


**FOCUS: WATER**

# STRENGTH FROM ABOVE

From left, OHM Construction Manager Alan McComb, Farmington Hills Director of Public Services Greg Mekjian and his assistant, Karen Mondora, Oakland County Water Sources Commissioner Jim Nash and Farmington Hills DPW Superintendent Kevin McCarthy stand in front of the City of Farmington Hills' almost-finished 3-million-gallon water storage tank. (Photography by Amy Voigt)

A photograph showing five people standing in front of a large, cylindrical water storage tank under construction. The tank is made of concrete blocks and has a green top section with the words "FARMINGTON HILLS" and a logo. The people are dressed in winter clothing. The background shows a snowy field and some trees.

Farmington Hills is building a massive water storage tower designed to reduce peak demand charges and save ratepayers millions of dollars annually

By Peter Kenter

**T**he Department of Public Services of the City of Farmington Hills, Mich., prides itself on providing the “meat and potatoes” of city services at a responsible price to customers. The city’s most recent major undertaking is

the construction of a 3 million gallon water tower, a \$16.9 million project expected to save water customers \$3.5 million annually by reducing peak demand on the system.

Farmington Hills is a city of about 80,000 people located a half-

hour’s drive northwest of Detroit. Its city services — roads and roadways, water mains and sanitary sewers, rubbish removal and recycling — are all managed by the Department of Public Services. The Detroit Water and Sewerage Department

(DWSD) provides all of the city’s water and sewage needs.

#### **Rates based on peak**

Water rates are calculated for each of the communities served by the DWSD on different rate mod-

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els, based on peak hour demand or maximum day demand and distance and elevation from the water treatment facility.

“There is no tiered structure to the rates for various demand levels,” says Gary Mekjian, director of Public Services with the City of Farmington Hills. “The water rate is based on meeting that peak demand with a certain pressure and flow. For our community, peak demand hours are from 6 to 10 a.m. By building this tower, we’re planning to shave off the



**PROFILE:**

**Department of Public Services, City of Farmington Hills, Michigan**

**YEAR UTILITY ESTABLISHED:**  
1973

**CUSTOMERS SERVED:**  
22,700 water customers;  
22,400 sewer customers

**AREA SERVED:**  
33 square miles

**DEPARTMENT STAFF:**  
52 employees

**INFRASTRUCTURE:**  
490 miles of water mains;  
329 miles of sewer lines

**ANNUAL DEPARTMENT OPERATING BUDGET:**  
\$45 million (sewer and water: \$29.4 million)

**ASSOCIATIONS:**  
American Public Works Association

**WEBSITE:**  
[www.fhgov.com/Services/PublicServices/OverviewPublicServices.asp](http://www.fhgov.com/Services/PublicServices/OverviewPublicServices.asp)

peak demand, and satisfy it with water we draw into the system at off-peak hours.”

Mekjian, however, notes that the tower is built on the back of a healthy water system — there’s no other low-hanging fruit that could achieve the same level of savings for the same investment.

“The age of the system is relatively new, with the oldest pipes dating back only to the World War II era,” says Mekjian. “The bulk of it was built during the 1970s, ’80s and ’90s, and water main breaks in the system are pretty rare.”

About 75 percent of the system is 8 inches in diameter, with about 15 percent at 12 inches. The remainder of the system is divided about evenly between 16-, 24- and 30-inch pipe. The system employs a variety of pipe materials, ranging from ductile and cast iron, to asbestos cement, high-density polyethylene (HDPE) and polyvinyl chloride.

“The replacement pipe is generally ductile iron or HDPE,” Mekjian says. “It can go either way depending on which is cheaper at the time.”

Both the water and sewer system are owned by Farmington Hills but all system maintenance and utility billing for the county are handled centrally from an office in Pontiac, the Oakland County seat.

“It’s a sweet arrangement in that their staff responds to any water main breaks or sewer problems,” Mekjian says. “As their largest client, they did try to place a maintenance office in Farmington to see if it would be more efficient, but we found that the service level was about the same, so the incremental expense wasn’t worthwhile.”

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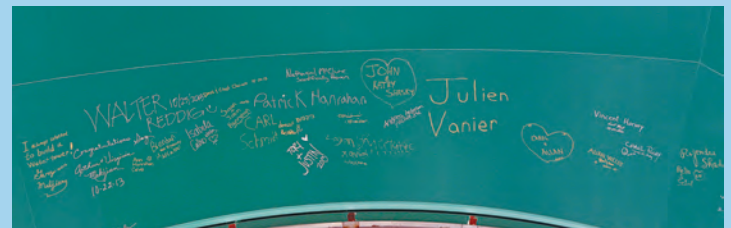
**WATER TOWER EVENTS INSPIRE COMMUNITY SUPPORT**

The construction of a water tower by the Department of Public Services of the City of Farmington Hills, Mich., will help to keep future water rate hikes under control. However, at a cost of almost \$17 million, the department wanted to ensure significant ratepayer buy-in.

“In addition to our public education efforts, one of our councilmen, Randy Bruce, came up with the idea of going to the community to seek out design proposals for the tower,” says Karen Mondora, assistant to the director of Public Services at the city.

The department teamed up with the city’s Cultural Arts Division to solicit design concepts from the public. The winning design from resident Lisa Sheldon featured the words “Live Farmington Hills, Love Farmington Hills” below the city’s logo.

The design was painted onto the tank while its sections remained on the ground.



The city also turned the tower’s steel water tank into a vehicle for charitable donations, with members of the public invited to sign the tank before it was raised into place. More than 200 residents placed their signatures on the tank and raised \$2,600 for the American Cancer Society, the Graham E. Smith Memorial Fund for Suicide Prevention Awareness, the Farmington/Farmington Hills Foundation for Youth and Families, and the Friends of the Rouge, an environmental charity.

“Even though the tower benefits all of the city’s ratepayers, both of these events helped to inspire grassroots community buy-in for the tower,” says Mondora.





OHM Construction Manager Alan McComb looks over the construction layout of the water tower in a conference area on the water tower site in Farmington Hills, Mich.



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#### Losses controlled at meter

Oakland County has piloted some acoustic leak detection programs in Farmington Hills, but has concentrated largely on ensuring that the city’s commercial and residential water meters are maintained and replaced in a timely manner.

“We’ve discovered that it isn’t just a function of the age of the water meter that affects its performance,” Mekjian says. “It’s also how much water has passed through it. We’re analyzing those figures to find the sweet spot for meter replacement, even breaking it down to the difference between meters with 5/8-inch connections and 1 1/4-inch connections.”

Mekjian says that the city is seeking support for proactive replacement of water mains as they approach the end of their optimal service life. The city currently budgets about \$1 million per year for main replacement.

“We would like to develop a more robust asset management plan and double that,” Mekjian says. “If

we do that over the next 10 years, we’ll take a real bite out of what we’d like to do.”

The current water tower project had its genesis in a City Council meeting in 2011 in which the discussion centered on ways to control water rate increases. However, with DSWD offering a monopoly service, the only way to affect rates was at the wholesale consumer side.

“It wasn’t just about water storage to reduce peak demand,” says Karen Mondora, assistant to the director of Public Services at Farmington Hills. “The water tower would also give us the secondary benefits of additional supply and capacity during power outages and increase our ability to provide fire protection for the city. We advised City Council that by moving forward with the project they wouldn’t have total control over rates, but that they would have some control over increases in rates.”

#### Part of the master plan

The water tower concept was

offered as part of the city’s overall master plan. Farmington Hills wasn’t the first DWSD customer to embark on a water storage plan, so the concept had a prior track record.

“Up until perhaps six years ago, DWSD was very reluctant to have people build storage tanks because they saw it as a potential threat to revenue,” says Mekjian. “However, they did a good job of outreach to their wholesale customers. About six years ago we saw a paradigm shift in which they started to sign contracts in which storage was a component. They essentially asked these customers what their peak demand would be and said they needed to abide by these parameters.”

After a series of public hearings, City Council approved the water tower plan. The construction was financed through a \$16.9 million bond sale. The bond was issued by Oakland County, which has a slightly better bond rating than the city. The funds will be fully reimbursed by the city from water customer revenues.

#### Site selection is key

The grounds of the city’s Division of Public Works complex was selected for the water tower site.

“Finding an ideal location for the tower was key,” says Mondora. “We were fortunate that our head-

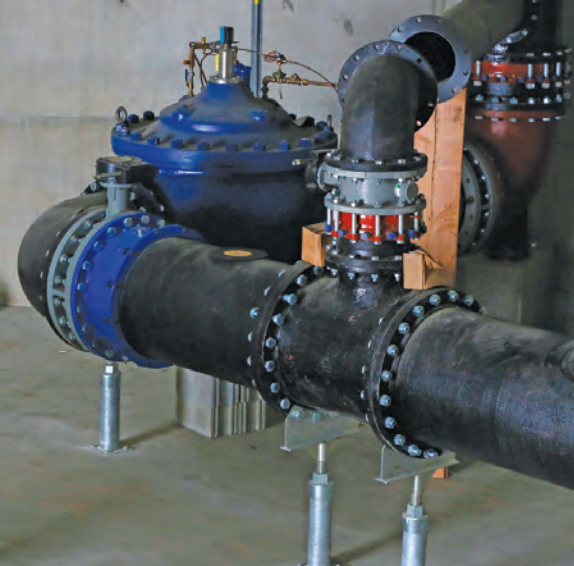
quarters are located in more of a commercial/industrial area of the community that isn’t surrounded by any residential properties. It made the site selection process a lot less complicated.”

The department achieved significant cost savings by building on city-owned land. The property was already serviced by existing water system pressure, ensuring that no additional pumping stations would be required to operate the tower.

The finished tower will stand 200 feet high and 60 feet in circumference around the concrete pedestal base. The steel tank on the top of the tower will measure 110 feet around.

“Bringing the tower online also required other system improvements, which are included in the budget,” says Mondora. “We’re adding 200 feet of 20-inch water main and 100 feet of 30-inch main. The second phase of the project also involved improvements to control valves at five locations, construction of two brand new ones, and flow control and metering at all those locations to tie it into our SCADA system.”

The project was divided into several contracts to avoid overheating the local construction market and to ensure competitive bids from local contractors. One contractor



Oakland County Water Sources Commissioner Jim Nash (front left) and Farmington Hills Department of Public Services Director Gary Mekjian (front right) speak with Alan McComb in the trunk of the unfinished water tower.



Jason Graham of Trojan Development Co, in Oxford Charter Township, Mich., works on the installation of a water main on the grounds of the Department of Public Services in Farmington Hills.

built the tower and another installed the control valves while two others split the water main installation work.

Work on the foundation began in November 2012. By December 2013, sections of the domed steel tank were being lifted into place. The tower was scheduled to be finished and fully operational by the time this issue went to press.

### New rates announced

Detroit announced its water rate hikes in January 2014. On July 1, Farmington Hills residential water rates will rise about 1.5 percent, as compared to neighboring Farmington's 4.2 percent. Mekjian attributes the smaller increase to the anticipated effect of the new tower on peak demand.

"For the new water rate to stick, we need to prove at that point that the system is doing what it's designed to do," says Mekjian. "A reasonable return on many infrastructure investments is 50-plus years. We believe this return on investment will be less than five years, even considering the fiscal uncertainty faced by Detroit. It's a good decision no matter how you look at it." ♦

**WATCH THEM  
IN ACTION**  
To learn more about the Farmington Hills Department of Public Services and the water tower project, view the video at [www.mswmag.com](http://www.mswmag.com).