

## **Wastewater Challenge in Indianapolis Infill Project**

Compact infill development is a trend throughout the country and central to an alternative wastewater solution project in Indiana as well.

Weak housing sales and downturn in construction have given rise to a demand for single family detached housing close to downtown. The economically driven housing decline has caused builders and developers to be reticent about green field developments. Infrastructure costs and a diminished market of buyers have put this option on hold. Many larger developments sit with unsold housing inventory and no immediate plans to build on the many vacant un-sellable lots in these tract housing ventures.

There is an ever-increasing demand for compact, infill development over suburban sprawl. The American Institute of Architects quarterly trend survey confirms this phenomenon. "Due to the prolonged decline in housing construction and increasing commuting costs, consumer preferences for community design are shifting away from areas removed from metropolitan hubs and toward infill sites that have greater access to public transportation options," says the report.

Wastewater concerns intersecting with desired infill housing is where the rubber meets the road with a recent Indianapolis house renovation project.

### **Appropriate Solutions Make Dream a Reality**

Indianapolis, the capital of Indiana, sits at the center of Marion County. It offers employment opportunities and is the major center for business and personal needs supporting a variety of nearby small cities, towns, and villages.

Within the boundaries of Indianapolis is a desirable hamlet of 2,000 residents located just 5 miles from downtown. Its proximity to a thriving commercial center helps to maintain long-term housing values. A small plotted subdivision in this community, an older self-effacing neighborhood with well-maintained properties and circa 1950 dwellings, is essentially an island district of homes served by private septic systems.

Central sewerage had been brought in nearby, but lateral lines were never extended and no new house has been built in this particular section of town for many years. "All houses in this neighborhood, except for one or two, have in ground private septic systems," said Bob Jordan of Fluid & Thermal Systems.

The owner of a modest home in the community loved the well-kept neighborhood charm, but it just didn't fit her needs anymore. "The home needed major remodeling and the septic tank was failing," the homeowner said. Age had taken its toll and repeated ground water seepage exacerbated the problem with wastewater removal. "The city officially told me the septic tank was unusable and notified me it couldn't be replaced with a new one," she added.

"I looked elsewhere and considered building a new house or buying an older home in a different location. New construction didn't meet my budget, older homes I found needed major renovation and none of the other settings were as pleasing," said the homeowner. Major renovation to the existing house was her first consideration but it wouldn't have addressed all of the problems.

A big challenge was the sanitary sewer connection. It would have taken 400 feet to 600 feet of gravity sewer run through several neighboring front yards along a very busy street to connect the new home to the City of Indianapolis sewer system.

"When I did the numbers for what the owner wanted she agreed that the small ranch style house on a half lot should be raised and demolished," said Greg Beretta at Beretta Brothers Builders. Using the same footprint and floor plan, a new residence was built.

Her contact with Beretta Brothers Builders, as it turned out, was serendipitous. Greg Beretta was familiar with Environment One's pressure sewer system. He called Fluid & Thermal Systems. "I'm building a house and the only way I can do this job is with your help," Greg told Bob Jordan at Fluid & Thermal Systems.

The E/One wastewater disposal alternative offered a cost saving, easement and disruption solution to the wastewater disposal problem. The routing of the outflow needed to run 450 feet across neighbors' lawns and driveways to access the municipal wastewater system. Using a conventional 4-inch pipe would have required cleanouts every 100 feet and a costly pump station to move wastewater from the slight downgrade house site to the higher street level municipal gravity main. As it was the 1-¼ inch pipe still needed to drop 27 feet after reaching the manhole.

E/One's grinder pump produces and pushes slurry through the narrow line to a central sewer outlet. The 1-¼ inch pipe, running along a 30-inch to 40-inch deep trench is much less disruptive to neighbors' lawns and easily fits in utility conduits already in place under driveways. The existing septic tank was filled in and replaced by E/One's low pressure system. An indoor grinder pump unit was installed in the basement of the new house.

After teardown, the new one-story house was built from the basement up. Although it has essentially the same footprint, usable basement space was increased, as was the overall square footage of first floor living area. Porches and a four-car detached garage provided even more room. The overall cost was only \$20,000 more to raise, demolish, build a new home and increase the house size from 1700 square feet, to 2044 square feet in comparison to the major renovation first conceived.

#### **Environment One Low Pressure Sewer System**

"The E/One Sewer is a low pressure system that is powered by E/One grinder pumps. A low pressure sewer system consists of a network of pressure pipes and grinder pumps, which may be installed at each home site. The grinder pumps collect all of the wastewater from the home and grind it into slurry. The wastewater is then pumped to a larger sewer main or directly to a wastewater treatment plant. E/One developed the concept of the household grinder pump starting in 1969. Today's grinder pump is more reliable and rugged than ever before," said George Earle, president of Environment One Corporation.

#### **Indianapolis Steps Up**

The Department of Public Parks in Indianapolis has stepped up efforts to meet the challenge. Their Septic Tank Elimination Program (STEP) is directed at replacing many of these sewerage systems to eliminate neighborhood health hazards. The basis of the underlayment in this region is very porous ground soils laid down long ago by glaciers at this terminal moraine. This condition increases wear and the problem.

The lifespan of a septic system is limited. Their ultimate failure is directly linked to high E. coli bacteria counts from the leaching of human waste into groundwater, backyards and neighborhood ditches and streams. "There are 12,000 to 15,000 failing private septic systems in Marion County that I'm aware of," said Bob Jordan.

STEP is converting private septic structures to city sanitary sewer systems- neighborhood by neighborhood. More than 2,000 homes have been converted to city sewers since 2006.

Over a four-year span from 2009 to 2013, the program is committed to developing city sewer systems for more homes currently on private septic tank hookups than ever before. During this period they will connect about 7,000 homes, more than 25 percent of the 27,000 homes now on private septic systems in the city.

Indianapolis' aggressive STEP is in the right direction. It's a wastewater solution that will undoubtedly interconnect with infill housing demand in the future as lot development continues to follow the current trend, one that is additionally impacted by contemporary economic conditions. SLDT

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