



### **Background**

The owners of the single family residential lot at 102 SW 2<sup>nd</sup> Street are planning the addition of a new concrete driveway and the elimination of their existing gravel driveway that runs along the east side of the residence. The new driveway/parking will be ADA compliant. The house is located on a 6,050 sf lot or 0.139 acres. There are currently no ponds, waterways, BMPs nor drainage systems located on the property. See Exhibit A - Existing Drainage Map for a depiction of the existing lot land usage.

### **Purpose/Scope**

The purpose of the memorandum is to determine if any negative impacts due to storm water runoff from the proposed improvements are anticipated downstream.

### **Methodology**

The study conforms to the requirements of the City of Lee's Summit, Missouri "Design and Construction Manual" and all applicable codes and criteria referred to therein.

### **Proposed Improvements**

The proposed improvements shall consist of a new concrete drive aisle, parking and sidewalk (1,018.20 sf) along with the elimination of the existing compacted gravel driveway which runs along the side of the house. See Exhibit B – Proposed Drainage Map for a depiction of the proposed improvements. The existing lot contained approx. 0.37 acres of impervious area. The proposed hard improvements as detailed in addition to the remaining infrastructure such as the house will makeup 0.45 acres of impervious area. The proposed increase in impervious area will be 18.4% which is greater than the 10% increase allowed for expansions and remodels per KC Metro APWA. Therefore the proposed project does not meet an exemption for stormwater improvements.

An analysis of existing peak discharge rates verse proposed peak discharge will be conducted to determine the increase in peak runoff. The difference or increase in peak runoff will be calculated and improvements designed to attenuate the net increase. The improvements will be detailed later in the memo. The improvements are designed to ensure no negative impacts from the proposed improvements are realized downstream.

### **Analysis**

Due to the size of the lot 6,050 sf the Rational Method was utilized to determine the peak discharge rates for both pre and post development conditions. The runoff coefficients for both existing and proposed conditions may be found in Exhibit C – Composite Coefficients. The peak discharge rates were calculated with the use of Hydraflow along with determination of allowable detention. The 100-year peak discharge rate for the existing condition is 0.69 cfs. The 100-year peak discharge rate for the proposed condition is 0.76 cfs. A net increase of 0.07 cfs is anticipated for the proposed condition during the 100-year storm event. See Exhibit D for a complete Hydraflow Report. In order to reduce the proposed peak discharge rate below existing a detention pit will be designed to attenuate peak discharge rates.



Storm Water Memorandum  
October 5, 2021  
102 SW 2<sup>nd</sup> Street  
Lee's Summit, MO

#### **Detention Pit**

Runoff from a portion of the lot and new infrastructure will be routed via a swale to a detention pit located in the backyard. The pit will measure 15' x 15' x 3' deep and consist of 3' of clean 1.5 to 2.5 inch gravel to promote infiltration of runoff into the surrounding soil. In addition a 1 inch outlet pipe will be installed 2 feet above the bottom of the detention pit to allow excess water to drain. The detention pit shall be sized to store the runoff generated by the increase in impervious area for the 100-year storm event. In addition the detention pit shall be depressed providing capacity to store a consecutive 100-year storm event. The surface of the detention pit shall incorporate deep rooted plantings to help accelerate infiltration into the pit. See Exhibit E – Detention Pit Detail for a depiction of the proposed detention pit. The peak discharge from the proposed detention pit during the 100-year storm event as currently designed is 0.024 cfs well below both existing (0.69 cfs) and allowable discharge rates (0.42 cfs).

#### **Conclusion**

The renovation project does not meet the exception criteria as specifically outlined in APWA however it should be noted that both the existing and proposed runoff coefficients are below allowable regulatory requirements for single family residences. Please advise if stormwater attenuation is necessary for this project do to some other downstream issue. The proposed detention pit will significantly reduce proposed peak discharge rates well below both existing and allowable peak discharge rates for the 100-year storm event. The storm water memorandum is in conformance with applicable codes and design criteria therefore we recommend approval of this storm water memorandum and its findings.

Should you have any questions related to the storm water memorandum please contact Matt Schlicht with Engineering Solutions.

Sincerely,

Matt Schlicht



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