



FEMA

# Best practices

Disaster Mitigation Working in Massachusetts

## New Drainage System Averts Flooding in Melrose



“The new drain system at Ell Pond saved our city.”

—Ed Kelly, Director  
Melrose Emergency Management Agency



Photo—City of Melrose

Water surrounds the Melrose Towers Condominiums just north of Ell Pond during the Mother's Day Flood in 2006

Despite ten days of record-breaking flooding across northeastern Massachusetts in March 2010, the City of Melrose “dodged the bullet,” thanks to the new drainage system for the city’s Ell Pond.

Runoff from several previous storms, most recently the “Mother’s Day Storm” in 2006, led to flood depths as high as six feet in buildings, yards, and streets to the north of Ell Pond. This Spring, the water barely topped the banks of the pond.

“The system worked almost flawlessly,” said Bob Beshara, Melrose City Engineer and Superintendent of Public Works. “The new drainage system replaced part of the

existing system and enhanced our ability to move floodwaters rapidly through the city’s central core area, while at the same time minimizing their impact.”

Ell Pond, a natural body of water within the City of Melrose, is bordered by homes, streets, recreational fields and landscaped park strips. The 23-acre pond receives water from an 1,100-acre watershed, which includes parts of the towns of Stoneham and Wakefield. Water leaves the pond through an outlet at its southeastern corner and flows southward be-

neath city streets to ultimately discharge to Lower Spot Pond Brook.

The original outlet channel allowed water to begin draining from the pond only when it became nearly full, so that the water level could not be lowered in anticipation of large storms and the resulting runoff.

The Ell Pond Project changed all that, and while storm runoff can’t be prevented, it can now be managed to reduce its effects. A 2001 study of flooding at Ell Pond identified alternatives for eliminating, or at least

minimizing the problem. In early 2005, city officials began to seek funding for the design and construction of what became known as the “Ell Pond Project.”

With funding of \$1.75 million provided by the Federal Emergency Management Agency’s (FEMA) Pre-Disaster Mitigation (PDM) program, supplemented by \$1 million in city funds, construction of the new drainage system was completed in time for its first real test by the recent rainfall and accompanying floods of early 2010.

The Ell Pond drainage project consists of a control gate structure at the southeastern corner of the pond and a 3,500-foot long, 48-inch pipe that extends from the control gate to the outlet at Lower Spot Pond Brook.

During periods of peak runoff following the storms of March 2010, the level of Ell Pond rose to as high as two feet above the top of the outlet pipe, and water was draining from the pond at a rate of 100 cubic feet (748 gallons) each second. Draining this much water this rapidly from Ell Pond reduced the extent and depth of inundation of areas around the pond compared to that in the March 2006 flood.

For instance, the West Knoll Soccer Field was flooded by 3 to 4 feet of water in March 2006; in March 2010, only the perimeter of the field was flooded. And the Cabbage Patch Park in front of the new middle school, which was covered by 2 to 3 feet of water in 2006, was not flooded at all this year.

“It’s all about water-level management,” said John Scenna, Deputy City Engineer and Project Manager for the Ell Pond work. “We can now adjust the level of the pond as conditions require, either raising it high enough to prevent wave action from eroding unvegetated parts of the shoreline or lowering it before storm runoff begins to enter. We did this in March, so the pond served as a temporary storage basin for at least part of that runoff.”

The gate that controls the level of the pond is automatically activated to main-



FEMA photo by Michael Moore

Water enters the new drainage system through the crest gate at the southeast corner of Ell Pond

tain or adjust the water to desired, pre-selected elevations, but the mechanism can also be manually activated. The control gate structure incorporates a sturdy debris trapping “trash rack,” and a high, level platform that provides a safe perch from which maintenance workers can remove trees and other woody debris that become lodged against the rack.

The construction phase of the new drainage system brought a year of inconveniences – such as torn up roads and temporary water hookups – to the citizens of Melrose. The rewards for their patience, in addition to a lessening of the flood risk to the areas around Ell Pond, were amenities such as new sidewalks and street paving along the construction route, beautiful landscaping around Ell Pond, a skate park, and new baseball and soccer fields.

“The new drain system saved our city,” said Ed Kelly, Director of Melrose’s Emergency Management Agency. “During earlier floods that inundated parts of central Melrose, large areas were underwater for as long as a week to 10 days. But in 2010, much smaller areas and only scattered depressions near Ell Pond were flooded to much lower depths than in those earlier floods, and the water drained away within a few hours to a few days at most. Now that’s a success story.”

Federal Emergency Management Agency  
Region I  
Federal Insurance & Mitigation Division  
99 High Street, 6th Floor  
Boston, MA 02110  
Telephone 617-832-4761  
[www.fema.gov](http://www.fema.gov)



**FEMA**

To learn more about FEMA mitigation grants, please contact:

Massachusetts Emergency Management Agency  
400 Worcester Road  
Framingham, MA 01702  
Mitigation Grants Manager  
Telephone 508-820-1445  
[www.mass.gov/mema](http://www.mass.gov/mema)



Massachusetts Department of Conservation and Recreation  
251 Causeway Street, 8th Floor  
Boston, MA 02114  
State Hazard Mitigation Officer  
Telephone 617-626-1406

