



*Volume X
Number 1*

Winter 2000

BY DESIGN

Storm Water Utilities

A Funding Option for City Infrastructure



Construction and maintenance of a stormwater collection/treatment system is costly, but can become more financially manageable when a stormwater utility billing system is developed and put into use. This type of utility employs a rate system based on careful inventory of properties and the anticipated runoff from each. Property owners, including tax-exempt organizations, are billed monthly at a rate that reflects the amount of runoff on the particular property. This method has worked effectively throughout Minnesota.

Storm water collection and its associated costs can be funded in any of the following ways. Commonly a community adopts a combination that suits its individual needs:

- Costs can be assessed to benefitting property owners using Minnesota Statutes 429 assessment procedures.
- A storm sewer improvement district can be established in accordance with Minnesota Statutes 444. In this case storm sewer costs are financed by a tax levy. Property owners in the district generally pay a rate that is related to property value.
- Stormwater system costs can be paid as part of the general levy on all properties within the community. Costs are distributed based upon value of the property.
- A stormwater utility can be established and used to bill property owners regularly for stormwater system use (in a manner similar to a water or electric utility). Most systems base these charges on the size of the property and the amount of impervious surface that generates direct runoff.

As a community makes stormwater system funding decisions it is important

to consider the benefits and drawbacks of each funding method. The method most familiar to the public, and most commonly used is the MS 429 Assessment. Although in this method specific storm sewer assessment formulas are not mandated by statute, assessments must be directly related to the value of the benefit received by the property. Such assessments are particularly difficult for very large watersheds or storm sewer projects that are built in several phases. In this situation upstream property owners may need to be assessed several times, as the various phases are completed.

Tax levy and property tax increase are also fairly well understood by the public. Because this method is based on property tax values it carries with it significant inequities. A large parking lot, for example, generates substantially more runoff, but less revenue, than a more highly valued but much smaller housing facility. An additional disadvantage is the potential for a referendum, which can be made necessary when an assessment does not cover the total project cost. Further, recovery of stormwater system costs by a general tax levy may divert funding from other projects which have fewer viable cost recovery options. Storm sewer improvement districts address some of the limitations of general taxation but still raise valuation concerns.

A well-planned stormwater utility directs stormwater collection and treatment costs directly to those who generate the runoff — including the owners of tax-exempt properties. This method is set in motion by a process of mapping, aerial photography, inspection, property inventory (based on tax records). The amount of



ENGINEERS
Turning Ideas
Into Reality[®]

NATIONAL ENGINEERS WEEK.
FEBRUARY 20-26, 2000

Storm Water Utilities

continued on page 4

Volume X *Editor: Nancy Thorkelson*
Number 1 *Production: ENVISION: Design that Works, Inc.*
Winter 2000 *Saint Peter, Minnesota*

Published Quarterly by Bolton and Menk, Inc.

Offices:
515 N. Riverfront Drive
Mankato, MN 56001-3499
Phone 507-625-4171 FAX 507-625-4177

219 North Main Street
Fairmont, MN 56031-1833
Phone 507-238-4738 FAX 507-238-4732

140 First Avenue North, P.O. Box 434
Sleepy Eye, MN 56085-0434
Phone 507-794-5541 FAX 507-794-5542

1515 East Highway 13
Burnsville, MN 55337-6857
Phone 952-890-0509 FAX 952-890-8065

bmi@bolton-menk.com

316 Fourth Street Southwest
P.O. Box 895
Willmar, MN 56201-0895
Phone 320-231-3956 FAX 320-231-9710

2730 Ford Street, P.O. Box 668
Ames, IA 50010-0668
Phone 515-233-6100 FAX 515-233-4430

108 North Water Street
Liberty, MO 64068-1787
Phone 816-792-5100 FAX 816-792-2133

Quality Engineering for
Tomorrow's World.

Bolton & Menk is an affirmative action employer.

BY DESIGN

Hopkins 1999 Street & Utility Improvements Wins CEC/M Honor Award

The Consulting Engineers Council of Minnesota (CEC/M) has recognized the City of Hopkins' 1999 Street and Utility Improvement Project with an Honor Award. The Engineering Excellence Award Program, initiated by the American Consulting Engineer Council (ACEC), recognizes engineering achievements which demonstrate the highest degree of merit, ingenuity and excellence. The program is designed to increase the public's perception of what it is engineers *really do*.

When the City of Hopkins, Minnesota, targeted the reconstruction of a major storm sewer trunk line for inclusion in its 1999 street and utility improvement plans, it appeared to be a fairly straightforward engineering endeavor. The existing line, a 500-foot, 88" x 64" corrugated metal arch pipe, was deteriorating. Furthermore, it lacked the capacity required by the City's long-range storm water management plan. The proposed solution was to replace the existing arch pipe with a 72" diameter reinforced concrete pipe.

As the design process unfolded, however, a geotechnical exploration of the site revealed a substantial layer of

organic peat extending along 400 feet of the proposed 500-foot alignment, just below its invert. This material would not support the new reinforced concrete pipe. Armed with this knowledge, designs for the storm sewer were revised to include a set of 50-foot concrete-filled steel friction piles at each end of each pipe section. Estimated construction costs for this length of storm sewer, including a large vault manhole at each end, were now approaching a half million dollars.

Working closely with City of Hopkins staff, Bolton & Menk, Inc., developed an alternative design that would prove to

solve the problems associated with the subsurface and reduce overall construction costs by roughly 60 percent in the exchange.

Bolton & Menk's new design utilized dual 54" high density polyethylene (HDPE) pipes. Much lighter weight than a single concrete pipe, the HDPE pipes eliminated the need for pilings, requiring only soil corrections beneath the invert. An additional three-foot subcut was made along the pipe alignment, extending through the organic material. The subcut was then lined with a geofabric and backfilled with an open-graded aggregate.

Finally, the geofabric was wrapped around the top of the aggregate, creating a "pillow" to support the dual pipes. Traditional bedding and backfilling operations of the HDPE pipe were employed above the aggregate pillow.

This reconstructed storm sewer trunk line serves nearly two-thirds of Hopkins' drainage area, ultimately discharging into Nine Mile Creek. The project has successfully addressed the City's long-term storm water management needs, and has offered the City a savings of nearly \$300,000 over the original concrete pipe and pile design.



Placement of the dual pipe system on top of the 'aggregate pillow.'

Storm Water Utilities

continued from page 1

impervious surface and the size of individual properties are determined. Capital improvement costs are calculated in a manner similar to that of other utilities. A rate is established based on property and cost data and anticipated runoff, and is applied to each property.

Because each property *makes a contribution based on its share of the total runoff to the system*, a well-constructed stormwater utility equitably allocates the costs of storm sewer pipes and detention basins necessary for flood control and water quality management. The property and impervious surface inventories can be tedious, particularly in communities without up-to-date mapping records, but some communities have streamlined the inventory

process by applying an equal, averaged charge to all residential properties. This can reduce inventory work by as much as ninety percent.

In actuality, most communities will rely on a combination of several financing options. Use of a stormwater utility does not prevent assessment of properties that benefit directly from improvements, or partial recovery of stormwater system costs through taxes. The "best" financing method for a stormwater system is the one that works most effectively in the particular community. Among the factors which may influence a community's final decisions are: the size of the community, the scope of its industrial base, long-term storm sewer improvement plans, and competing program needs.

City of Saint Peter Project Wins MPWA Award

The Minnesota Chapter of the American Public Works Association has announced that the **Minnesota River Force-main Project** in Saint Peter, Minnesota has received the 1999 Project of the Year Award (less than \$2 Million category). In 1998, the project also won a CEC/M Grand Award. The project was designed by Bolton & Menk, Inc. and constructed by Rice Lake Construction and Michels Pipeline.

www.bolton-menk.com

FIRST CLASS MAIL
U.S. POSTAGE
PAID
Owatonna, MN
Permit No. 110

Attn. Circulation
515 North Riverfront Drive
Mankato, MN 56001-3471

BY DESIGN