

CHURCH OF THE WOODS

Response to Dept. of Transportation Comment Letter

Dated 2/22/19 Section "Hydraulics" #1

Addendum to Drainage Study

June 3, 2019

- 3-11 1. There is an area in the southeastern portion of the site that, in its natural state, drains onto the Caltrans Right of Way. This area contains 129,197.00 SF or 2.97 Acres.

In the developed state of the project, there will be 91,560.42 SF or 2.10 Acres draining to the Caltrans Right of Way. Of this area, 68,721.43 SF or 1.58 Acres will remain in its natural condition.

These areas undeveloped and developed are shown on the attached exhibits.

Also attached are rational method hydrology calculations using the 100-year 1-hour storm event. The results are:

Pre-development $Q_{100} = 16.759$ cfs

Post-development $Q_{100} = 15.192$ cfs

San Bernardino County Rational Hydrology Program

(Hydrology Manual Date - August 1986)

CIVILCADD/CIVILDESIGN Engineering Software, (c) 1989-2005 Version 7.1
Rational Hydrology Study Date: 05/31/19

Program License Serial Number 6222

***** Hydrology Study Control Information *****

Church Of The Woods
Undeveloped
Cal Trans Area Runoff

Rational hydrology study storm event year is 100.0
10 Year storm 1 hour rainfall = 1.400(In.)
100 Year storm 1 hour rainfall = 2.100(In.)
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 2.100 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

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Process from Point/Station 1.000 to Point/Station 2.000
**** INITIAL AREA EVALUATION ****

UNDEVELOPED (average cover) subarea
Decimal fraction soil group A = 0.000
Decimal fraction soil group B = 0.000
Decimal fraction soil group C = 0.000
Decimal fraction soil group D = 1.000
SCS curve number for soil(AMC 2) = 84.00
Adjusted SCS curve number for AMC 3 = 96.40
Pervious ratio(Ap) = 1.0000 Max loss rate(Fm)= 0.071(In/Hr)
Initial subarea data:
Initial area flow distance = 458.100(Ft.)
Top (of initial area) elevation = 5662.000(Ft.)
Bottom (of initial area) elevation = 5603.900(Ft.)
Difference in elevation = 58.100(Ft.)
Slope = 0.12683 s(%)= 12.68
TC = k(0.706)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 12.375 min.
Rainfall intensity = 6.341(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.890
Subarea runoff = 16.759(CFS)
Total initial stream area = 2.970(Ac.)
Pervious area fraction = 1.000
Initial area Fm value = 0.071(In/Hr)
End of computations, Total Study Area = 2.97 (Ac.)
The following figures may

be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area effects caused by confluences in the rational equation.

Area averaged pervious area fraction(A_p) = 1.000
Area averaged SCS curve number = 84.0

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***** Hydrology Study Control Information *****

Church Of The Woods
Developed
Cal Trans Area Runoff

Rational hydrology study storm event year is 100.0
10 Year storm 1 hour rainfall = 1.400(In.)
100 Year storm 1 hour rainfall = 2.100(In.)
Computed rainfall intensity:
Storm year = 100.00 1 hour rainfall = 2.100 (In.)
Slope used for rainfall intensity curve b = 0.7000
Soil antecedent moisture condition (AMC) = 3

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Process from Point/Station 3.000 to Point/Station 4.000
**** INITIAL AREA EVALUATION ****

Soil classification AP and SCS values input by user
USER INPUT of soil data for subarea
SCS curve number for soil(AMC 2) = 79.21
Adjusted SCS curve number for AMC 3 = 93.53
Pervious ratio(Ap) = 0.9080 Max loss rate(Fm)= 0.115(In/Hr)
Initial subarea data:
Initial area flow distance = 306.100(Ft.)
Top (of initial area) elevation = 5626.400(Ft.)
Bottom (of initial area) elevation = 5608.100(Ft.)
Difference in elevation = 18.300(Ft.)
Slope = 0.05978 s(%)= 5.98
TC = k(0.498)*[(length^3)/(elevation change)]^0.2
Initial area time of concentration = 8.642 min.
Rainfall intensity = 8.153(In/Hr) for a 100.0 year storm
Effective runoff coefficient used for area (Q=KCIA) is C = 0.887
Subarea runoff = 15.192(CFS)
Total initial stream area = 2.100(Ac.)
Pervious area fraction = 0.908
Initial area Fm value = 0.115(In/Hr)
End of computations, Total Study Area = 2.10 (Ac.)
The following figures may
be used for a unit hydrograph study of the same area.
Note: These figures do not consider reduced effective area
effects caused by confluences in the rational equation.

Area averaged pervious area fraction(Ap) = 0.908
Area averaged SCS curve number = 79.2