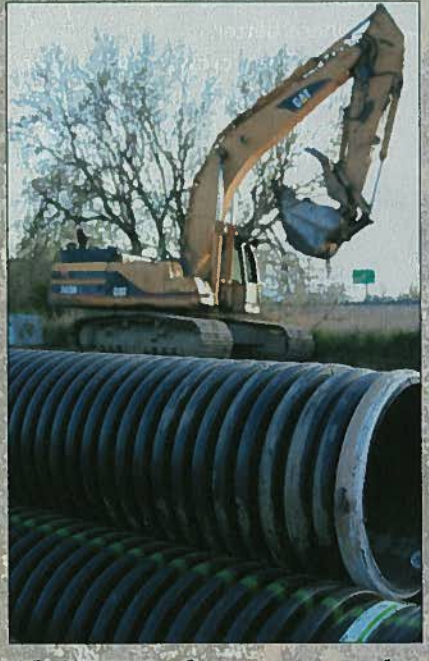
HDPE Pipe to Drain Parkway

UDOT counts on pipe for long life and environmental protection.

The Legacy Parkway is a 14-mile, four-lane highway that will provide an alternate road between Salt Lake City and Farmington to alleviate congestion in one of Utah's most heavily traveled areas now served mainly by I-15.

"The goal of the Legacy Parkway is to provide a single, continuous alternate north-south route through the North Corridor," explained Todd Jensen, Legacy Parkway project director for the Utah Department of Transportation (UDOT). "This new route is essential to reduce traffic congestion and increase safety."

The need for the Legacy Parkway is based on a projected increase in vehicle traffic. Population along the Wasatch Front in Salt Lake, Davis, and Weber counties is forecast to increase by about 60 percent by 2020. When completed in September 2008, the Legacy Parkway is expected to take some 30 percent of the traffic off nearby I-15, which on an average day carries more than 130,000 cars.



The HDPE pipe features a corrugated exterior and smooth interior for both strength and maximum hydraulic capacity.

Because the Legacy Parkway is close to the Great Salt Lake and near the Farmington Bay Waterfowl Management area about ten miles north from Salt Lake City, there is a high level of environmental concern. It runs along marshlands and the Legacy Nature Preserve, which is home to migrating birds and ducks. The preserve is a 2,200-plus acre area on the southeastern shore of the Great Salt Lake and was established as environmental mitigation for the Legacy Parkway Project.

The impact of excavation, building, construction traffic, and materials were important considerations in this environmentally sensitive area. Construction crews are required to learn about environmental standards and pass a test before performing work on the project. Minimum intrusion into the sensitive areas and durability of materials were goals of the design team and contractors.

The Legacy Parkway project will see almost 56,500 ft of high-density polyethylene (HDPE) pipe used for its stormwater drainage system. The HDPE corrugated pipe was selected based on structural and durability performance, competitive costs, and its ability to withstand the corrosive nature of the soil.

The parkway will be built with more than ten miles of various sizes of HDPE pipe from 18- to 60-in. diameters. The majority of pipe is from Advanced Drainage Systems (ADS, www.ads-pipe.com), made at a nearby plant. The project also called for a run of 54-in. diameter pipe to meet the design flow rate. Available from Hancor (www.hancor.com), the 54-in. diameter BLUE SEAL® HDPE pipe was the exact diameter needed to carry the design flow and maintain appropriate cover without changing the road profile.

From both manufacturers, watertight products were specified and selected. ADS N-12® and Hancor BLUE SEAL pipe have an integral bell and spigot system and have been widely used in gravity flow storm sewer systems. They also fit the EPA's Phase II best management practices for long-term service reliability.

With a corrugated exterior and smooth interior, the HDPE pipe provides both strength and optimum hydraulic capacity. Because of its light weight, pipe sections can be easily handled with minimal equipment by one- or two-person crews—an eight-ft section of HDPE pipe will weigh just a few hundred pounds. And because HDPE pipe has nominal 20-ft lay lengths, the number of joints are reduced, saving labor and installation time.

The entire Legacy Parkway project is unique in that it consists of ten neighborhood trail heads; created and protected wetlands in the median; user friendly and visually pleasing raised pedestrian crossings; native walk pedestrian trails; a nature preserve consisting of more than 2,200 acres, of which over 700 acres are wetlands; size limitations for trucks; and reduced speeds. The $685-million project is 100 percent state funded through the Centennial Highway Funding program.

Special aspects contributed to some unique design concepts such as independent horizontal and vertical align-

ments to minimize the impact on the wetlands and visual impact to the neighborhoods. This use was approved by the Army Corps of Engineers and the Federal Highway Administration. Additionally, UDOT chose to raise the pavement section to 4,217 ft, higher than the floodwater elevation of 4,212 ft, which was reached in 1983. Throughout the project, there are multiple HDPE pipe sections for equalizing the flow of the floodwaters of the Great Salt Lake.

During the course of the project's development, there were many adaptations and changes from the original layout design and even the bidding process. The original Environmental Impact Statement was started in 1997 with a projected project completion date before the 2002 Olympic Games in Salt Lake City. Although construction had started in January 2001, work was restricted by a court injunction in November due to environmental concerns.

The Great Salt Lake is recognized as an international flyway for migratory birds. The Utahans for Better Transportation and the Sierra Club had filed suit listing 46 items of concern. A total of 46 issues were brought forth and the court favored UDOT in 41 of the issues with only five outstanding issues. The five issues were related to the right-of-way width, wildlife, sequencing, Denver and Rio Grande Railway alignment, and the integration of mass transit with the highway. UDOT was required to perform a Supplemental Environmental Impact Statement (SEIS) to address these outstanding issues.

During the SEIS process, UDOT chose to meet with the plaintiffs and structure a settlement agreement that required legislative and governor approval. The agreement was signed November 2005 by UDOT, the Sierra Club, and Utahans for Better Transportation. In addition, the legislature mandated the construction schedule. Some provisions included:

- 125 aces of additional nature preserve.
- 55 mph speed limit.
- Trucks with five or more axles or more than 80,000 lb were prohibited, except for emergencies.
- Trail systems and neighborhood trailheads were incorporated.
- Quiet pavement to reduce the noise.
- Funding of a $2.5-million study to assess the possibility of bus, rapid transit, and light rail.

Another change to the Legacy Project was the bid letting process. The project originally was a design-build project, which was partially terminated due to the court decision that an SEIS was required. After the SEIS was completed and the settlement agreement was signed, the project was contracted as three design-bid-build projects to encourage industry competition and because the parkway concept was a rather new design concept within the United States.

During the research to find existing parkways for comparison, UDOT found little information. The closest concept was the George Washington Parkway in the District of Columbia. Due to this concern, UDOT retained design ownership and proceeded with the traditional design-bid-build process. UDOT believed that this process would best incorporate citizen concerns and the best design practices for this concept. Throughout this process HDPE pipe remained the pipe of choice.

The project was broken into three segments:

- Segment 1—2200 North & I-215 to just north of 500 South in Bountiful
- Segment 2—North of 500 South in Bountiful to South of Glovers Lane in Farmington
- Segment 3—Glovers Lane to the I-15/US-89 Interchange

Each segment is about $90 to $100 million in construction costs for:

- Segment 1—A&W Construction (Ames and Wadsworth Brothers); Carter Burgess, designer
- Segment 2—Ames Construction; H.W. Lochner, designer
- Segment 3—Clyde and Geneva; Horrocks Engineers, designer

The teams were allowed ten months for design. Construction began in December 2006 and was substantially completed by September 2008. Contractors selected HDPE pipe for all three segments. GE

Here, the HDPE drainage pipe awaits installation, a process that is facilitated by its light weight requiring only one- or two-person crews.

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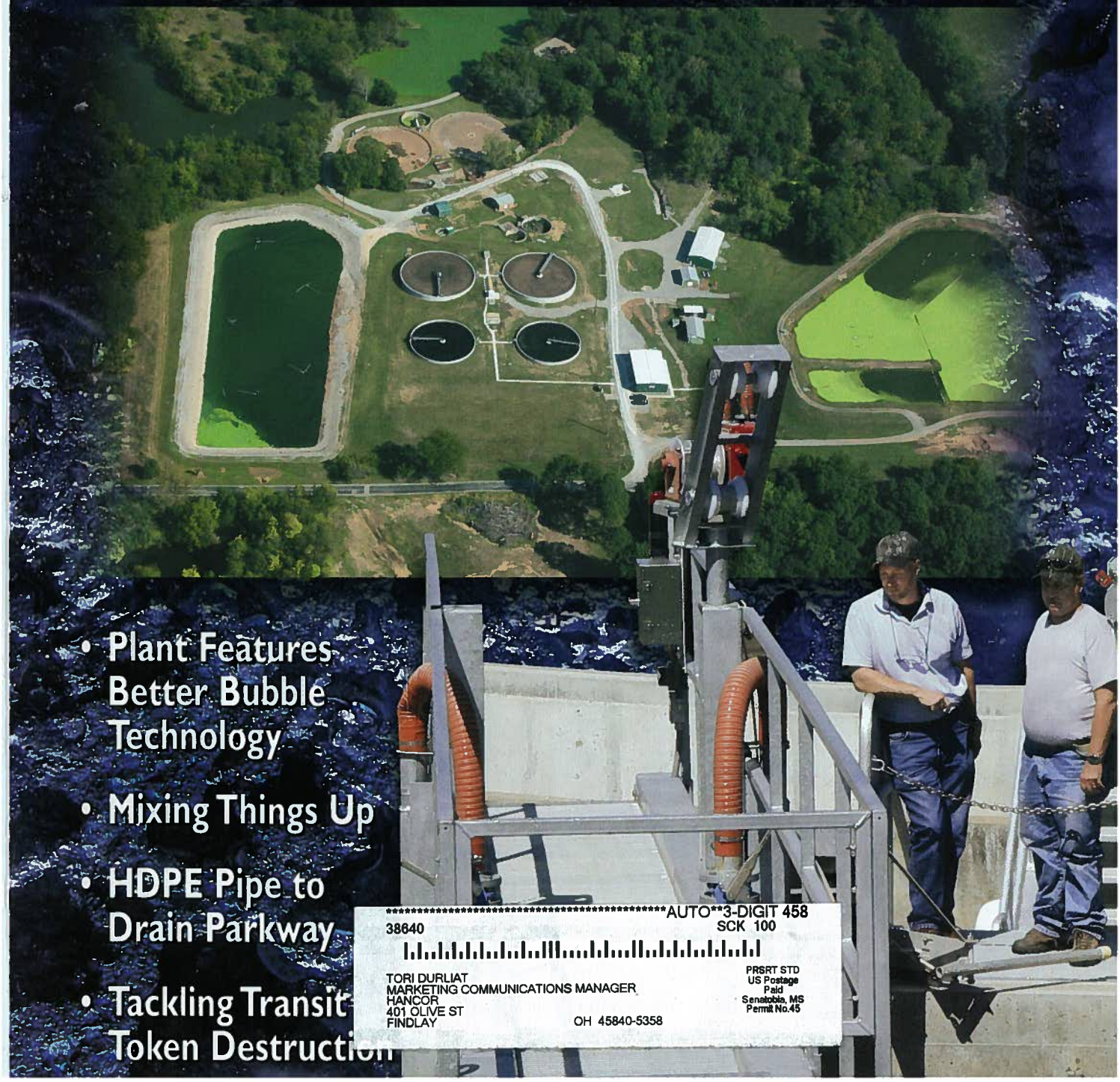

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