



ENGINEERING & ENVIRONMENTAL SERVICES DEPARTMENT

2008 Annual Report

MISSION STATEMENT

Our mission is to provide professional engineering and environmental services in a respectful and efficient manner, which safeguards the Township's public infrastructure and natural resources for the well being of our residents.

I. Department Services and Programs

The Engineering and Environmental Services Department (EESD) provides engineering and environmental support to Bloomfield Township residents, local businesses and commercial developments, as well as other Township departments. The department manages the Township capital improvement projects, provides construction administration, and coordinates a variety of services. The EESD also provides technical oversight and manages several programs that have potential impact on our community's public health and environment. Below are some of the services and programs provided this past year:

General Services:

- Perform site plan reviews for new developments
- Review wetland permit and right-of-way permit applications
- Construction administration for public improvements
- Update the website and newsletter articles
- Provide technical support to Lake Improvement Boards
- Review and apply for grant funding opportunities
- Provide technical assistance for the National Flood Insurance Program (NFIP)
- Provide assistance for miscellaneous residential concerns (Emerald Ash Borer, flooding/drainage, natural features, etc)
- Coordinate projects with other public agencies

Engineering Programs:

- Water System Capital Improvement Program
- Sanitary Sewer Rehabilitation Program
- Safety Path Construction Program
- Road Improvement Program
- Coordinate data acquisition for utility mapping
- Manage/coordinate Special Assessment Districts (SAD)/Escrow Accounts (EA)

Environmental Programs:

- Manage Phase II Storm Water Permit requirements
- Gypsy Moth Management Program
- West Nile Virus Management Program
- Wetland inventory mapping updates
- Manage flood mitigation projects
- Perform drinking water monitoring (Disinfectant and Disinfection Byproducts, Lead/Copper, etc.)

II. Department Staff

In 2008, we had one retirement (30 year experience) and one staff member (4 years experience) transfer to another department. The following are current EESD employees with their years of Township service included.

Wayne Domine PE, Director (17 years)

Department Head and Township Engineer, responsible for supervising the overall activities of the department in the implementation of engineering and environmental services, in conjunction with the Township's water supply system, sanitary sewer system, watershed management, and other public works activities.

Lance Scram, Project Coordinator (11 years)

Coordinates the project administration and field oversight of Township contracted public work projects with consultants, contractors and customers.

Colleen Rowland, Administrative Assistant (22 years)

Provides office administrative support associated with the department's various engineering and environmental programs.

Noah Mehalski, Environmental Specialist (1 year)

Responsible for implementing the activities involving management of the Township's environmental programs to meet regulatory compliance in conjunction with the Township's Phase II Watershed-based Storm Water permit, wetlands, pest management, woodlands, and protection of other natural features.

Olivia Olsztyn, PE, Staff Engineer (1 year)

Coordinates engineering services with consultants, contractors and customers during the construction of public improvement projects. Provides technical support associated with the planning and construction of public improvements and review of site development projects in the Township.

The following staff members retired or transferred from the EESD mid-year.

Meghan Bonfiglio, Environmental Services Manager (4 years)

– Transferred to Department of Public Works, October, 2008

George Roose, Engineering Coordinator (30 years)

– Retired, December, 2008



III. Summary of Services

Support Services

The EESD supports other departments in the review of projects that seek permits from the Township. In cooperation with the Planning, Building & Ordinance Department and Department of Public Works, the EESD reviewed 73 applications for building permits and 23 applications for right-of-way disturbance permits. As members of the Township Wetland Committee, the EESD reviewed 18 applications for wetland permits during 2008.

Technical Assistance

In 2008, the EESD staff provided support to the Lake Boards by assisting in the development of construction administration for dredging, and projects for Upper Long Lake as well as to assist in the completion of an engineering study on Gilbert Lake.

2008 Escrow Accounts

Escrow accounts are established to retain funds from applicants in the administration and construction oversight of private developments. EESD managed the following projects that total up to \$130,000 in funds that were used to cover Township expenses:

EA #	Amount	Site Location	Improvement
797	\$2,500.00	2169 Telegraph	Fire Hydrant
817	\$8,000.00	Hickory Grove & Hickory Grove Ct.	Safety Path Relocation/AT&T
818	\$6,000.00	3939 Ann Rose Ct.	Sanitary Sewer
819	\$72,000.00	Costco, 2343 Telegraph	Site Improvements
820	\$700.00	2045 Orchard Lake Road	Site Improvements
823	\$29,000.00	Bloomfield Park	Site Improvements
825	\$3,900.00	Hickory Grove Elementary	Site Improvements
827	\$7,900.00	Kirk in the Hills	Site Improvements
Total	\$130,000.00		

Capital Building Project

In 2008, the EESD assisted in implementing the site improvements at the Golf Drive Storage Yard. Improvements consisted of a temporary storage building, site grading, screening and water main installation. EESD also provides support in the construction activities for the Senior Center and DPW facility.

IV. Summary of Construction Projects

Construction Cost Summary: \$5,852,000.00

The Engineering and Environmental Services Department provides construction oversight and management to a variety of projects. Some of our key programs include: safety path construction and maintenance, concrete road repairs, water system improvements, special assessment district project oversight, and tri-party road construction projects. The EESD managed approximately \$5,852,000 in project funds during 2008.

Safety Path Program: \$1,950,000.00

In 2008, 4.6 miles of new safety paths were constructed as part of the master plan approved with the 2004 millage renewal:

- Lone Pine Road, Timberlake Drive to Lahser Road .8 Miles
- Opdyke Road, from Warwick Drive to South Boulevard 1.4 Miles
- Hickory Grove Road, from Telegraph Road to Franklin Road .3 Miles
- Franklin Road, from Telegraph Road to Long Lake Road 1.4 Miles
- Square Lake Road, from Target to Klingensmith Road .6 Miles
- Timberlake Drive, Lone Pine Road to Library Entrance .1 Miles



Maintenance of the Township's existing safety paths or sidewalks is an ongoing project. During 2008 a total of 57,200 sq. ft. of concrete was replaced or repaired on existing paths or sidewalks:

- Bloomfield Village Subdivision: 56,000 sq ft
- Various locations throughout the Township: 1,200 sq ft

PROJECT SPOTLIGHT: Indianwood Subdivision Private Road Reconstruction SAD # 398



In the fall of 2007, construction for the Indianwood Subdivision Private Road Reconstruction Project began. The project consists of replacing two privately owned bridge structures and repaving Lochridge Drive in the Indianwood Subdivision. The homeowners association estimates the original bridges to be 80 years old. For safety reasons, it was imperative that the bridges be replaced. Evaluations by bridge contractors deemed the existing bridges could not be repaired.

Through a collaborative effort with our consulting engineers, Hubbell Roth & Clark (HRC), Nelson Engineering, the Homeowner Association and the EESD staff, construction plans were developed that met the residents desires and would safely service the subdivision. Each bridge consists of two one-piece spans, which are manufactured off site and delivered to the site by a semi-truck and lifted into place with a crane. The new bridge was designed for 72,000-pounds, which is roughly equivalent to two Bloomfield Township fire engines, stacked on top of each other. The east bridge was completed in December 2007 and the west bridge and pavement resurfacing were completed in June 2008.

Concrete Road Repair Program: \$300,000.00

Through the ongoing concrete repair program, approximately 6,700 sq. yds of concrete was removed and replaced within local roadways:

- Wabeek Ridge Subdivision 2,800 sq yds
- Bloomfield Crossing Subdivision 2,100 sq yds
- Bennington Green Subdivision 1,200 sq yds
- Chapel Hill Estates Subdivision 600 sq yds

Water System Improvements: \$1,059,000.00

Projects constructed as part of the long-term capital improvement program for the public water supply system include the following:

- Water Main and Hydrant Installation at Golf Drive storage facility
- Charing Cross Estates Subdivision Water Main Replacement
- Abandonment of old wells and structures on two Township owned properties
- New Pressure Reducing Valve chamber on Franklin Road

Sanitary Sewer System Improvements: \$452,000.00

Projects constructed as part of the long-term capital improvement program for the public sanitary sewer system include the following:

- Inkster Road Sanitary Sewer Evaluation Study (SSES) – Manhole Inspection and Smoke Testing
- 2008 Sanitary Sewer Rehabilitation at various locations
- Phase II SSES in the Colberry Park/Holiday Hills/Hickory Grove Hills district, and the Bloomfield Highlands/Colonial Hills district, – to be completed in 2009
- Maintenance Sanitary Sewer and Manhole Investigation and Rehabilitation – to be completed in 2009
- Assessment and Renovation of Sewage Pump Stations – construction to be completed in 2009

PROJECT SPOTLIGHT: Bloomfield Township Gateway Phase 1

After over a year of planning the Bloomfield Township Gateway sign was installed July 30, 2008. It is located in the median of Telegraph Road, immediately north of 14 Mile Road. Township staff from Engineering & Environmental Services, Public Works, Planning and Community Relations Departments directed the project.

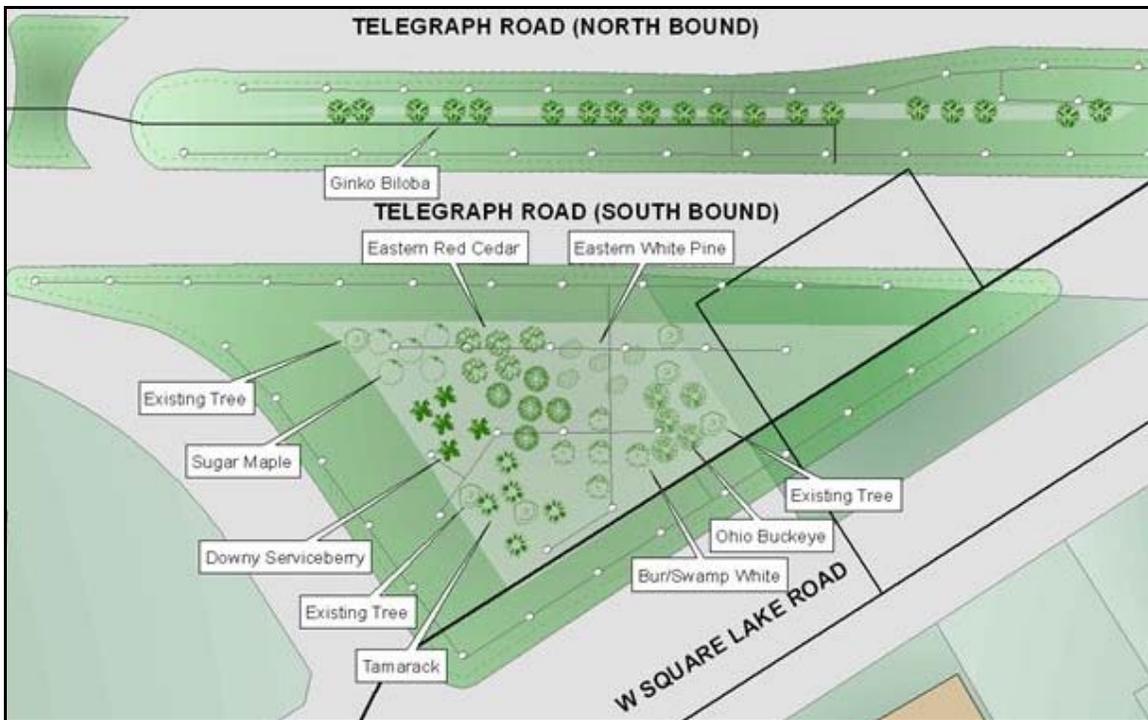
The sign is constructed of condensed styrene foam with fiberglass coating meant to resemble natural stone. The landscaping at the site includes nine Ginkgo trees, nine Dawn Redwood trees, and clusters of daylilies, junipers, carpet roses, mugo pines, sumac and viburnum. Water and electrical services had to be brought to the site and many other technical challenges had to be overcome to create this new Bloomfield Township Landmark.



Telegraph Road Beautification

In 2004, the Township Board approved a conceptual master landscaping plan for landscaping the major intersections and medians along Telegraph, Woodward, and Square Lake roads. The third project under this initiative was the Telegraph Road Beautification located north of Square Lake Road. This project included the installation of 175 trees. The trees were planted in the medians of Telegraph Road at the intersection of Square Lake Road.

Also included as part of the project is the installation of an irrigation system in the medians and a Michigan native tree garden on the triangular portion of land on the northwest corner of the Square Lake and Telegraph Road intersection. The native tree garden is viewable by motorists as well as pedestrians from the safety path along Square Lake and Telegraph Roads. As part of their new store construction, the Target Companies and Costco Wholesale donated funding to the Township beautification fund for this phase of the work. The EESD provided the plan design, bidding, and contract administration solely with in-house staff.



V. Summary of Environmental Projects

West Nile Virus Management

In 2008, the Township West Nile Virus Management Program continued to address the WNV problem through an integrated pest management program that consisted of identifying and prioritizing approximately 1900 catch basins and detention basins. Public areas found to be in high priority of mosquito control treatment are sampled and treated on a monthly basis.

The Township program began in June and was completed in early October. Throughout the year the EESD provided public education and community outreach activities through the WNV hotline, Township newsletter articles, and printed materials. The website provides additional information, such as the modes of virus transmission; means of prevention; and how to reduce the risk of exposure. Though there were no reported cases of the WNV in the Township for 2008, however there were seventeen positive human cases within the state and nine confirmed human cases in Wayne County.

Gypsy Moth Management

Since 1993 Bloomfield Township, together with the National Gypsy Moth Management Group, has implemented an integrated pest management approach to reduce and contain the Gypsy Moth problem. Components of the program include: public education, intensive biological monitoring and treatment plus evaluation.

In 2008, the National Gypsy Moth Management Group personnel collected data from biological surveys at permanently established survey locations to determine Gypsy Moth population, density and health, susceptibility and vulnerability of trees and infestation trends. In the spring, fungus inoculations were applied to 66 locations throughout the Township. Twenty-four of the highest infestation sites were treated with a natural bacteria, (*Bacillus thuringiensis*) which specifically targets the gypsy moth, for control purposes.



A final report from the company is submitted in the winter for review and determination of future actions. The report outlined the program's effectiveness including such issues as treatment timing, control measures and identification of improvement. Results from the 2008 assessment have indicated that egg mass density has decreased 78% and therefore the treatment program for 2008 will need to be adjusted to reflect this. In 2009, the Township will again be using a combination of biological control (fungal inoculation) and targeted ground-based spraying to control the expanding Gypsy Moth populations.

Drinking Water Testing

In September 2008, the EESD staff, in collaboration with DPW water division staff, completed water sampling in order to comply with the USEPA's *Stage 2 Disinfectant and Disinfection Byproducts (DBP) Rule* for drinking water systems. The purpose of the testing is to assure that levels of total trihalomethanes (TTHM) and haloacetic acids (HAA5) do not accumulate at the farthest reaches of the distribution system. A final report was submitted to the Environmental Protection Agency in October 2008 for their review.

Electronic Waste Recycling, Medication Disposal & Paper Shredding Event

Bloomfield Township hosted a very successful electronic waste recycling and bulk paper shredding event for our residents on April 19, 2008. The Engineering and Environmental Services and the Public Works departments collaborated to effectively plan for, setup, and facilitate this event in a similar fashion to the bi-annual Household Hazardous Waste events. Cars began lining up before 9:00 am and maintained a steady stream until our 2:00 pm end time. In total, 613 cars came through the drop-off line.

Approximately 11,000 pounds of paper was shredded then recycled and 56,000 pounds of electronics were demanufactured then recycled. All residents were given certificates of destruction that certified that the material they dropped off would be destroyed and recycled. In addition, nearly 500 pounds of unwanted medications were properly disposed of through the event.



Lawn Care for Lakes in Bloomfield Township Public Education Event

On September 8, 2008 Bloomfield Township and the Southeast Oakland County Water Authority co-sponsored a public education event aimed at riparian property owners and lake association members. There were 54 citizens in attendance for the meeting. The content of the program focused on low-impact lawn care and the utilization of healthy lawn care principles and practices. Also, the program sought to educate attendees regarding services provided by Bloomfield Township through the Engineering and Environmental Service Department. The reaction to the event was all very positive and a lively discussion lasted for nearly thirty minutes after the conclusion of the program.

PROJECT SPOTLIGHT: Rouge Rescue 2008



The Bloomfield Township Engineering and Environmental Services and Senior Services Departments partnered with the Bloomfield Hills Public Schools to host this year's Rouge Rescue Event at the E. L. Johnson Nature Center. The event took place June 7, 2008 and was geared towards residents of Bloomfield Township and neighboring communities. During the event, participants had an opportunity to enjoy the grounds of the Nature Center through service-learning projects such as invasive species removal, tree plantings and a lesson regarding the Benthic Macroinvertebrates (Bugs) living in the river bottom. Through this event, participants learned how the Township plays an important role as a headwaters community in the Main 1-2 Subwatershed of the Rouge River. Also, a plant exchange that was organized by the Senior Services Department drew many visitors.

Drafting of Tree Preservation & Protection Ordinance

The EESD along with the Planning, Building & Ordinance Department developed a draft Tree Preservation & Protection Ordinance. The Ordinance is meant to protect Bloomfield Township's woodland areas and the quality and character of the neighborhoods within our community. The draft ordinance went before the Planning Commission and the Township Board during 2008 and was approved by the Township Board in March 2009. The development of the Tree Preservation and Protection Ordinance has been a two-year long process involving research into other local ordinances, informational presentations, and public education regarding the ordinance.

VI. Grant Projects

Charing Cross Subdivision House Lead Grant: \$445,000.00

In an effort to reduce inflow and infiltration (I/I) to the sanitary sewer, the Township utilized a grant funded by the Oakland County Water Resource Commissioner's (OCWRC) office. This grant provided funding for rehabilitation of sanitary house leads in the Township. The area selected for the work was the Charing Cross Estates Subdivision. The Project included televising and inspecting the mainline sanitary sewer owned and operated by the Township, televising and inspecting house leads in the subdivision, performing rehabilitation to the mainline sewer as revealed by the inspection and lining the house leads. It was suspected that older house leads are a significant source of I/I. All together; 88 house leads were lined, along with 263 joints grouted, 23 spot liners and full-length liner on portions of the Township's sanitary sewer.

PROJECT SPOTLIGHT: Westbourne Drive Tree Planting: \$2,000.00

Trees are an integral part of our public and private landscape. The goal of this tree-planting project was to replace trees lost due to the EAB infestation, while also providing screening and wildlife habitat at a Township owned pumping facility. Through this project a total of 49 trees were planted and will be maintained for years to come. In addition, the diverse mixture of properly planted and maintained trees will provide maximum habitat and aesthetic benefits for Bloomfield Township, its visitors, and residents.

In the short term, this project is providing screening for a Township owned facility. In the long-term, increasing the quantity and variety of trees planted and properly maintained within Bloomfield Township in this way, will likely result in increased habitat quality in the affected area. In addition, healthy vigorous trees sequester oxygen more readily, increase neighborhood beauty, reduce soil erosion, improve water quality, and can result in increased property values. The project was a great success and all feedback from area residents has been positive. It is our hope that the benefit provided by these trees will be realized far into the future.



The EESD obtained a grant from the Federal Emergency Management Agency (FEMA) for the development of a Flood Mitigation Plan. The mitigation plan is required by FEMA to demonstrate the Township's commitment to reducing risks from natural hazards and will serve as a guide for future efforts and grant opportunities. The plan components include: 1) property inventory, 2) flood risk assessment, 3) risk reduction alternatives, and 4) potential mitigation projects. This grant project is a great opportunity to address flood-related issues and opens up resources for future funding to mitigate them. The plan will be completed in July 2009.

VII. Staff Training and Education

In 2008, the EESD hosted several lunch and learn sessions, in which vendors and product manufacturers were invited to speak on behalf of their services. In an effort to provide this informational opportunity to other departments, the EESD invited several other departments that would also benefit from the information. The following lunch and learns were hosted in 2008:

02/05/2008 – Porous Concrete

Aaron Harris, Promotions Manager from Michigan Concrete Association was invited to speak on the use, benefits, maintenance and installation of porous concrete.

Five members of the EESD, three members of the Planning and Building Department, and one member from the Department of Public Works attended the seminar. Additionally, three staff members from Hubbell, Roth & Clark, Inc., the Township's Engineer Consultant, attended.

The focus of the presentation was the benefits porous concrete provides with regards to the reduction of storm water runoff volume and improving the storm water runoff water quality. The presentation included examples of local porous concrete projects and addressed several common concerns for cold weather climates, including winter maintenance, plowing, deicing, and placement. Aesthetics was addressed as well as usability in business areas.

02/20/2008 - Harmful Algal Blooms: Cyanobacteria and their Toxins

Bloomfield Township hosted an AWWA webcast regarding probable causes and possible treatments of cyanobacteria blooms. The event was organized by the Engineering and Environmental Services Department (EESD) and was held at the Township hall on February 20, 2008 from 1-3 p.m. Speakers included scholars and professional in the field of natural resource protection and environmental health.

In all eight individuals attended the webcast. Meghan Bonfiglio and Noah Mehalski represented Bloomfield Township. Others in attendance were from the Oakland County Drain Commission, Farmington Hills and a local consulting firm.

The webcast contained information on contamination caused by excessive growth of cyanobacteria in both drinking water and recreational water supplies. What affect this contamination may have on human and animal populations and what can be done to mitigate these contaminants.

04/15/2008 – Porous Asphalt

Charles Mills, P.E., Director of Engineering, from Asphalt Pavement Association of Michigan was invited to speak on the use, benefits, maintenance and installation of porous asphalt.

Five members of the EESD, three members of the Planning and Building Department, and three members from the Department of Public Works attended the seminar. Additionally, two staff members the Township's Engineer Consultant, attended.

The focus of the presentation was the benefits porous asphalt provides with regards to the reduction of storm water runoff volume and improving the storm water runoff water quality. The

presentation included examples of porous asphalt projects and addressed several common concerns for cold weather climates, including winter maintenance, plowing, deicing, and placement. Aesthetics was addressed as well as usability in business areas.

06/12/2008 - Advance Drainage Systems, Inc./Hancor

Chirs Owen, P.E., and Randy Nosek, Sales Representative, from Advance Drainage Systems, Inc. (ADS) were invited to speak on the use, benefits, maintenance and installation of HDPE pipe and PVC storm water structures.

Five members of the EESD, and one member of the Planning and Building Department attended the seminar. Due to the destructive storms on June 8, 2008 and required cleanup, several members from the DPW were unable to attend. Additionally, three staff members from the Township's Engineer Consultant, attended.

The focus of the presentation was the use, installation and benefits of HDPE pipe for storm water conveyance systems and storm water detention. The use of HDPE products in storm water applications results in lower costs and ease for material, installation and transportation of products. There were concerns among the attendees of the freeze/thaw temperature range and flash point range of the pipe. The presenters discussed how HDPE is flexible and has a lower freeze point than reinforced concrete pipe (RCP). The flash point was also addressed and specified to be similar to that of asphalt. HDPE pipe is being used in the underground detention system for the Township Capital Building Improvements under the Senior Center parking lot.

The vendor also discussed their PCV storm water structures. Again, the focus was on the ease and lower cost of material, installation and transportation of products. Emphasis was also made on the ability of the PVC structures to be adjusted in height, pipe connection size and elevation.

10/22/2008 - Contech Construction Products, Inc.

Contech Construction Products, Inc. produces several materials relating to storm water, wastewater, precast bridge structures. John Morgan, PE, and Mark Powell from Contech Construction Products, Inc. were the representatives present.

The underground storm water detention system utilized at the newly developed Costco Warehouse used Contech storm water products.

VIII. 2009 ... A Look Ahead

As we look ahead to 2009, the EESD will be moving to our new facility while continuing to oversee projects such as management of the Township's stormwater permit, Gypsy Moth Program, West Nile Virus treatment, fire hydrant replacement project, the installation of the gateway signs, replacing old water mains, renovating sewage pump stations, rehabilitating combined and sanitary sewers, and the construction of new safety paths. In addition, the EESD will continue to provide support to all Township departments regarding the environment and natural features and provide plan review support to the Planning, Building & Ordinance Department.