

Stream Corridor Concepts for Harris County, Texas

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The natural creeks and bayous of Harris County have, for the most part, been modified and become single-purpose drainage ditches. Man-made ditches make up two-thirds of the 2,500 stream miles in the county, and have also been primarily constructed as utilitarian stormwater corridors. Improved designs are being developed and implemented due to increased public interest in multi-objective use of stream corridors, and a long-range view regarding maintenance and water quality. The Harris County Flood Control District's Mason Creek Extension project serves as an example of the potential for man-made systems to become the "bayous of the future." Other stream corridor and stormwater detention design concepts are being developed in growth areas of the county that serve to preserve natural corridors while also serving the demands of the growth. Concepts of retrofitting existing channels are also being developed.

The Harris County Flood Control District (District) is a special purpose district created by the Texas legislature nearly 70 years ago. Its mission is to devise flood damage reduction plans, implement those plans, and maintain the infrastructure. The District strives to provide flood damage reduction projects that work, with appropriate regard for community and natural values.

District projects recognize the need for balancing flood damage reduction with community and natural values. Two primary examples are the Mason Creek Extension and The Hill at Sims Bayou Greenway projects.

The Mason Creek project involves a 1.5-mile extension of the creek near Katy, Texas and includes an 80-acre stormwater detention basin to mitigate the effects of the channel project and future development in the service area. The project was constructed from 2002 to 2005 at a cost of \$1.4 million for land plus \$5.1 million for construction. In addition, about 7,000 trees have been planted at a cost of about \$370,000.

New channel concepts developed for this project include flatter and variable side slopes (4h:1v to 10h:1v), benched side slopes for trails and access, a meandering centerline, and narrower top maintenance berms due to flatter side slopes. The channel capacity is designed to reflect trees and shrubs within the cross section. The stormwater detention basin for the Mason Creek project includes flatter and variable side slopes, permanent water features that add capacity and water quality treatment, and establishing a desirable tree canopy. The project results in a more natural system in the long-run that will be an asset to the community and require less maintenance. Harris County has entered into an interlocal agreement with the District to develop park features along the channel and stormwater detention basin.

The Hill at Sims Bayou Greenway is a stormwater detention basin serving to reduce flood levels along Sims Bayou. The project name reflects that some of the excavation for the stormwater detention basin was used on-site to create a unique “hill” feature that is about 60 feet high above natural ground and nearly 100 feet when measured to the bottom of the excavation. The overall site is about 280 acres with the detention excavation covering about 100 acres. The project cost includes about \$2.3 million for the land and about \$6.0 million for construction. About 10,000 trees have been planted at the site at a cost of about \$530,000. The project was started in 2004 and was completed at the end of 2005.

The detention basin includes water features for environmental and water quality enhancement, variable and undulating side slopes, and establishing a desirable tree canopy that will enhance environmental values and aesthetics, as well as reducing long-term maintenance costs. Discussions are ongoing with Harris County and the City of Houston Parks and Recreation Department regarding multi-objective use of the site.

There are many more examples of ongoing and completed projects that reflect these design concepts. The District is responding to increased public interest in quality-of-life issues and providing projects that reduce the risk of flooding while recognizing community and natural values. These features are also reducing the long-term maintenance requirements by providing more stable channels that require less routine or cyclical maintenance. The features also serve to improve water and air quality.