
Work for Others

Besides responding to FEMA missions, the Corps provided assistance to other federal and state agencies as requested. The Corps, for example, responded to a request from CALTRANS for a "forensic" engineering study of the collapsed I-880 section in Oakland, California. The two-tiered elevated structure, the Cypress Street Viaduct, fed traffic from Oakland onto the Bay Bridge. During the earthquake, the upper deck fell onto the lower deck, crushing motorists. Widespread interest focused on discovering exactly why the structure failed.



A collapsed section of the two-tiered I-880 in Oakland, California.

On 18 October, after visiting the collapsed Cypress Street Viaduct, Colonel LeCuyer contacted Robert K. Best, the director of CALTRANS, to offer help in the cleanup and removal of the structure. At the request of CALTRANS, on 19 October, Sacramento District officials provided a general

plan for the work. A forensic engineering study was to be included, presumably to be conducted by or at the direction of CALTRANS. Best favored the forensic study because it would:

- Establish the facts concerning the standards by which the bridge was designed, constructed, and retrofitted.
- Document the damage and establish how the structure failed.
- Determine the performance of existing seismic restrainers.
- Determine the condition and performance of the footings and piles.
- Provide new knowledge concerning details and materials for use in future seismic retrofit projects.¹⁰¹

CALTRANS officials asked the Sacramento District to contract with an expert engineering firm to conduct a detailed study. The Corps had to move quickly before the entire viaduct was demolished.¹⁰² On 26 October, Best asked General Sobke to proceed with the selection of the consultant engineers for the forensic engineering study. Sobke realized that such a study could put the Corps in the position of criticizing CALTRANS and the engineers who had constructed the freeway, and he knew that others were already making assessments. When General Hatch visited the area on 26 October, Sobke asked him for guidance.

General Hatch informed General Sobke that the forensic study mission was not appropriate for the Corps of Engineers. The Department of Transportation's Federal Highway Administration had the principal oversight and funding authority to conduct the proposed forensic analysis and the Corps would defer to it. Moreover, a congressional committee had asked the National Institute of Standards and Technology to study the I-880 collapse. Additional studies were under way at the state level, including Governor Dukemejian's Blue Ribbon Commission, and Corps officials wanted to avoid any duplication of effort. The issue of the I-880 collapse was controversial and sensitive, and General Hatch did not want the Corps to put itself in the position of criticizing the work of other engineers.¹⁰³

Although the Corps declined the forensic study mission, the Sacramento District sent four people to the site to create a record of the failed structure for future reference. Between 20 and 23 October, they took hundreds of photographs and recorded hours of videotape of the structure, which they later turned over to the state. The district also developed a contingency plan for demolishing the failed sections and contacted other districts to identify personnel and companies with heavy-lift experience and equipment. District officials pulled the team off the site with 75 percent of their documentation effort complete, and the structure was demolished soon after. The technical information that the district compiled proved to be a very valuable resource for post-earthquake response studies.¹⁰⁴

Besides the request for a forensic study, on 20 October, CALTRANS asked the Corps to help clean up the Cypress Street Viaduct. CALTRANS could handle the removal of debris, but it needed the Corps' help in obtaining a disposal site for the estimated 60,000 cubic yards (120,000 tons) of heavily reinforced concrete to be removed from the collapsed structure.¹⁰⁵

On 25 October, the Sacramento District and the South Pacific Division representatives met with CALTRANS and others to discuss potential ocean disposal sites. Corps personnel explained that because the I-880 rubble was not dredge or fill material, the Corps had no permit authority for disposal beyond the three-mile limit. The Corps tried to locate a site acceptable to the federal agencies involved in the approval process. After evaluating various alternatives, they identified a deep-water site roughly 30 nautical miles west of the Golden Gate Bridge as the most feasible.

Corps officials also explained that to expedite the disposal of rubble, CALTRANS needed to obtain an exception to the Ocean Dumping Act. The basis was to allow the placement of materials at this site to enhance the development of fisheries resources. Under the applicable regulations, the National Oceanographic and Atmospheric Administration (NOAA), the U.S. Coast Guard, the Environmental Protection Agency, and the Corps of Engineers had to concur before the site was used.¹⁰⁶ The Environmental Protection Agency gave the site

preliminary approval as a “fisheries resources site” and obtained the necessary concurrence from the U.S. Coast Guard and the Corps. However, NOAA’s approval was stalled because of objections from commercial fishing interests.

Another potential site, about six miles out and known as the “BART site,” was also proposed, but with a caveat that time-consuming coordination with numerous agencies was required. An upland disposal alternative, which the port and CALTRANS had been discussing, was mentioned. The Corps representatives cautioned that portions of the Oakland airport could not be used due to wetlands classification. On 30 October, Colonel LaCuyer provided CALTRANS with a report identifying various aquatic and upland disposal sites.¹⁰⁷

Besides work for CALTRANS, the Corps also provided support to the Port of Oakland. The Oakland airport, owned and operated by the Port of Oakland, suffered \$30 million in damage. It had to be repaired immediately to handle the increasing demands resulting from the earthquake. The major damage was to its 10,000-foot air-carrier runway and parallel taxiway. Massive cracks in both had taken a third of the taxiway and runway out of service. In addition, the dike along the eastern side of the runway that held back the bay waters had been damaged significantly.

The failure of the Bay Bridge and the I-880 section had greatly increased the demands on the Oakland airport. Several air carriers announced plans to increase the number of flights into Oakland because of limited access to the San Francisco airport. The Oakland airport was also one of the nation’s largest aircraft maintenance facilities. Military Air Command flights between the United States and Korea, Japan, and the Philippines could not operate from Oakland without the repairs.¹⁰⁸

The Port of Oakland’s maritime facilities also suffered \$75 million in damage; \$50 million of this was to the port’s Seventh Street Marine Terminals, constructed in the 1960s. Because the 75-acre Seventh Street Public Container Terminal was inoperable, the port was losing an important source of revenue. The other \$25 million in damages occurred throughout the port area and included subsidence damage to utilities, wharves, and other harbor structures.

The port facilities were particularly critical in the wake of the earthquake. After the closing of the Bay Bridge, the major transportation link between East Bay and San Francisco, a passenger ferry system had been established at the port. The port was a major export facility for California Central Valley agricultural products as well as cargoes from the inland areas of the United States destined for the Pacific Basin. It was also important for national defense. Portions of the port's Outer Harbor Terminal were located on waterfront property leased from the U.S. Army. The port's rent payments were used for rehabilitating the Army's wharf facilities. Federal legislation authorized such leasing arrangements to assure that the U.S. military services could maintain adequate shipping facilities at minimal cost to taxpayers.¹⁰⁹

At the request of the Port of Oakland, the Sacramento District inspected the port and Oakland airport and prepared preliminary damage assessments. The district was tasked with doing the preliminary damage assessment only, and by 24 October, it had 20 inspectors at work. The San Francisco District would perform a disaster survey report with assistance from the Sacramento District if necessary. Port of Oakland authorities estimated the damage to be \$108 million, including damage to the Oakland airport. The Federal Aviation Administration delivered \$8 million of \$17 million in emergency funding for the airport on 27 October.¹¹⁰

Occasionally, work for others took the form of technical assistance. The U.S. Department of Education, for example, asked the Corps to survey damage to school districts in the declared counties. The Corps also wrote disaster survey reports for San Francisco International Airport for the Federal Aviation Administration. The Los Angeles District structural engineers helped the General Services Administration inspect federal facilities in San Francisco. Engineers were also assigned to the Presidio and Oakland Army Base to help with damage assessments. The Small Business Administration tasked the Corps to provide eight people to verify damages beginning 4 January 1990.¹¹¹