

Cameron Meadows – Storm Drainage

Report:

Storm Drainage Evaluation - Cameron Meadows Domenichelli & Associates January 2023

COMMENTS RE REPORT (see pertinent sections of the report below)

It is evident from the report that Rasmussen Pond provides the majority of the project runoff mitigation provided the spillway is modified so that water surface elevation (WSE) is modified in the following way:

Summer Maximum WSE is decreased by 1 ft to 1389 ft
This reduces the maximum aquatic/riparian environment by 10%

The peak 100-year WSE is increased by 0.37 ft to 1394 ft providing a freeboard of 2 ft that was originally 2.37 ft

This is achieved by reducing the cross section area of the spillway and thus reducing the rate at which water is able to flow out of the pond. In the event that the 100-year precipitation is exceeded this increases the possibility that the pond will over-top the dam embankment resulting in catastrophic failure.

The reliance on Rasmussen Pond providing the majority of project runoff mitigation relies on the integrity of the dam embankment.

The embankment was constructed circa 1952 and is on record by the Department of Safety of Dams as "Krell Dam and Reservoir, No. 3466" and was likely inspected under that jurisdiction until March 15, 1973 when the spillway crest was reduced by 2.6 ft. This altered the structure to non-jurisdictional size. Since then it is unlikely that the dam embankment has been inspected regarding its integrity.

The dam embankment is now more than 70 years old. As with all such structures they deteriorate with age. Such deterioration is caused by natural settlement and burrowing by both land and aquatic animals. This causes leakage through and under the embankment. Such leakage causes erosion and eventual failure of the structure. The lush nature of the vegetation throughout the year along the toe of the dam embankment indicates that some under-seepage is already occurring.

Failure of a deteriorating embankment is most likely to occur when the WSE is at its maximum. For this case the increase in depth from the minimum WSE is 5ft. This causes a significant increase in pressure on the lower regions of the embankment exacerbating the flow through any existing leakage paths and therefore increasing erosion.

Failure of the embankment in the present situation is unlikely to cause significant damage to existing structures as there is a large field over which the discharge would be dissipated. The proposed project shows houses within 100 ft to 150 ft of the toe of the dam embankment. Even a minor failure of the dam embankment would be catastrophic for these structures and the residents.

Another cause of concern is that even slow leakage of the dam embankment will result in drainage issues for structures build close to the toe of the dam.

Taking account of the above, it would be appropriate to include as a condition of the development permit a survey of the dam embankment regarding its integrity and the implementation of any remedial

action required by such a survey.

COMMENTS REGARDING OTHER DRAINAGE STUDIES

Cameron Park Drainage Study by Stantec commission by El Dorado County Water Agency and Cameron Park Community Service District on or about June 2023.

It should be mandatory that any decisions regarding the requirements for the drainage mitigation for the Cameron Meadows project take into account the results of this study.

H&H Study in 1995 commissioned by EDC DOT: Cameron Park Drainage Study by Psomas and Associates

This study recommended upgrades to the drainage system in Cameron Park. As far as can be ascertained the recommended drainage upgrades were never carried out.

Included in the recommendations of this 1995 study was that no housing development be permitted until the upgrades are implemented. Since then Cameron Woods, East Wood, North View and Cameron Valley comprising more than 500 houses have been built.

Comment by R. Kyle Ericson, PE, Water Agency Resources Engineer

There are two principal components of the proposed assessment; built infrastructure and natural drainage courses. The County DOT is principally responsible for the majority of the built infrastructure, while the CPCSD has the authority (although not initiated) to mitigate drainage issues within the riparian areas. Based on the initial reports of flooding issues it appears that both components may be contributing factors.

That is, CPCSD did not carry out the required maintenance of the storm drainage system. Hence the significant flooding event in Jan, 2023

The above indicates that a building permit should not be issued until the recommendations of the Psomas study are implemented. Failure to implement any flood mitigation measures will be knowingly putting at risk the property and lives of residents.

The consequences of the failure of EDC to comply with the recommendations of the 1995 H&H study and the resultant flooding will be tested in court via a Mass Tort and could cost EDC many millions of dollars. Far exceeding the cost of the mitigation measures.

Storm Drainage Evaluation - Cameron Meadows prepared by Domenichelli & Associates January 2023

Pertinant Sections

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2. Project Description

....In addition to constructed detention basins, **the Rasmussen Pond provides the majority of the runoff mitigation.** The pond spillway will be modified to include a concrete structure with a low flow outlet 1 foot below the existing spillway elevation. Additionally, the spillway will be narrowed to approximately 13 feet wide up to an elevation of 1394' resulting in additional storage capacity during peak inflow ultimately reducing the peak outflow.

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Proposed Watershed Conditions

....To help mitigate for increased on-site runoff

from the developed (improved areas), individual water quality/detention basins are provided. However, due to

conveyance timing through the site, **additional stormwater attenuation is needed**. To completely mitigate the downstream peak flow impact of development and further reduce existing peak flows, the existing Rasmussen Pond spillway is modified (in the proposed conditions model) to reduce the spillway elevation, providing more detention storage. The 100-yr event under proposed conditions results in a maximum **water surface elevation** of 1364' which is 0.37 feet above the existing max WSE in the pond. This results in a freeboard to the top of embankment of 2.0 feet (see Section 4 Modeling Results for more details). We recommend armoring of the spillway to a shape and elevation during the design phase of the project to reduce the risk of scour and to produce a long-term dependable outflow rating curve.

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Detention

Peak flows are increased due to onsite development and need to be mitigated to maintain the existing condition flows for flood control and hydromodification mitigation.

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5. Hydromodification Mitigation

Hydromodification mitigation should be provided to the satisfaction of the State Water Resources Quality Control Board MS4 Section E.12.f.ii.a

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7. Conclusion

...The modified outlet structure at the Rasmussen Pond reduces both the volume and conveyance necessary to allow the downstream channels to pass the storm events similar to the existing conditions.

To achieve this, the Rasmussen pond maximum summer WSE is reduced to 1389'. The peak 100-year WSE in the pond is increased by 0.37' while still maintaining 2.0 feet of freeboard.