

KIHEI NO. 2 FORCE MAIN REPLACEMENT



BYPASS VALVE VAULT – Special equipment for wastewater lines. Plug valve on left and air release valve on bottom right.

PROJECT TEAM

Agency: County of Maui, Department of Environmental Management, Wastewater Reclamation Division
Contractor: P. B. Sullivan Construction, Inc.
Civil Engineer: Ronald M. Fukumoto Engineering, Inc.
Geotechnical Engineer: Hawaii Geotechnical Consulting, Inc.
Archaeologist: Xamane Researches, LLC
Funding: US EPA Clean Water State Revolving Fund

PROJECT DESCRIPTION

The Kihei No. 2 Force Main Replacement is a \$880,000 maintenance project in South Maui for the County's Wastewater Reclamation Division (WWRD). The project is located oceanfront on South Kihei Road from Uwapo Road to Ohukai Road in Kihei, Maui. Numerous residences, Kenolio Park, and the Kihei Youth Center adjoin the mauka side of South Kihei Road. The ocean adjoins the makai side of the road.

The project included sewerline replacements of: 2,420 feet of 10-inch C900 PVC forcemain, and 75 feet of 12-inch SDR 26 PVC gravity sewerline. The project runs from Pump Station No. 2 at Uwapo Road to a connection at Ohukai Road. Bypass valves and an underground vault were installed at the pump station. The entire width of the roadway was repaved within the project limits.



AIR RELEASE VALVE ON SEWERLINE – The valve is actually a combination air valve that allows air to be released from the line, but also allows air to enter if the line empties.



INSTALLING SEWERLINE - Force main being installed in South Kihei Road.



BACKFILLING TRENCH - Pipe being backfilled with tracer tape on top. Special precautionary measures were taken to avoid disturbance to sand dunes.



VAULT LID – Due to the 1,500-lb. weight of the lid, spring-loaded hinges were added for ease of opening.

ENGINEERING DIFFICULTY

Special air release valves (ARV) and shut-off valves capable of handling fluids with suspended solids were selected for the sewer force main. The project required a large 10-foot by 6.5-foot concrete bypass valve vault with spring-loaded hinges to help with opening the heavy vault lids.

Discrepancies in the as-built plans of the existing sewerline resulted in a conflict between the existing and the new sewerline. The design concept called for keeping the existing line in operation while the new line was installed. The discrepancies in the as-built plans were discovered at the start of construction. This resulted in having to redesign the new sewerline during construction.

CONSTRUCTION DIFFICULTY

Besides having to deal with a major design change when the contractor was ready to start construction, field adjustments also needed to be made. This is often the case when installing sewerlines which are typically the deepest utility.

Understanding the gravity sewerline would be installed near sea level elevation, the contractor was tasked with designing a dewatering plan. The plan included a sophisticated series of point wells to temporarily lower the groundwater table. When implemented, the wells successfully kept water out of the nearby trench during construction.

ENVIRONMENTAL CONSIDERATIONS

Replacement of aging sewerlines near the ocean prevents infiltration of seawater into the lines and prevents exfiltration of wastewater into the ocean. Preventing seawater infiltration reduces operational costs of pumping and processing the wastewater at the reclamation plant. Preventing wastewater exfiltration helps to preserve ocean water quality.

Along the majority of the project, the construction zone is adjacent to the sand dune at the beach. The sand dune was surveyed and plans were prepared to avoid this environmentally sensitive area.

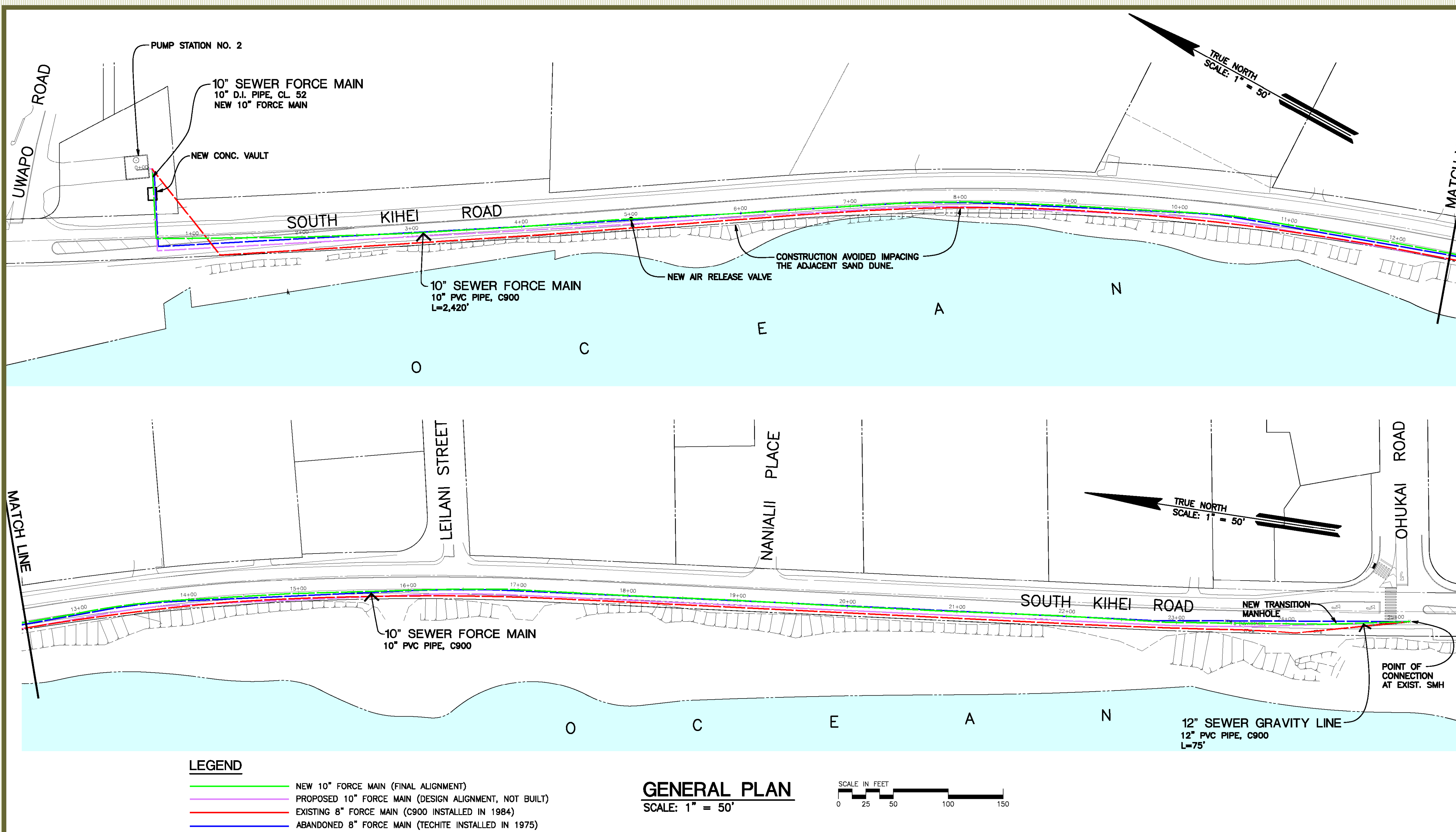
PUBLIC BENEFIT

Due to the project impact being limited to the southbound travel lane, only half of the roadway was required to be repaved. However, knowing that the pavement was in poor condition, the Department of Public Works provided funds to pave the other half of the road.

Accurate as-built plans were created. They will be a valuable resource for future sewer, other utility, and roadway projects.



FRESH PAVEMENT - Although the sewerline was only under the makai side of the roadway, the entire roadway width was repaved.



OLD SEWERLINE – Portions of the original sewerline installed in 1975 needed to be removed. The sewerline was abandoned in 1984 because it was made of fiberglass reinforced material with a history of catastrophic failures.



DEWATERING WELLS – A series of wells were used to temporarily lower groundwater.

Event: HSPE MAUI CHAPTER
2012 PROJECT OF THE YEAR
COMPETITION

Sponsor: Hawaii Society of Professional Engineers
Maui Chapter

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