

PERIMETER

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MEMORANDUM

Date: December 1, 2008

To: Mr. Chris Cheng
City of Ann Arbor
100 N. Fifth Ave.
Ann Arbor, MI 48107

From: Kathy Keinath, P.E.

Regarding: 523 Packard
Storm water Narrative

Dear Mr. Cheng,

We are providing this narrative in response to the question that was posed at the Planning Commission meeting regarding the storm water treatment system for the above referenced site. We trust that the following additional information and descriptions will address the concern that was raised regarding the water quality component of the system.

There is currently no storm water management system at the site. The layout of the parcel consists of the house, driveway and gravel parking area. There is a steep slope along the north property line that flows toward the parking area and house. The runoff continues to flow across the site to the adjacent parcels located to the south of the site. There is minimal vegetation on the property to slow down or filter the runoff.

The proposed site will include the building addition with covered parking, additional vegetated areas and a storm water management system that meets the requirements of the City's Code for retention of the first flush volume of storm water. In addition to the first flush volume, the system will provide sediment forbays that are sized to hold 5% of the 100 year retention volume. There are two forbays provided on the site. The first is a rain garden located at the base of the steep slope along the northerly property line. It will provide pretreatment of runoff from the steep slope and roof water. The rain garden is sized to hold 72 cf of runoff and provide water quality treatment. The water collects in the rain garden and is detained to allow the water to pond. This also allows some of the water to infiltrate into the ground. Sediments settle out of the water and pollutants are removed as the water is stored in the garden. There is an overflow in the rain garden to control the depth of the ponding water. The overflow connects to the underground storage tank located in the driveway.

The second forbay is located in the underground storage tank. There is a baffle wall that separates the forbay compartment from the detention compartment. This forbay is to be a minimum of 38 cf and collects the runoff from the proposed vegetated area along the east

property line, a portion of the northerly slope and the uncovered parking area. The water enters the forbay compartment and is detained to allow sediments to settle out of the water. The water then overflows the baffle wall into the compartment that provides the first flush storage. The detention tank provides the required first flush detention volume of 309 cf and discharges through an outlet control structure designed to release the detained water at a flow rate of 0.004 cfs.

The Planning Commission requested that we also investigate installation of an inlet device such as a Stormceptor to provide water quality in place of the forbays. It would be possible to eliminate the rain garden, install a yard inlet, and pipe the storm water to a Stormceptor unit in the driveway. The Stormceptor would most likely be sized to allow 80% of the sediment to be removed from the storm water. The Stormceptor would provide adequate sediment removal however it is our opinion that a rain garden is a more appropriate best management practice for this portion of the site. It allows for natural cleaning of the water and infiltration of the ponded water with less maintenance requirements than a mechanical treatment method such as the Stormceptor. The second forbay in the underground tank collects a much smaller portion of the site. The primary contribution to this forbay is the uncovered parking area which includes two spaces. A small Stormceptor unit in this location could be used to replace the forbay compartment of the underground tank. However, the area contributing to this unit is limited and adequate storm water quality control that meets the City requirements is provided by the proposed system. The owner is also considering using the underground storage tank as storage for water to be reused in the proposed building. This would require installing a pump system and reusing the storm water for grey water toilet flushing.

The currently proposed design meets all of the requirements of the City code for a storm water management system. We have provided the required detention capacity for storm water quantity and the required forebay capacity for storm water quality. The proposed rain garden and underground tank are industry acceptable best management practices for the control of sediment from runoff and will greatly improve the current conditions at the site.