

# PROJECT PROFILE



The bike path near I-90. Maintenance schedules must consider the presence of heavy traffic in the area.

## KEEPING RIGHT-OF-WAY MAINTENANCE DOWN

Washington state's I-90 project is designed to require a minimum of landscape maintenance.

by Leslee Jaquette

**T**he seven mile stretch of Interstate 90, recently completed between Bellevue and Seattle, Wash., is touted as the most expensive strip of highway in the country. The landscape treatment alone will cost taxpayers \$25 million.

The 200-acre landscape area includes 12 miles of trails, three multi-use lids and seven structures widened to support landscaping. Only one-third complete, the project will use 775,000 cubic yards of soil and nearly one million plants.

To establish and promote thousands of trees, shrubs and ground-cover plants, the Department of Transportation landscape team designed each of the 20 projects with

practical maintenance in mind. A computer controlled irrigation system in tandem with value engineering and other common sense maintenance decisions should prove the landscape design a success for generations.

"Considering the scope of the entire project, the DOT has done an excellent job," says Rich Osaka, owner of Fuji Industries of Tacoma. "They have used great forethought in creating a variety of aesthetic and functional environments that are maintenance friendly."

### Plants establishing

One of the first contractors to work on the I-90 bike path across Mercer Island, Osaka's project is in the

second year of plant establishment. It simulates an orchard, using snowberries, Rugosa roses, ivy and flowering pear trees. After the third year of maintenance, as with all the projects, maintenance reverts from the contractor back to either the DOT or the local municipality. Osaka says by the time his contract ends, most of the plants will have filled in to the point that very little weeding or pruning will be necessary.

Local engineers agree with Osaka that the I-90 project has been well conceived and carefully negotiated to the point that there should be few surprises at turn-over time. Director of Maintenance for the City of Mercer Island, Dick Williams, says

he is just starting to look at potential staff increases and equipment needs for next year. For now, he plans to use the city's Ransome's five-gang mower on the additional flat areas, including play fields and parks.

His main concern is that care be taken when it comes time to fertilize the lids. These large cement structures are covered with a thin layer of soil only 18 to 24 inches deep.

### Reducing maintenance

Early on, the DOT conducted extensive value engineering studies to develop a plant palette of about 80 different visually attractive and functional species. The palette allows for about a dozen species of evergreen shrubs, deciduous shrubs, large deciduous trees, small to medium deciduous trees, coniferous evergreen trees and groundcovers. Five primary plants were used extensively in each category.

In conjunction with the careful selection of trees and plants, large expanses were planted with a single species. Architect Don Howe says the design calls for acres of ivy. In fact, in one area alone, 620 gallon-size plants were used for underplanting. Each ivy plant cost around \$5 and had four 10-inch runners. They were planted three feet on center.

Howe believes the extra cost for bigger plants is worth it. The larger plants insure the roots can get below bark mulch within the three-year establishment period. Erosion control is expedited and maintenance decreased due to their quick spread.

Cliff Cooper, I-90 engineer on Mercer Island, says tree size was a critical issue from the beginning. Citizens were concerned the DOT would plant six-inch high trees. Since then, the planting of 3 1/2-inch caliper, 18-foot high cedars and maples has obviated most anxieties.

### Cost-effective soil mix

The trees and other plants grow in a value-engineered soil composed of 75 percent sand and 25 percent bark plus nutrients. Howe says this soil mix was cost-effective. It was also easier to make mountains of the mix than it was to find enough native soil for the project. Around 130,000 cubic yards of the sand/bark mix was used on the Seattle and Mercer Island lids. An additional 625,000 cubic yards was used elsewhere in the linear park areas, medians and trails.

To insure that the trees and shrubs don't drown in the soil, the

projects provide for positive drainage. In an environment that sees months of steady and sometimes heavy rain, it was imperative that each project use lots of conduits and free-draining material. Howe explains that great masses of unsuitable drainage material such as clay had to be excavated and hauled away, substituted by tons of gravel.

### Choosing irrigation

One of the most unique aspects of the I-90 landscape design is the irrigation system. According to DOT landscape designer Raymond Willard, the basic purpose of the irrigation system is to establish the plants. Despite that initial goal, and the system's temporary status, it is designed to be activated during droughts.

Willard says that although the plants were selected for their tenacity, the irrigation system has the capability to provide permanent irrigation if needed. This feature enables the DOT or municipalities to irrigate areas with landscaping over the freeway, widened crossings, lids and play fields. Turf areas with only 18 inches of subsoil and structures with up to only six feet of soil for trees will require regular irrigation.

This computer controlled irrigation system is the wonder child of the DOT landscape design. The RainBird Maxi ET program controls the irrigation system as well as monitoring the system for problems. The RainBird software and flow sensors by Data Industrial Manufacturing were selected after extensive comparative research on five major systems.

Willard says RainBird was chosen after the DOT matrixed all the capabilities, costs, company reliability and user-friendly features of all contenders. Three computers will be installed for each of the different government agencies that will eventually take over maintenance of the landscaping: City of Seattle, City of Mercer Island, and the DOT.

All 20 landscape projects require irrigation systems. Willard notes some of the projects involve skirting 30-foot walls and canyon-like sections of highway. Contractors used ductal iron pipe for these areas to carry water up to 80-feet in elevation around barriers. The computer system is partially justified as a safety measure because of its ability to monitor water application and guard against leaks and broken heads in these difficult areas. The RainBird-controlled system's ability to automatically shut-off irrigation could help avoid wall failure or washouts.

The computer program is linked to weather station information. Using the latest weather data, the software automatically adjusts irrigation according to the temperature, rainfall and humidity. Maintenance is also enhanced by its ability to be customized to irrigate specific zones and not others.

The DOT selected three main sprinkler heads to provide continuity throughout the projects: RainBird, Toro and Hunter. In another move to decrease maintenance DOT designers opted for ground-level couplers and thousands of pop-up heads that retract when not in operation. The landscape team also requires metal detector tape be placed above laterals and valve boxes so they can be easily located with a metal detector.

In an additional effort to minimize maintenance, the design calls for 12-inch mowing strips between ground cover and lawn areas. Howe notes the Seattle lid alone uses more than 5700 feet of the cement stripping, to expedite mowing.

### Maintenance issues

There are numerous long-term maintenance issues yet to be finalized, says Howe, but as the first contracts approach turn-over, individual management plans will be developed.

General guidelines do exist, however. For example, only licensed pesticide applicators will be approved and each project will be individually evaluated.

Howe says the biggest challenge continues to be dealing with the populace. It is difficult to develop "extensive landscaping" that meets both the DOT's needs and the needs of the community.

"Each individual has his own view of what it should look like," says Howe with a shake of the head. "Some see it as a forest, others want a 180-degree view."

The I-90 landscape design will require very little maintenance because of careful planning and progressive systems. Still, considering erosion control is the main justification for planting, Howe admits a certain amazement at the whole project. "With less than two percent of the total highway budget," says Howe, "the landscape effort will enhance the project for decades." **LM**

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