FEMA

When It Rains, It Pours
Preventing Sewer Backup

Cook County, Illinois

Chicago, IL - Looking out the window as one flies into O'Hare airport, a sea of rooftops fills the Chicago landscape. And off those rooftops, much rain does run - straight into the city's sewer system.

With an abundance of buildings, streets and parking lots, urban areas have very little green space to absorb or slow down the onslaught of water in a heavy rain. It's especially a problem in the City of Chicago, a city built on a swamp. The high water table contributes to slower absorption rates and more water flowing overland to fill the city's sewers - an interconnected system carrying both storm runoff and sanitary sewer waste.

Chicago's long and colorful history includes troublesome tales of flooded homes filled with five feet of contaminated, bacteria-carrying water from sewer backup. Residents have had to clear muck, throw out possessions and redo their basements - time and time again.

After the flood of 1997 caused hardship and property loss for some 35,000 residents of its close to 3 million population, City officials took action. Officials formulated a two-pronged strategy: install mechanical devices called inlet restrictor valves and promote downspout disconnection by homeowners citywide. Purchase and installation cost $75 million. This was about a quarter of what traditional sewer system improvements would have cost.

A $7.8 million grant from the Federal Emergency Management Agency Hazard Mitigation Grant Program (HMGP) jumpstarted the Chicago project in 1998 by funding a pilot program in three areas of the City that were repetitively hit with basement flooding. John Roberson, Chicago Sewer Department Commissioner, said, "In every subsequent rain that we've had since the pilot program was implemented, the pilot areas have not experienced the type of flooding they normally would have."

The question is this: can any system be designed for a city as large as Chicago to prevent sewer backup when a storm cloud releases tremendous amounts of water on the city within only a few hours? The morning commute on August 2, 2001, was brought to a standstill as a record 3.56 inches of rain fell over portions of the city during rush hour. The deluge, termed by the Illinois State Water Survey as an 80-year-storm event, caused flash flooding in some areas of the city. Ponding water in the streets indicated that the valves were doing their job of slowing the flow of storm water into the main sewer system.

"The system acted the way it was designed to," said John Roberson. "We would have had 14,000 to 16,000 calls on basements without the 'Rainblocker' installed. This time we had five to six thousand calls ... There isn't a sewer system big enough to handle what we faced with the three to four inches of rain in little over an hour."

The city is the first to recognize flooding problems still exist. Flooded streets, a problem deemed preferable to flooded basements, are an acknowledged byproduct of the valve system because of the restricted flow of water into the sewers. The "Rainblocker" program is clearly a work in progress, but if basement backup has been minimized each time it rains, then it appears the city is headed in the right direction.

Quick Facts

Sector:
Public

Cost:
Amount Not Available

Primary Activity/Project:
Flood-proofing

Primary Funding:
Hazard Mitigation Grant Program (HMGP)