

Appendix

Appendix G Hydrology Report

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Christ's Church of the Valley
New Auditorium Building
7576 Etiwanda Avenue
Etiwanda, CA

Hydrology Report



January 2018

Revised: March 2019

Prepared For
Christ's Church of the Valley (CCV)
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Prepared under the supervision of:

A handwritten signature in blue ink, which appears to read "Jeffrey D. Meiter".

Jeffrey D. Meiter
RCE No. 64696
Exp: 06/30/20

3/11/19

Date

CONTENTS

- 1.0 INTRODUCTION
- 2.0 PURPOSE
- 3.0 METHODOLOGY
- 4.0 SITE DESCRIPTION
- 5.0 RESULTS

SECTIONS

- A REFERENCE MATERIALS:
 - VICINITY MAP
 - POINT PRECIPITATION FREQUENCY ESTIMATES
- B SOILS REPORT, WEBSOIL SURVEY
- C RATIONAL METHOD Q100 – PREDEVELOPED CONDITION
RATIONAL METHOD Q100 – POST DEVELOPED CONDITION
- D HYDROLOGY MAP

1.0 INTRODUCTION

The Christ's Church of the Valley re-development project is located at the northeast corner of Victoria Park Lane and Long Meadow Drive in the City of Rancho Cucamonga. The size of the property is approximately 9.92 acres, consisting of a developed portion located on the easterly half of the property and an undeveloped land located on the westerly half of the property.

The proposed re-development includes the addition of a new auditorium building, new children's wing and additional parking stalls to accommodate the additional buildings on this property. The stormwater for the developed site will be mitigated by using gutters to concentrate the flow and drop inlets to capture and move effluent into the underground storm chambers and 6" above ground infiltration basins. These chambers will be sized to capture and retain a 100-year storm event for the re-developed area. Landscaping will be designed along the property and right-of-way lines to ensure a buffer for the stormwater. These landscaping buffers will be graded to slope away from the property lines to ensure that the stormwater for this property will be captured and treated on-site. There is an overflow outlet pipe connected to an existing storm drain pipe that exits the property in Long Meadow Drive to the public storm drain system.

2.0 PURPOSE

The purpose of the study is to quantify the 100-year peak storm flow rates for the existing and proposed site condition. In this study, we will also demonstrate that the proposed on-site drainage basin is adequately sized to contain the additional runoff generated in the post developed condition for the 100-year storm.

The proposed drainage basin was designed to comply with the City of Rancho Cucamonga criteria stating that post-development flows shall not exceed 80% of pre-development flows. The 100-year storm was used for the on-site basin design.

Existing and proposed condition rational method calculations for the 100-year storm events are presented in this report in Section C.

3.0 METHODOLOGY

The analysis will be performed in accordance with the San Bernardino County Hydrology Manual. CivilDesign software by Bonadiman was used to perform rational method and hydrograph basin routing computation. The 100-year intensity and Antecedent Moisture Condition (AMC) III was used to simulate the developed hydrology condition.

4.0 SITE DESCRIPTION

A preliminary soil examination was conducted using the online resource WebSoilSruvery. This resource shows that the project site location is characterized as having high infiltration rates that can range from 5.95 to 19.98 in/hr. The site contains type A soils (TuB and TvC), which are described as Tujunga Loamy Sand and Tujunga Gravely Loamy Sand, respectively. Saturated hydraulic conductivity (K_{sat}) refers to the ease with which pores in saturated soil transmit water. Site soil type A has high to very high capacity of the most limiting layer to transmit water.

Existing Drainage Condition

Existing runoff at the site is delineated into two subareas. Subarea A1 is located on the easterly portion of the re-developed area. This portion is mostly hardscape and will flow from the northeast to the southwest. Subarea A1 discharges to a low point at the southwest corner of the property. Subarea A2 is located on the westerly portion of the re-developed area. This undeveloped portion drains from north to south and is collected in an existing storm drain corrugated metal pipe (CMP). The flow from Subarea A1 is also collected in the existing storm drain structure. The collected stormwater is discharged into the city storm drain system in Long Meadow Drive. The existing flow pattern from these subareas are depicted on the existing hydrology map in Section D.

Proposed Drainage Condition

The re-developed site will be graded to closely mimic the existing drainage patterns. Flow patterns will flow generally from northeast to southwest. The proposed condition will be delineated into two subareas. Subarea A1 will collect the runoff from the easterly majority of the re-developed area. This area will collect runoff from the proposed auditorium, portland cement hardscape (PCC) hardscape, landscaping and asphalt concrete (AC) pavement. This flow will collect in a landscaped island on the east side of the proposed drive approach. Subarea A2 will collect runoff from the westerly majority of the re-developed area. This area will collect runoff from PCC hardscape, landscaping and AC pavement. Runoff from Subarea A2 collect in the previously mentioned landscaping island. Two different curb openings will be used for each Subarea. A drop inlet will be used in the middle of the landscaped island to transport stormwater into proposed underground storage chambers for retention. The proposed flow pattern from these subareas can be seen on the proposed hydrology map in Section D.

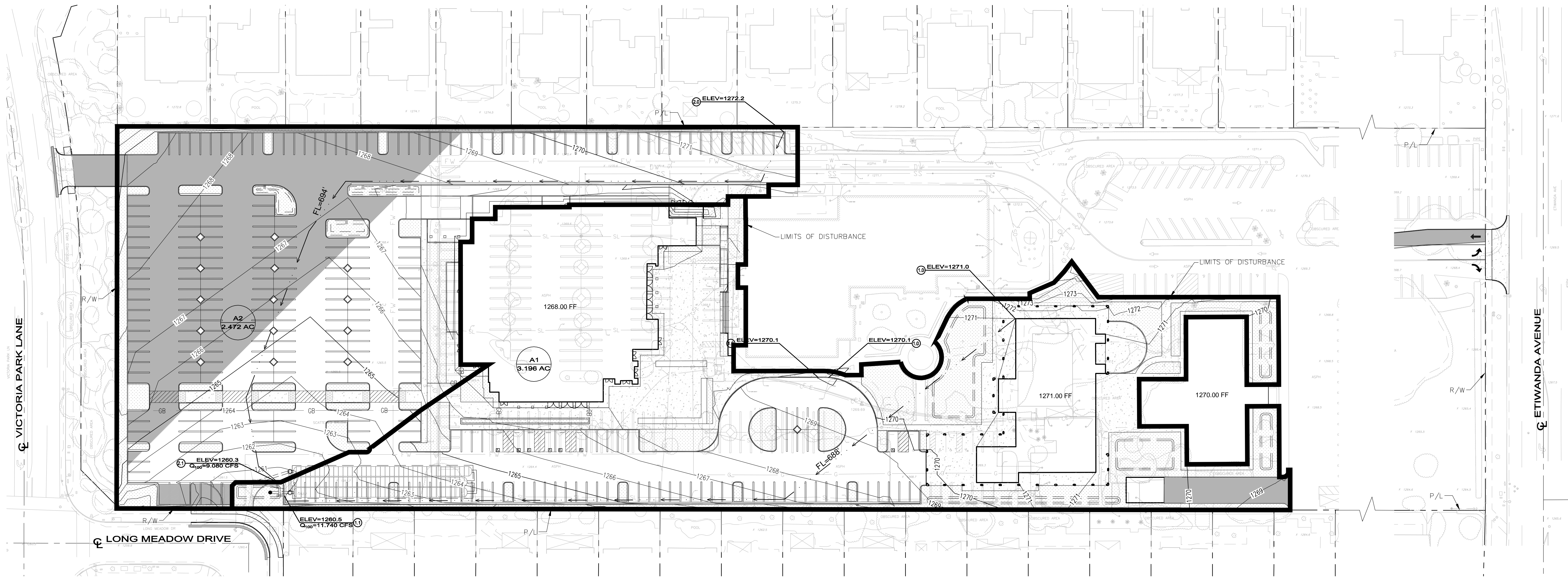
5.0 RESULTS

The following table summarizes the data and results for the 100-year storm events for the existing and proposed condition. All calculations can be found in Section C of this report.

	100-YR
Pre-Development Site Runoff	20.193 cfs
Post-Development Site Runoff	20.820 cfs

The existing 100-year storm pre-development flow for this site is 20.193 cfs. The proposed 100-year storm post-development flow for this site is 20.820 cfs. The proposed site will increase the site discharge by 0.627 cfs. There is one emergency outlet that will be used for excess flows and would prevent stormwater from backing up onto the site. The existing site does not retain any stormwater in the existing condition. Released flows into the city storm drain system will not exceed the 80% flow for a 100-year storm event.

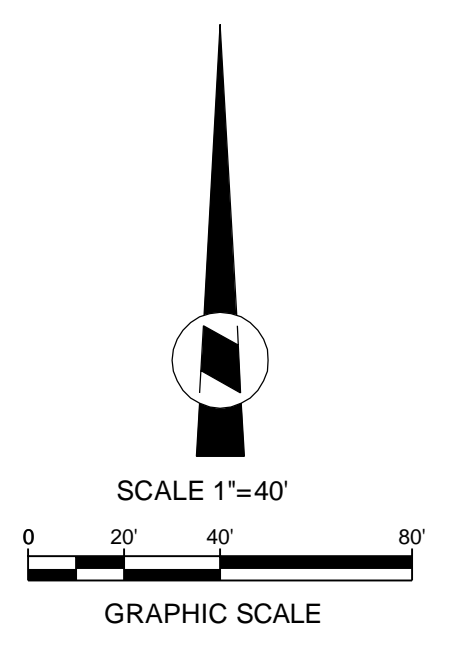
In conclusion, the proposed development will not adversely affect the existing drainage patterns in the area. The proposed on-site storm drain system is designed to reduce the existing runoff by 10%.



LEGEND

- BASIN BOUNDARY
- DENOTES NODE No. and FG ELEVATION
- FL FLOW LENGTH
- A BASIN AREA
- FLOW PATTERN

PROPOSED HYDROLOGY		
SUBAREA	ACRE	Q ₁₀₀
A1	3.196	11.740
A2	2.472	9.080
TOTAL	5.668	20.820



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REVISION BLOCK				DESIGNED BY
				DAVID HWAN
				DRAWN BY
				BILL WALLANDER
				CHECKED BY
				JEFF MEITER
				DATE
				AUGUST 2016
MARK	DESCRIPTION	APPR	DATE	

PLANS PREPARED UNDER SUPERVISION OF:

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PRELIMINARY POST-DEVELOPED HYDROLOGY MAP

CHRIST'S CHURCH OF THE VALLEY

7576 ETIWANDA AVENUE
City of Rancho Cucamonga, California

SHEET **1** of **1**

CONTRACT _____

ACCOUNT _____

DRAWING No. _____