

## OFD "Education Station" Pervious Concrete and Bioretention

South 50<sup>th</sup> and Pine Street, Omaha, NE

City of Omaha Stormwater Program & Omaha Fire Department

## SITE AND PROJECT SUMMARY

In 2013, the Omaha Fire Department (OFD) renovated a historic Fire Station at 50<sup>th</sup> and Pine Street that serves as a fire safety educational facility and a museum on the history of fire fighting in Omaha. As a part of the renovation, a pervious concrete parking lot was installed for staff and visitor parking. Stormwater from the parking lot is stored beneath the pervious pavement in an aggregate layer, when full, excess water is directed to a bioretention garden on the west side of the building.

In order to better understand pervious concrete and bioretention systems, several real-time monitoring sensors were installed, including: soil moisture, temperature, rain gauges, and water level sensors for the parking lot. Realtime controls were also installed to actively manage the water stored under the parking lot. The system can be programmed to pull in National Weather Service forecasts while simultaneously looking at current water levels within the aggregate storage layer, allowing for the outlet control valve to be opened or closed and thus increasing stormwater retention times. The valve can also be manually operated. The soil moisture sensors have been installed in groups of three at varying depths adjacent to the permeable parking lot, bioretention, and a control location at the southwest corner of the lot. These sensors look at lateral moisture migration in the soils near these practices. Temperature sensors are installed at varying depths in the pervious concrete parking lot and examines the temporal depths of the freeze/ thaw lines throughout the aggregate system.



## **PROJECT DETAILS**

	BIORETENTION SYSTEM			PERM	EABLE PAVEMENT	
System Footprint	500 ft <sup>2</sup>			3,500	3,500 ft <sup>2</sup> of porous concrete	
Underdrain	4" PVC & washed limestone			4" PVC & v	4" PVC & washed limestone for lower & upper underdrain	
Pre-Treatment System	Permeable Pavement & Bioswale				None	
Outlet Control	2" Brass Curb-Stop Valve			Real-time	Real-time controlled 4" slide-gate valve	
Contributing Area	0.25 acres + overflow from parking lot			t	0.25 acres	
Percent Impervious (%)	50%				95%	
Predominant Soil Types	Classic Urban Complex, Silty Clay		Classic	Classic Urban Complex, Silty Clay		
COSTS		ΜΟΝΙΤ	ORING		METHOD	
Design	\$18,678.00	Rainfall Water Depth		HC	HOBO rain gauge	
				Ultra-sc	Ultra-sonic level sensors (2)	
Construction	\$116,400.00	Outflow		Calculated: Th	Calculated: Thel-Mar Weir w/level sensor	
Material Testing	\$5,471.00	Soil Moisture		HOBO Soil moisture sensors		
g		Tempera	ture	ново т	HOBO Temperature sensors	
Total	\$140,549.00	Real-Time Controls			Opti-RTC	
DESIGNED BY		TED BY		NITORING/ SSMENT BY	MAINENTANCE BY	
Lamp, Ryerson & Associates, GeoSyntec, Opti-RTC	Dostal's Construction		City of Omaha Stormwater Program		City of Omaha Stormwater Program	



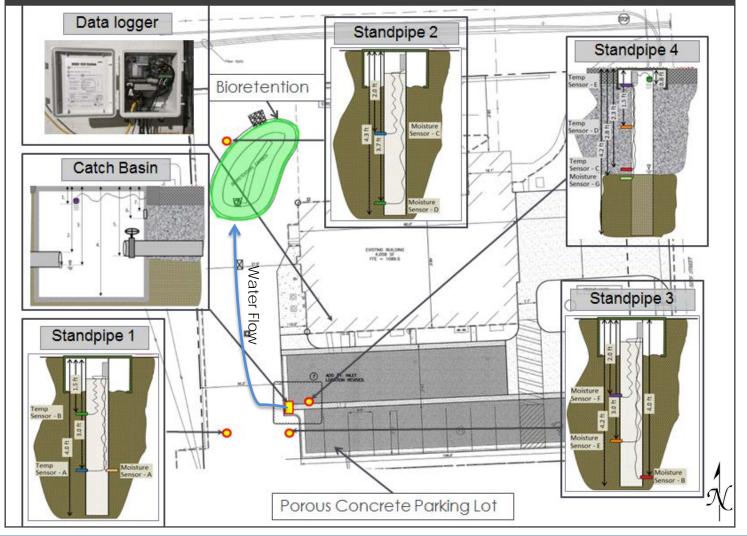
## PERMEABLE PAVEMENT INSTALLATION



PHOTOS







OmahaStormwater.org