

Footing Drain
Disconnection
**HOMEOWNER
INFORMATION**



Oakland County Drain Commissioner

**City of Southfield
Department of Public Works**

**Footing Drain
Disconnection Program**

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Background

Within the City of Southfield, there are groups of homes that have experienced basement backup problems. Many of these have been the result of wastewater backing up from the sanitary sewers through basement floor drains, especially during periods of heavy rainfall. This wastewater presents a potential health risk and can cause damage to the structure and to belongings stored in the basement.

In addition, this excess rainwater/groundwater places a strain on the sanitary sewer system and must be conveyed through the Evergreen/Farmington Sewage Disposal System (EFSDS). Due to capacity agreements with the Detroit Water and Sewer Department (DWSD), it is critical to minimize the amount of unnecessary rainwater/groundwater sent as wastewater to the EFSDS.

In 2004, the OCDC entered into an Administrative Consent Order (ACO) with the Michigan Department of Environmental Quality (MDEQ) to perform certain analytical tasks for the Evergreen Farmington SDS wet weather operation and to update a computer simulation model of the districts hydraulics and hydrology. The consulting firm of Hubbell, Roth & Clark performed the technical tasks.

Findings and Recommendations

Ten storms, occurring between 2000 and 2003, were used to evaluate the performance of the EFSDS.

The study showed that groundwater infiltration and inflow to the sanitary sewer system appeared to be a major component in the flows generated in the system. Reduction in the infiltration would lead to reduced wastewater charges from DWSD.

Recommendations stated that member communities should develop a local plan for removal of infiltration and inflow and investigate the root causes of sanitary sewer overflows. Footing Drain Disconnection (FDD) has been successful in other Southeast Michigan cities at reducing inflow of groundwater to the sanitary sewer, and at reducing basement backups.

To assist in the FDD program design, OCDC and the City of Southfield have retained the engineering services of CDM, an engineering consultant. CDM has extensive experience in managing the City of Ann Arbor Footing Drain Disconnection Program which has been successfully reducing inflow to the sanitary sewer since 2001. For this project, CDM will be working directly with the homeowners in your area to explain the benefits of participating in the FDD program and how your property will be affected.

What is Footing Drain Disconnection?

As shown on Figure 1 below, footing drains are small, pervious drainage pipes (also commonly called “drainage tiles”) located near the foundation of your house. They are intended to keep rainwater that seeps through the ground from building up along the foundation or basement walls. In many homes, the downspouts, which carry rainwater from the gutters, discharge near the foundation walls. This water can drain through the soils and into the footing drains.

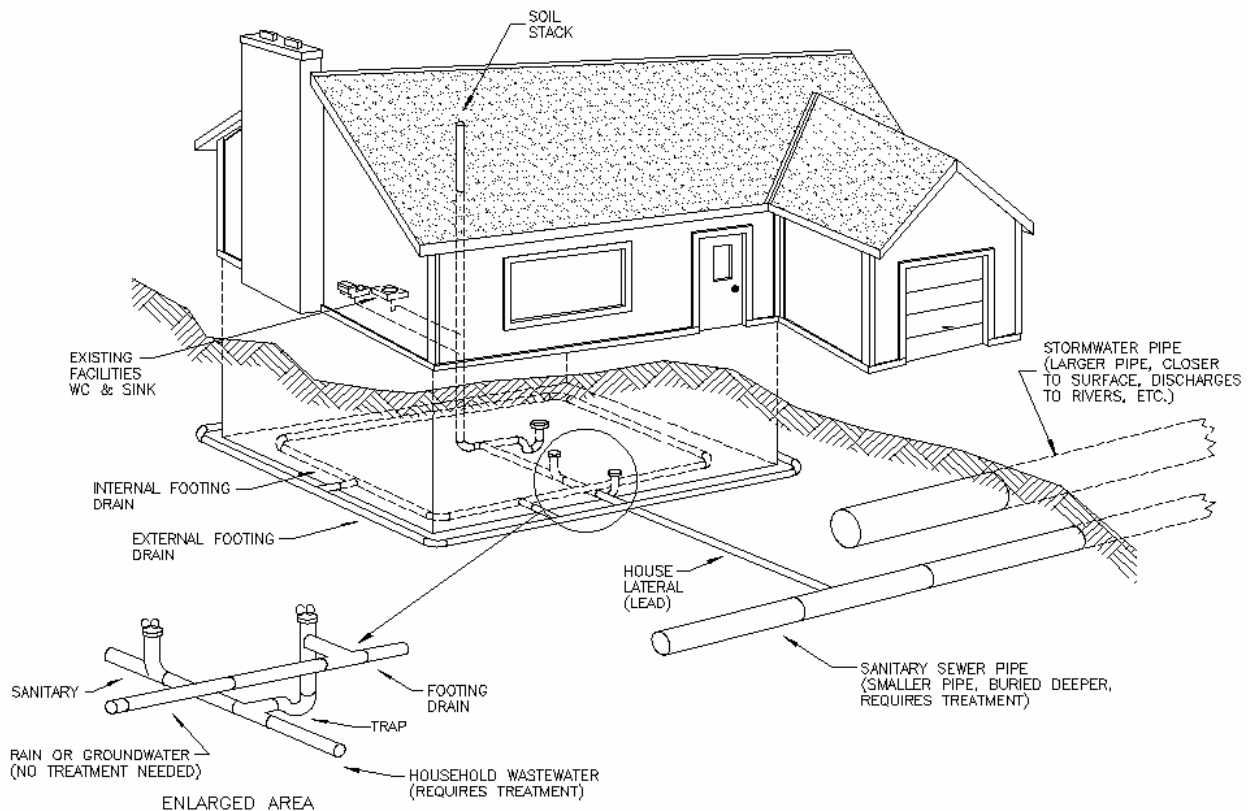


Figure 1 – Pre-construction Conditions

In most homes constructed before the 1980s, the footing drains are connected to the house sanitary connection (house lead) as shown in the figure above. This house lead carries the footing drain flow and wastewater from the house to the sanitary sewer system.

When it is not raining this is not normally a problem, but during a severe storm event too much rainwater can enter the sanitary sewer system. This excess flow can cause the mixture of rainwater and wastewater to backup in the house lead of some homes and cause basement backups.

Footing drain disconnection is performed to remove the rainwater flows from the sanitary sewer system. This is accomplished using the following steps:

1. Disconnect the footing drains from the house sanitary lead and install a sump pump to move water from the footing drains into the stormwater system. If the connection to the sanitary house lead is inside the basement (typical for homes in the City of Southfield), the sump is installed in the basement as shown in Figure 2 below.

For most homes, the sump discharge will be connected to the storm sewer either at a catch basin or by digging between the sidewalk and curb to access the storm sewer directly. There may be some alternatives to sending the flow into the stormwater system in some neighborhoods or homes if rain gardens or low areas in backyards are available. A priority is placed on safe disposal of the stormwater.

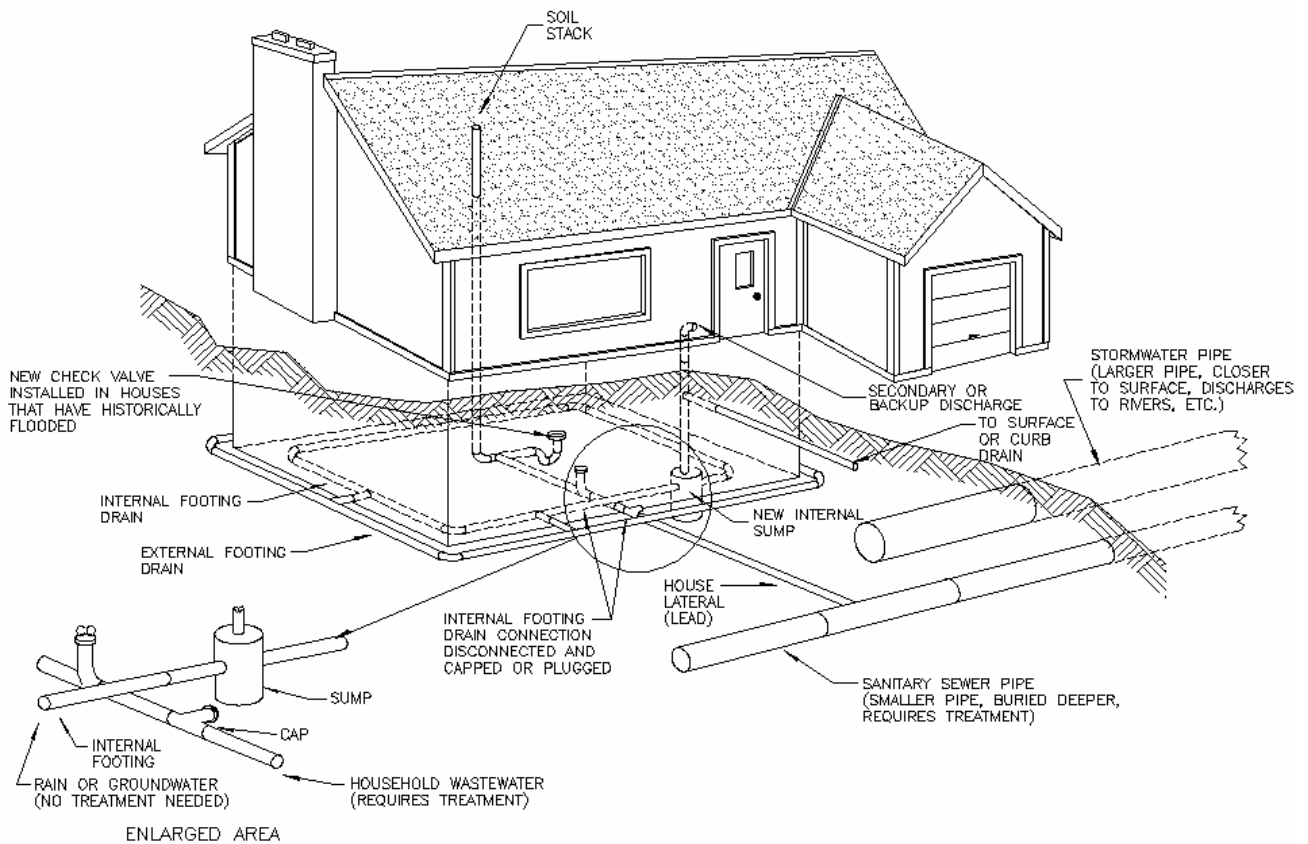


Figure 2 – Basement Sump Construction

2. In homes that have experienced basement backups or are at risk for basement backup, install check valves to keep water from flowing back into the home from the sanitary sewer system.

Why Disconnect Footing Drains?

The purpose of disconnecting footing drains is to keep rainwater out of the sanitary sewer system. During dry weather, the sanitary system has plenty of capacity to carry wastewater. In neighborhoods where footing drains are connected to the sanitary system, however, rainwater can overflow the sanitary system during heavy storms resulting in the rainwater/wastewater mix backing up into basements. Keeping rainwater out of the house 'lead' greatly reduces the amount of rainwater getting into the sanitary system, which protects downstream residents and reduces costs at the wastewater treatment plant. It also frees the house connection to carry wastewater to the sanitary system.



Footing drain disconnection has the following advantages:

- Provides short-term and long-term protection for homeowners who have had sanitary backups during severe storm events.
- Takes rainwater out of the sanitary system, reducing problems for downstream residents and eliminating both treatment and conveyance costs for the rainwater.
- Preserves natural features and protects watershed by minimizing the risk of sanitary sewer overflows.
- Sump installation provides access to sections of your home's footing drains that may be clogged or damaged and causing basement flooding. Cleaning or repairing the damaged footing drains during the FDD construction could help to alleviate the flooding problems.

What Will Happen at My Home?

After you receive the homeowner information packet, you should contact the FDD Construction Manager (see page 11 for contact information) to arrange for the initial meeting at your home. This will be an excellent opportunity to ask specific questions about your home, and to learn more about the steps of the program. Next, you will choose from a list of pre-qualified contractors, obtain estimates and arrange a contract. (See page 10 for a list of the contractors) The actual construction work should take from 1 to 3 days of in-home construction. More details on the different parts of the work are included below:

Pre-Construction Meeting will be conducted by the Construction Manager with the homeowner and will include actions to:

- Determine if your footing drains are connected
- Identify possible locations for sump pump installation
- Assess site drainage options, including identification of any needed changes in downspout connections.
- Assess options for installation of sump discharge lead (piping) to an approved discharge location
- Review options for backup-powered sump pumps or overflow floor drains

Curb drain installation work may be performed in the area between the curb and sidewalk (only if no storm sewer is available on your side of the street) and will include:

- Staging of equipment and pipe material, commonly in the area between the curb and sidewalk and in the parking lanes in your neighborhood.
- Marking of underground utilities (gas, electric, etc) with paint and flags in the work zones.
- Excavations of these utilities to precisely determine their location and depth.
- Installation of the curb drain using directional drilling equipment to minimize disruption of the lawn extension area.
- Connection of the curb drain to the catch basins and installation of house tees and cleanouts.
- Cleanup and restoration of the damaged grass and concrete areas.

Inside work will be confined to the basement and will include:

- Removal of a section of the basement floor to access pipes and install the sump
- Disconnection of the footing drains from the house lead and routing of new discharge lines.
- Installation of a new electrical circuit.
- Installation of the sump pump
- For homes that have previously experienced basement backup or those deemed to be at-risk for basement backup, installation of check valves on all plumbing fixtures located in the basement or a single check valve to protect all facilities in the basement.
- Repairs to the work area (i.e., replacing concrete, tiles, etc.)
- Clean up of the work area.
- Restore areas to original conditions.



Work in the yard includes:

- Installation of a small pipe to carry footing drain water from the sump pump to a rainwater collection system or an approved alternative. Depending on the slope in the yard, a mole tool may be used to bore under the ground. In some cases, an open trench installation will be required, typically at a depth of 2-4' below ground.
- Cleanup and restoration of any grassed areas impacted by the installation.
- Repair of any concrete surfaces removed during the construction (one slab of the sidewalk will frequently need to be removed to access the storm sewer).



What Will It Cost?

The City and OCDC will pay for the ‘core’ work up to \$4,500 for a typical household *, ultimately financing this through a grant. **The City and OCDC** will pay for:

- Parts and labor for standard sump installation
- Parts and labor for discharge pipes and connection to the storm sewer
- Basic restoration of interior and exterior work areas.

The Homeowner will be responsible for the following costs where applicable:

- Additional features or restoration beyond what is required for basic installation and items classified as home improvements or that exceed building code requirements (i.e. replacement of inadequate electrical service panel, construction of new enclosure for sump, etc.)
- **Backup Sump Pump** - In the event of a power failure, the primary sump pump will not function. This can result in groundwater collecting around the outside of your basement walls where it can seep through cracks in the concrete or through the sump lid. The plumbing contractors can install (at your expense) either battery-powered or water-powered backup sump pumps that will operate during an electrical failure or if your primary sump pump fails. You need to assess your desire for this additional level of protection as only you can understand the impacts of moisture would have on your belongings in your basement, and the frequency of power failures in your neighborhood. Based on our experience with power failures during storm events, homeowners are advised to strongly consider the need for a backup system. (See questions 8 in the Frequently Asked Questions pamphlet for additional information)
- Long-term maintenance of the sump pump and discharge system

* Exceptional circumstances within a household may warrant payment beyond the \$4,500 (the typical funding threshold). Prior to signing a contract, a homeowner may request additional city support. This request will be reviewed and may be approved by the OCDC Project Manager and the City Project Manager.

Next Steps Summary

Please review and complete the steps below to aid in a reliable and trouble free disconnection.

1. Review this packet of information carefully.
2. Attend the scheduled information meeting for your neighborhood.
3. Arrange an in-home assessment with the Construction Manager to determine the need for a disconnection, review possible pump and discharge locations, and identify any special needs of your home.
4. Execute documents giving authorization to commence with the work.
5. Review the list of pre-qualified contractors (page 10) and make an appointment with one or more to receive an estimate of costs for the work to be done in your home.
6. Review costs that are funded by OCDC/City of Southfield and identify any additional options you may want or need to contract for at your personal expense.
7. Upon receiving approval of a funding amount from the Project Manager, arrange a contract and work schedule with your selected contractor.
8. Clear basement work area (Contractor will provide specifics). If desired, add additional dust protection to exposed areas.
9. Monitor the work underway to ensure it meets your contract agreements. Consult the Construction Manager, City Project Manager or OCDC Project Manager, if help is needed.
10. Review finished work with the contractor to ensure you understand maintenance and operations of your system.
11. OCDC Construction Inspector visits the home to review finished work with the property owner.
12. Complete the project and contractor feedback form

Footing Drain Disconnection Pre-Qualified Contractor List

TO BE DETERMINED – SEPTEMBER/OCTOBER 2007

Contact Names and Numbers

OCDC Staff:

- **Chief Engineer** – Philip Sanzica..... [248-858-1031]
- **Project Engineer** - Sid Lockhart [248-858-1082]
- **Construction Inspector** – Bob Pousho [248-858-1105]

City of Southfield Staff:

- **Director, Public Works** – Gary Mekjian [248-796-4804]

Construction Management Staff:

- **CDM Construction/Project Manager** – Jay Zawacki [734-213-5444]
- **CDM Assistant CM** – Justin Woods [734-213-5444]
- **CDM Project Manager** – Yolanda Walton..... [313-230-5650]

Neighborhood Association Representatives:

- **Beacon Square** – Barbara Bodzin
- **Evergreen Trails** – Michael Reade
- **Mt. Vernon** – Yvonne Jones

Glossary of Terms

- *Catch Basin* – A drainage structure with metal grate that is located along the curb and gutter to collect runoff from the streets, driveways, and yards of the neighborhood. The catch basins drain directly into the storm sewers underground.
- *Check Valve* - pipe fitting or valve which allows flow in one direction only e.g., prevents flow from coming into the house but allows flow to leave the house when a backup condition does not exist
- *Computer Modeling* – Computer program used to simulate the behavior of the collection system.
- *Downspout* – This is the pipe that takes water from the roof gutters in most houses. This should discharge onto the lawn.
- *Flow Meters* – Used to measure flows in the sewer system.
- *Footing Drain* – A drainage pipe (or tile) that is installed around the foundation of most basements of houses. This drain makes sure that water in the ground does not make the basement damp. This is connected to the sanitary sewer, to a sump pump, or directly to the storm sewer.
- *House Leads* - sewer pipe connecting an individual house to the City sewer
- *Infiltration* – This is rainwater flow that enters the sanitary sewer system through underground cracks in sewers.
- *Infiltration Device* - underground chamber that handles flow discharged from the sump pump, this chamber allows water to infiltrate into ground rather than discharge to storm sewer (limited to sandy soils or other soils that drain well)
- *Inflow* – This is a direct connection from surface drainage into the sanitary sewer.
- *Manhole* – This is the access structure that allows field crews to inspect sewers.
- *Rain Gage* – Used to measure the amount of rain from storm events.
- *Sanitary Sewer* – Sewer pipe that conveys wastewater to the Ann Arbor Wastewater Treatment Plant.
- *Storm Sewer* – A different pipe that takes rainwater collected in catch basins located in the street and conveys these flows to a creek or river.
- *Sump Pump* - pumps footing drain flows from lowest drainage point (sump) to the City storm sewer
- *Surface Drainage* – Rainwater that flows down the street or yard to a storm drain or into a creek or river.
- *Wastewater* – The used water that flows down drains in your home.