

Lahaina WASTEWATER PUMP STATION NOS. 5 & 6 FORCEMAIN REPLACEMENT

2006 STATE OF HAWAII



PISCES AWARD



TRAFFIC CONTROL - The construction site borders Front Street, a busy roadway filled with shops and restaurants. Crews must detour traffic around the construction site, and this poses daily challenges.



MANHOLE REHABILITATION - Existing sewer manholes were re-channelized (top left) and protected with an epoxy coating (bottom right).

PROJECT TEAM

Agency: County of Maui, Department of Environmental Management, Wastewater Reclamation Division
Contractor: Frank Coluccio Construction
Civil Engineer: Ronald M. Fukumoto Engineering, Inc.
Mechanical Engineer: Engineering Dynamics Corp.
Electrical Engineer: Morikawa & Associates LLC
Archaeologist: Scientific Consultant Services, Inc.
Planner: Munekiyo & Hiraga, Inc.
Funding: US EPA Clean Water State Revolving Fund

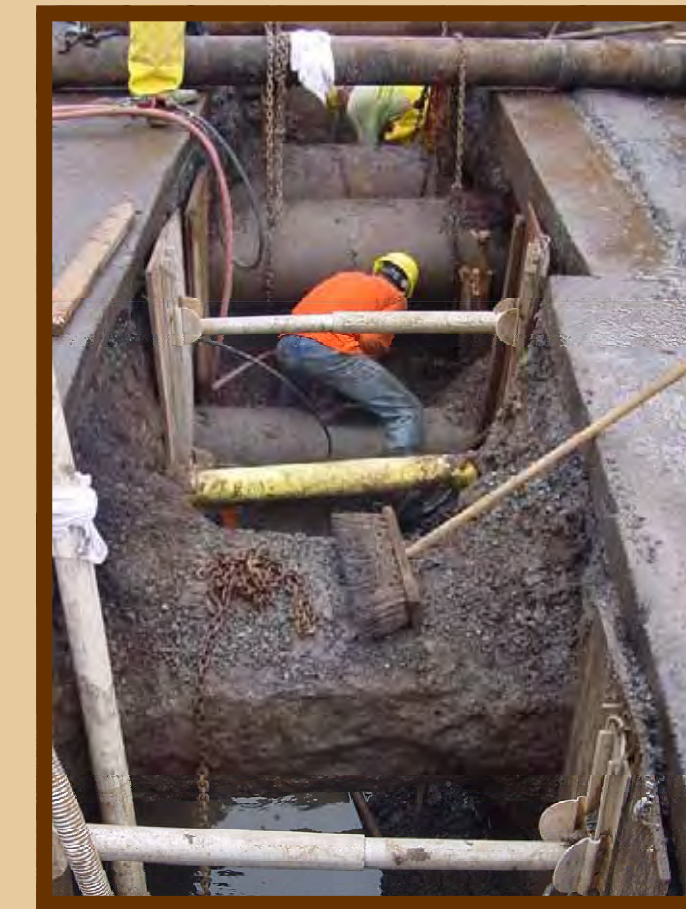
PROJECT DESCRIPTION

The Lahaina Wastewater Pump Station Nos. 5 & 6 Forcemain Replacement is a \$3.3 million maintenance project in West Maui for the County's Wastewater Reclamation Division (WWRD). The project is located on Front Street, Shaw Street, and Honoapiilani Highway in Lahaina, Maui. Along Front Street and Shaw Street, the project adjoins numerous residences, 505 Front Street's shops and restaurants, and the Lahaina Shores Beach Resort. Along the state highway, the project adjoins various residential and commercial properties, and the County Department of Parks and Recreation's Lahaina Aquatic Center.

The project included outfitting both pump stations with new pumps and controls and replacing cast iron wastewater lines, some dating back to 1948 and 1965, with polyvinyl chloride (PVC) lines. Line replacements along Front Street consisted of 550 feet of 10-inch PVC, C900 forcemain and 1,400 feet of 12-inch PVC, SDR 35 gravity sewerline from Pump Station No. 6 to Pump Station No. 5. The work along Shaw Street and Honoapiilani Highway included 4,350 feet of 16-inch PVC, C905 forcemain and 40 feet of 18-inch PVC, C905 forcemain from Pump Station No. 5 to a connection point on Dickenson Street.



UTILITY CONFLICTS - The new sewerline crosses many existing utility lines, requiring field adjustments and concrete encasements.



ENGINEERING DIFFICULTY

Engineers are required to perform many duties. Technical construction issues are not the only challenges engineers face. Actually, it is often said technical issues are only a small percentage of engineers' decisions over their career. This project's challenges were faced in the management and planning phases which rely on sound engineering judgment. WWRD is faced with assessing the condition of the wastewater reclamation system, allocating budget dollars to the prioritized installation, repair and maintenance projects, and lobbying for funds when their budget falls short. This is a daunting task for an expanding and aging system.

CONSTRUCTION DIFFICULTY

Replacing utility lines through a developed area is always challenging. Once the shovel hits the ground, it is a gamble as to what will be uncovered. Potential utility crossing conflicts are

increased when installing wastewater lines, typically the deepest relative to all other utility lines. Complications are guaranteed when working on the congested Front Street in historic Lahaina town. Field adjustments and design changes were required to accommodate unforeseen underground utility conflicts.

ENVIRONMENTAL CONSIDERATIONS

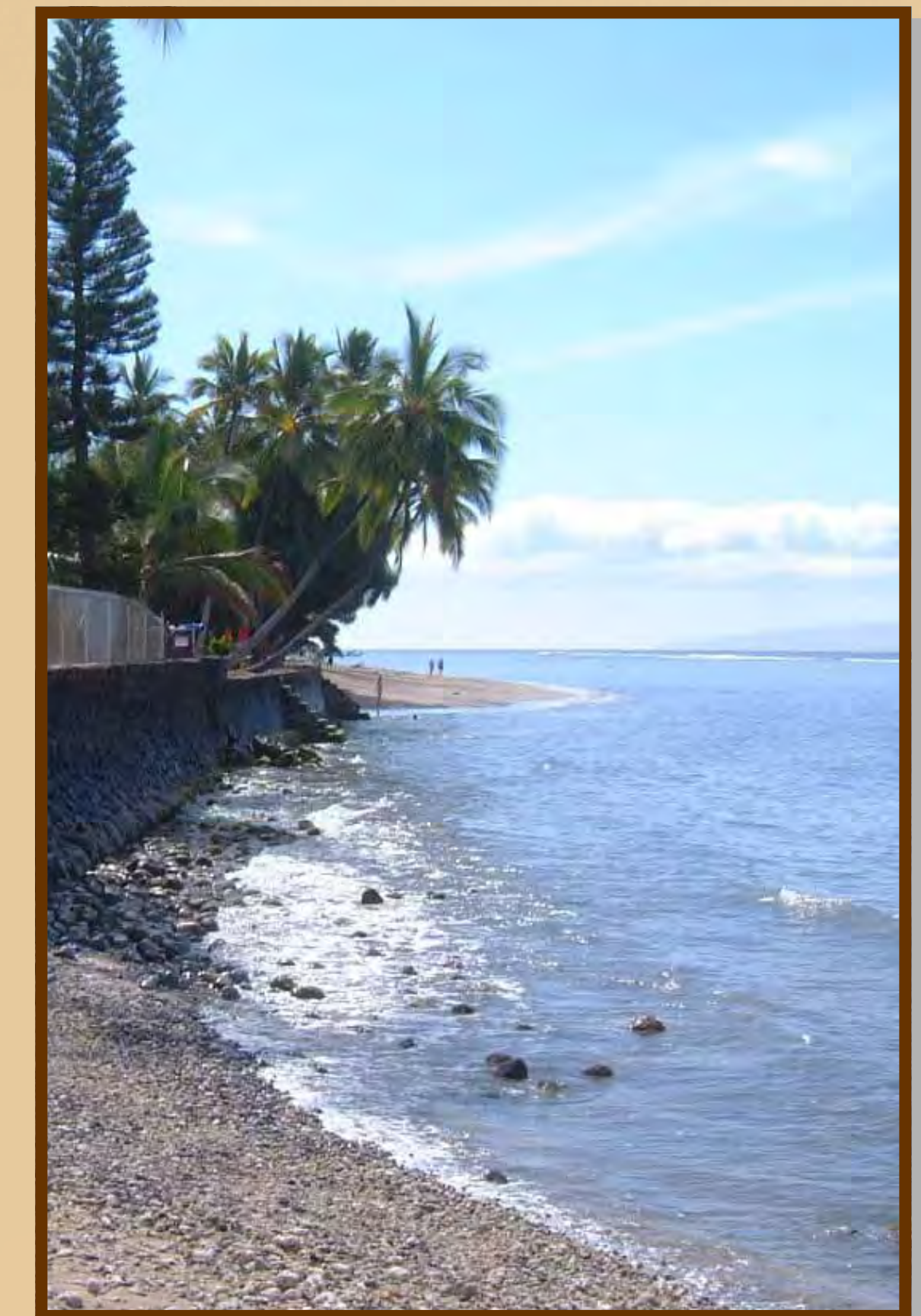
Recognized by the United States Environmental Protection Agency, the project was awarded the Performance and Innovation in the SRF Creating Environmental Success (PISCES) Award for the State of Hawaii in 2006. It was selected as the best project to increase the sustainability of wastewater infrastructure as part of the Clean Water State Revolving Fund (CWSRF).

An obvious environmental benefit comes from updating the pump station equipment and reducing the pump failure potential. WWRD was able to produce additional benefits by relocating the majority of the force main running parallel to the shoreline on

Front Street to the more upland roadway shoulder of Honoapiilani Highway. This moves potential contamination further from the shoreline. It also reduces salt infiltration into the wastewater collection system. Lowering salinity levels will help increase the demand for reclaimed water used for landscape and agricultural irrigation. Striving for a more desirable product will help ensure water recycling in the future, recharge the groundwater, and reduce the unnecessary use of domestic water.

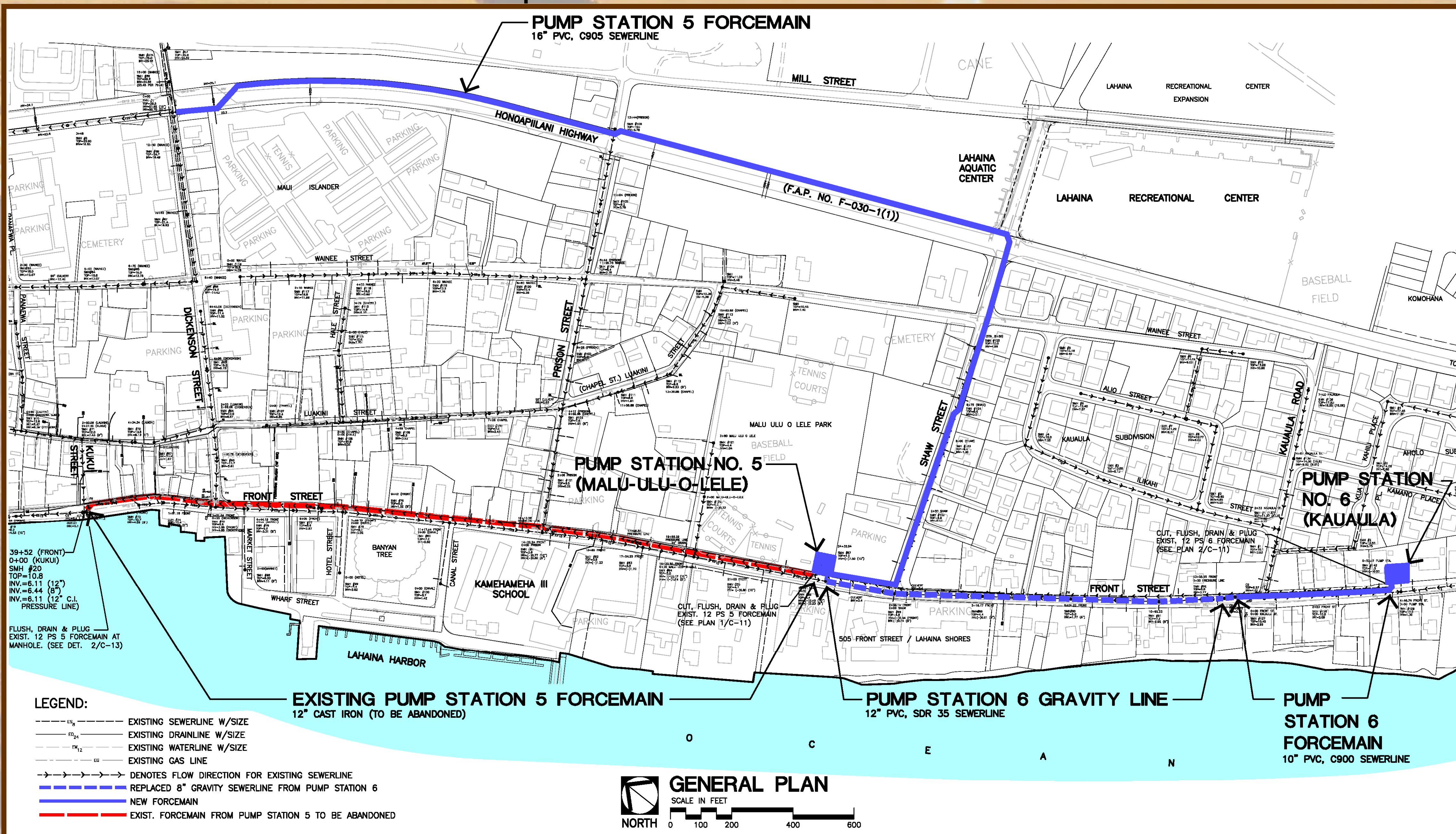
PUBLIC BENEFIT

In addition to the environmental benefits of moving the force main mauka to the highway, the relocation also helps local residences and businesses. Minimizing the utility lines running down Front Street will minimize the street closures and detours required for construction activity including installation, maintenance repairs, and future replacement. Installing the new wastewater line in the Honoapiilani Highway shoulder allows for minimal disruption to the highway traffic.

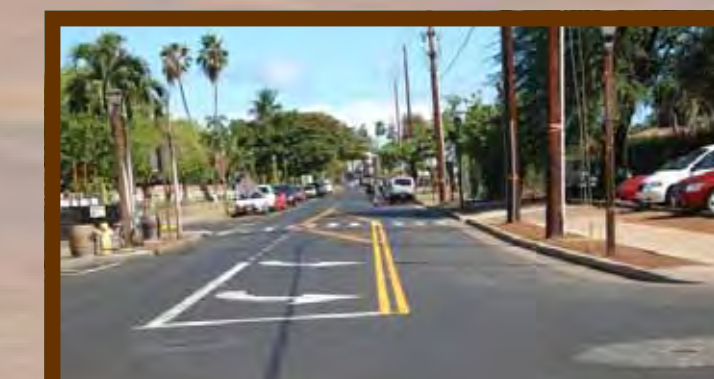


SHORELINE NEAR KING KAMEHAMEHA III ELEMENTARY SCHOOL - The Pump Station No. 5 forcemain was relocated from Front Street up to Honoapiilani Highway, moving potential contaminants further from the shoreline.

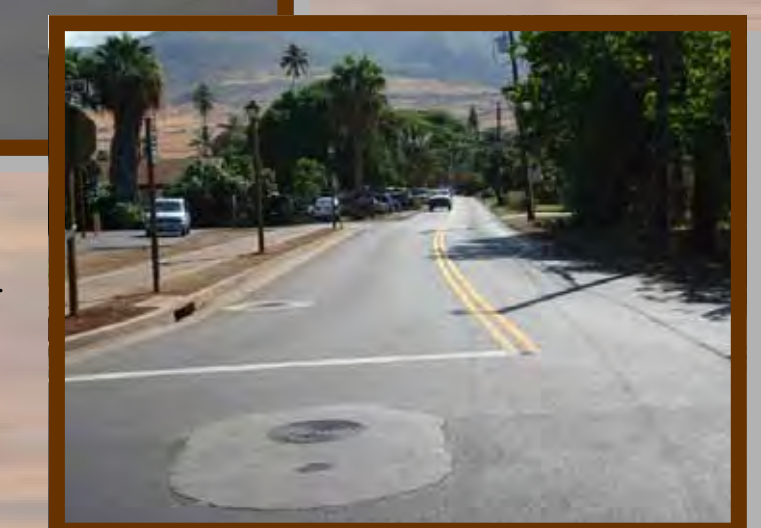
As quoted from NSPE Position Statement #1724 regarding infrastructure...
 "The issue of creating an improved national infrastructure, as well as providing for the future operation and maintenance of these systems, depends on the implementation of comprehensive planning and management techniques... The enhancements and improvement of our vast network of public works and utility infrastructure has been the engine of unprecedented economic growth. This growth has provided economic opportunity and quality of life improvement for every single American. It is basic that continued aggressive development of the nation's infrastructure will continue to drive our economy toward an ever greater quality of life for all our people. It is also essential if we are to maintain our position in an increasingly competitive world."



SEWER RELOCATION - Pump Station No. 5 forcemain was moved up to the shoulder of Honoapiilani Highway, adjacent to the Lahaina Aquatic Center.



ROAD REPAVING - The project was topped off with a new layer of asphalt pavement.



Event: HSPE MAUI CHAPTER 2008 PROJECT OF THE YEAR COMPETITION
Sponsor: Hawaii Society of Professional Engineers Maui Chapter
Date: January 18, 2008
By: Ronald M. Fukumoto Engineering, Inc. 1721 Wili Pa Loop, Suite 203 Wailuku, Hawaii 96793

