

HRC *by Design*

Winter 2004

An HRC First...Welcome

In an effort to enhance our communications with our clients and friends, we are proud to introduce *HRC By Design*. Through *HRC By Design*, we hope to keep our readers informed of ongoing projects at HRC and provide helpful technical tips about relevant engineering issues. For those less familiar with the firm, we plan to describe the capabilities of our various departments and acquaint you with some of the historical accomplishments and events at HRC.

HRC, founded in 1915 by Clarence W. Hubbell, is one of the largest engineering firms in Michigan, offering engineering and architectural services to municipal, industrial and other private clients.

We hope you find this newsletter both interesting and enlightening. Enjoy!

How Safe Is Your Water System?

HRC Provides Water Vulnerability System Assessments to Local Communities

(RAM-WSM Certified)

In response to the prospect of new and potentially serious threats to our nation's infrastructure, the government has developed sweeping new measures to address the threat of terrorism. The Public Health Security and Bioterrorism Preparedness and Response Act was signed into law on June 12, 2002 by President Bush to tackle these issues. As part of the Act, the Federal Safe Drinking Water Act was amended to contend with Drinking Water and Security matters. The Amendment (Sec. 1443) requires that each community water system serving a population of greater than 3,300 persons shall conduct an assessment of the vulnerability of its system to a terrorist attack or other intentional

(continued on page 3)

In this Issue...

***HRC Launches New Web Site
New Right-of-Way Services
GIS Department Profile***

City of Birmingham's Quarton Lake Restoration Project



Aerial View of Quarton Lake

HRC was retained by the City of Birmingham for an extensive \$1.5 million undertaking...the Quarton Lake Restoration Project. The deposition of sediment and other pollutants over the past 30 years led to decreased water quality in Quarton Lake, a 13.2 acre impoundment of the Rouge River located in Birmingham, Michigan. Shoreline erosion affected the aesthetics of the surrounding park and residential areas. A 1990 MDNR survey of the lake indicated oxygen depletion below the 5 foot depth due to poor water quality and carp exceeded 90% of the fish captured. Since 1990, water quality has continued to deteriorate and aquatic growth is minimal.

The City of Birmingham obtained Rouge River National Wet Weather Demonstration Project grant funding to restore the lake as a demonstration project for other communities in the watershed. HRC and the local community developed and implemented a comprehensive plan to restore Quarton Lake. The plan included dredging the lake to remove accumulated sediments, sediment trap installation, carp

removal and game fish stocking, waterfowl deterrent implementation, shoreline stabilization, habitat enhancements, bottom aeration, and wetland/aquatic plantings. Extensive public input was solicited during the design process through a series of Ad Hoc Committee meetings.

The HRC Team provided design and construction management services, including lake mapping, a stream bank erosion inventory to identify sources of sediment, fish habitat survey, water quality monitoring, and development and implementation of a public education program for on-going improvements using watershed management. HRC also provided the City with grant application data to obtain funding assistance for the project as well as detailed coordination with MDEQ and MDNR to gain acceptance of the project and minimize permit review times. HRC also played a major role within the City and at the Ad Hoc Committee Meetings by gathering residential concerns, and incorporating appropriate resolutions into the project.

(continued on page 2)

Quarton Lake at a Glance...



(continued from page 1)

The Project Team implemented and applied many original and innovative techniques for this project:

➤ **Dredging and Dewatering Loss** Hydraulic dredging with no water level draw-down was utilized. This approach saved the City over \$50,000 vs. alternate methods considered, and minimized damage to the aquatic life. Dredging spoils in excess of 30,000 yards were dewatered successfully through the first-time, large scale application of geo-tubes. A polymer deflocculant was added to the geo-tube process in order to dewater quickly enough to meet the time schedule for the work. This was a first time application for a polymer used in this manner and special permitting processes and coordination were

facilitated by MDEQ/MDNR to meet the tight time schedule. Timely dewatering of the spoils would not have been possible due to the limited ½ acre of available land, without the implementation of the geo-tubes and polymer. Dewatered spoils were transported off-site for landfill disposal. The 24/7 dredging and dewatering operation was completed within a 6 week period under winter conditions without any residential complaints, a testimony to the planning and smooth project operation.

➤ **Shoreline Stabilization** Approximately 5,540 lineal feet of shoreline was stabilized. Coir logs, economical and natural, and made from 100% coconut fiber, provide a strong, biodegradable, shoreline stabilization media into which native plantings are bedded. Stone terraces were added to provide pedestrian access to the Lake.

➤ **Fish Collection** Cost-effective electro-shocking was used to gather fish in lieu of more conventional applications of the chemical Rotenone, (which would have killed the fish population) thus sparing much aquatic life and minimizing the impact of the fisheries management operations on the lake. Carp removal was needed to re-establish a quality fishery and restore water quality. Upon completion, the lake was restocked with additional game fish and minnows.

➤ **Fish Habitat** New fish habitat features were created in the lake, such as deep holes/channels, spawning areas made from pea stone and gravel, brush piles and luncker structures. The installation of the habitats were unique in that the aggregate, brush piles and luncker structures were placed out on the ice during the winter months and allowed to sink into the lake as the ice melted. This eliminated having to create these habitats during the open water months with boats and scuba divers, thus saving significant time and money for the City.

➤ **Sediment Trap** A deep hole structure was designed at the upstream end of the lake to capture the incoming sediment load.

➤ **Aqua Mats** This technology was adapted from the fishery industry and is a first-time application in a Michigan pond. The mats, which act like a sea-grass filter, are suspended underwater from framework, at the sediment trap, causing the fines to drop out and into the trap.

➤ **Aeration** A solar powered aerator was added to deep lake areas to provide oxygenation.

➤ **Re-Use of Spoils** The project design incorporated the re-use of project spoils. Broken concrete removed from the parking lot was used as ballast to sink the fish habitats. Invasive shoreline brush was cut down, bundled and turned into fish habitats. Carp were sent to a re-processing center; wood chips and compost were used as path material.

➤ **Shoreline Path System** A new path system was incorporated into the design, helping to eliminate stream bank erosion by re-directing random foot traffic to planned locations.

This Demonstration Grant Project shows the benefits of taking a holistic approach to restoring the ecological structure and function of an aquatic ecosystem. Many “first-time” applications of processes and products were used. The education of and participation by the public allowed interaction and beautification of residential areas, while establishing the basis for a naturalized watershed management system. It also showcases the successful and economical implementation of coir logs, geo-tubes and material re-use on a large scale basis. The successes and lessons learned from this project will provide practical experience to other suburban communities in implementing watershed restoration practices.

HRC also developed a residential education program to assist homeowners in adopting environmental practices that will preserve the lake’s restored ecology. As a result of the restoration project, the residents will enjoy cleaner water, stable shorelines, abundant angling opportunities for game-fish and a revitalized community park.

For more information on HRC’s Stormwater Management Services, please contact Margaret Synk Kuhn, P.E. at (248) 454-6300 or msynk@hrc-engr.com.



City of Southfield Constructs First Miracle League Baseball Field

Playing baseball. Catching, hitting, pitching, rounding the bases - for most kids, it's simply taken for granted. However, for the tens of thousands of special needs children, it has only been a dream. That is, until now.

The Miracle League provides these special children with the opportunity to suit up in a uniform, step up to the plate, and enjoy playing the game of baseball in its purest form. It is a dream most of these children would not be able to realize as members of a traditional youth league. The games are the same except for a few additional rules: every player gets a hit, gets on base, and crosses home plate. No one keeps score, but you'd never know it listening to the cheers from enthusiastic parents in the stands or teammates in the dugout.

To provide this great opportunity, special facilities and fields are needed. The City of Southfield has recently been selected as the first City in Michigan to adopt this program. The City has selected one of its existing ball diamonds to be retrofitted for use by the Miracle League. HRC provided design, construction and survey services for the project and is extremely pleased to be part of this exciting program.

Water Vulnerability Assessments

(continued from page 1)

acts intended to substantially disrupt the ability of its system to provide a safe and reliable supply of drinking water.

HRC has offered valuable guidance to several communities in Southeastern Michigan enabling them to prepare satisfactory VA's in a timely manner so as to meet their required deadlines. Currently, HRC has prepared VA's and updated EOP's for the 10 communities of Southeastern Oakland County Water Authority, the cities of Bloomfield Hills, Farmington Hills, Ferndale, Howell, Sterling Heights, South Lyon, Wixom, Utica, the Townships of Bloomfield, Independence, West Bloomfield and Oxford, and the Village of Romeo.

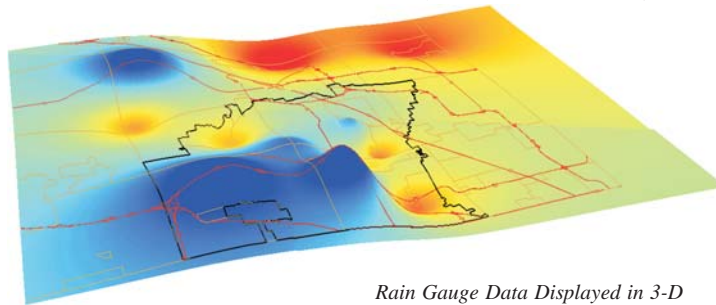
For more information on Water System Vulnerability Assessment and available grants, contact Mike MacDonald, P.E., mmacdonald@hrc-engr.com or Brad Shelper, bshepler@hrc-engr.com or your HRC representative.

HRC Launches New Web Site



Have you visited our new web site yet? Visit www.hrc-engr.com for a look at our new and improved web site. Navigation throughout the site is simple, yet effective, utilizing pull-down menus and bullet items. We think you will find our new web site graphically pleasing and easy to explore. Look for future updates...

GIS Department Profile



Rain Gauge Data Displayed in 3-D

HRC's GIS Department provides GIS services to both public and private sector clients in the areas of parcel and utility mapping, land use and environmental planning, transportation corridor planning and congestion management, modeling of utility and transportation systems, as well as facility management systems for private and public buildings. HRC has in-house GIS and CAD application development capabilities and has developed field data collection techniques integrating GPS, GIS and hand held computer technologies. HRC is an authorized ESRI Business Partner using their full suite of GIS software products to meet our clients' database and GIS needs.

GIS is a term that many people have heard of, but may not be sure of what it really means. Most people can relate to the visual or "Geo-

graphic" component of GIS, especially if they have a background in computer-aided drafting (CAD) programs such as MicroStation or AutoCAD. The biggest difference between CAD and GIS is the "I," for *Information*, in GIS. While both types of computer systems may display a drawing of a road, a GIS can also tell you whether it is concrete, asphalt or gravel, if it is one way, its thickness, the year it was built, its suggested speed limit and how many turning lanes it has. All of this or other similar information may be valuable for communities and organizations in planning and managing their infrastructure needs.

For more information, contact Keith McCormack, P.E., at (248) 454-6300 or kmccormack@hrc-engr.com.



HRC Offers New Right-of-Way Services

Hubbell, Roth & Clark, Inc. (HRC) is now offering Right-of-Way acquisition services. HRC's team is experienced in the acquisition of all types of property, from total ownership to easement and Rights-of-Way, that you may need to construct your project. HRC has the resources, ability and expertise to follow any established guidelines that you may have. We are experienced in Federal, Michigan Department of Transportation and County drain requirements.

Services include:

Permanent Easements
Temporary Easements
Grading Permits
Sanitary Sewer Easements
Storm Drain Easements
Watermain Easements
Sidewalk Easements
Public Utility Easements

Wetland Easements
Conservation Easements
Airport Avigation Rights
Pathway Easements
Drain Rights-of-Way
Road Rights-of-Way
Flood Plain Easements
Scenic Easements

For more information regarding HRC's complete Right-of-Way Services, please contact Mr. James Isaacs, P.S. at (248) 454-6300, or your HRC representative.



H R C

HUBBELL, ROTH & CLARK, INC.

555 Hulet Drive
P.O. Box 824
Bloomfield Hills, MI 48303
248.454.6300
www.hrc-engr.com

*Offices:
Bloomfield Hills
Detroit
Centerpoint
Howell*

*Please address comments, special
requests and other correspondence to
Editor@hrc-engr.com*

Consulting Engineers Since 1915