

# PROJECT UPDATE - LAUREL LAKE RESIDENTS CHOOSE CREATIVE WASTEWATER SOLUTION



**F. R. Mahony & Associates, Inc.**

## Laurel Lake — Pressure Sewer Solution

**Lenox, MA**

**Special points of interest:**

- Minimally Invasive Construction Methods with Low Visual Impact
- “Green” Construction Techniques.
- State of the art Pressure Sewer System
- Time Saving Ballast System

**Results**

- Economical Wastewater Solution

Residents of Laurel Lake enjoy some of the most spectacular waterfront views on this beautiful 165 acre water body.

Laurel Lake borders the Towns of Lenox and Lee Massachusetts. These homes are nestled in the heart of the Berkshires with access to world renowned art and cultural centers while enjoying a peaceful place to relax and enjoy nature’s wonders. What they do not have is adequate separation to groundwater for proper on-site wastewater disposal systems.

Many of the residences along Laurel Lake are serviced by Municipal Sewers. However, the residents of Lenox on the north east Shore of Laurel Lake longed for a solution to their wastewater needs.

Percolation tests and the proximity to ground water quickly ruled out conventional on-site septic systems. The residents wanted to find a solution to restrictive septic tanks and “tight tanks” while preserving the quality of the lake and maintaining the beauty of their homes.

The homeowner’s association contracted with Marshall White of White Engineering in Pittsfield, MA to find solutions to their problems. Investigation of options found that Public Sewer was 3,100 feet away in the neighboring Town of Lee. Sewer connection would require approvals of both towns and would also require pumping due to the higher elevation of the sewer on nearby Route 20. High groundwater and the relatively flat terrain along with

bordering wetlands made “Conventional Gravity Sewers” prohibitive. White Engineering has designed a number of pressure sewer systems and contacted F. R. Mahony & Associates, Inc. of Rockland, MA to help with a system design.

A pressure sewer design was completed with 2-inch HDPE pipe as the recommended choice. Construction along this long access road through wooded wetlands had to be designed to protect these resources. Borings and soil investigation determined that Horizontal Direction Drilling (HDD) could be used to minimize impacts to this area.

*(See HDD Page 2)*



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## Project Scope

### Pressure Sewer

Grinder pumps will be used at each home in this neighborhood to collect and process wastewater and discharge to the common 2-inch diameter main pipe. Wastewater will be pumped 3,100 feet to a gravity sewer located in Route 20 in the Town of Lee. Each home will have the ability to pump wastewater through this common system to the final receiving sewer. The homes are a blend of seasonal and year round occupancy. Careful consideration of flows during these periods of time was required to allow for the proper flow characteristics during all flow periods. The higher pressure capabilities offered by the Environment One® grinder pumps allowed for smaller lines sizes to accommodate low flow periods and maintain capacity for higher flow conditions.

**Costs were a strong factor in the overall consideration of construction methods. The Homeowners paid for 100% of the cost of this system.**

## Pressure Sewer Solution (Continued from page 1)

### HDD Solution

The use of the HDD method of construction made permitting of this work much easier and greatly reduced the typical requirements to protect wetlands. Areas of excavation are much smaller and therefore allowed for less need to line the entire project with silt barriers. HDD also eliminated the need to excavate soils and disturb natural groundwater flow.

As this pipeline is drilled into the soil no gravel or stone is required for backfill bedding used in the "conventional open cut" type excavation.

Costs were a strong factor in the overall consideration of construction methods. The Homeowners are paying for 100% of the cost of this system. Therefore anything that minimizes the construction time and costs of restoration were a key benefit.

HDD allows for very long line segments of 400-500 feet to be installed in one pull.



### Pressure Sewers

Pressure sewer systems are provided by Environment One® Corporation of Niskayuna, NY. This project is very much like the early pressure sewers provided by E/One over 40 years ago when this technology was first introduced. Pressure Sewers first labeled "Low-Pressure Sewers" gained recognition in difficult locations along shorelines and in remote areas.

Over the years this technology has gained greater acceptance and has become a very viable option to more costly and disruptive sewer collection techniques. Today these systems are used in much larger projects and projects that once were only considered to be serviceable with gravity sewers or costly lift stations.

F. R. Mahony & Associates (FRMA) has represented E/One locally for over 35 years and provided the design support and details to White Engineering for final plan approval. FRMA has worked with White Engineering before and has completed many successful pressure sewer installations.



*"A mind that is stretched by a new experience can never go back to its old dimensions."*

- Oliver Wendell Holmes, Jr.



### Construction

Pipeline construction is now complete. The firm of Joe Wilkinson & Sons Excavating, Inc. of Sheffield, MA was selected to do the HDD and pump installations. Joe Wilkinson and his crews have used HDD for many years and have a great deal of expertise in this field. Almost the entire mainline pipe has been installed in less than 2 weeks. Final work along Route 20 required some careful drilling to avoid ledge outcrops, storm drains, and transit water mains; requiring the drill operator to carefully guide his machine. Driving along the common driveway access to these properties, it is very difficult to see any signs of a major sewer project.

During construction one could occasionally see a road cone marking the end of a segment of pipe that will be joined with the next. Smaller excavations were made at these locations to join sections of pipe. These smaller disturbed areas were much easier to control and to restore. As you can see from the images on the next page, very little restoration work was required.

## Construction (continued)



View along pipe route showing restoration of HDD launch and coupling area.

Pressure sewers installed with coils of HDPE pipe require very few pipe joints.

Thermal fusion provides a coupling that is stronger than the pipe itself. This assures a leak free continuous pipeline. The flexible nature of the HDPE material allows for gradual changes in direction. This allows for easy insertion into the HDD pathway that has been cleared with the drilling apparatus.



Depending on the soil characteristics a slurry of material (Bentonite clay or "drilling mud") mixed with water may be used to fill the voids and lubricate and protect the pipe during insertion into the HDD pathway.

## Grinder Pump Installation

Pump units are pre-assembled grinder pump packages in HDPE chambers. These chambers are completely assembled and leak tested at the factory. These systems reduce the need for on-site assembly and field constructed structures.

Due to the high water table and difficult soil conditions, the contractor has chosen to use shorter pump basins and is using a new ballast product from **Bal-Last™ Interlocking Ballast Systems** of Townsend, MA.



These light weight basins require structural ballast to connect with the basin and use the weight of the basin, ballast and back-filled soil to overcome the buoyant groundwater forces. The Bal-Last™ system is a unique HDPE form designed to conform to the tank ribs and is filled with high strength concrete. A



system of (4) four interlocking blocks are locked around the base and are used to provide the required ballast and lifting system to install the units in the ground quickly and easily. This system reduces the installation time by avoiding the need to form and pour concrete ballast on site. Setting the pumps with the Bal-Last™ System was "perfect" according to Joe Wilkinson, General Contractor.



## Landscaping & Startup

Final cleanup before winter was completed after Thanksgiving. Spring touch up work will be done to finish lawn restoration. Final yard grading and spreading of loam for all of the homes is now complete. Minor grading of disturbed roadway areas was also completed.

Homeowners living with "Tight Tank" systems had the Thanksgiving Gift of fully functional wastewater disposal.





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#### WASTEWATER

We specialize in process solutions for the collection and purification of wastewater from single family homes to large municipal systems.

#### WATER

We will assist you in the application of state of the art processes for the clarification, treatment and disinfection for drinking water.

#### ON SITE TREATMENT

Our Amphidrome® system provides the highest level of treatment attainable with the lowest site impact

Providing SBR, MBR, and RBC technologies to fit the right solution for you.

#### SEWER SYSTEMS

Our applications group will assist you with the application of Pressure Sewer System technology and custom designed pump stations for your project.

#### SAGB® SYSTEMS

Process solutions for the nitrogen reduction in recycle streams.

### water supply and pollution control equipment

#### Startup Checklist

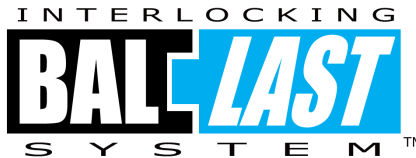


Final Startup inspections are done on all Environment One® pumps sold through F. R. Mahony & Associates, Inc.

A multi-point checklist is used to test the function of the pump and alarm panel. The pump units are test run and operation is verified. During inspection, any deficiencies that are noted can be easily corrected before the contractor leaves the site.

**FRMA Service Line 508-765-0051**

**No one knows your grinder pump better than your Certified Service Center.**



[www.interlockingballast.com](http://www.interlockingballast.com)

**The Bal-Last™ Interlocking Ballast System** is the result of extensive research and experience working with installers who handle Environment One® pump installations daily. Installers and their Environment One® Dealers have long sought a convenient and affordable solution to the time consuming and wasteful methods used in the past.

The **Bal-Last™** system eliminates the forming and pouring or pre-casting of concrete. Let's face it - the concrete truck rarely comes on time. Why waste billable time waiting for the concrete to arrive? Further more, why waste valuable time waiting for concrete to cure before you backfill?

If you have a difficult installation in high groundwater, you know that time is critical to installing your station quickly and safely. An unstable soil condition with dewatering is no place to waste time forming or pouring concrete. Simply attach **the Bal-Last™** system and place your pump quickly and safely. Then backfill immediately to stabilize your pump station installation.



**Make your next E-One® installation an easy one with Bal-Last™ Interlocking Ballast Systems**