The Village received principal foregiveness funding from the Ohio EPA Water Pollution Control Loan Fund (WPCLF) to fund 100% of the project.

**WEST UNITY WASTEWATER TREATMENT PLANT**

PDG was the prime consultant for the evaluation, design and construction of improvements to the Village of West Unity’s existing wastewater treatment system.

**Scope of Work**

- Addition of variable speed drives to the three (3) existing raw sewage pumps
- New mechanical self-cleaning raw wastewater influent screen
- Vortex type grit removal system
- New headworks building to house the screen and grit removal equipment
- Replacement and upgrade of the two existing oxidation ditch aeration rotors with new rotors including variable speed drives
- Final clarifier equipment repair
- Upgrade of the ultraviolet disinfection system with a new self-cleaning system
- New administration building including lab facilities, office, restroom and a garage bay
- New supervisory control and data acquisition (SCADA) system to monitor various plant parameters.

**Project Relevance**

- Wastewater Treatment Plant
- Construction Services
- Oxidation Ditch
- Grit Removal
- Grant Administration

**Location**

- West Unity, Ohio

**Services Provided**

- Environmental and Electrical Engineering

**Project Cost**

- $2.68 million

**Project Funding**

- Ohio EPA Water Pollution Control Loan Fund (WPCLF) – Principal Foregiveness Funded 100%

**Size**

- 325,000 GPD
- 1,460,000 GPD Peak

**Schedule**

- Professional Services 2018

**Project Team**

- Mike Atherine, P.E. – Project Manager
- Steve R. Wonderly, P.E. – Project Engineer
- Dan L. Knott - P.E. – Electrical/Controls
- William M. Villata – Senior Design Technician
- Ken McOwen – Inspection

**Reference**

Joshua Fritsch
Village Administrator
419.924.2215
westunityadmin@roadrunner.com
PDG was the prime consultant for the evaluation, design and construction of various improvements to the Village of Montpelier’s existing wastewater treatment system. Work consisted of replacement of the existing grit removal system, replacement of the aeration tank air piping and diffusers with fine bubble type aeration diffusers, replacement of blowers, replacement of two (2) final clarifier sludge collection mechanisms, installation of FRP launder covers on three (3) final clarifiers, replacement of six (6) sludge pumps, installation of a self-cleaning ultraviolet disinfection system, installation of a chemical storage and feed system for phosphorous removal, new primary sludge pump station, new liquid sludge truck fill station, addition of a Supervisory Control and Data Acquisition (SCADA) system to monitor various plant parameters and miscellaneous valving, grating and handrail replacement.

The Village received $2.32 million in principal forgiveness and a zero percent (0%) loan from the Ohio EPA Water Pollution Control Loan Fund (WPCLF) to fund the project.
PDG and HRG attended several meetings with WWTP and Village staff and prepared a comprehensive SSES proposal to address the Village’s WWTP and collection system problems. The investigative process addressed issues at the WWTP, including review of existing sanitary sewer plans and data, demographic profile analysis, existing collection system evaluation, existing WWTP evaluation, growth and development analysis, identification of alternatives, evaluation of alternatives and costs, financing options, and an implementation schedule. This included the potential for constructing a new WWTP. PDG assisted the Village in pursuing OWDA and other funding for this study, as well as for design and construction.

PDG was the prime consultant for the design and construction of the new WWTP. The project involved a new headworks facility (screening, grit removal and submersible raw sewage pumps), two new SBR tanks for the waste activated secondary treatment process, post aeration, NPW systems, and ultraviolet disinfection. The existing wastewater treatment tanks were converted to aerobic sludge holding/digester tanks. The existing raw sewage pump station was converted to a septage receiving station.

PDG and HRG assisted GOTL with a 2009 OPWC project, which included a new sludge press at the WWTP. Based on the wastewater system investigation proposal and problems with the plant flow meter, GOTL, PDG and HRG reviewed alternatives and costs to solve problems while paving the way for a longer-term solution.
WASTEWATER TREATMENT

NEW LEXINGTON WWTP IMPROVEMENTS
WWTP improvements consisting of UV disinfection, two 41 foot diameter final settling tanks, influent and effluent flow splitter chambers, RAS/WAS pump stations, and chemical feed equipment/building. The existing Imhoff tanks will be demolished. The project is currently in design.

Project Cost
Current Engineers Estimate $2,354,000
Bidding Anticipated, July, 2016
Construction Anticipated Completion Dec. 2017
Contact Scott Bryant • Administrator • Village of New Lexington • 740.342.2177 • nladmin@rrohio.com

GENEVA-ON-THE-LAKE WWTP IMPROVEMENTS
PDG and Herbert, Rowland, and Grubic, Inc. (HRG) attended several meetings with WWTP and Village staff and prepared a comprehensive SSES proposal to address the Village’s WWTP and collection system problems. The investigative process addressed issues at the WWTP, including review of existing sanitary sewer plans and data, demographic profile analysis, existing collection system evaluation, existing WWTP evaluation, growth and development analysis, identification of alternatives, evaluation of alternatives and costs, financing options, and an implementation schedule. This included the potential for constructing a new WWTP. PDG assisted the Village in pursuing Ohio EPA WPCLF and other funding for this study, as well as for design and construction.

PDG is the prime consultant for the design and construction of the new WWTP. The project involves a new headworks facility (screening, grit removal and submersible raw sewage pumps), two new SBR tanks for the waste activated secondary treatment process, post aeration, NPW systems, and ultraviolet disinfection. The existing wastewater treatment tanks will be converted to aerobic sludge holding/digester tanks. The existing raw sewage pump station will be converted to a septage receiving station. The Village was awarded $2.5 million of principal forgiveness by Ohio EPA WPCLF.

Project Cost
Engineers Estimate $6,628,650
Bid Amount (July 15, 2015) $6,456,394
Construction Anticipated 2016
Contact Mr. Mark Mizak • Village Administrator • Village of Geneva-on-the-Lake • 4929 South Waines Drive • Geneva-on-the-Lake, Ohio 440421

CRESTON WWTP IMPROVEMENTS
The Village of Creston retained PDG to provide professional engineering services for the development of an Ohio EPA approvable wastewater treatment plant evaluation and study. The engineering study identified treatment alternatives that would resolve water quality compliance issues, and would also be financially affordable. The selected treatment alternatives which were constructed and placed in service in 2014 included a new mechanical screen, raw sewage pump and building improvements, an oxidation ditch, final settling tanks (2), blower replacements, auxiliary power, phosphorous removal equipment and a new laboratory and administration building.

This project eliminated existing tertiary filters and now is in full compliance with all of the Villages effluent permitted water quality standards. The design capacity of the treatment plant still remains at .230 MGD on an average daily basis, with a peak design capacity of 1.5 MGD.

Project Cost
Engineers Estimate $3,600,000
Bid Amount (February 21, 2013) $3,607,741
Construction Cost $3,702,165
Completion 2014
Contact Jeff Hostetler • BPA President • Village of Creston • 330.435.6506

OBERLIN WATER ENVIRONMENT PROTECTION FACILITY TERTIARY FILTER SYSTEM
The City of Oberlin’s Water Environment Protection Facility Tertiary Filtration System was in need of replacement to improve phosphorous removal and increase wet weather
treatment capacity. The upgraded system needed to fit within the footprint of the existing system, handle peak flows with minimal backwashing volume and accomplish a higher degree of phosphorus removal.

PDG was the prime consultant for the investigation, design and construction of improvements to the City’s Water Environment Protection Facility Tertiary Filtration System.

**Project Elements**
- Upgraded existing sand filtration system from a capacity of 3 MGD to 6 MGD
- Replacement of the existing sand filtration system with an innovative 5 micron cloth media disk filter system
- Enhanced phosphorous removal
- Minimal backwash water volume
- Retrofitted within existing structures
- Does not require down time for backwashing

**Project Cost**
- Engineers Estimate: $1,600,000 to $1,740,000
- Bid Amount (June 18, 2014): $1,509,230
- Construction Cost: $1,509,230
- Completion: September, 2015

Contact Steve Hoffert • Wastewater Superintendent • City of Oberlin • 440.775.7280

GRAFTON WWTP EXPANSION

PDG was the prime consultant for the design and construction of phased improvements to the existing wastewater treatment plant consisting of a four-basin Sequencing Batch Reactor (SBR) type treatment process, cloth disk filter type tertiary treatment system, self-cleaning ultraviolet disinfection system, chemical feed facilities for phosphorous removal, dried sludge cake storage building, PLC based automated control system, demolition and renovation of existing treatment plant components, control building laboratory improvements, diesel engine generator standby power system, influent raw wastewater self-cleaning screen, two 400,000-gallon aerobic sludge holding tanks, computerization of plant controls, 1.5-meter-wide sludge dewatering press, 5 MG equalization basin, and miscellaneous buildings. The treatment plant has a capacity of 1.5 MGD on an average daily basis with a peak hydraulic capacity of 4.5 MGD.

The project also involved modifications to sanitary sewer lines, repairs to manholes and several thousand feet of sanitary sewer extension from 12-inch to 24-inch diameter. The cloth disk filter type tertiary filter system, which is the first system in Ohio, was selected over conventional sand filters because of its compact footprint and ease of operation.

The following costs are for the latest phase of work.

**Project Cost**
- Engineers Estimate: $2,500,000 to $3,000,000
- Bid Amount (November 14, 2013): $3,098,331
- Construction Cost: $3,278,496
- Completion: July, 2015

Contact Dave Divencenzo • President of Council • Village of Grafton • 440.926.2401

DELTA WWTP IMPROVEMENTS

PDG was the prime consultant for the planning, design and construction of improvements to the Village of Delta’s wastewater treatment plant. Work consisted of new motors, and variable frequency drives and PLC control for the four raw sewage pumps; and a new mechanical fine screen to replace the grinder and masonry building to enclose the screen. The aerated grit removal equipment was replaced with vortex style grit removal equipment, we replaced the decanters in the SBR tanks and modified the influent piping to the SBR tanks, and replaced the SBR blowers, including variable frequency drives. Submersible waste sludge pumps were installed in the SBR tanks. Improvements were made to the sludge holding tanks including structural rehabilitation, diffused aeration and new blowers. An ultraviolet disinfection system replaced the chlorine disinfection equipment and a new administration building with a laboratory was constructed.

**Project Cost**
- Engineers Estimate: $2,610,500 to $2,900,000
- Bid Amount (November 21, 2013): $2,577,000
- Construction Cost: $2,652,776
Completion
December, 2014
Contact Dan D. Miller • Mayor • 419.822.3190 • mayor@villageofdelta.org

CITY OF BOWLING GREEN – WATER POLLUTION CONTROL FACILITY (WWTP) IMPROVEMENTS

As part of the City’s Combined Sewer Long Term Control Plan, the existing sand filtration system had to be upgraded from a capacity of 16 mgd to 30 mgd. Also, as mandated by the City, the upgraded filtration system and UV disinfection system needed to fit within the footprint of the existing system, handle peak flows with minimal backwashing volumes and be integrated into the existing SCADA system.

PDG was the prime consultant for the investigation, design and construction of improvements to the City’s Wastewater Treatment Plant Tertiary Filtration System and Ultra-violet Disinfection System. To accomplish the plan requirements, an innovative cloth media disk filter system was selected to replace the existing sand filtration system because of its compact footprint and ease of operation. The existing medium pressure UV disinfection system was also replaced with a more energy efficient high intensity low pressure UV disinfection system. The UV disinfection system is flow paced which means that both the number of bulbs operating and the intensity at which the bulbs operate is varied in proportion to the flow rate.

Both projects were completed within a 13 month period to meet EPA deadlines.

<table>
<thead>
<tr>
<th>Tertiary Filtration Improvements Project Cost</th>
</tr>
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<tbody>
<tr>
<td>Engineers Estimate</td>
</tr>
<tr>
<td>Bid Amount</td>
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<tr>
<td>Construction Cost</td>
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<tr>
<td>Completion</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Ultraviolet Disinfection System Project Cost</th>
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</thead>
<tbody>
<tr>
<td>Engineers Estimate</td>
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<tr>
<td>Bid Amount</td>
</tr>
<tr>
<td>Construction Cost</td>
</tr>
</tbody>
</table>

The cost of the tertiary filters was $1,388,000 and is not included in the project cost shown above.

Grit Removal
The most recent project was replacement of the existing grit removal system, addition of new raw sewage screen for east of I-75 sewers, addition of odor control systems to Poe/Mercer Pump Station, existing septage receiving station and grit removal facility and evaluation of the flushing system for the existing CSO basin. The $2.5 million project is currently under design. Anticipated completion is 2016.

Contact Doug Clark • Superintendent • City of Bowling Green 419.354.6274 • DClark@bgohio.org

VILLAGE OF LEIPSIC – WASTEWATER TREATMENT PLANT IMPROVEMENTS

Over the past 20 years, PDG has provided ongoing consulting, design and construction administration services to assist the Village of Leipsic in the continued improvement of its wastewater treatment plant. These improvements have included: conversion of existing trickling filters to high rate design, final clarifiers, wet weather overflow basin and pumping station, laboratory building, interceptor sewer system, standby power, two SBR basins for high-strength industrial wastewater pretreatment, blower/chemical feed building, three aerated sludge holding tanks, 1.5-meter-wide sludge dewatering press, sludge dewatering building, and related site work. 2006 improvements included the construction of a third SBR tank with coarse bubble diffused aeration, new SBR PLC based control system, flow splitter chamber for three-tank operation, and an ultraviolet disinfection system.

Most recent improvements completed in 2013 include the construction of a Headworks facility with a mechanical fine screen, vortex grit removal equipment, and submersible raw sewage pumps. A fourth SBR tank was constructed increasing the secondary treatment capacity of the WWTP by 40% to 1.5 MGD. Fine bubble diffuser aeration was installed in all 4 SBR tanks to increase oxygen transfer efficiency.

A SCADA system was installed to monitor and control the wastewater treatment process. The UV disinfection system
was relocated to a new concrete tank and enclosed in a building. An operation center with offices for the plant personnel was added to the lab/control building. New stand-by power generator was included in the project.

Most Recent Project Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineer’s Estimate</td>
<td>$4,022,900</td>
</tr>
<tr>
<td>Bid Amount (March 8, 2012)</td>
<td>$3,797,000</td>
</tr>
<tr>
<td>Construction Cost</td>
<td>$9,360,054</td>
</tr>
</tbody>
</table>

*EDA funding allowed a substantial expansion and additional improvements to the plant.

Completion: April, 2013

Contact: Mr. Kevin Lammon, Village Administrator • Village of Leipsic • 419.943.2009

SANITARY SEWER SYSTEMS

NORTHEASTERN WATER & SEWER DISTRICT

PDG has provided professional engineering services to the District since its establishment in 1994. During the last three years, PDG has assisted with the following sanitary sewer collection projects:

- Bloomdale/Bairdstown Sanitary Sewers, (2) Pump Stations and Oxidation Ditch WWTP
- West Millgrove Sanitary Sewers
- Five Point Road Sanitary Sewers
- Sugar Ridge/Mercer Road Sanitary Sewers
- Rossford - Glenwood Road Sanitary Sewers
- Ampoint Sanitary Sewers
- Country Manor Pump Station
- Huffman/Kramer Road Sanitary Sewers
- Rudolph Road Sanitary Sewers
- Rossford - Hillview Sanitary Sewers
- Northwood Homecraft Sanitary Sewer Rehabilitation
- Sanitary Sewer 200 area
- Rossford Colony Sewer Rehabilitation
- Colony Pump Station

Contact Jerry Greiner • President • Northwestern Water & Sewer District • 419.544.9090 • jgreiner@nwwsd.org

PATASKALA VINE/CEedar STREET WATER LINES AND SANITARY SEWER REPLACEMENT

This project included the replacement of existing waterlines on Cedar and Vine Streets. The scope of this project included upgrading the existing lines from 4” to 6” to 8”, installation of new service lines and shut-offs to 43 residents and new hydrants and mainline valves. Record drawings of the existing system were vague so PDG personnel worked with the City of Pataskala’s Water Division in the field to locate existing valves and determine the size of the valves and mains which were unknown. Through this work we were also able to identify portions of the system that weren’t looped. These deficiencies were also addressed in the project and were upgraded so that the City has more operational flexibility going forward.

Project Cost

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Engineers Estimate</td>
<td>$530,000</td>
</tr>
<tr>
<td>Bid Amount (February 7, 2012)</td>
<td>$574,796.00</td>
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<tr>
<td>Construction Cost</td>
<td>$591,635.02</td>
</tr>
</tbody>
</table>

Increase in construction costs was due to a 4” waterline extension required after it was discovered that several homes on a side street adjacent to the project were being served by a 1” service line.

Completion: 2013

Contact Nathan W. Coey, Utilities Director • 740.927.4134 • ncoey@ci.pataskala.oh.us

MT. GILEAD–ORCHARD DRIVE SANITARY SEWER EXTENSION

PDG was selected by the Village to design sanitary sewers to an un-sewered area within the Village of Mt. Gilead. The project is located on Orchard Lane at the intersection of State Route 95 and extend south 1,000 lineal feet to the village corporation line.

Project Elements
Installation of approximately 850 lineal feet of 8" gravity sewer, manholes, and service laterals for 8 homes of which will be served by a grinder pump

One duplex submersible grinder pump station will be installed to pump sewage from the remaining 7 homes through 1,000 lineal feet of 2" force main

**Project Cost**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Engineers Estimate</td>
<td>$150,000</td>
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<tr>
<td>Bid Amount (February 4, 2014)</td>
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<tr>
<td>Construction Cost</td>
<td>$162,241</td>
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<td>Completion August, 2014</td>
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</tbody>
</table>

**Mt. Gilead Sanitary Sewer Rehabilitation**

The Village of Mt. Gilead’s sanitary sewer system has segments that are very old, prone to operational emergencies, i.e. blockages, pipe failures, back-ups, and constructed of VCP (vitrified clay pipe) that experiences considerable infiltration under wet weather conditions. The Village is proposing to rehabilitate portions of this system in order to reduce I&I (inflow/infiltration) in these areas and reduce repair frequency and cost. The proposed project is located in (4) four separate locations in town and is depicted further in project area maps. For purposes of this narrative they are described as the following, Baker Street Project Area, Lincoln Street Project Area, Southwest Trunk Project Area and the South Street Project Area.

The proposed project involves cleaning and televising (pre/post) work, cleaning will also include identified root removal. After cleaning and repair of identified deficiencies, work will include, repairing "hammer taps" in the mains, lining of sewer mains, plugging leaks in existing manholes as well as lining of sanitary manholes, complete with new frame and castings with appropriate seals to prevent inflow.

Mt Gilead is a small community with approximately 1,518 households and pays a monthly sewer rate of $43.36 and pays a month water rate of $35.08. The Village had $89,522 to commit to this project, and is requested the remaining $254,793 in OPWC grant assistance.

**Project Cost**

<table>
<thead>
<tr>
<th>Description</th>
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<tbody>
<tr>
<td>Engineers Estimate</td>
<td>$315,000</td>
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</tbody>
</table>

**Bid Amount November 24, 2015**

**Completion Anticipated May, 2016**

Contact Mr. Dan Rogers • Village Administrator • Village of Mount Gilead • 419.946.4861

**ERIE COUNTY - BAY VIEW SANITARY SEWERS**

PDG is working with the Village of Bay View and the Erie County Sanitary Engineer to develop detailed design for the construction of a sanitary sewer collection system. PDG completed a preliminary engineering evaluation and report in 2009 and assisted the Village and RCAP with an application for funding assistance for design and construction from USDA, Rural Development.

The current method of wastewater treatment is by individual on-site septic systems, which have been identified by the Erie County General Health Department (ECGHD) as a failed system. Bacteria testing in the bay was completed by the ECGHD and levels were identified that exceed water quality standards for public use.

The PDG report recommends that a gravity sewer collection system be constructed within the incorporated area of Bay View. The existing on-site septic system will be abandoned and the new sewer collection system will collect the wastewater from each service connection and will flow by gravity to a pump station that will deliver the wastewater to the City of Sandusky for treatment.

The gravity sanitary sewer collection system in Bay View will include approximately 33,500 LF of PVC sanitary sewers, manholes, laterals, restoration, two pump stations and 22,000 LF of 6’ force main to Sandusky is estimated to cost $6.4 million. The project will be funded by USDA Rural Development.

**Project Cost**

<table>
<thead>
<tr>
<th>Description</th>
<th>Amount</th>
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<tbody>
<tr>
<td>Engineers Estimate</td>
<td>$6,513,253</td>
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<tr>
<td>Contract A - Bay View Sewer and Pump Station Improvements:</td>
<td>$5,839,818.00</td>
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<tr>
<td>Contract B – Force Main Improvements:</td>
<td>$673,435.00</td>
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<tr>
<td>Bid Amount (November 5, 2015)</td>
<td></td>
</tr>
<tr>
<td>Contract A</td>
<td>$5,952,442</td>
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</table>
NEW LEXINGTON SANITARY SEWER REHABILITATION

PDG was the prime consultant to prepare plans and specifications for New Lexington’s sanitary sewer rehabilitation project. Contract B and C consisted of cleaning and internal televising approximately 9,000 lineal feet of sanitary sewer, relining approximately 7,500 lineal feet of 8” – 18” diameter sanitary sewer, and rehabilitate approximately 23 manholes. Contract A consisted of replacing approximately 2,000 lineal feet of 8” – 12” diameter sanitary sewer and replacing approximately 10 manholes.

Project Costs

<table>
<thead>
<tr>
<th>Description</th>
<th>Contract B</th>
<th>Contract A/B/C</th>
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</thead>
<tbody>
<tr>
<td>Construction Cost</td>
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<td>$653,265.00</td>
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<tr>
<td>Completion</td>
<td>Anticipated Completion May, 2017</td>
<td>February, 2015 and June, 2015</td>
</tr>
</tbody>
</table>

Contact: Jack Meyers, P.E. • Erie County Department of Environmental Services • 419.433.7303 • jmeyers@erie-county-ohio.net

MONROEVILLE SANITARY SEWER

PDG provided professional engineering to design and perform construction administration for the installation of approximately 2,360 lineal feet of 12” gravity sanitary sewer, 50 lineal feet of 8” sanitary sewer, and approximately 1,550 lineal feet of 6” service laterals. The project also included the installation of new manholes, general restoration and 2,700 square yards of asphalt replacement.

A bid alternate was also completed to install approximately 1,466 lineal feet of 10” sanitary sewer, 359 lineal feet of 8” sanitary sewer and 925 lineal feet of 6” service laterals via open-cut, 10 sanitary manholes, general restoration, and approximately 1,200 square yards of asphalt replacement.

Project Costs

<table>
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<tr>
<th>Description</th>
<th>Contract B</th>
<th>Contract A/B/C</th>
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</thead>
<tbody>
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<td>Construction Cost</td>
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<tr>
<td>Completion</td>
<td>November, 2015</td>
<td>November, 2015</td>
</tr>
</tbody>
</table>

Contact: Tom Gray • Administrator • Village of Monroeville • 419.465.4443 • villageadm@monroevilleohio.com