



Working Together

The Lanai Community Joins Planners and Engineers to Solve Manele Drainage Problems

- 1. The moon sets at the rising sun at Manele Bay.
- 2. Waterfalls at Manele Bay during an intense storm in 2002.
- 3. Fair weather brings out the bay's stunning beauty.

Photographs by Ron Gingerich



An old Chinese proverb says, "Where there is crisis, there is opportunity." After a series of destructive storms on Lanai in 2002, Castle & Cooke Resorts LLC (CCR) faced a tough engineering problem and Lana'i residents who were weary of storm water problems. A year later, a newly updated drainage master plan for Manele, currently on file with Maui County, offers a fresh approach to protecting:

- Life and property from flooding,
- Hulopoe Bay from sedimentation, and
- The watershed from erosion.

On-Island Presence

One of R.M. Towill Corporation's first decisions in helping CCR with its Lana'i drainage problems was to assign Ken Sakai, P.E., RMTc's chief civil engineer and a quality control specialist, to work and live on Lana'i full-time to get to know the community and the situation firsthand. Sakai recalls, "At first the Lana'i community was surprised that an engineering firm from Honolulu would make a commitment to having an on-island presence. Now everybody knows who I am and where to find me for help."

Being "Prudent"

RMTc Senior Project Manager Greg Hiyakumoto, P.E., has led RMTc's multi-disciplinary team in examining Manele's water, drainage, physical planning and permitting issues. "From the beginning, we



emphasized being prudent," Hiyakumoto says, "and we had to be at liberty to disagree with the client if we believed there was a better approach. We wanted to offer the client good, workable solutions that would also receive community support."

Hiyakumoto adds, "We have an active planning function in our firm, and realize the importance of involving the community in decision-making early and often." Castle & Cooke Resorts gave the RMTc team an opportunity to be open with the people of the community from the very beginning and to show how they could have an impact on what gets done on their island.



Power to the People: Developing the Drainage Master Plan

"Input from the community was the only way to learn about the local flood history," says Hiyakumoto. "Their memories of past conditions are critical in analyzing the watershed because of the site-specific nature of drainage." Building community trust in the process took some time and effort. At first, only broad topics about Manele's infrastructure and construction were on the table. "We listened a lot," says Hiyakumoto. Slowly, the lines of communication were opened with the members of the public.

"RMTc told people we were enhancing the

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drainage master plan for the island,” Hiyakumoto continued, “but we also explained that we needed to know what their concerns were, what was important to *them*. We know how to do the engineering, but needed the people’s help to learn about the local conditions on Lana’i to develop a good product.” Later, when the team went back to the community, people were able to recognize the impact of their suggestions on the shaping of the plan.

Remembering Nature’s Own Sediment Basin at Hulopoe Bay

Through community participation in the planning process, engineers and planners learned that Manele Bay used to have a natural siltation basin that was altered for parking some time ago. The draft drainage master plan proposes restoration of a natural sump through a drainage basin at Hulopoe Beach Park. This modification is envisioned to occur through a park master planning process.

1. Water parks where it pleases: The Hulopoe Beach Park parking lot, located where a natural siltation basin used to be, is inundated during a storm. **2.** The morning sun turns the water of the bay to silver as a fisherman casts his line.

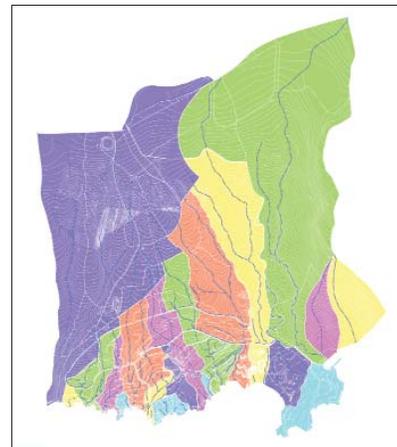


The Multi-Pronged Technical Attack

Correctly laying out drainage patterns throughout the watershed on Lana’i was the most critical step. All subsequent flood analyses were based on those determinations. Photogrammetrists at RMTc used color aerial photographs of the Manele area taken in May 2003 to create topographic contour maps (see map of proposed watershed, above right).

Once drainage patterns were better understood through mapping, physical planning solutions were integrated into the plan to control the flow of storm water in Manele. “The engineering solutions for slowing down the water,” says Alan Fujimori, ASLA, RMTc’s Vice President of Planning, “can be disguised as plantings which intercept storm flows and are beautiful at the same time.”

Vegetative cover has been designed to maximize its sediment filtration ability, thereby reducing sheet flow runoff. Non-invasive, drought- and salt-tolerant vegetation, along with native plantings, will be environmentally beneficial, cut down on water consumption for irrigation and still provide the water interception needed. Previously developed areas in the Manele resort are also



undergoing a botanical transformation. Pohinahina, A’alii and other native plant species are gradually replacing exotic ones.

With the benefit of physical planners and landscape architects on the team, RMTc engineers formulated a range of aesthetically appealing drainage solutions. Manele is already seeing results with the strategic placement of flow-filtering plants. The island is also starting to see a significant reduction in drainage problems through changes in the revised layout of roadways and drainage facilities.



808 842 1133 www.rmtowill.com

R. M. TOWILL CORPORATION

420 Waiakamilo Road Suite 411 Honolulu Hawaii 96817-4941

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