

INNOVATIVE MACOMB COUNTY SEWER PROJECT

WILL CURB PIPE CORROSION AND HYDROGEN SULFIDE ODORS

Submitted by William Misterovich, Macomb County Public Works Chief Deputy

Construction bids for an innovative sewer project designed to reduce pipe corrosion and odor problems in the Macomb Interceptor Drain (MID) were taken recently. The project, known as the Biofilter Ventilation Project, was awarded to Reliance Building Company of Novi with a low bid of \$1,836,970.

Macomb County Public Works Commissioner Anthony V. Marrocco said the project consists of installation of a 20,000 cubic foot per minute fan housed in an underground concrete vault, with electrical and mechanical instrumentation. The system will discharge hydrogen sulfide gas that collects in the interceptor into three 60 by 40 foot biofilter woodchip-media beds three feet high.

The biofilter apparatus will draw air from the interceptor through a network of interconnected ductwork and piping. The air will then be forced through the organic media beds for primary odor removal. The media beds will consist of specialized biofilter woodchip media containing chemically resistant rock materials, overtopped by an organic layer of composted materials.



Paul Modi of Giffels Webster (center) consulting engineer, describes the location of the biofilter ventilation project to Macomb County Public Works Commissioner Anthony V. Marrocco (right) and Jason Matteo, Chief Engineer of Wastewater Services for Macomb County. The site is south of 15 Mile Road and west of Garfield in Fraser. In the foreground is a manhole to a flow control gate on the 15 Mile Road Interceptor located 61 feet below ground. It was installed as part of the repair of the 2004 sewer collapse on 15 Mile Road in Sterling Heights.

Paul Modi, P.E., partner at Giffels Webster, consulting engineer, said, "We are excited to be a part of an innovative solution to serious problems facing our communities. Pipe corrosion and odors affect the integrity of our aging sewer systems. We have

partnered with some of the best specialists in the country to provide a solution to these unique problems."

Biofilters are a type of corrosion and odor control system that absorb and oxidize odorous compounds using micro-organisms growing in a soil or compost substrate. Biofilters are successful in treating hydrogen sulfide, low concentrations of ammonia, all types of organic odors and volatile organic compounds from wastewater.

Currently, hydrogen sulfide gas is being released at drop shafts in the interceptor and is being pushed back up through the concrete meter pits, where it is causing corrosion and concrete loss in the sewers and structures. The biofilter will create negative pressure in the interceptor, which will pull the hydrogen sulfide gas released at the drop shafts through the interceptor where it can be treated through the biofilter media and prevent structural corrosion, while also reducing odors generated by the sewer gases.

The system will be installed on a 1.8 acre vacant parcel located at 16510 15 Mile Road, west of Garfield Road, Fraser. The fan vault will be 24 feet long, 18 feet wide and 12 feet deep. It will be installed flush to the ground, with 8-inch concrete walls. The project has been approved by the Fraser City Council and Planning Commission, as well as the Michigan Department of Environmental Quality.



A fan similar to this will be installed as part of the Biofilter Ventilation project on 15 Mile Road in Fraser to reduce odor and pipe corrosion in the 21½ mile long Macomb Interceptor Drain. The fan has a 50 horsepower variable frequency drive motor with a displacement capacity of 20,000 cubic feet per minute at 10 inch static pressure and a maximum fan speed of 1,650 RPM.

Marrocco said the project is being funded through the state Revolving Fund, which offers a 2% interest rate on 20-year bonds. The bonds will close in September, with construction expected to start soon thereafter.

Debt service on the bonds will be paid by the community members of the Macomb County Wastewater Disposal District. The District consists of the cities of Fraser, Sterling Heights and Utica; townships of Chesterfield, Clinton, Harrison, Lenox, Macomb, Shelby and Washington; and the village of New Haven. Warren is a non-paying member of the District because it is not connected to the interceptor.

“This is an important project to protect valuable sewerage assets of Macomb County and is a demonstration of good asset management practices by the county,” said James Pistilli, PE, Senior Project Manager, Giffels Webster. Pistilli said biofilters require no chemicals, little operation and maintenance, and are cost effective when compared to other viable alternatives. The Biofilter Ventilation Project will be designed to blend in with surrounding landscaping. The fan vault will be installed underground and will not be visible from the street level.

Activities completed to date:

- Demolition and soil erosion control measures
- Storm sewer and structures
- Asphalt maintenance drive

Due to the severe winter and long lead times on the custom piping and equipment, construction was postponed during the winter months. Activity is expected to resume within the next few weeks and will include the installation of the primary components of the system:

- Foul Air Duct piping and structures
- Underground fan vault and related appurtenances
- Electrical, mechanical, and instrumentation devices to operate the system
- Specialized media beds for primary odor control
- Irrigation and landscaping

System, start-up and project completion is expected by July 2014. A team of consultants that includes experts from Michigan, Massachusetts and Texas, will oversee the installation of critical components, system start-up and monitoring.



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