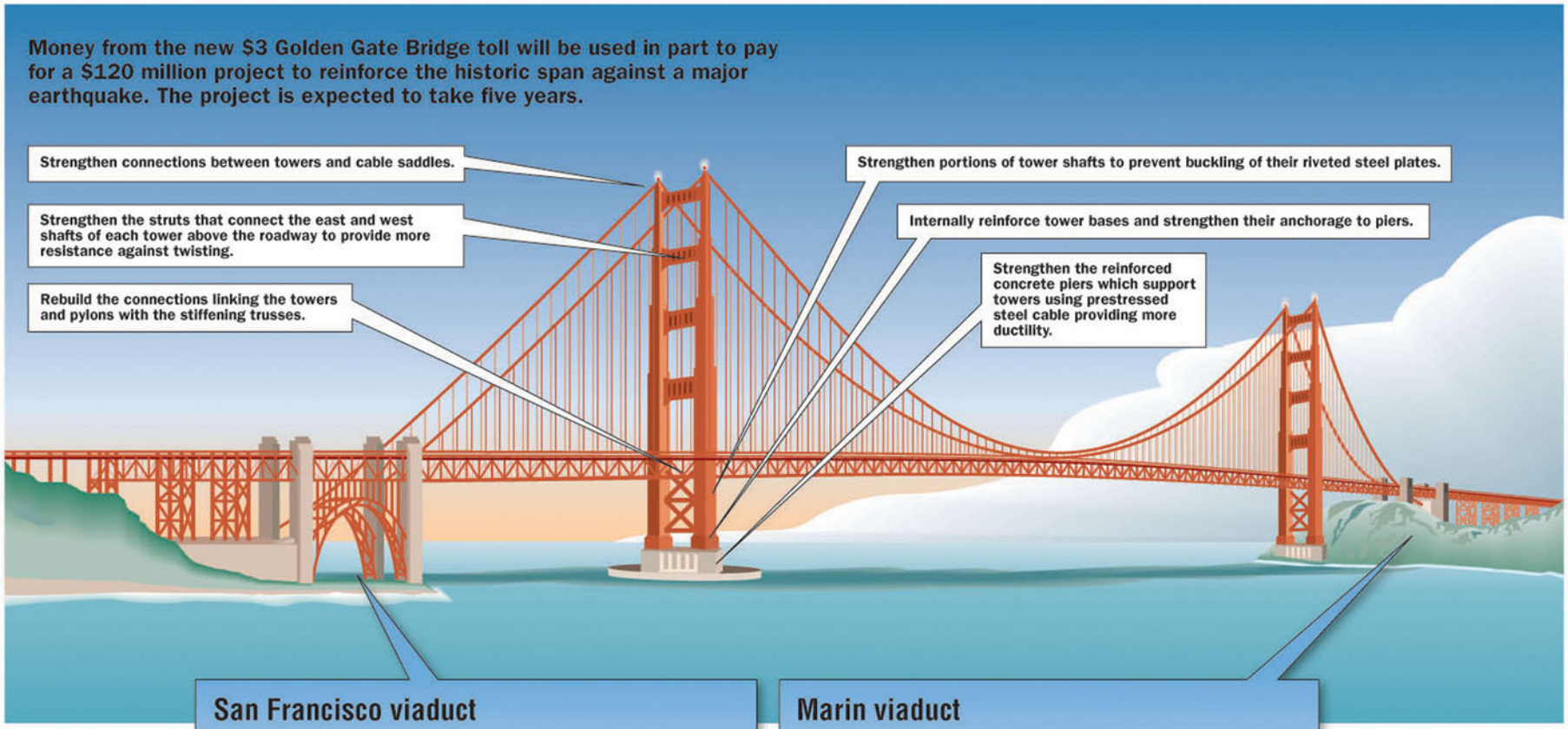
Like many stations, these two are racing – but running in place. Each wants to go on the air righ now. But

Continued on Page 12

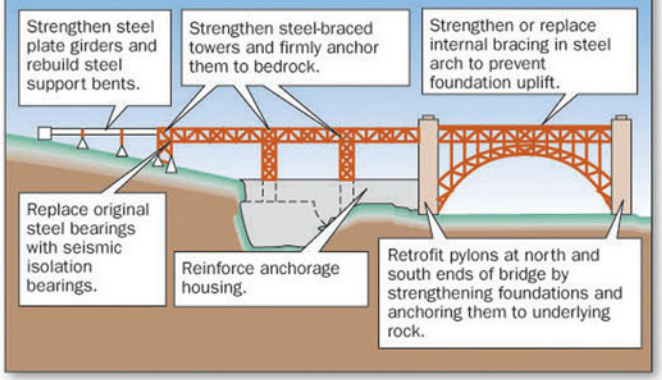
Illustration by Joe Shoulak for The New York Times

TUNING AND STRENGTHENING THE BRIDGE

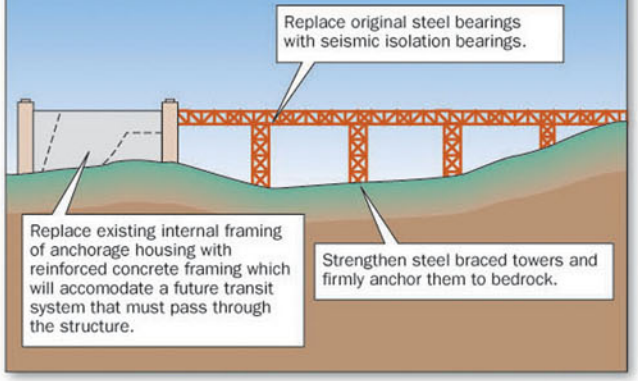
Money from the new $3 Golden Gate Bridge toll will be used in part to pay for a $120 million project to reinforce the historic span against a major earthquake. The project is expected to take five years.



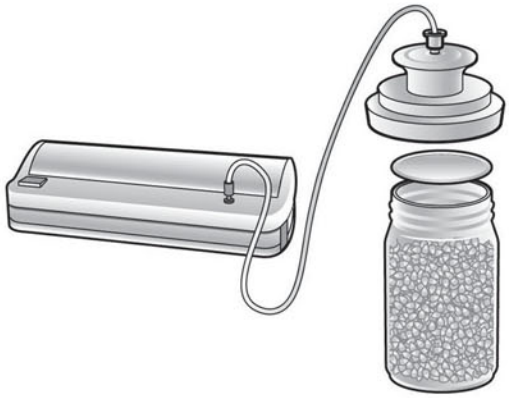
San Francisco viaduct

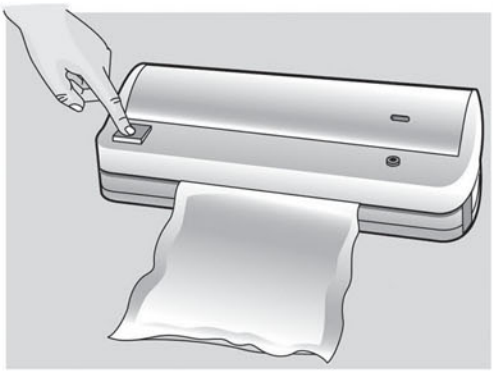


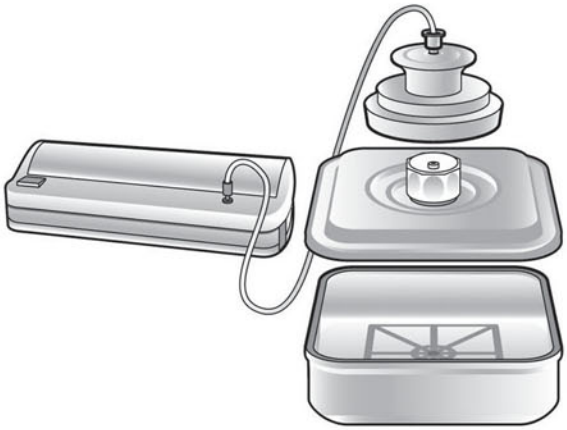
Marin viaduct

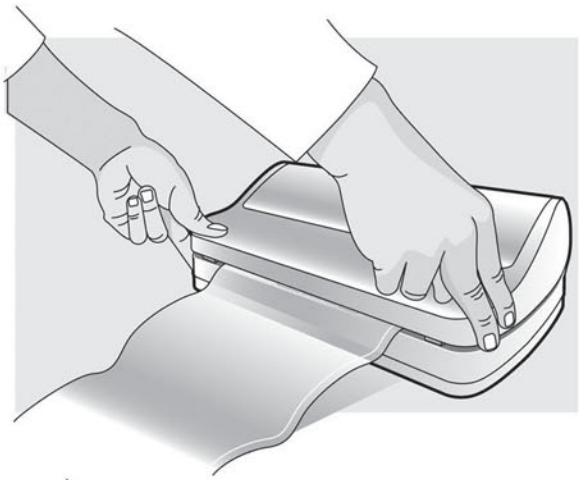


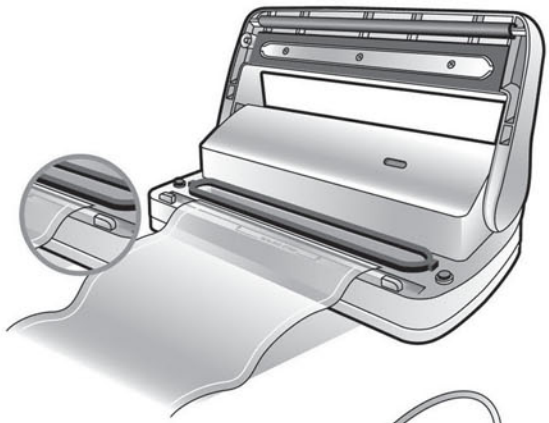
EXAMINER/JOE SHOULAK

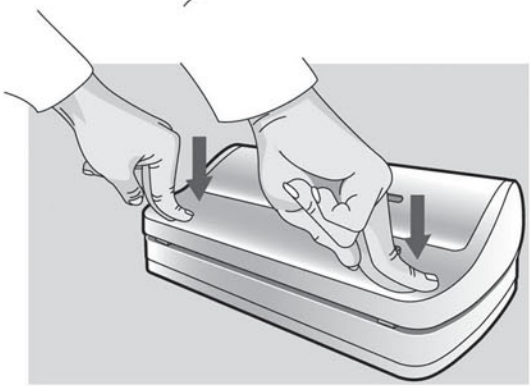


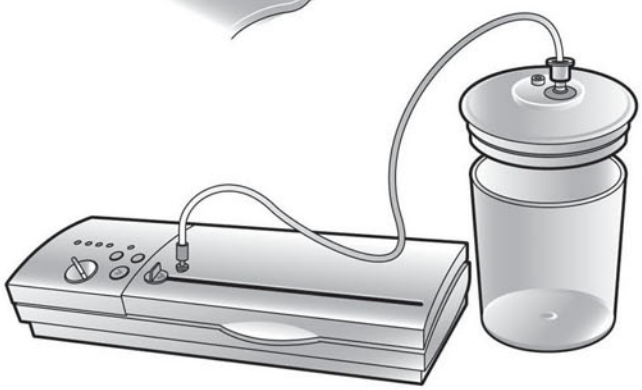


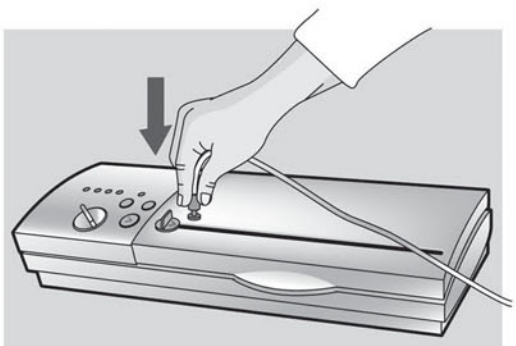










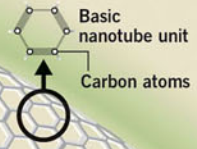


All about nanotechnology

Inventions as small as a large molecule are making big gains

Nanotechnology used to be viewed as a field that would only bear fruit well into the future. But at a growing number research institutes and companies — notably in the Bay Area — the future has already arrived. Intel's Pentium 4 processors contain transistors half the size of a virus. HP Labs has built a working 64-bit memory chip in a space so small that 1,000 could fit across the end of a human hair.

◄ Nanotubes: Promising building blocks of nanotechnology



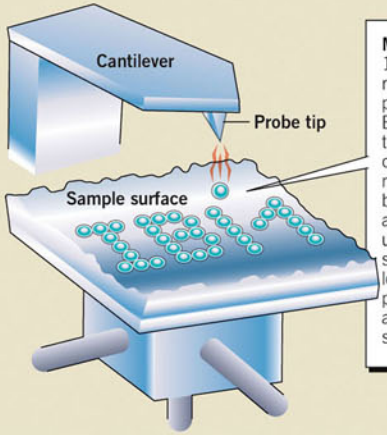
Carbon nanotubes composed of six-sided carbon rings are stronger and lighter than steel. These nanotubes may some day become the wiring in ever-smaller computer systems or structural supports in big construction projects.

Nanotechnologists study structures on the scale of 0.1 to 100 nanometers.

The unaided human eye can see things no smaller than 10,000 nanometers across

Powerful tools opened the doorway

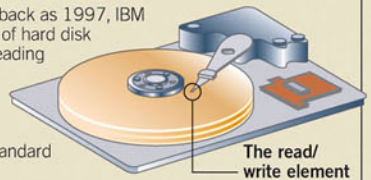
In the early 1980s IBM scientists invented the scanning tunneling microscope (STM), followed by other tools that allowed researchers to visualize individual atoms and their surface properties, like magnetism.



Making things: In 1989, IBM research physicist Don Eigler showed that the construction of materials could be controlled atom by atom. He used the STM to spell out the IBM logo by precisely placing 35 xenon atoms on a nickel surface.

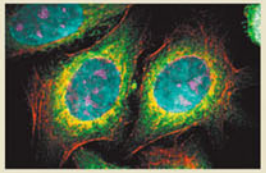
How nanotechnology is used today

► **Computers:** As far back as 1997, IBM boosted the capacity of hard disk drives using a data-reading element that contained metal layers only a few atoms thick. The technique became standard in the industry.



► **Clothing:** Eddie Bauer and other manufacturers are using fine-spun fibers to confer stain resistance on khaki pants (left) and other products.

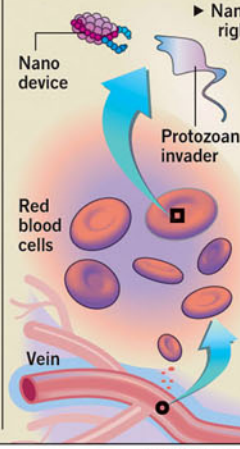
► **Quantum dots (below):** Quantum Dot Corp. of Hayward is developing semiconductor crystals that emit varying colors of light depending on their size. The nano-scale dots can be used in biological imaging for research.

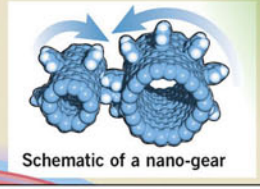


Future uses?

► **Nano-medicine (below):** Scientists may be able to design nanoscale devices that act like antibodies, recognizing infectious agents or cancer cells and targeting them for destruction.

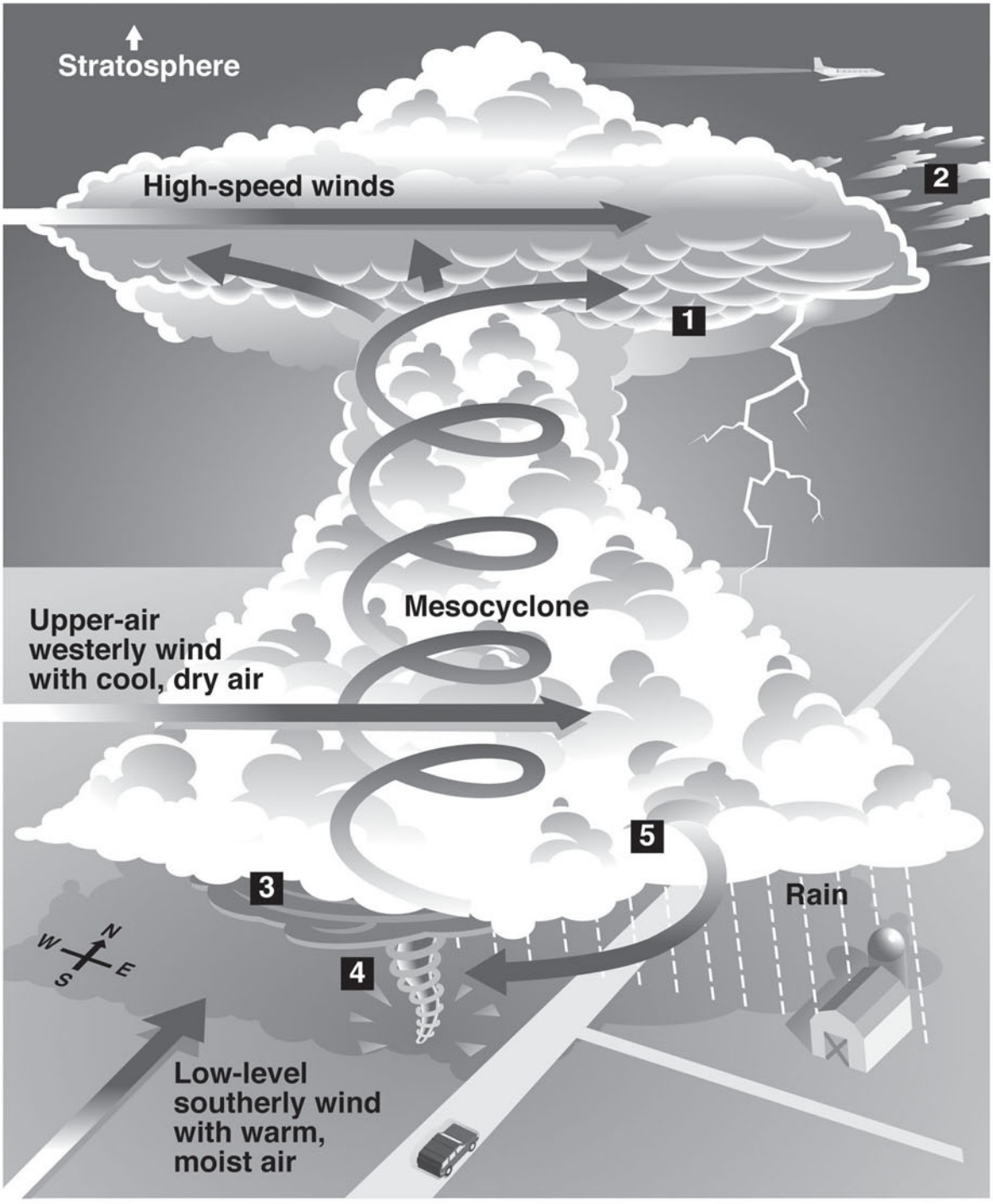
► **Nano-gears (below right):** Living things contain a toolbox of gears, motors, clamps, etc. made of proteins or other organic molecules. Nanotechnologists have been inspired to try to mimic the tiny mechanisms in cells, creating artificial devices on the nanoscale.





Sources: IBM, Hewlett-Packard, Cornell University, Rice University, New York University, Foresight Institute, Xerox PARC, Quantum Dot Corp., Eddie Bauer

Text by Bernadette Tansey, *Graphic by* Joe Shoulak / *The Chronicle*

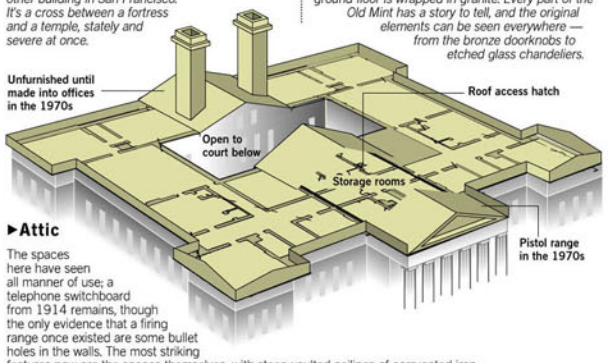


1. Rising warm air condenses and forms bumpy mamatocumulus clouds under the thundercloud's "anvil."
2. High-speed winds freeze water vapor, creating wispy, crystalline cirrus clouds atop the storm's "anvil."
3. Wall cloud.
4. Tornado.
5. Rain causes cold downdraft that either (a) snuffs out the mesocyclone tornado or (b) generates its own low-level wind shear, forming a new tornado.

Layout of the Old Mint

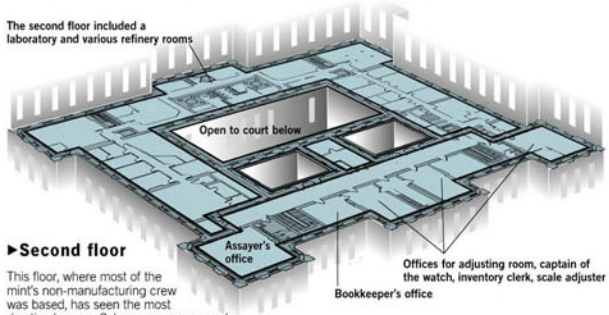
This 1874 structure designed by U.S. Treasury Supervising Architect Alfred B. Mullett is like no other building in San Francisco: It's a cross between a fortress and a temple, stately and severe at once.

The doors behind the 30-foot-high sandstone columns at the main entrance are iron; the entire ground floor is wrapped in granite. Every part of the Old Mint has a story to tell, and the original elements can be seen everywhere — from the bronze doorknobs to etched glass chandeliers.



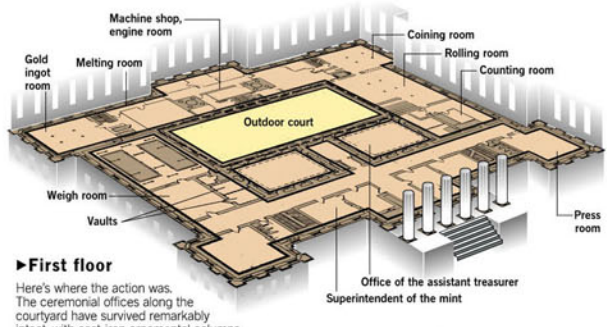
▸Attic

The spaces here have seen all manner of use; a telephone switchboard from 1914 remains, though the only evidence that a firing range once existed are some bullet holes in the walls. The most striking features now are the spaces themselves, with steep vaulted ceilings of corrugated iron. Also of note: two huge brick chimneys framing the western attic. Seismic hazards, but they show the building's industrial past — and preservationists say they should not be removed.



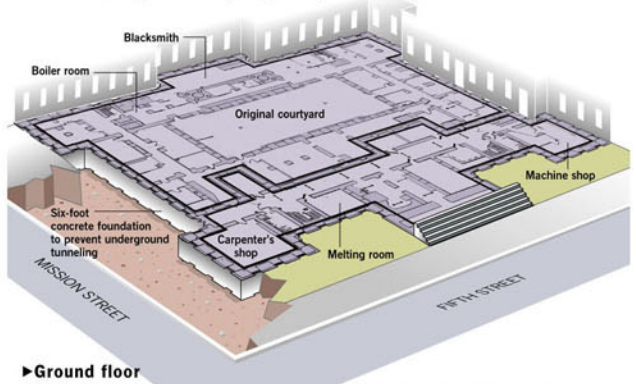
▸Second floor

This floor, where most of the mint's non-manufacturing crew was based, has seen the most drastic changes. Columns were removed and ceilings lowered when it was turned into space for computers in the 1970s. But some original features remain, including pink marble fireplaces and curving metal stairways that lead to the attic.



▸First floor

Here's where the action was. The ceremonial offices along the courtyard have survived remarkably intact, with cast-iron ornamental columns topped by ornamental molding and balconies once occupied by armed guards. The rest of the floor is where coin production took place — metals were melted in furnaces, cast into ingots, then flattened to the proper thickness in the rolling room and finally stamped into spendability in the press room.



▸Ground floor

When the mint opened in 1874 this was filled with some coin production and such basics as coal storage and the blacksmith's shop. But as gold reserves grew, so did the need to guard them — which is why some of the most interesting parts of the building now are granite- and metal-lined vaults. Also of note: brick ceilings with iron beams and the original stone floors. The courtyard once allowed light in here, but it was topped off before 1914 so an engine room could be added to the basement. Two of the three development proposals would reopen the space.

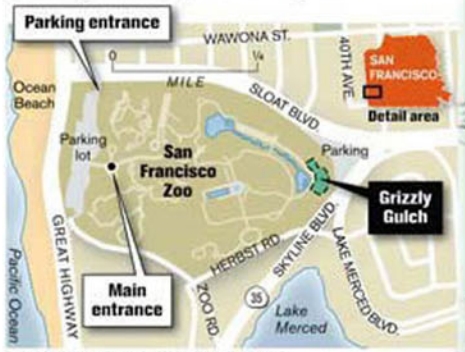
TEXT BY JOHN KING, DRAWINGS BY JOE SHOULAK / *The Chronicle*

The new Hearst Grizzly Gulch at the San Francisco Zoo

The new grizzly bear exhibit at the San Francisco Zoo is the largest grizzly exhibit in a United States zoo.

The entire exhibit encompasses about an acre.

Rocks were brought from the Sierra, and California native vegetation was planted throughout.



Source: ESRI, TeleAtlas, San Francisco Zoo

The 4-year-old twin sisters

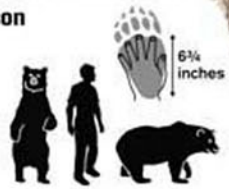
Kachina and Kiona were on the verge of being euthanized in Montana after ransacking a rancher's barn when they were rescued by the San Francisco Zoo in fall 2004.

Kachina likes to sit upright and greet onlookers with a wave. She is fond of her sister but tends to tease her, picking fights with her and taking away her ball and milk- crate toys. She likes a tidy meal, and her favorite food is fish.

Kiona tends to get pushed around by Kachina. She can't go one day without a long swim and enjoys an afternoon nap in the sun. She loves a hearty helping of honey and likes to snack on floundering fish.

Size comparison

One of the bears standing on her hind legs is just under 6 feet. When on all fours, the bear is 3 to 3½ feet in height.



Source: San Francisco Zoo

Joe Shoulak / The Chronicle

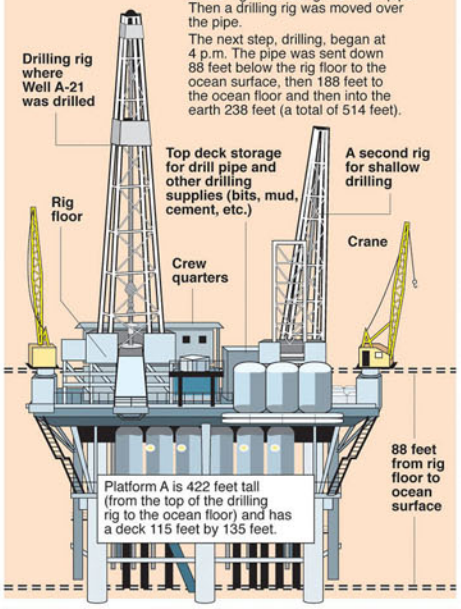
HOW THE SPILL OCCURRED

1 The platform

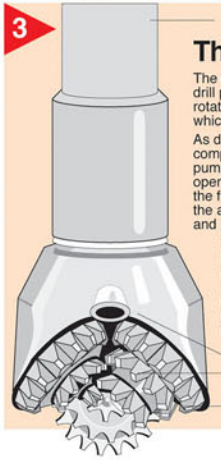
Union Oil Platform A was placed in the Santa Barbara Channel in 1968. By January 1969, three wells were drilled without incident. On Jan. 14, routine drilling procedures began on the fourth, Well A-21.

First, an initial hole was pounded into shallow ground using a 24-inch pipe. Then a drilling rig was moved over the pipe.

The next step, drilling, began at 4 p.m. The pipe was sent down 88 feet below the rig floor to the ocean surface, then 188 feet to the ocean floor and then into the earth 238 feet (a total of 514 feet).



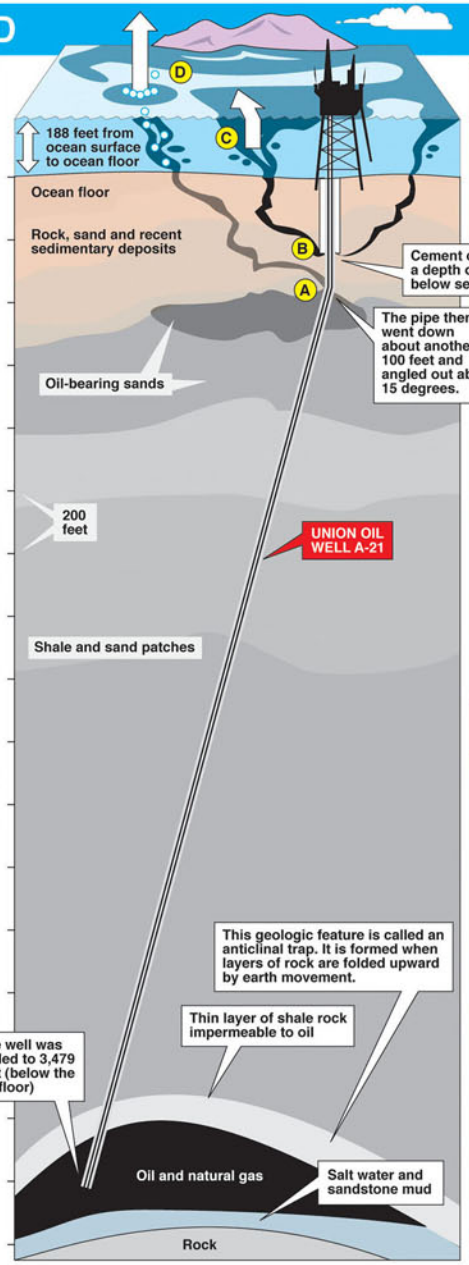
3 The drilling



The drill bit is attached to hollow drill pipe. The bit and drill pipe are rotated against the sub-sea formation which fractures the rock into chips.

As drilling progresses, fluids or muds composed mostly of clay and water are pumped down the pipe and through openings in the bit. After exiting the bit, the fluids go back up the hole through the annulus (the area between the hole and pipe).

The purpose of these fluids is to remove the cuttings from the bottom of the drill hole and carry them to the surface for removal, to lubricate and cool the drill bit and to seal the wall of the well.



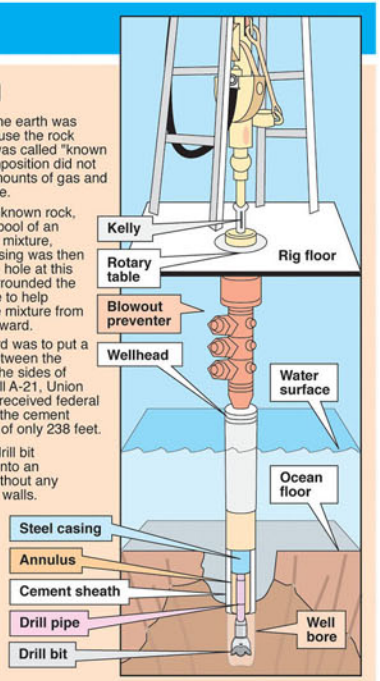
2 The rig

Drilling 238 feet into the earth was considered safe because the rock had been studied. It was called "known rock" because its composition did not contain dangerous amounts of gas and oil under high pressure.

Drilling deeper into unknown rock, however, could tap a pool of an oil and gas mixture, so steel casing was then put into the hole at this point. It surrounded the drilling pipe to help prevent the mixture from blasting upward.

A further safeguard was to put a cement sheath between the steel casing and the sides of the hole. With Well A-21, Union Oil asked for and received federal permission to put the cement sheath to a depth of only 238 feet.

Below that level, the drill bit continued downward into an unknown formation without any protection on the side walls.



4 The blowout

At 3,479 feet the drill had reached oil and gas. The crew pulled out the drill pipe with the bit on the end and it was partially out of the hole.

At about 10:45 a.m. January 28, the well started to produce. Oil and gas erupted out of the top of the pipe.

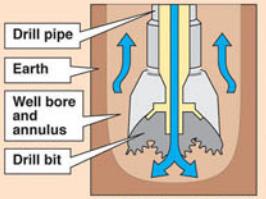
To protect themselves from the flammable gas, the crew activated the blowout preventer which effectively choked off the gas and oil (under the rig floor) and closed the hole.

- **A** Some of the oil and gas leaked from the unprotected hole through fissures in the earth here.
- **B** Most of the oil and gas leaked through the fissures at the end of the cement sheath.
- **C** Oil and gas rose to the ocean floor and then up to the surface of the water.
- **D** Gas bubbles and oil on the surface signaled that a blowout had occurred.

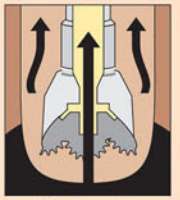
In the first few days, a series of measures were taken to stop the flow. They included:

- Forcing 13,000 barrels of drilling fluids and 1,150 sacks of cement into the well hole and fissures.
- Opening the other three wells to produce oil and relieve the gas pressure.

Well A-21 is now completely filled with cement to the 238-foot level.



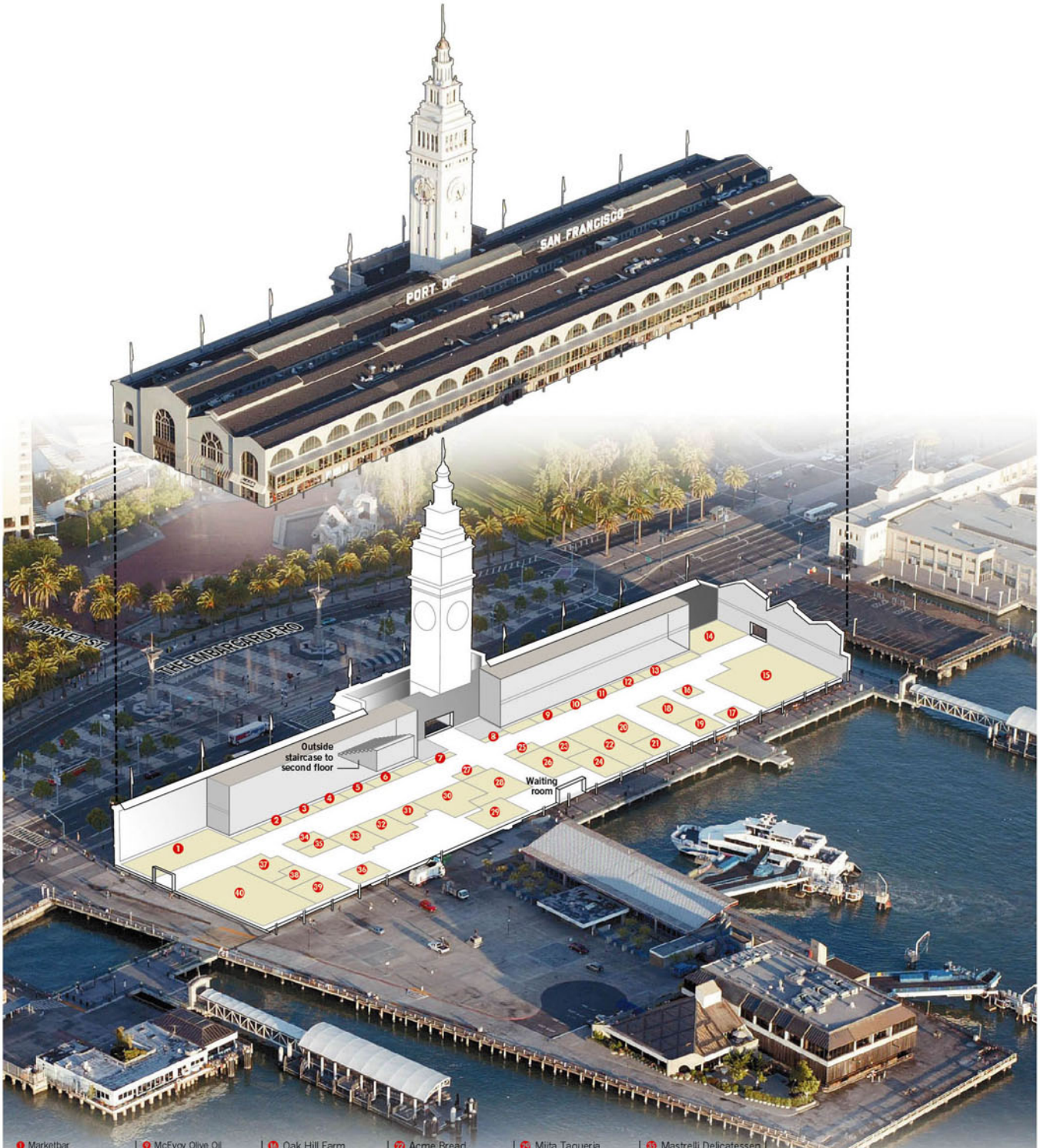
Arrows indicate ordinary drilling fluids circulation



Oil and gas flow just before blowout

SOURCE: News-Press, Unocal

Joe Shoulak/News-Press



1. Marketbar
2. Far West Fungi
3. Pottery Family Farms
4. Recchiuti Confections
5. Stonehouse Olive Oil
6. The Gardner
7. Bay Crossing
8. Kingdom of Herbs
9. McEvoy Olive Oil
10. Scharfenberger Chocolates
11. Tsar Nicolas caviar
12. Mette Cakes
13. Ciao Bella Gelato
14. Taylor's Refresher
15. Slanted Door
16. Oak Hill Farm
17. Mistral Rotisserie
18. Farmer's Garden Produce
19. Hog Island Oyster Bar
20. Golden Gate Meats
21. Ferry Plaza Seafood
22. Acme Bread
23. Cowgirl Creamery
24. Book Passage
25. LuLu Petite
26. Peet's Coffee
27. Capay Organic
28. Delica Prepared Foods
29. Mijta Taqueria
30. Ferry Plaza Wine Merchant
31. Imperial Tea Court
32. Village Market
33. San Francisco Fish Company
34. I Preferiti Di Boriana
35. Mastrelli Delicatessen
36. Frog Hollow Farm
37. Culunare
38. Mailroom
39. Boulett's Larder
40. Sur la Table

 | www.joeshoulak.com | joe@joeshoulak.com | (510) 520-6841