



Breaking Through Stormwater Challenges

Stormwater management solutions vary based on climate change and various flood areas. Metropolitan Industries offers customized systems to provide solutions to the problems municipalities face following a heavy rain event.

Aging infrastructures and budget restraints present municipalities with many challenges. Fortunately, there are cost-effective solutions available to prevent problems caused by stormwater by determining the origin of system failures and finding ways to prevent breakdowns in the future.



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Breaking Through Stormwater Challenges

Right: One of four repaired and repainted excess flow pumps at a pump station waiting to be installed.

Featuring:
City of Whiting, IN
Village of Riverdale, IL
Calumet City, IL

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City of Whiting, Indiana

When one of four excess flow pumps began to run inefficiently due to a damaged impeller from wear and tear over the years, the City of Whiting, Indiana turned to Metropolitan to help solve the problem.

The four pumps at that station have played a crucial role in preventing city flooding during heavy rainfall for the past 40 years. The aging infrastructure meant that it was only a matter of time before the other three pumps required repairs as well.

Initially, Metropolitan supplied a brand new pump for the station so that the other pumps could be removed sequentially without sacrificing capacity in case a heavy rain event were to occur during the rebuilding process. It was imperative for each pump to be repaired or replaced in a seamless manner.

After removing and inspecting the first 40 foot pump, the first unit was replaced and it was found that the remaining units were repairable. The second unit was successfully rebuilt and re-installed, while the third unit

was removed. Eventually, all four pumps will be repaired with new components to extend their life.

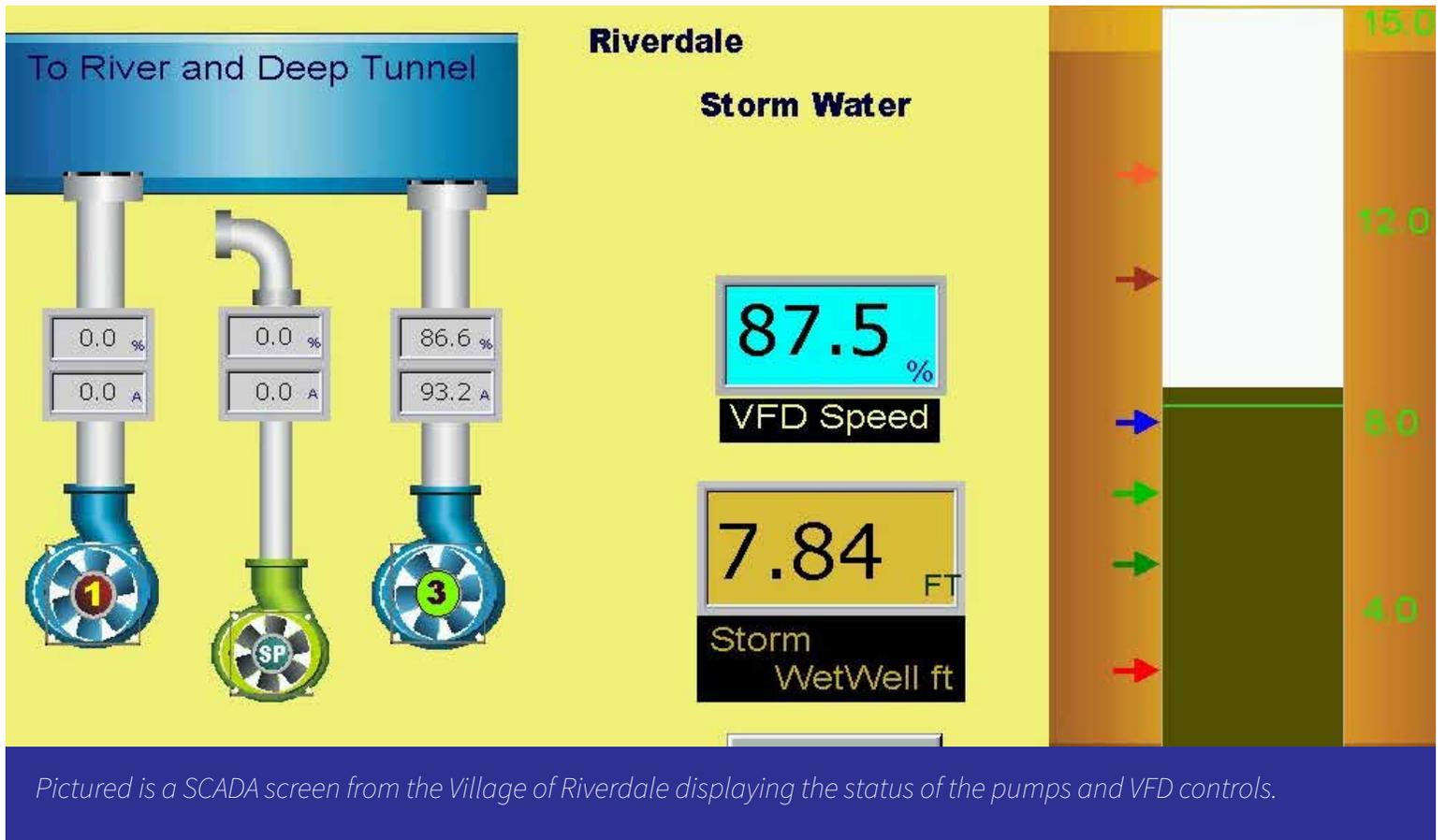
During a storm event, when the rainfall exceeds the operating capacity (3 million gallons per day) of the raw pumps, the treatment plant closes its influent sewer gate. The excess flow pumps are designed to divert the excess water into the retention pond near the plant where the water is stored until it can be evenly paced back to the treatment plant following a heavy rain event.

Each pump stretches 40 feet long, with a 36" diameter discharge and produces 32,000 GPM. In less than two months, two of the four pumps have been repaired at Metropolitan's shop.

Village of Riverdale, Illinois

A grant from the Hurricane Ike Recovery Fund was awarded to the Village of Riverdale in Cook County, Ill. This gave the village the opportunity to restructure a crucial stormwater lift station that was in desperate need of an upgrade.





In collaboration with Gaskill Walton Construction Company in Chicago Heights, Ill., Metropolitan designed a solution to improve the existing pump station.

The 84" sewer pipe comes into the lift station parallel to the deep tunnel and pumps the water to the river. The upgrades also included two 42" diameter discharge flap gates and a stainless steel bar screen.

Inside the existing building are upgrades to the control equipment and two new variable speed pumps running at 30,000 GPM with space for a third. The motor control center (MCC) includes VFDs for large motors at 125 HP, a 350 KW diesel generator and a PLC touch screen integrated into the existing SCADA system. To help save money the controls are run manually.

The village will also use Metropolitan's M2M cellular plan to improve communication efficiency at the pumping station. M2M cellular refers to technologies that allow both wireless and wired systems to communicate with each other over cellular, giving customers the most reliable data for the best value.

The "M2M Ready" control panels include features like alarm notification, remote access, video surveillance and telemetry required for SCADA systems out of the box. All of the challenges associated with activating, troubleshooting, and maintaining M2M devices and

accounts are eliminated. The video surveillance can be viewed remotely through a cellular modem.

The lift station will qualify for rebate incentives from the Department of Commerce and Economic Opportunity (DCEO) for installing VFDs in the system. The system is an energy efficient operation and matches influent demands to save money.

Calumet City, Illinois

In conjunction with Robinson Engineering LTD of South Holland, Ill., Metropolitan Industries was assigned the important task of assisting in the renovation of a critical combined sewer overflow (CSO) pump stations in the South Suburban Chicagoland-area. The pump station, located in Calumet City, Ill., has been responsible for keeping many of the nearby south suburban municipalities from flooding during heavy rain events since it was originally built with Works Progress Administration (WPA) money in the 1930s.

The nearby Metropolitan Water Reclamation District (MWRD) will close its influent sewer gate to prevent exceeding the capacity of the collection and treatment system due to the combination of normal sanitary flows and the excessive infiltration of stormwater. When this gate closes, the water accumulates at a rapid rate and begins to seek higher elevations, at which point, it begins to fill the wet well of the Calumet City CSO Pump Station.



Top Left: Part of the original combined sewer overflow pump station remained during the construction of the new building.

Top Right: The new building during the installation process.

Bottom Left: A view inside the new control building shows all new control equipment related to the upgrade.

Bottom Right: The prefabricated building's exterior matches other existing pump stations in Calumet City.

The station's reliable operation during high capacity rain events is critical due to the negative consequences (of rising water) the surrounding municipalities would face if the stormwater is not conveyed to the Calumet River immediately.

Four new submersible pumps were supplied, including the associated discharge tubes designed to house the pumps and convey the discharged water to the effluent trough that leads to the river.

The city was provided with three 355 HP pumps and one 215 HP pump, which all discharge at a combined rate of approximately 155,000 GPM. One of the many unique aspects of this project is its great size. This is one of the larger submersible pumping stations in all of Chicagoland and one of the larger prefabricated buildings Metropolitan Industries has produced.

In addition to four new pumps, Metropolitan also supplied all of the power distribution equipment, controls and motor equipment related to the upgrade, including switch

gear (to support existing standby generators) and SCADA equipment, all housed in a prefabricated building.

The building houses low harmonic variable frequency drives, which accelerate or decelerate pump motors to match the influent rate. Regardless of the rainfall event or its severity, the pumps will speed up or slow down to match the influent rate to remove the combined sewer flows in an energy-efficient manner.

The city's need of an extensive upgrade of this pump station can be attributed to a number of factors, including corroded power distribution equipment due to hazardous sewer gases accumulating in the 1930's building and pumping equipment last updated in the 1980s.

Once the new building was complete, the existing building was demolished and the new building was set in its place. Following delivery of the building, the project contractor, John Burns Construction of Orland Park, Ill., added a gabled roof and an aesthetic finish to the structure used to match other Calumet City municipal buildings.

Metropolitan Announces Latest in Battery Backup Systems

Metropolitan Industries announced earlier this month the newest version of Sumpro® availability, an intelligent battery backup system with premier fully automatic auxiliary power source. Performance-tested for optimal functionality, Sumpro® systems can be used in conjunction with pumps with a variety of horsepower ratings. The Sumpro® has delivered dependability for over 20 years and has become a favorite among contractors, plumbers and homeowners around the country.

With the latest technology and a smaller footprint, the updated Sumpro® provides even more dependability. New features include an LED screen, which displays critical system information, an improved charging circuit, alarm contact for remote monitoring and notification and more. Metropolitan has also developed a new line of batteries which, when combined with the new version of Sumpro®, will give users an increase in run time by 25 percent.

Sumpro® systems install in minutes as users simply plug units into a standard dedicated wall outlet. When a power failure is detected, Sumpro® will automatically supply standard household electricity to any connected appliance until utility power is restored.

Continuing Metropolitan's commitment to energy efficiency and the environment, the new Sumpro® offers users the ability to work in conjunction with the latest green technologies including both solar and wind inputs, adding to the diversity of the product.

In addition, the Ion® Products residential flood control series and residential division offers the Ion® System Solution, which includes battery backup systems, pumps, float switches and pump controllers needed for complete flood protection. For more information regarding the new Sumpro®, intelligent battery backup system and our residential solutions, please visit www.ionproducts.net or call (815) 886-9200.



Seal Water System Extends Pump Life

Right: Seal water pump system with attached break tank installed at a major wastewater treatment facility in Broward County, Fla. Far Right: One of two of the stainless steel seal water control systems for the North Shore Sanitary District in Lake County, Ill. Below: The diagram below explains the flow of the seal water.

Extending the life of the shaft seals on larger wastewater pumps has many advantages. When a shaft seal fails the main pump has to be removed from service and repairs can be costly. With this in mind, many system designers specify an external flow of seal water to cool the main pump shaft seals all with the intent of extending seal life. Often times the supply is potable water, requiring a physical separation of the source.



When potable water is used to provide seal water flow, it is important to address the need for back flow prevention. Many designers and public health authorities favor a physical air-gap/ break tank as a positive means of separating the water source from the process. Physical air gap type systems require a pumping system to re-pressurize the water for seal water service.

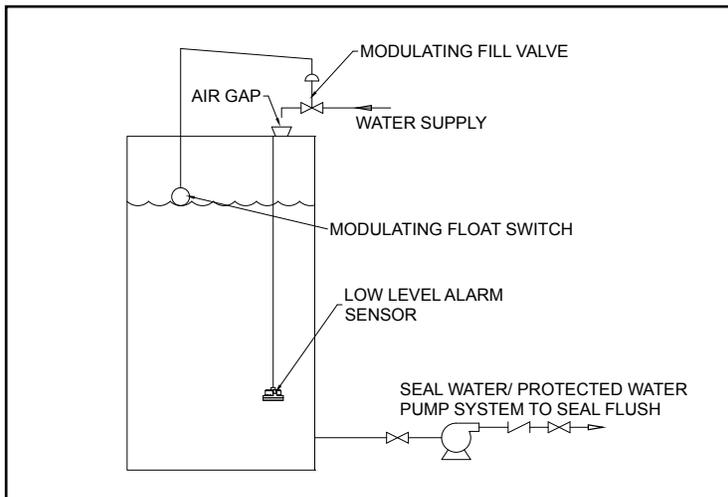
Recently, Hazen & Sawyer Engineering turned to Metropolitan Industries to recommend a seal water pump system for a major wastewater pumping facility in Broward County, Florida. This main pump station pumps

raw sewage to the regional wastewater treatment plant that services over 600,000 residents. Included in the design was a seal water system with a physical air-gap/ break tank intended to supply seal water and also protect the community water source.

The main pumps used at the Broward County facility included three 250 horsepower high flow pumps and one 60 horsepower low flow pump. The seal water flow rate required for each of these pumps was 2 GPM, a total of 8 GPM of seal water flow required. Supply pressure is carefully coordinated with the seal manufacturer's specifications.

The seal water system was designed as a totally integrated package with an air gap tank, pumps, piping, valves, safeties and controls. The package is factory prefabricated, tested and delivered to the site as a complete assembly for ease of installation and integration with on-site utilities.

A pressurized supply of clean, cool water is key when protecting the shaft seals of large wastewater pumps. Flushing water helps extend seal life and minimize downtime and costs associated with repairs. An air gap type seal water pump package is an ideal choice if potable water is chosen as the source.





Hot Water Return Provides Comfort to 400 E. Randolph

Hot water return systems help maintain hot water in plumbing systems to reduce wait time for hot water at the fixtures, while saving water and energy that would otherwise be wasted. These systems are especially important for residents of condominiums using hot water during off-peak times throughout the day when hot water is not used as frequently.

In an effort to accommodate the residents living at 400 E. Randolph in Chicago, Asmir Zenkic, Chief Engineer of the 400 Condominium Association turned to Cecchin Plumbing and Heating, Inc., of Bloomingdale, Ill., and Metropolitan Industries to design a pump package that would provide consistent hot water temperature to the residents within the complex.

Built in 1963, the building previously known as the Outer Drive East, is situated just off Lake Shore Drive and within walking distance to Grant Park and Millennium Park. Converted to condos in 1973, the 42-story high-rise now houses 956 residential and commercial units.

As part of its domestic water piping replacement project over the past four years, Project Manager, Joe Nিকেle of Cecchin Plumbing and Heating has worked diligently with the complex

to replace all domestic water piping throughout the building.

One of the final phases of the project addressed the hot water return pumps. The two original hot water return systems that serviced the entire building were inadequate, especially for a building this size, and in desperate need of an upgrade. Included in the upgrade are two customized duplex hot water return pump systems, uniquely designed to run at variable speed in order to meet the energy codes required for the condominium.

The design also includes a customized control scheme to measure temperature, flow and pressure on a color touch screen with a programmable controller and an operator interface showing the system status. The first priority is to maintain a temperature of 115 degrees, if the temperature falls below the set point, the control will speed the pump up to create more flow to pull the hot water through the plumbing system and increase the temperature.

The building, divided into a high and low zone, maintains consistent temperature to accommodate each unit. Each zone is equipped with a duplex (two pump) system for 100 percent redundancy.

The low zone hot water return pump system has been designed to provide a flow-rate between 40 and 90 gpm at a constant discharge pressure of 140 psi, with a minimum net suction pressure of 100 psi. The high zone hot water return pump system is designed to provide a flow-rate between 40 and 90 gpm at a constant discharge pressure of 185 psi, with a minimum net suction pressure of 165 psi.

In order to achieve maximum efficiency, it is important that the pumps work within a range of velocity so that the maximum allowable velocity is not exceeded in the pipe, which would cause pressure problems in the pumping zone as the pumps speed up. The building was also re-piped with copper to decrease friction within the system.

Since the systems were installed, the goal of more efficiently reducing wait time for hot water has been resolved and the systems are functioning seamlessly as designed.

“The equipment upgrade and piping that was replaced throughout the entire building is a major improvement to the complex,” said Nিকেle, “this has been an ongoing project and we couldn’t have asked for a better outcome.”

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Future dates to be added!

SEMINARS 2014

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Residential-Commercial Plumbing Applications: Sump & Sewage: 4 CEUs (IEPA, ILDPH), 4 PDHs	Mechanical- Steam Basics: 3 PDHs	
Dates Available: TBD Time: TBD	Dates Available: 10/1 Time: 3:00 pm - 6:00 pm	
Municipal		
Infrastructure Improvements- ABCs of pump system improvements: 4 CEUs (IEPA), 4 PDHs	How to get the most from your SCADA system: 4 CEUs (IEPA), 4 PDHs	
Dates Available: 12/10 Time: 9:00 am - 2:00 pm	Dates Available: 11/6 Time: 9:00 am - 2:00 pm	
Commercial-Plumbing		
Self-Priming Pump Application/ Installation/ Operation/ Maintenance: 4 PDHs	Commercial Water Systems- Energy Saving Strategies: 4 CEUs (IEPA), 4 PDHs	Commercial Building Pressure Reducing Valves – Application / Operation / Maintenance / Repair: 4 PDHs
Dates Available: 11/19 Time: 3:00 pm - 7:00 pm	Dates Available: 10/29, 12/4 Time: 9:00 am - 2:00 pm	Dates Available: 10/15, 12/17 Time: 3:00 pm - 7:00 pm