Appendix H:
Hydrology and Water Quality Supporting Information

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KIER+WRIGHT

December 6th, 2021

RE: Toyota Walnut Creek – Conceptual Hydrology Analysis

To Whom it May Concern,

Kier + Wright performed a conceptual hydrology analysis for the potential Toyota Walnut Creek development in Walnut Creek, CA on November of 2021. Kier + Wright understands that this project will redevelop approximately 359,000 SF of existing land into a multi-use development with underground parking.

The conceptual hydrology analysis is shown in the attached Exhibit A. The conceptual analysis shows that the pre-development peak runoff for the sites total ~20.42 cfs. The post-development runoff would have a reduced peak runoff of ~18.05 cfs. The post-development analysis assumed the following parameters:

- The proposed development would be composed of all impervious surfaces except for the areas needed for treatment.
- The treatment ponds/planters would all have catch basins fitted with orifices to reduce the peak runoff.

Sincerely,
KIER & WRIGHT

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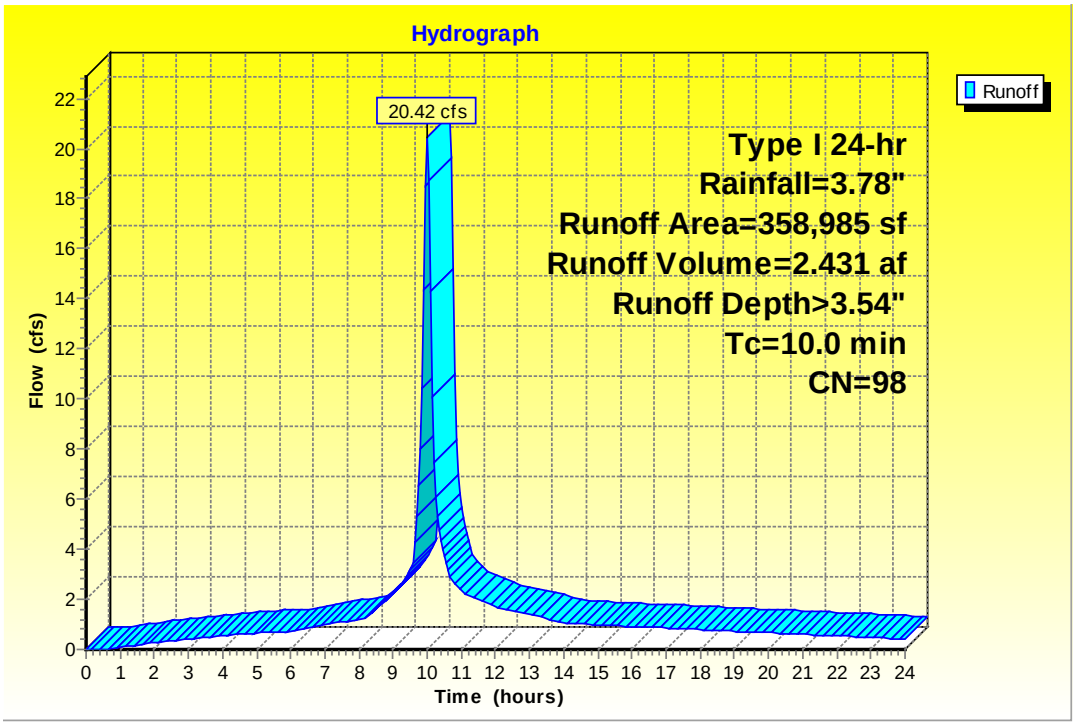
EXHIBIT A

Toyota Walnut Creek - Pre-Development Hydrology:



Summary for Subcatchment 1S: Existing Site

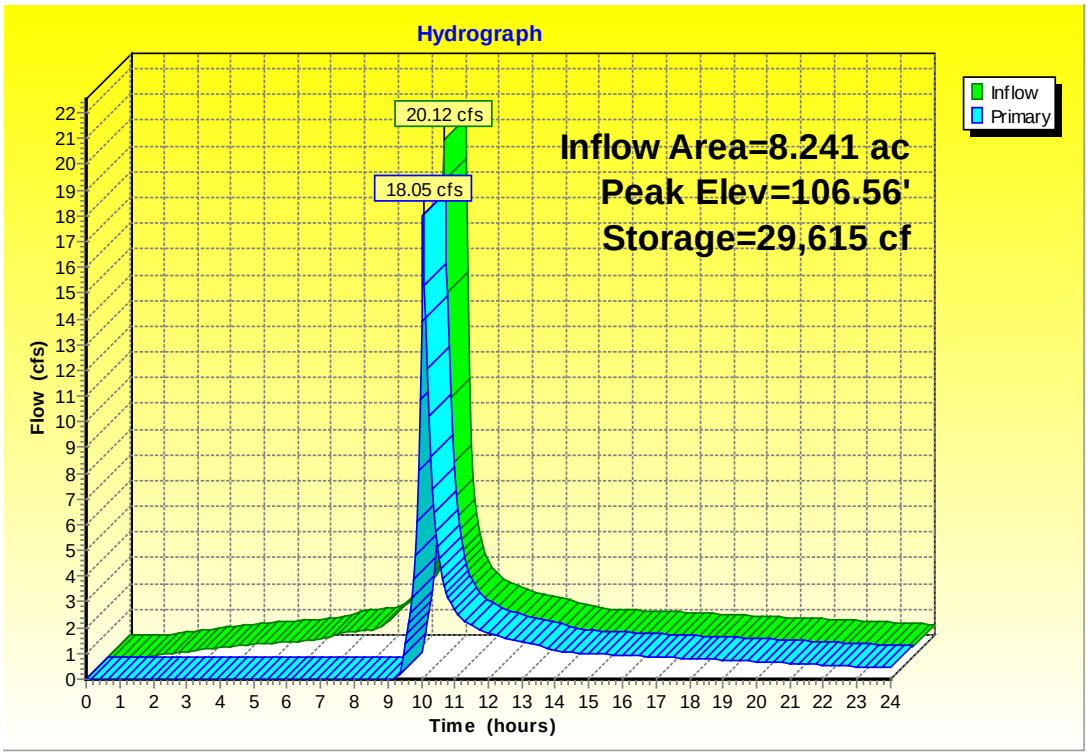
Runoff = 20.42 cfs @ 10.00 hrs, Volume= 2.431 af, Depth> 3.54"

Runoff by SCS TR-20 method, UH=SCS, Weighted-CN, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Type I 24-hr Rainfall=3.78"

Area (sf)	CN	Description
339,837	98	Paved parking, HSG D
19,148	89	<50% Grass cover, Poor, HSG D
358,985	98	Weighted Average
19,148		5.33% Pervious Area
339,837		94.67% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
10.0					**Direct Entry,**

Toyota Walnut Creek - Post Development Hydrology:



Summary for Pond 2P: TCM 1

[93] Warning: Storage range exceeded by 0.06'

Inflow Area = 8.241 ac, 96.00% Impervious, Inflow Depth > 3.43"
Inflow = 20.12 cfs @ 10.00 hrs, Volume= 2.353 af
Outflow = 18.05 cfs @ 10.06 hrs, Volume= 1.843 af, Atten= 10%, Lag= 3.2 min
Primary = 18.05 cfs @ 10.06 hrs, Volume= 1.843 af

Routing by Stor-Ind method, Time Span= 0.00-24.00 hrs, dt= 0.05 hrs
Peak Elev= 106.56' @ 10.06 hrs Surf.Area= 17,948 sf Storage= 29,615 cf

Plug-Flow detention time= 207.4 min calculated for 1.843 af (78% of inflow)
Center-of-Mass det. time= 90.2 min (802.8 - 712.6)

Volume	Invert	Avail.Storage	Storage Description
#1	103.00'	29,615 cf	**Custom Stage Data (Prismatic)** Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Voids (%)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
103.00	14,359	0.0	0	0
105.50	14,359	40.0	14,359	14,359
106.00	14,359	100.0	7,180	21,539
106.50	17,948	100.0	8,077	29,615

Device	Routing	Invert	Outlet Devices
#1	Primary	101.50'	**40.0" Round Culvert** L= 100.0' Ke= 0.500 Inlet / Outlet Invert= 101.50' / 101.00' S= 0.0050 '/' Cc= 0.900 n= 0.012, Flow Area= 8.73 sf
#2	Device 1	106.00'	**40.0" x 40.0" Horiz. Orifice/Grate** C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=17.72 cfs @ 10.06 hrs HW=106.55' (Free Discharge)
↑**1=Culvert** (Passes 17.72 cfs of 73.02 cfs potential flow)
↑**2=Orifice/Grate** (Weir Controls 17.72 cfs @ 2.42 fps)