

APPENDIX Q -
FEMA CONDITIONAL LETTER OF MAP
REVISION

Camarillo Springs Golf Course

FEMA Conditional Letter of Map Revision (CLOMR)

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HEC-RAS Models

- a. Duplicate Effective
- b. Corrected Effective Existing / Proposed

1 Introduction

The following report documents a Conditional Letter of Map Revision (CLOMR) application for the Camarillo Springs Golf Course project, in Camarillo, CA.

1.1 Project Description

The existing Camarillo Springs Golf Course is located in the City of Camarillo, CA in southeastern Ventura County (*Figure 1*). The project site is south of Ridge View Street, about 1,000 feet east of Conejo Creek. The proposed project improvements will consist of an approximately 32-acre of residential development, revised golf course area, parks, and open space within the current Golf Course property boundary. The project flood protection improvements include elevating 32-acres of development area, and constructing a drainage system for flows developed on the local tributary watershed. The proposed improvements will provide new residential area, create new neighborhood recreation facilities, and remove more than 150 existing residential structures from the effective floodplain.

1.2 Limits of Study and Effective FEMA Flood Hazards

The present study is for the reach of Conejo Creek from approximately 1,300 feet upstream of Howard Road, to just downstream of the Highway 101 Bridge. The downstream study limit corresponds to FEMA effective model cross section number 48073, and the upstream study limit corresponds to FEMA effective model cross section number 54749.

The project property is on FIRM Panels 06111C0934E and 06111C0953E, each with an effective date of January 20, 2010. The floodplain boundaries in the area have since been revised by two Letters of Map Revision (LOMR). The effective floodplain boundary data in digital format (DFIRM) was obtained and used to create the effective mapping of the area shown in *Figure 2*.

The flood hazard from Conejo Creek is shown mapped as Zone AE with floodway. Complete FIRM panels showing the published FIRM mapping are included in *Appendix A*, but these do not include the Letters of Map Change approved after the published date of the panels.

2 CLOMR HEC-RAS Modeling

2.1 HEC-RAS Models

A complete set of HEC-RAS models are presented for the CLOMR application, including duplicate effective, corrected effective, and proposed conditions models. The corrected effective, and proposed conditions models are based on the effective models, which were obtained as part of a FEMA backup data library request.

2.1.1 *Effective FEMA Hydraulic Models*

Downstream Portion of Study Reach, XS 48073 to XS 51231

The effective mapping for the downstream portion of the study reach, from XS 48073 to XS 51231, was developed with a steady state HEC-RAS model using VCRat peak flowrates from a VCWPD Watershed Hydrology Study of Calleguas Creek, which includes Conejo Creek. This model was originally used to develop 10-yr, 50-yr, 100-yr and 500-yr water surface elevations for the entire study reach, however the results for the upstream portion of the study reach have been superseded by the models from a 2015 LOMR.

Upstream Portion of Study Reach, XS 51491 to XS 54749

The effective modelling for the upstream portion of the study reach consists of an unsteady HEC-RAS model for the 100-yr event mapping and floodway analysis, and a steady state HEC-RAS model for the 500-yr event mapping. These models are part of a Letter of Map Revision (Case No. 10-09-2501P), approved by FEMA in 2011, and reissued in 2015 as part of Case No. 15-09-1145P.

The BFE information from the models were verified against the BFEs listed in the Ventura County FIS study and on the effective FIRM panels.

2.1.2 *Corrected Effective / Existing Condition Model*

A single corrected effective HEC-RAS geometry for the entire study reach was created using the stream centerline, cross section numbering, and cross section alignments from the two effective models. The cross sections were revised using updated topographic data. The roughness values, boundary conditions, and flowrates are unchanged.

The 100-yr event and the floodway were analyzed using an unsteady model, and the 500-yr event was analyzed using a steady state model. Both models use the same geometry. The hydrographs for unsteady model and the flowrates for the steady state modelling are exactly the same as in the effective models. The two corrected effective models are provided in the *Additional Enclosures* folder.

2.1.3 *Proposed Condition Model*

The proposed conditions HEC-RAS geometry model was created from the corrected effective geometry by modifying certain cross sections to reflect the proposed grading. As with the corrected effective modelling, the 100-yr event was analyzed using an unsteady model, and the 500-yr event was analyzed using a steady state model. A Topographic Workmap is shown on *Figure 3*. The two proposed condition models are provided in the *Additional Enclosures* folder.

2.2 HEC-RAS Model Input

The input parameters for the model follow the guidelines of the HEC-RAS Modeling User's Manual (v5.0) and the HEC-RAS Supplemental User's Manual (v5.0.4). The input variables were adjusted to match the conditions of the project area.

2.2.1 Topographic Data

The topographic data was provided by the County of Ventura and covers the entire reach of Conejo Creek from the creek's confluence with Calleguas Creek upstream to near the Upland Road Drain. The digital LiDAR topographic mapping data was flown by the County of Ventura in July 2013, and is high resolution LiDAR with a 10-ft x 10-ft grid resolution. The vertical accuracy was 9.25 cm. The digital topographic data, used to generate a TIF (Tagged Image File) which stores raster information, was applied as the terrain for computations in the HEC-RAS Model. Two terrains, existing condition (unchanged) and proposed condition (with proposed grading) were used in the models. The proposed grading was supplemented with local topography flown in May 2018 for grading and contour development.

2.2.2 Model Extents

The model of Conejo Creek extends from approximately 4,250 ft upstream of Highway 101 downstream to a point just upstream of the junction between Conejo Creek and Calleguas Creek. Approximately 18,800 ft of Conejo Creek is modelled. The study limits for the present CLOMR are from just downstream of the Highway 101 Bridge to a point approximately 1,300 feet upstream of the Howard Road crossing.

2.2.3 Manning's Roughness

The roughness values in the corrected effective and proposed conditions models are the same as in the effective models.

2.2.4 Boundary Conditions

The downstream boundary condition in the corrected effective and proposed conditions models is the same as in the effective model from the downstream portion of the project reach.

The upstream boundary condition in the unsteady corrected effective and proposed conditions models, for 100yr event analysis, is the same inflow hydrograph in the unsteady effective model from the upstream portion of the project reach.

No upstream boundary condition is necessary for the steady state corrected effective and proposed conditions models because the subcritical flow regime is used.

2.2.5 Flowrates/Inflow Hydrographs

The flowrates for the steady state modelling are the same as in the corrected effective model. The hydrograph inputs for the unsteady 100-yr modeling are the same as in the corrected effective model, except for one of the lateral inflow hydrographs which comes from the Camarillo Springs Creek watershed at XS 53187. That lateral inflow hydrograph is reduced, in proposed conditions, to reflect the proposed conditions interior lake storage by scaling the ordinates so that the new volume has been reduced by 90 ac-ft.

3 HEC-RAS Model Results

3.1 Conejo Creek Model Results, Base Flood (100-yr) Event

The water surface elevation results from the models are shown in *Table 3-1*. Included in the table are the effective base flood elevations (BFE), the calculated water surface elevations for the duplicate effective, corrected effective/existing, and proposed models, and proposed new base flood elevations for the study reach. The water surface elevation results from the models show that there are minimal changes to flow depth on the main property area, and decreases observed near the south area where floodplain overbank storage is increased.

Table 3-1 Calculated Water Surface Elevations

Section	Effective BFE	Duplicate Effective	Corrected Effective / Existing	Proposed	New BFE
54800	Highway 101				
54749	XS Q = 118.0	118.0	117.2	117.8	XS Q = 117.8
54668		118.1	117.5	117.9	
54330		118.0	117.4	117.3	
53914		118.0	117.4	117.8	
53451		118.0	117.4	117.7	
53187		118.0	117.3	117.5	
53057	XS P = 118.0	118.0	117.3	117.4	XS Q = 117.4
53000	Ridge View Street				
52939	XS O = 117.9	117.9	117.3	117.3	XS O = 117.3
52809		117.5	117.1	117.2	
52620	XS N = 117.1	117.2	116.8	116.8	XS N = 116.8
52377		116.7	116.1	116.2	
52059		116.1	115.3	115.4	
51699		113.9	113.5	113.5	
51593		113.5	112.6	112.6	
51491	XS M = 113.6	113.6	112.9	113.0	XS M = 113.0
51231		113.1	112.5	112.5	
50917		112.5	111.8	111.7	
50597		112.0	111.3	111.2	
50305		111.2	110.7	110.1	
50231		111.0	110.6	109.9	
50143	XS L = 110.8	110.8	110.6	109.7	XS L = 109.7
49815		110.5	110.2	109.3	
49746		110.0	110.1	109.4	
49667		110.0	110.0	109.4	
49405		109.9	109.7	109.4	
49043		109.7	109.4	109.3	
48736		109.6	109.3	109.3	
48408	XS K = 109.3	109.3	109.1	109.2	XS K = 109.2
48258		109.3	109.0	109.0	
48073		109.2	108.9	108.9	

The HEC-RAS results show that FEMA base flood elevations do not increase. Revised floodplain boundaries are shown on the Floodplain Comparison Map, *Figure 4*. New base flood elevations are provided in *Table 3-1* and on the Annotated FIRM in *Figure 5*.

3.2 Conejo Creek Model Results, Floodway

The floodway for Conejo Creek was determined using the unsteady 100-yr corrected effective model. Floodway results are provided in *Table 3-2*. Both the effective floodway and the revised floodway are shown on the Floodplain Comparison Map, *Figure 4*, and on the Annotated FIRM, *Figure 8*.

Table 3-2 Floodway Elevation Results

Section	Corrected Effective / Existing	Floodway	Difference
54800	Highway 101		
54749	117.2	118.1	0.3
54668	117.5	118.5	1.0
54330	117.4	118.4	1.0
53914	117.4	118.2	0.8
53451	117.4	118.0	0.6
53187	117.3	117.9	0.6
53057	117.3	117.7	0.4
53000	Ridge View Street		
52939	117.3	117.7	0.4
52809	117.1	117.5	0.4
52620	116.7	117.1	0.4
52377	116.1	116.6	0.5
52059	115.3	115.7	0.4
51699	113.5	114.1	0.6
51593	112.6	112.8	0.2
51491	112.9	113.3	0.4
51231	112.5	112.8	0.3
50917	111.8	112.1	0.3
50597	111.3	111.6	0.3
50305	110.7	111.0	0.3
50231	110.6	110.9	0.3
50143	110.6	110.8	0.2
49815	110.2	110.5	0.3
49746	110.1	110.4	0.3
49667	110.0	110.3	0.3
49405	109.7	110.1	0.4
49043	109.4	109.8	0.4
48736	109.3	109.7	0.4
48408	109.1	109.5	0.4
48258	109.0	109.4	0.4
48073	108.9	109.3	0.4

4 Floodplain Mapping and CLOMR Application FORMS

The proposed revised Conejo Creek floodplain and floodway boundaries are shown on the Floodplain Comparison Map, *Figure 4*.

Note that ponded water from Calleguas Creek to the west abuts the Conejo Creek Zone AE floodplain, and is shown on the FIRM panels as a broad area of Zone AO. The limits of the Conejo Creek Zone AE on the effective mapping are shown on the overbank where the Conejo Creek flow is one foot deep, thus matching the Zone AO area between Conejo Creek and Calleguas Creek at one foot of depth. This Zone AO was retained on the proposed revised floodplain mapping.

The proposed revised floodplain mapping is shown on the Annotated FIRM, *Figure 5*.

A complete set of FEMA MT forms are included in *Appendix A*.