

Vermont Town Looks Downstream With New Stormwater System

In 1990, the Vermont Agency of Natural Resources adopted a Combined Sewer Overflow Control Policy to assure that all combined sewer overflows (CSO) within the state are identified. If the wastewater collection system has a 50 percent probability of overflow in a one-year period, the respective municipality must take corrective action. The state published a timetable to bring municipalities into compliance with the Vermont Water Quality Standards and the Federal Clean Water Act.

The state advised the two-hundred year old town of Randolph, population

primary and secondary treatments.

Dubois & King reported the findings to town officials and presented three solutions to correct the overflow problem and bring the municipality into compliance with CSO policy.

- Build additional treatment capacity at overflow points.

- Store the overflow volume, estimated at one-million gallons, in an aerated holding tank. Treat the overflow at the existing treatment facility when the storm flows subside.

- Create a separate system to handle stormwater and relieve the existing sanitary sewer system.

mandates and results in infrastructure improvement that provides substantial long-term benefit for the town."

The money for the project, according to Town Manager Gwen Halismith, is part loan, grant and bond. The loan is zero interest from EPA. The grant and bond are through the State of Vermont.

Engineering Design

The basis of the engineering design was to stay within the existing town-owned right-of-way to minimize disruption to private landowners. Only five new and 20 temporary easements were required. The stormwater line runs along



Town of Randolph, VT installs new stormwater system in response to combined sewer overflow (CSO) control policy.

2,200, located 40 miles southeast of Burlington, that overflows exceeding the standard are suspected in their 80-year old collection system due to stormwater runoff.

Problems & Solutions

Randolph turned to the consulting firm of Dubois & King to assess the situation. Over a span of 30 days, using open channel meters, the consultant investigated possible overflow sites and tested for sewage content. Two were confirmed by Dubois & King as active sites during the design storm standard of the CSO policy. One was at a manhole within the collection system. The other was at the headworks—the entrance—to the Randolph wastewater treatment facility. There, sewage was bypassing

Recommendation

At the recommendation of the consultant, Randolph opted for creating a separate system, although it was the costliest alternative. Town officials were strongly swayed by the long-term benefits of a separate system.

- Cleaner water will drain into the nearby river.

- Potential public health threats caused by back-ups and flooding are reduced.

- Hydraulic stress at the treatment facility during storm events is reduced.

- Use of a separate system eliminates the need for a separate treatment process. According to Chuck Goodling, P.E. with Dubois & King, "The separation alternative accomplished the short-term objective of compliance with state

Randolph's main and side streets, parallel to the existing sanitary sewer system and other utilities. As a check for other sources of extraneous flow—other than road drainage—the consulting firm surveyed over 100 homes along the path of the line, checking for sump pumps and floor drains. Few were found and formal plans were drawn up for the project.

The town wanted a pipe requiring minimum maintenance and with a smooth inner wall for maximum flow. Lamson Vylon PVC pipe was the choice. The pipe was supplied by Milardo Hunt Associates, Hampstead, NH. The project requires 13,500 feet in diameters 12 through 42-inch. The Lamson Vylon PVC pipe connects to new concrete drainage structures and manholes. Bedding is compacted gravel

or crushed stone to the springline. Backfill is native soil above the springline. When completed, stormwater will discharge into the nearby Third Branch White River through 36 and 42-inch pipe outlets.

Construction Challenges

E.A. Grandfield Construction Company, Moretown, Vermont won the contract for the project. Work began July 1995 and was scheduled for completion December 1995. The construction schedule is very tight because the streets must be repaved before winter set in.

According to Grandfield Construction Manager Steve Martin, there are a number of challenges on the Randolph project and there has been one surprise.

Installing the stormwater pipeline along the path of utilities means working around, and under the existing systems at depths of 10 to 12-feet. Regulations call for a minimum five-foot offset from stormwater to sewer, making for tight working conditions underground. The working depths require a wide trench and walls are difficult to maintain because Randolph's native soil contains gravel and sand. A box is standard operating procedure. Many of the streets within the town with the deepest exca-

vations are only 18 to 22 feet wide, leaving little or no room to maneuver equipment or materials.

Before the project is over, much of the town, over 20 streets, will be impacted by the construction. "The importance of maintaining good public relations in a project of this scope is crucial," says Martin. "It can make or break a job. At every opportunity, I explain where we are in construction. It helps make people feel a part of what's going on."

A surprise for construction crews and town officials was the discovery under the street of very old 10,000 gallon cisterns once used by Randolph to store freshwater. Installation was temporarily halted until the large cisterns were filled-in.

The topography of the town is essentially flat. Staying on grade is another challenge faced by the construction company. The importance of grade was brought into sharp focus when the pipeline was installed 20 feet under a railroad crossing. Two bores were made in an effort to stay on grade. The first used a 48-inch diameter steel casing, 105 feet long with the 36-inch Lamson Vylon PVC stormwater pipe installed inside. The grade was slightly off so the contractor repeated the operation using 60-

inch diameter casing. The larger diameter of the new casing provided the flexibility needed to adjust the alignment of the pipe. Spacers hold the PVC pipe in place and sand within the annular space provides additional support. Installation took two weeks. Coordination and permitting with the railroad took eight months.

David Gilderdale, Randolph Bridge and Roads Supervisor, notes all sections and joints of pipe have tested to specifications. Low-pressure testing, manhole to manhole, was conducted, using inflatable 1,200 pound balls.

In a sense, Randolph has capitalized on the temporary disruption caused by construction of the stormwater line by moving ahead with a revitalization program for its commercial district that includes streetscape improvements like new sidewalks, curbs, landscaping, historic lighting and street repaving. At the same time, businesses throughout the commercial district are rebuilding storefronts.