



## Village of Thiensville Channelization Project

### Full Mitigation Best Practice Story

#### *Ozaukee County, Wisconsin*



For nearly 50 years, the downtown area of the Village of Thiensville, located in Ozaukee County, Wisconsin, had been plagued with constant flooding. The flooding repeatedly affected 10 residential and 30 commercial properties when Pigeon Creek overtopped its banks during heavy rainfall. Having experienced six major flood events since 1973, four of which resulted in a federal disaster declaration, Thiensville decided to do something about the creek. They came up with a project that not only remedied some of the problems, but also received an award for Excellence in Project Design or Implementation from the Wisconsin Association for Floodplain, Stormwater and Coastal Managers as well as “Top Project” by Storm Water Solutions magazine.

“We had a storm in 1985 and previous to that there were several storms in the early 70s and 80s that flooded downtown Thiensville,” said Mike Campbell, project engineer. “As the consulting engineer, I identified major restrictions that had been placed in the creek, a lot of man-made obstacles.”

Noteworthy obstacles included: a floodplain that had been filled in (downtown area); placement of two undersized, lengthy culverts; and construction of a dam upstream in the neighboring city of Mequon (which was also an obstruction to fish passage).

“When it rained, even with a 10-year storm event, Pigeon Creek would overtop its banks and downtown would flood, causing damage to a number of buildings as well,” said Campbell.

The Village of Thiensville applied for a Pre-Disaster Mitigation grant in 2003. The grant was awarded in 2006 and totalled \$2,308,620. The Federal Emergency Management Agency (FEMA) provided 75 percent (\$1,731,460) of the project cost. The project was administered by Wisconsin Emergency Management. The Village Board amended the Tax Incremental Financing District to assist with the remaining funds needed to defray project costs.

The flood mitigation project was executed in three phases.

**Phase One:** Easements were obtained to detain stormwater in an open space area upstream in the neighboring city of Mequon. A plate was installed on the upper half of an existing outlet culvert that controls the culvert’s outflow, causing flood storage during high water events.

**Phase Two:** Two restricting undersized culverts, which allowed roadway passage from a parking lot to a commercial building, were removed and replaced by a 50-foot clear-span bridge.

**Phase Three:** The high-flow channel of the creek was widened from its previous width of 10 to 20 feet, in some areas, to 60 feet to increase the capacity of the creek. A meandering 25-foot wide low-flow channel, which is rock-lined, was created for fish passage. Invasive trees were removed and replaced with native species. Wetland and prairie plants were added along the creek’s bank to prevent erosion.

“We had a tough time coordinating with utility companies because the project was ‘on again, off again resulting from delays in obtaining 27 voluntary easements,” said Campbell. “We had to fast track the construction contracts too. They were bumping into each other because of it.”

“A contributing factor included the fact that we had an original Board of Trustees (no new members to question whether it was a good project), who knew about all the years of flooding and who probably thought ‘If we don’t do it now, folks are going to be sitting here 100 years from now dealing with the same thing’. They didn’t want to pass the problem on to another board,” said Karl Hertz, Village President.

According to Andrew LaFond, Director of Public Works, the Village has had three flood events in 2010 that would have normally caused road closures and property damage in the downtown area. That did not occur due partly to the successful completion of the project.

“Water flows from two directions into Pigeon Creek, northeast and northwest and it all collects in about a block and a half before Pigeon Creek gets to the Milwaukee River,” said Hertz. “This project took care of the northwest water. We have executed two or three projects over the years to handle the northeast flow, including securing funding for the construction of detention ponds, one of which is located in the city of Mequon.” Thiensville had previously received a FEMA grant through the Hazard Mitigation Grant Program to construct one of the detention ponds

Hertz credits the Village Administrator, Dianne Robertson, for her resourcefulness in securing grants for project funding.

Heralded as a great mitigation measure, the project fostered other positive outcomes including partnerships with an association, in neighboring city, Mequon, for flood storage; private property owners who provided easements for the project; and the coordination of other agencies such as the Department of Natural Resources. It also had a positive effect for fish habitat.

“Would we do it again? Yes we would. We had an end goal in mind; however, it required a coordinated effort to make sure all critical steps were followed,” said Campbell. “I’m glad it’s done. There were a lot of road blocks, but the project is functional and it’s also beautiful. It gave Pigeon Creek a totally new look. The end result of the project will remove approximately 20 percent of the properties from the floodplain, which will greatly aid in redevelopment efforts,” added Robertson.

#### Activity/Project Location

Geographical Area: **Single County in a State**

FEMA Region: **Region V**

State: **Wisconsin**

County: **Ozaukee County**

City/Community: **Thiensville**

#### Key Activity/Project Information

Sector: **Public**

Hazard Type: **Flooding**

Activity/Project Type: **Flood Control**

Activity/Project Start Date: **08/2006**

Activity/Project End Date: **11/2010**

Funding Source: **Pre-Disaster Mitigation (PDM)**

Funding Recipient: **Local Government**

Application/Project Number: **EMC-2004-PC-001**

#### Activity/Project Economic Analysis

Cost: **\$3,165,244.00 (Actual)**

Non FEMA Cost: **1433784**

## Activity/Project Economic Analysis

## Activity/Project Disaster Information

Mitigation Resulted From Federal  
Disaster? **No**

Value Tested By Disaster? **Yes**

Tested By Federal Disaster #: **1944 , 10/21/2010**

Repetitive Loss Property? **Unknown**

## Reference URLs

Reference URL 1: <http://www.village.thiensville.wi.us/>

## Main Points

No Main Points were entered.



June 13, 2008 flood in downtown area of Village of Thiensville. Flood caused damage to residential and commercial properties.



clear span bridge that replaced culverts that were too small to provide adequate water flow



a portion of Pigeon Creek's rock-lined low flow channel and newly constructed retaining wall.