



December 21, 2011

Mr. James Green, P.E.
Green Engineering Services, Inc.
1341 S. Fountain Dr.
Olathe, KS 66051

Dear Mr. Green,

The City was requested to analyze the floodplain at and surrounding the REFERENCED TRACT to determine 1) the extent to which future land uses may be impacted by the current floodplain and, 2) whether the City has regulatory authority regarding the floodplain as it affects the property, thereby providing the City the discretion to modify the existing floodplain maps.

The REFERENCED TRACT lies within an area identified as the Community Designated Floodplain, which is not regulated by FEMA, nor has the REFERENCED TRACT ever been regulated by FEMA. Development in the Community Designated Floodplain is regulated locally through Chapter 18.50 (Floodplain Zoning) of Olathe's Unified Development Ordinance (UDO) and Chapter 17 of the Olathe Municipal Code. While FEMA floodplain maps show only where flooding is likely to occur now (prior to development upstream), the Community Designated Floodplain map, instead, shows where flooding is likely to occur in the future (based on expected development upstream).

The City conducted an analysis of the floodplain, and has determined that consideration of both 1) utilization of the existing detention ponds and 2) removal of a downstream culvert reduces the floodplain by approximately 3.6 feet (See attached Report). Thus, by making these considerations the footprint of the floodplain would be primarily contained within existing drainage easements (See Figure 1).

In summary, development within the Community Designated Floodplain is allowed, provided Olathe's Floodplain Zoning and Permitting requirements are met. City staff is confident that a majority of the REFERENCED TRACT is suitable for development. The exact amount of the REFERENCED TRACT which is developable will be determined when a detailed engineering analysis of the proposed site layout is completed.

The future development of the REFERENCED TRACT is very important to the City of Olathe. We look forward to working closely with your design consultant to provide both flood control and clean runoff.

Sincerely,

Mary K. Jaeger, P.E.
City Engineer

Little Cedar Creek Floodplain Mapping between Frontier Lane and Highway 56

Introduction

The objective of this analysis is to evaluate the accuracy of the floodplain mapping on Little Cedar Creek, between the railroad tracks and Frontier Lane. Per Flood Insurance Rate Map (FIRM) panel 20091C0093G the floodplain upstream of the railroad tracks is designated as Zone X-Shaded, which is not regulated by FEMA. The floodplain mapping is not coincident with a stormwater study completed by Green Engineering in 1988 for the Southpark Development. The 1988 stormwater study provides hydrologic design calculations for 6 wet bottom detention basins between Southpark Boulevard and Frontier Lane, as well as 2 dry bottom detention basins between Frontier Lane and the railroad tracks. Runoff from the site drains northerly through the detention basins to an 84" CMP under the railroad. After crossing the railroad tracks, the runoff continues northerly to triple 36" CMP's located under a railroad spur, which appears to be abandoned. The discharge then continues northerly via an open channel to Highway 56.

The scenarios evaluated are:

- A comparison of the Cedar Creek Watershed Study and the 1988 stormwater study models.
- Potential solutions to reduce the FEMA floodplain to limits similar to the 1988 Study.

Procedure

The basis of the analysis is the Cedar Creek Watershed Study completed by Black & Veatch for the Johnson County Stormwater Management Program. The hydrologic model for the Cedar Creek Watershed Study includes detention storage upstream of the railroad tracks. This detention storage results in a significant reduction in flow rates, which is reflected in the Watershed Study hydrologic model results. The reduction in peak discharges due to detention storage is input into the Cedar Creek Watershed Study HEC-RAS model at the railroad tracks, rather than at the upstream limits of the model. In order to realize the benefits of detention throughout the site, the reduced 100 year peak runoff of 338 cfs was input at the upstream end of the model.

A cursory review of the railroad culverts revealed that the removal of the railroad spur and culvert downstream of the railroad tracks would produce a significant reduction in water surface elevations upstream of the railroad. To further evaluate this condition this culvert was removed from the model. To account for potential changes in hydrologic conditions caused by the removal of this culvert, the 100 year discharge was allowed to increase from 338 cfs to 658 cfs immediately downstream of the railroad rather than increasing immediately upstream from US Highway 56 as modeled in the Watershed Study. This condition overestimates the peak runoff whereby increasing the limits of inundation on the adjacent property located between the railroad tracks and Highway 56.

Results and Discussion

The Cedar Creek Watershed Study 100 year peak discharges at the railroad tracks are similar to those presented in the 1988 stormwater report; however, the 1988 floodplain mapping did not consider the effects of water backing up at the railroad crossing. Because the water surface elevation upstream of the culvert is higher than the top of the ponds, the floodplain mapping presented in the Cedar Creek Watershed Study is an accurate prediction of the inundation limits.

The removal of the railroad spur and culvert downstream of the railroad tracks was evaluated as a potential measure to reduce water surface elevations upstream of the railroad culvert. Removing the culvert reduced the 100 year water surface elevation south of the railroad tracks approximately 3.6'. While the reduced water surface elevation exceeds the depths calculated in the 1988 stormwater report, the limits of inundation are similar. The attached exhibit illustrates the change in the 100 year floodplain when the above referenced modifications are made to the Cedar Creek Watershed Study HEC-RAS model.

The analyses completed for this report assumed that minimal topographic changes will be made to the site and that the railroad spur downstream of the railroad will be removed prior to development. The following design criteria must be considered when a final site development plan is reviewed for approval.

- The peak 100 year discharge throughout the site must be not exceed 340 cfs. This includes providing compensatory storage for fill placed within the floodplain.
- The railroad spur must be removed, or other equivalent hydraulic improvements must be provided.

- While the floodplain limits are similar, the 100 year water surface elevations will most likely exceed those presented in the 1988 stormwater report, so the basis of 100 year freeboard will be the site specific stormwater report.
- The Cedar Creek Watershed Study identified a flood risk for several buildings adjacent to Frontier Circle. If the low adjacent grade of the buildings is lower than the revised 100 year water surface elevation, a LOMA may be completed to verify that the buildings are elevated above the 100 year floodplain.
- The hydrologic impacts to the property north of the railroad must be acknowledged by the property owner or otherwise mitigated.

FIG. 1