

LAND & RESOURCE
+-----+
ENGINEERING AND SURVEY
+-----+
Common Sense • Lasting Solutions

May 6, 2011

Mr. Joe Parman, Drain Commissioner
Van Buren County Drain Office
219 Paw Paw St. Ste. 301
Paw Paw, MI 49079

**Re: Petition to Extend or Add a Branch Drain
 North Branch of the Phoenix Drain
 City of South Haven, Michigan**

Dear Mr. Parman:

We are writing in regards to the petition to establish an extension or branch drain within the Phoenix Drainage District in the City of South Haven and South Haven Township. The information enclosed is intended to illustrate the details of our observations during our inspection of the area and to assist you and the Board of Determination during the review of the petition. Please note that the information in this letter is based on our review of record drawings and site observations and is preliminary in nature. We plan to attend the Board of Determination to present the details of our review and to field questions as needed.

Land & Resource Engineering and Surveying, Inc. performed an inspection of the subject area to identify the character of the area, verify the localized flooding occurrences and to identify the approximate area tributary to the existing channel. Following is a summary of our observations.

Existing Conditions:

The existing drainage way begins east of Blue Star Memorial Highway north of 6th Avenue. This portion of the drainage way consists of enclosed conduits that collect and route surface and subsurface drainage west across Blue Star Memorial Highway. Approximately 150' west of the right-of-way, the drainage way transitions from an enclosed system to an open channel. The open channel is narrow and shallow and meanders westerly through a wooded area and then divides residential properties along the east side of Cherry Street. There is evidence of flooding in the side and rear yard and garage of the home east of Cherry Street adjacent to the ditch. As the ditch approaches Cherry Street, the flow is directed along a concrete chute and then through an 8' diameter drainage structure and outlet at the west side of the right of way.

As the channel continues, it becomes well defined. The side slopes are scoured and are approximately 3'-5' high on both sides. The channel bottom appears to be stable and is 4'-6' wide.

The ditch extends through residential area to a transition to 24" conduit at the east side of Bailey Street. The side slopes are severely scoured in this area and there is evidence of severe flooding in the yards and garage south of the ditch along Bailey Street. Based on our observations, the flooding is due to significant debris collected by the ditch, which plugs the 24" inlet on the east side of Bailey Street. Given there is no storm water management upstream of this location, it is likely the 24" pipe is not large enough to convey the 25 year rainfall event, but further investigation is necessary to determine the capacity of the exiting enclosed system.

From the transition to enclosed conduit east of Bailey Street, the conduit conveys sort water runoff along Green Street. Drainage inlets along the road serve as access for surface drainage along the road and front yards along Green Street. Approximately 1,600' east of Bailey Street the pipe redirects the flow north between two homes and transitions from a 24" concrete pipe to a 42" corrugated metal pipe (CMP).

The 42" pipe outfalls to an open ditch approximately 400' north of Greet Street. The ditch is poorly defined in this area, but is located at the bottom of a large ravine. The ditch meanders along the bottom of the ravine approximately 320' to the convergence with the Phoenix Drain, which continues northerly.

Summary:

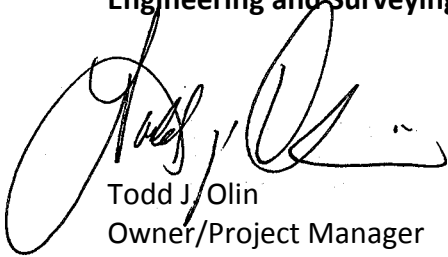
According to residents along the drain, flooding has become more common in the past few years where the drain crosses Cherry and Bailey Street. In most cases the flooding damages the yards adjacent to the drain, but in more severe cases, the garages are flooded and there are reports that surface water exceeded the banks near Bailey Street and flooded Green Street to the west. Given the low profile and limited capacity of the ditch east of Cherry Street, it is likely flooding occurs much more frequently in this location.

While the area was not flooded during the course of our inspection, we did observe conclusive evidence of significant flooding in the area. In addition, the channel is severely scoured. The evidence is based on water marks within the ditch line, elevation of floatable debris in the ditch, water stains on adjacent garage walls and photos of flood events from area residents.

Please review the information enclosed and call if there are any questions or concerns. As stated earlier, we will attend the Board of Determination and will present the details we observed.

Sincerely,

**Land & Resource
Engineering and Surveying, Inc.**

A handwritten signature in black ink, appearing to read 'Todd J. Olin', is written over a faint, circular stamp or watermark.

Todd J. Olin
Owner/Project Manager