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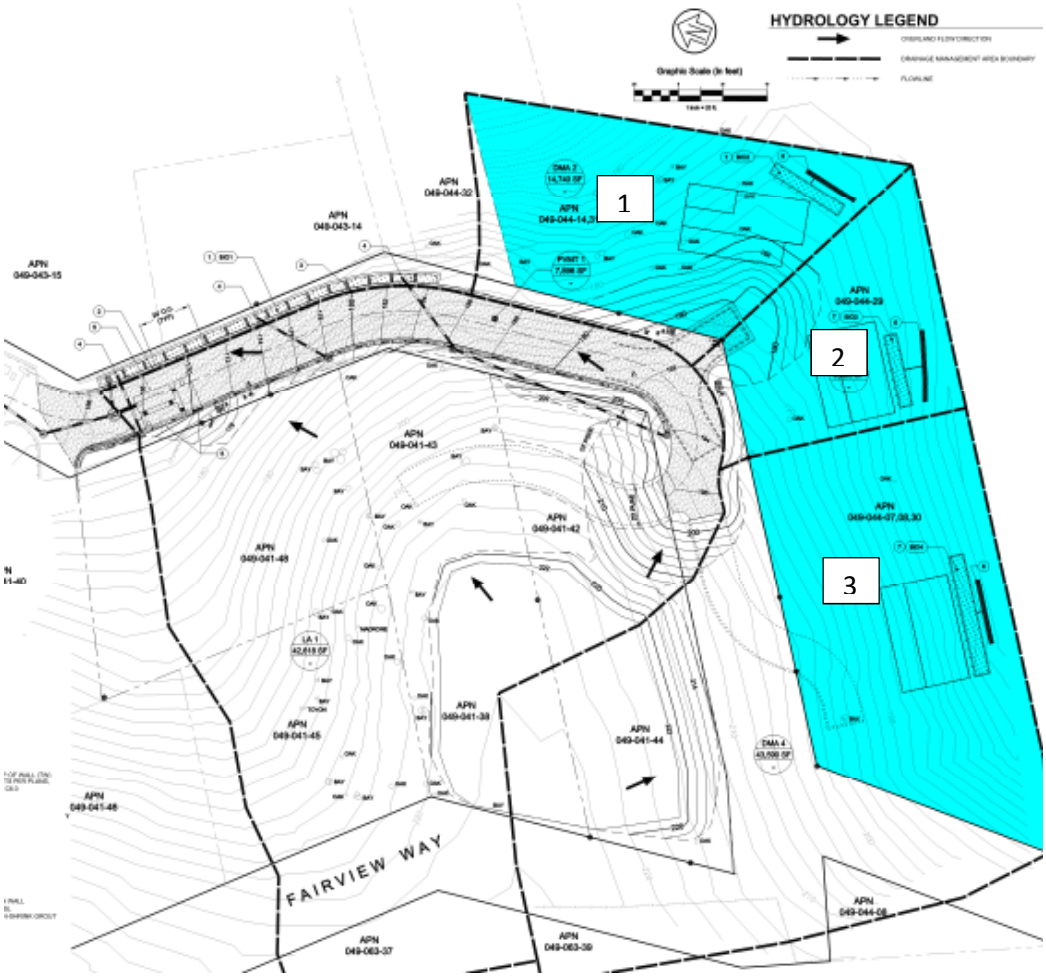
TECHNICAL MEMORANDUM

TO: Berenice Davidson P.E., Marin County DPW
FROM: Richard Souza P.E., CSW|ST2
DATE: June 4, 2020
SUBJECT: Alta Way Roadway Extension – Stormwater Control Plan Update

This technical memorandum further clarifies stormwater runoff on the three (3) lower parcels lying east and south of the proposed Alta Way roadway extension. As indicated in the 2/14/20 technical memorandum, there is a net decrease of stormwater runoff on the parcels below the roadway extension and future development on these parcels is subject to current County regulations for stormwater treatment and retention. To further analyze the effects of future development on stormwater runoff, CSW|ST2 prepared feasibility plans for each parcel as indicated on Sheet C4.3 of the Permit plans. Additionally, the Stormwater Treatment plan (Sheet C8.0) was updated to reflect potential future stormwater treatment and retention areas.



Hydrology calculations are based on assumed improvements and will vary based on the actual site development. The calculations follow criteria contained within the "County of Marin Department of Public Works Hydrology Manual Simplified Instructions". The analysis herein utilized the Rational Method to calculate existing and proposed peak flow rate. Raifall Intensities for use with the Rational Method are developed from Intensity-Duration-Frequency data available from the National Oceanic Atmospheric Administration (NOAA) specific to the geographic location of the project site. Below is a summary table for pre- and post-development areas as indicated in the highlighted image.

Table 1: Existing Peak Discharge Calculations - 100 Year Storm Event

Watershed ID	Recurrence Interval (Year)	Tributary Area (ac)	C-Factor	Time of Concentration (min)	Discharge (cfs)
1	100	0.34	0.61	9.6	0.9
2	100	0.21	0.61	9.3	0.6
3	100	1.00	0.61	9.6	2.6

Table 2: Future Peak Discharge Calculations - 100 Year Storm Event

Watershed ID	Recurrence Interval (Year)	Tributary Area (ac)	C-Factor	Time of Concentration (min)	Discharge (cfs)
1	100	0.34	0.69	8.8	1.0
2	100	0.21	0.72	8.3	0.7
3	100	1.00	0.64	9.3	2.8

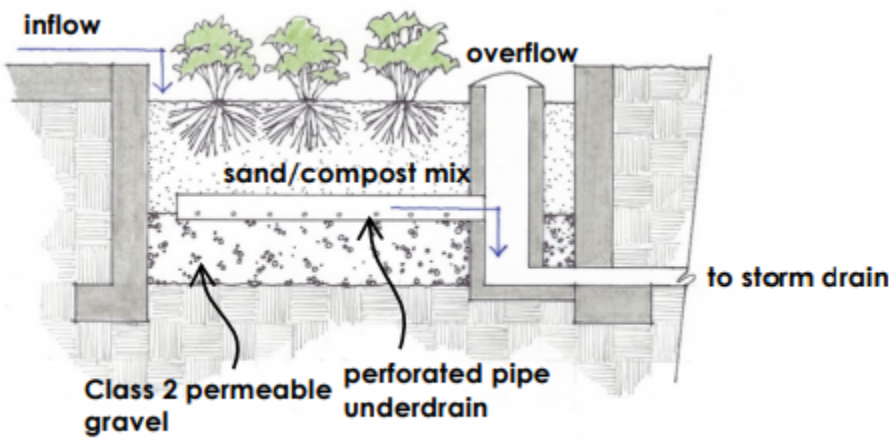
Future development of the subject properties will increase the hardscape area (building roof, driveway, patio, etc.). Assuming the tributary area is not effected by future development(s), there is a net increase of stormwater runoff due to the increase of hardscape area. The calculated net increase of stormwater runoff for each tributary area is indicated in Table 3.

Table 3: Storm Water Runoff Net Increase - 100 Year Storm Event

Watershed ID	Recurrence Interval (Year)	Net Increase (gallons)
1	100	572
2	100	483
3	100	947

To mitigate the net increase of runoff, bioretention areas (indicated in Sheet C8.0) as potential future treatment and retention facilities. The bioretention design will comply with the Bay Area Stormwater Management Agencies Association (BASMAA) post-construction manual (Appendix C). BASMAA provides design guidance for stormwater treatment and control for projects in Marin County.

More specifically, stormwater runoff from the hardscape areas will be collected and drained into the bioretention areas. The bioretention areas will be depressed at least 6 inches below the outlet/overflow pipe to provide the required retention volumes indicated in Table 3 for the 100-year storm event. For smaller storm events (1-year interval or less), stormwater will filter through the sandy loam soil before collection into a subdrain system and dispersed into the native soils in an outfall dissipater. The outfall dissipater consists of a perforated pipe encased in a rock trench, approximately 2-feet deep. The length and width of the dissipater will be based on the actual location and future site developments.



TYPICAL BIORETENTION DETAIL

In summary, the future development on the lower (3) parcels is anticipated to increase stormwater runoff due to the increase of hardscape area. To mitigate the increase of stormwater runoff, bioretention facilities, which meet BASMAA standards, may be utilized. Actual development of the site will vary. The proposed improvements indicated on C4.3 are conceptual and should be used as a guide only.