

APPENDIX 4.8

Storm Drain Capacity Study

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STORM DRAIN CAPACITY STUDY

FOR

**CITY CENTER II
WILSON AVENUE & ORANGE STREET,
GLENDALE, CA**

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August, 2007



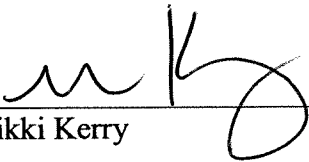
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and Associates, Inc.



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and Associates, Inc.

Certification by Engineer or Authorized Qualified Designee

I certify under penalty of law that this document and all attachments were prepared under my jurisdiction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system or those persons directly responsible for gathered the information, to the best of my knowledge and belief, the information submitted is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.


Nikki Kerry

8-14-07
Date

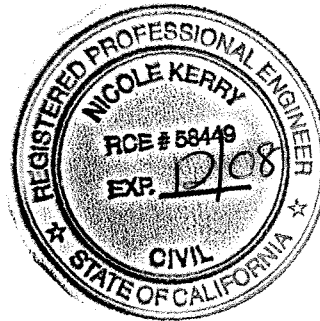




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1.0 Introduction

The purpose of this Storm Drain Capacity Study is to examine the current sewer conditions in the study area and the future flows generated as a result of the proposed development at Wilson Avenue and Orange Street. The study will consider any potential capacity issues resulting from the development and provide mitigation alternatives if necessary.

2.0 Site Description

The City Center II is a proposed development of approximately 1.35 acres located at the southeast corner of Wilson Avenue and Orange Street in the City of Glendale. The project site is bounded by Wilson Avenue on the north, Orange Street on the west and Brand Boulevard on the east. A vicinity map of the project location is attached as Exhibit 1.

3.0 Project Description

The project located is currently a vacant lot. This development will consist of a 20 story structure with 135 residential units and an 18 story hotel/residential tower consisting of 49 residential units and 172 hotel rooms. The runoff from the proposed development will drain into the catch basin located on Orange Street, which drains into an 18-inch storm drain.

4.0 Existing Storm Drain Pipe Capacity Analysis

The proposed project is located close to downtown Glendale, which is located on the eastern edge of the San Fernando Valley, which forms part of the Los Angeles River Basin. The surface water flows from the Los Angeles Basin drain into the Los Angeles River and flow into the Los Angeles/Long Beach Harbor and into the Pacific Ocean.

The project area is a vacant lot and therefore is highly pervious. The development will cause a greater amount of runoff then there is currently. According to the City of Glendale's As Built Storm Drain Plan No. 4-530R, there is currently one catch basin located to the west of the development which drains into the 24-inch storm drain located on Orange Street. The City of Glendale As Built Storm Drain Plan No. 4-530R was approved by the project engineer J. Cruikshank on July of 1998.

In addition to the hydraulic analysis for the peak flow rate, a National Pollutant Discharge Elimination System (NPDES) will be required including a Standard Urban Storm Water Mitigation Plan (SUSMP) as the project site is greater than 1-acre. The SUSMP will address mitigating sediment-laden water from entering the storm drain system during construction activities and be filed with the Regional Water Quality Control Board (RWQCB).



5.0 Proposed Flow Generation

The proposed development will drain into the catch basin located on Orange Avenue and will increase the storm drain flow by 2.86 cfs. This will increase the total 10-year flow to 8.67 cfs. See Appendix A for flow calculations.

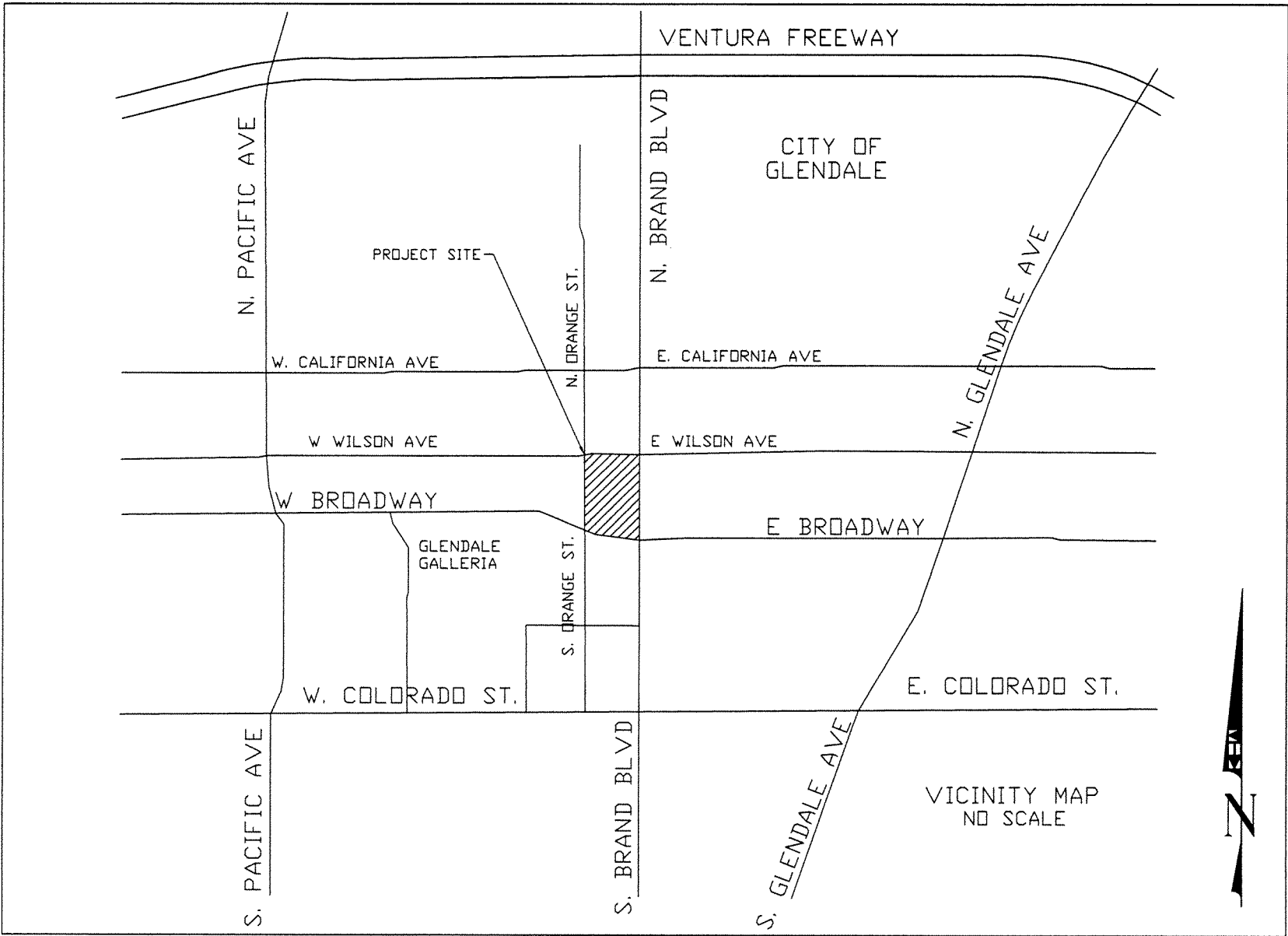
6.0 Conclusion

The existing 24-inch storm drain, located on Orange Street is sufficient for the runoff from the proposed development. The proposed development will increase the runoff because it is currently a vacant lot. The existing 10-year flow rate is 5.81 cfs and the capacity of the pipe is 23.83 cfs. The proposed development will increase the flow rate by 2.86 cfs to a total of 8.67 cfs, using under 50% of the pipe's capacity.



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Exhibit 1: Vicinity Map



VICINITY MAP
NO SCALE





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Appendix A: Storm Drain Demand and Capacity Calculations



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project City Center II Project
location Wilson & Orange Street
client Amidi Real Estate Group

by ALS
date 8/8/07

sheet no.

job no. 094500000

Hydrology calculations per LACDPW Addendum to the 1991 Hydrology/Sedimentation Manual

Input Data:

Proportion Impervious Value, IMP = **0.855** (Portion Impervious Values)

50-Year, 24-Hour Rainfall Depth = **6.4 inches** (10-year $0.714 \times 6.4 = 4.569$) (Isohyet Map)

24-Hour Intensity, $I_{1440} = \text{Rainfall Depth} / 24 \text{ hr} = 7.854 \text{ in} / 24 \text{ hr} = \mathbf{0.190 \text{ in/hr}}$

Soil Type: **006** (Hydrologic Map)

Using $T_c = 7$ minutes, Intensity-Duration, $I_7 / I_{1440} = \mathbf{12.22 \text{ in/hr}}$ (Normalized Rainfall Intensity-Duration)

7 minute Intensity, $I_7 = I_{1440} \times (I_7 / I_{1440}) = 0.327 \times 14.32 = \mathbf{2.727 \text{ in/hr}}$

Undeveloped Runoff Coefficient, $C_u = \mathbf{0.98}$ (Runoff Coefficient Curve)

Developed Runoff Coefficient, $C_d = (0.9 \times \text{IMP}) + ((1 - \text{IMP}) \times C_u) = \mathbf{0.912}$

Verify T_c is accurate, $T_c = 10^{-0.507} \times (C_d \times D)^{-0.519} \times L^{0.483} \times S^{-0.135}$, in all cases $T_c = 7 \pm 0.5$ use $T_c = 7$, in all other cases reiterations with the revised T_c is necessary

Peak Discharge, $Q_{10} = C_d \times I_t \times A$.

Area No.	Area		% IMP	I_5	C_u	C_d	T_c	Q_{10}
	(sq-ft)	(acres)		(in/hr)			(min)	(cfs)
1	58,610	1.35	0.855	2.727	0.98	0.912	7	2.86



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Appendix B: Los Angeles County Hydrology Tables

APPENDIX A: Normalized Rainfall Intensity-Duration

The intensity-duration relationship is as follows:

$$I_t/I_{1440} = (1440/t)^{0.47}$$

Where t = time of concentration in minutes,
And I = the intensity in inches per hour for the duration given.

Tabulated Intensity-Duration Values

Time (min.)	I_t/I_{24}
5	14.32
6	13.14
7	12.22
8	11.48
9	10.86
10	10.34
11	9.89
12	9.49
13	9.14
14	8.83
15	8.54
16	8.29
17	8.06
18	7.84
19	7.65
20	7.46
21	7.29
22	7.14
23	6.99
24	6.85
25	6.72
26	6.60
27	6.48
28	6.37
29	6.27
30	6.17

$C_D = (0.9 * IMP) + (1.0 - IMP) * C_u$
 Where: C_D = Developed Runoff Coefficient
 IMP = Proportion Impervious
 C_u = Undeveloped runoff coefficient



Los Angeles County Department of Public Works

RUNOFF COEFFICIENT CURVE
SOIL TYPE NO. 006

