

May 10, 2018

Mr. Doug Hughes
Principal Engineer, Planning Dept.
Development Review Services
600 2nd Street NW
Albuquerque, NM 87102

Re: La Cueva Arroyo – Floodplain Work Map

Dear Mr. Hughes:

Thompson Engineering Consultants (TEC) and RESPEC have performed a hydraulic analysis of the La Cueva Arroyo located south of Alameda Boulevard and north of Signal Avenue running east from the AMAFCA concrete channel to Ventura Street.

The La Cueva Arroyo flows from east to west, in the North Albuquerque Acres Area. The arroyo flows naturally until it reaches AMAFCA's confined concrete channel west of Ventura street and north of Alameda Blvd. According to the North Albuquerque Acres Drainage Master Plan (October 1998), the arroyo corridor between Signal Avenue and Alameda Blvd flows at 3090 cfs in the 100-yr storm event. FEMA Flood Insurance Rate Map (FIRM) shows Zone AH east of Ventura and Zone AE west of it. Signal Village development is located west of Ventura Street and is affected by the FEMA floodplain. This property currently slopes at approximately 3% from east to west and free discharges northwest, to the La Cueva Arroyo.

Methodology and Hydraulic Analysis: HEC-RAS version 5.0.3 was used to analyze and model the 1D floodplain using a steady state run. Manning's coefficients were referenced per HEC-RAS user manual – table 8-1 "*Roughness Variation for Alluvial Streams*". At a well-defined cross section, it was assumed $n=0.025$ where the main channel or thalweg morphology acts as plane bed, and $n=0.03$ to 0.04 where the banks and floodplain contain dense vegetation such as brush and bushes (see Exhibit A for pictures at given cross sections). At poorly defined sections where n values horizontally varied, the values were input manually at each station to accommodate the change in n . Boundary conditions were set for critical depth downstream and known water surface elevation upstream, taken from the previous study completed in March 2012 by Weston that mapped the recent FEMA floodplain.

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Proposed Condition: It is proposed to build a Scour Wall at the east and north perimeter of the property. The purpose of the Scour Wall is to contain the incoming arroyo from the east, thus removing the floodplain and protecting the future development. The proposed length of the scour wall is 420 feet starting at the south east corner of the property, continuing north and west following along the left bank of the arroyo. As shown in the HEC-RAS model, the proposed cross sections are in compliance with the proposed grading plan and the water surface elevation at these sections (along the wall) demonstrates that the flow will be contained within the main channel (see existing and proposed tables, cross sections 11+62 to 11+70 for elevation differences). The model run indicates that the scour wall reduces the floodplain on the property as shown in the attached Exhibit A. The proposed floodplain is mostly within the current floodplain boundary, except for those areas where the existing condition model also deviates. The existing condition model is a better baseline for comparison than the mapped FEMA floodplain because this analysis was performed with recent design level survey as opposed to the older lidar contours used in Weston's analysis.

If you should have any questions about this letter report, please call me at 271-2199.

Sincerely,



David B. Thompson, P.E.

Enclosures