

March 14, 2022
Job No.: 3302-000

MEMORANDUM

TO: Public Works Department, City of Calistoga

FROM: Ryan Hansen - CBG

SUBJECT: Drainage Narrative
2008 Grant Street
Calistoga, California

At the request of the Public Works Department, this memorandum shall serve as a summary for the onsite drainage and detention design to illustrate conformance with the project conditions of approval. Along with mandated post project stormwater treatment measures, the project hydrology and hydraulic models shall be designed to retain the 100 year, 24 hour storm event to ensure post project improvements' peak stormwater discharge is not higher than existing conditions. Technical data and calculations are provided in the "Hydrologic and Hydraulic Modeling for Preliminary Stormwater Control Planning for 2008 Grant Street, Calistoga, Napa County, California" prepared by Balance Hydrologics, Inc, dated April 8,2021.

Stormwater detention modeling results

During large storm events, model results demonstrate that the proposed bioretention basins will be effective in attenuating post-project peak flow rates to less than the pre-project peak flow rates. In other words, the proposed bioretention basins not only provide the required BASMAA standards for stormwater treatment, but the flow-duration and hydromodification requirements as demonstrated by the hydrologic modeling results. For example, the peak flow rate for the 100-year, 24-hour storm is predicted to decrease from 7.4 cfs to 3.7 cfs in the post-project (with detention) condition.

Summary: The project will provide a 50% reduction in peak flow when compared with the pre-project condition. It should also be noted that the runoff from the proposed bio-retention will not enter the drainage ditch, rather the public 42" main that connects to the Grant Street storm drain system.

Hydraulic Modeling and Ditch Capacity

Peak flows from the offsite contributing watershed were studied from the 1991 Northwest Calistoga Drainage Study. To assess the flooding concerns, the Preliminary Stormwater Control Plan includes an underground 42-inch diameter storm drain that connects to the existing 42-inch outfall at the upstream end of the ditch and reroutes flows that would normally enter the ditch under the private street and Redwood Avenue to the main 54-inch storm drain line running along Grant Street. As part of the proposed design a flow splitter would be installed at the upstream end of the ditch that would allow all runoff originating upstream of the site to enter the new 42-inch pipe until the capacity of the pipe is reached. After the pipe capacity is exceeded, any excess flow would enter the ditch via overland release.

Summary: The new 42-inch storm drain pipe would have a capacity flowing full of approximately 77 cfs which leaves a peak post-project flow in the ditch of 77 cfs, half of the 100 year storm. This is less the calculated ditch capacity of 87 cfs.

Lot 8-13 Drainage Design

The proposed on site grades were designed to account for existing perimeter constraints as well as specific design requirements related to stormwater drainage and treatment.

The current design anticipates that some of the eastern lots (6-13) will require a retaining wall at the edge of the property line due to the necessary fill onsite. In order to retain existing trees along the property line as requested by the City, lots 8-13 will have an 15' inset retaining wall to avoid the root structure of the trees in question.

To account for any drainage at the rear of the lot, we intend to provide an earth swale at the property line, intermittent inlets and a subdrain that would be the responsibility of each lot owner. This is not a continuous swale given each lot will be fenced in and it only will collect the 15' x 75' wide area at the back of each lot then makes a direct connection to the public storm drain in A Street via a private storm drain main and easement. Roughly 85% of each lot will drain in the other direction towards the private street, limiting the runoff collected in the rear lot drainage system.