



MEMORANDUM

To: Rhys Rowland, Dianna Jensen, City of Davis

CC: Paul Gradeff, HighBridge Properties

From: Lena Rystrom, Martin Lewis, Cunningham Engineering Corporation

Date: 24 February 2017

Subject: Lincoln 40: Drainage Evaluation for 2-Year and 10-Year Events

The purpose of this memo is to describe the project site's hydrologic response in the 10-year/24-hour storm and 2-year/24-hour storm events, and to show that the proposed detention basin to be located at the eastern corner of the site has been sized to adequately to provide stormwater quantity control for the 5.92-acre Lincoln 40 site.

Existing Condition

The existing Project site is partially developed, interspersed by open space. There is an existing curb drain inlet at the end of the paved portion of Hickory Lane, as well as the end of the sidewalk, curb and gutter on the north side of Olive Drive which connects into a 24" storm drain main. All other site drainage flows overland to the east, following the site topography. The site is located within FEMA Zone X, as indicated on FIRM Panel 06113C0611G, June 18, 2010 and therefore is not located within a FEMA 100-year special flood hazard area. The existing impervious area is 1.24 acres (21% impervious).

Proposed Condition

The Project design seeks to limit the post-project 10-year peak discharge to estimated existing levels. In addition, current State Water Resources Control Board (SWRCB) requirements call for limiting the 2-year/24-hour peak discharge to pre-project levels, in order to mitigate for potential hydromodification impacts. The proposed impervious are is 3.37 acres (57% impervious).

Proposed site detention storage will be within the detention basin at the eastern corner of the site. It is recognized that the proposed site LID features/water quality BMPs (pervious pavement, bioswales and stormwater planters) may contribute incidental storage (and potentially some peak flow attenuation) during storm events in excess of the stormwater quality storm. However, for the purposes of evaluating the 2-year or 10-year storms herein, any additional storage associated with upland BMPs has been conservatively assumed to be zero. Detained site runoff will flow through the city storm drain pipe system and outlet to the Davis Core Area Drainage pond.

Hydrologic Analysis

The rainfall/runoff analysis and detention routing was conducted using the HEC-HMS model. Within HMS, the response of each sub-basin element was computed using a combination of the USBR (Sacramento region) unit hydrograph method and the initial/constant loss method.

The model results tabulated in Figures 1 and 2 below represent two site conditions : the existing (pre-project) and the proposed (post-project) condition. The peak discharge from the existing-condition sub-basin (named “EXIST” within the table) provides the target site discharge (both 2-year and 10-year) for the proposed model. The proposed condition sub-basin - named “DEV” in the table below- has a peak discharge which is greater than existing due to the increase in impervious area in the developed site. In the developed condition, approximately 71% of the site area will drain to the proposed detention basin (“Reservoir-1”). The remaining 29% (from the portion of the site south of the building) will drain directly to Olive Drive. This flow split is represented in the model via a diversion element (“Diversion-1”). The total post-project discharge for the site is summed at “Junction -1”, which comprises the outflow from the detention basin combined with the free-discharge component of the site. The results from the Figures below for both the 2-year and 10-year storms confirm that the overall peak discharge at “Junction-1” is equal to or less than the existing condition.

Figure 1: 2-Year, 24-Hour Storm Results

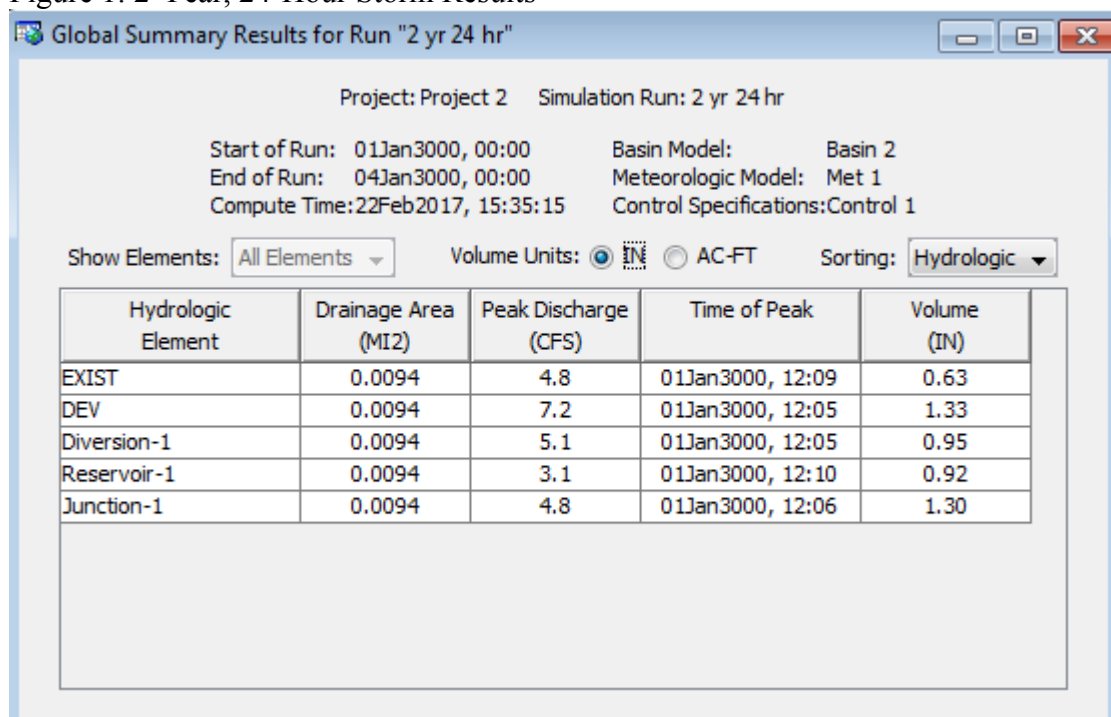
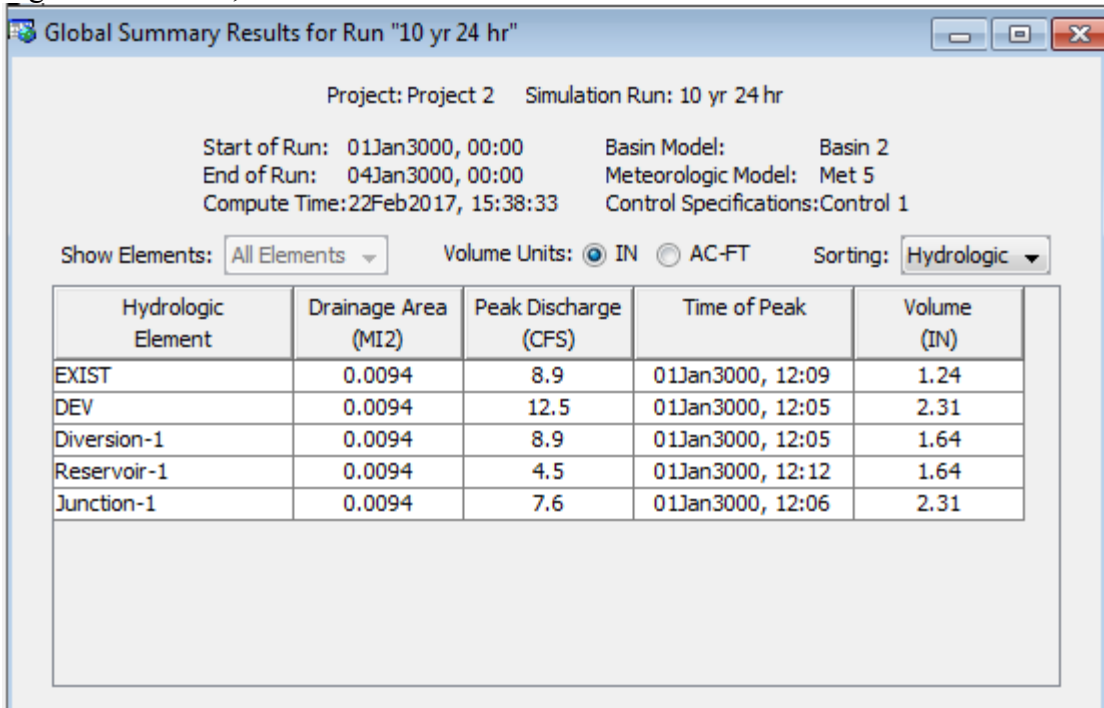


Figure 2: 10-Year, 24-Hour Storm Results



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