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August 10, 2015

MJW Investments, LLC
1278 Glenneyre, Suite 439
Laguna Beach, California 92651
Attention: Mr. Matthew J. Waken

Job No. 15369-2

Subject: Infiltration Investigation
Proposed 28-Lot Residential Development
West of San Dimas Avenue
Between West Gladstone Street and Allen Avenue
San Dimas, California

Dear Mr. Waken:

As requested, double-ring infiltrometer tests were performed for the subject project. This report presents the test data and summarizes the scope of testing. We completed two double-ring infiltrometer tests on August 6, 2015. The tests were conducted at a depth of approximately 5 feet below the existing ground surface consistent with the planned depth of the proposed basin.

Utilizing the double-ring infiltrometer method described in ASTM D3385, tests were performed at the locations indicated on the attached Test Location Map. The tests were located just north of and adjacent to the planned basin location due to site constraints that include an ongoing equestrian training operation and the presence of shed structures and fencing that precludes access to the basin location with excavation equipment at this time. Based on observations in the excavations utilized for infiltrometer testing and consistency of the soil profile encountered in geotechnical borings in the project area, the soil profile within the test area is consistent with and representative of the soils within the basin area. These soils consist of alluvial fan sediments that are fine- to medium-grained to coarse-grained silty sand with gravel and few cobble-size clasts.

The soil at the test locations was classified in the field using a visual/manual procedure. A soil sample from one test location was returned to our laboratory for testing by sieve analysis. The soil type is summarized in Table 1. The results of sieve analyses are attached.

The double-ring infiltration tests were performed by driving two open aluminum rings into the ground, one inside of the other. A tamping rod was used to compact disturbed soils adjacent to the rings. The rings were partially filled with water to equal depths. The water was maintained at a constant level using a float valve and water source for each ring. The volume of water added to the inner and outer rings was recorded at timed intervals. The graduated cylinder corresponding to the inner ring is readable in increments of 25 mL. The infiltration test was performed until a relatively steady-state infiltration velocity was reached. These data were used to calculate the infiltration rate of the soil.

The steady-state infiltration velocity is presented as the infiltration rate—summarized in the following table. The infiltration rate provided does not include safety factors.

Table 1: Summary of Infiltrometer Tests

Test Location	Infiltration Rate		Test Depth (ft.)	Soil Type
	(cm. / hr.)	(in. / hr.)		
P-1	10.8	4.2	4	(SW-SM)
P-2	21.8	8.6	4	---

It should be noted that infiltration rates determined by the double-ring method are based on field test results utilizing clear water. Infiltration rates in the as-built condition can be affected by silt buildup, debris, degree of soil saturation and other factors. Application of an appropriate safety factor may be prudent to account for subsoil inconsistencies, possible compaction related to site grading and potential silting of the percolating soils, depending on the application.

LIMITATIONS

CHJ Consultants has striven to perform our services within the limits prescribed by our client and in a manner consistent with the usual thoroughness and competence of reputable geotechnical engineers and engineering geologists practicing under similar circumstances. No other representation, express or implied, and no warranty or guarantee is included or intended by virtue of the services performed or reports, opinion, documents, or otherwise supplied.

This report reflects the testing conducted on the site as the site existed during the investigation, which is the subject of this report. However, changes in the conditions of a property can occur with the passage of time, due to natural processes or the works of man on this or adjacent properties. Changes in applicable or appropriate standards may also occur whether as a result of legislation, application, or the broadening of knowledge. Therefore, this report is indicative of only those conditions tested at the time of the subject investigation, and the findings of this report may be invalidated fully or partially by changes outside of the control of CHJ Consultants. This report is therefore subject to review and should not be relied upon after a period of one year.

The conclusions and recommendations in this report are based upon observations performed and data collected at separate locations, and interpolation between these locations, carried out for the project and the scope of services described. It is assumed and expected that the conditions between locations observed and/or sampled are similar to those encountered at the individual locations where observation and sampling were performed. However, conditions between these locations may vary significantly. Should conditions that appear different from those described herein be encountered in the field, by the client or any firm performing services for the client or the client's assign, this firm should be contacted immediately in order that we might evaluate their effect.

If this report or portions thereof are provided to contractors or included in specifications, it should be understood by all parties that they are provided for information only and should be used as such.

The report and its contents resulting from this investigation are not intended or represented to be suitable for reuse on extensions or modifications of the project or for use on any other project.

CLOSURE

We appreciate this opportunity to be of service and trust this report provides the information desired at this time. Should questions arise, please contact this office at your convenience.

Respectfully submitted,
CHJ CONSULTANTS

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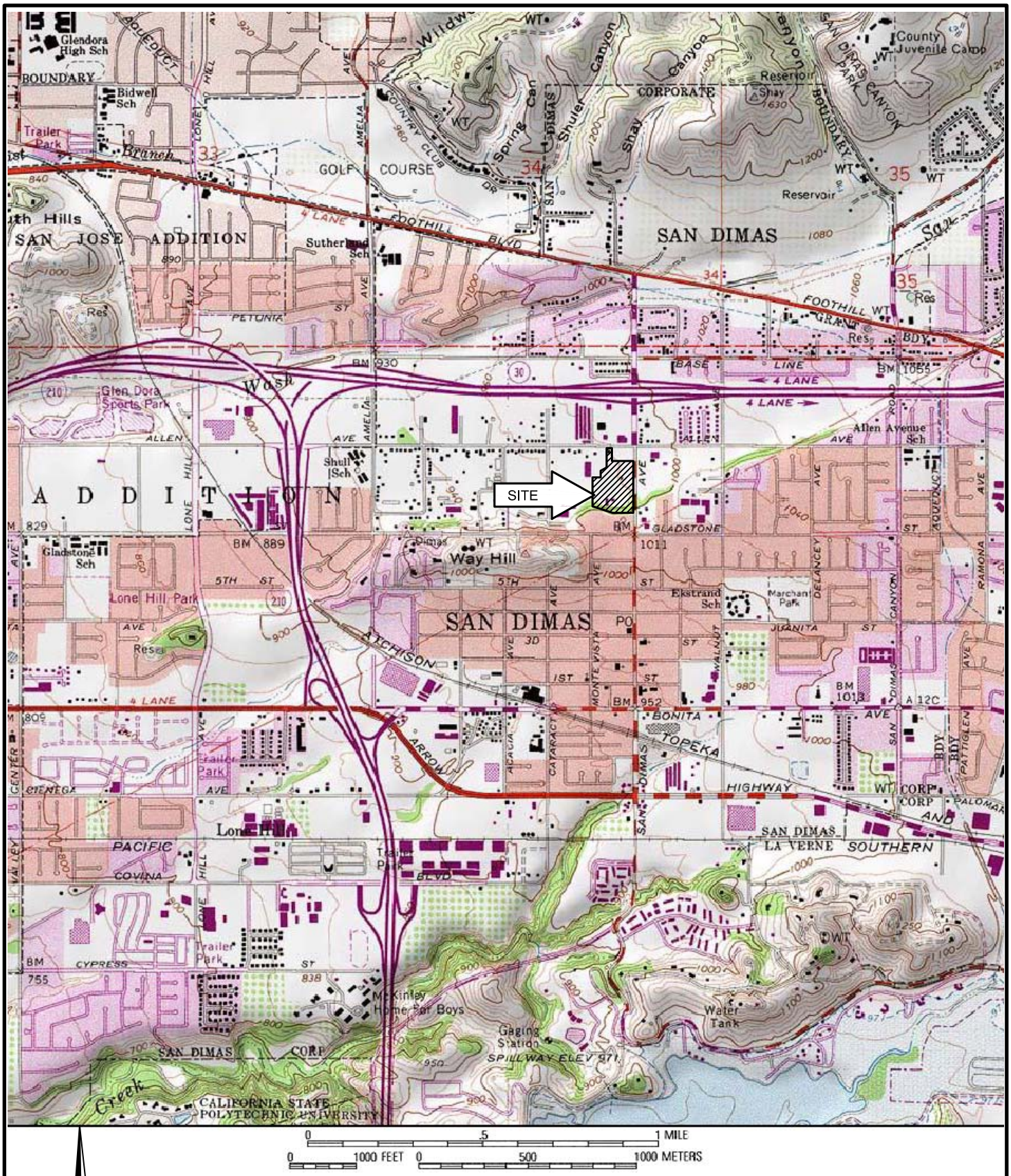
James F. Cooke, G.E. 3012
Managing Engineer

Robert J. Johnson, P.E.
President

JMc/JFC/RJJ:lb

Enclosures:	"A-1"	- Index Map
	"A-2"	- Site Plan
	"B-1" - "B-2"	- Exploratory Boring Logs
	"C-1"	- Particle Size Distribution
	"D-1" - "D-2"	- Percolation Test Data

Distribution: MJW (2 and electronic)



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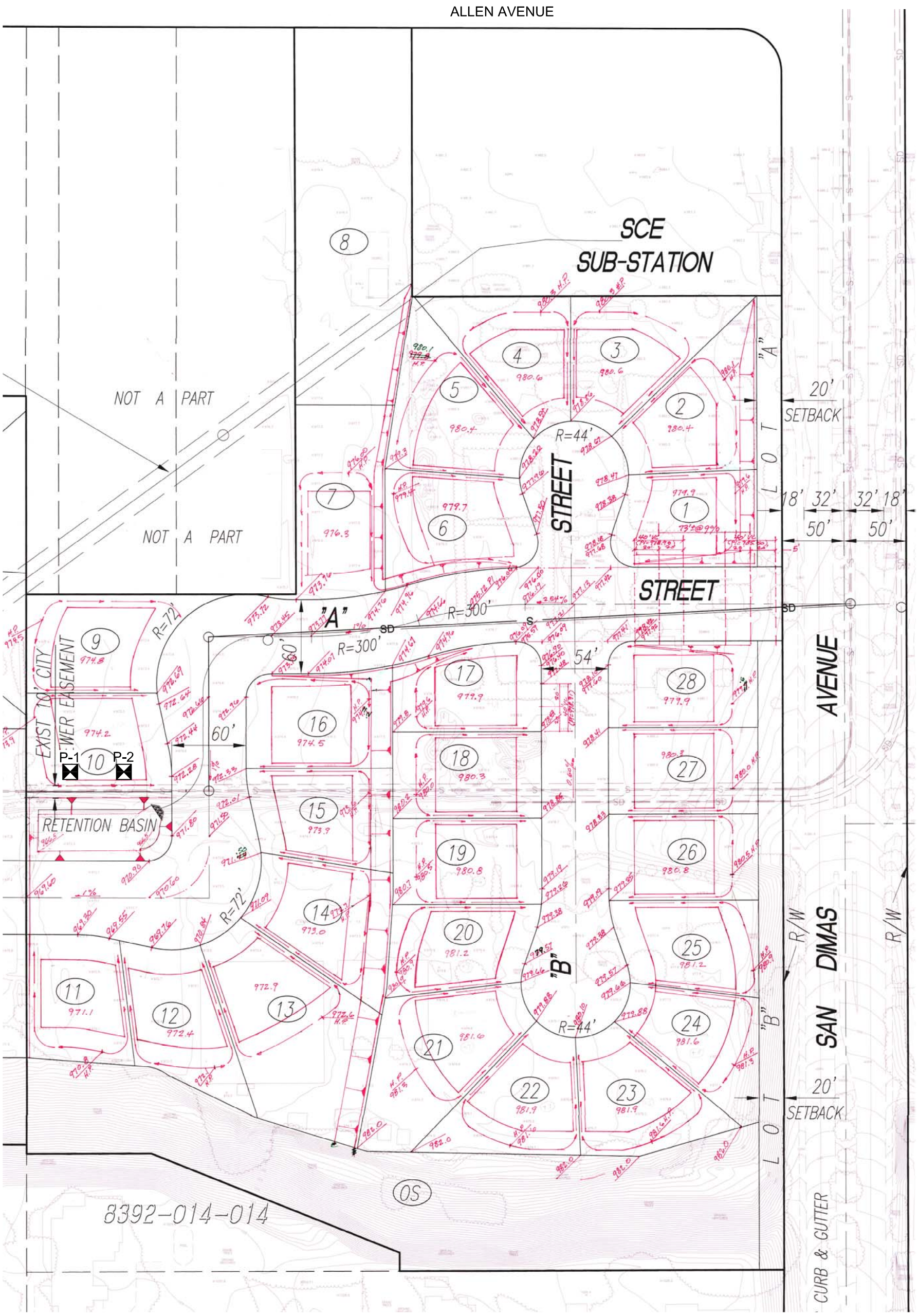
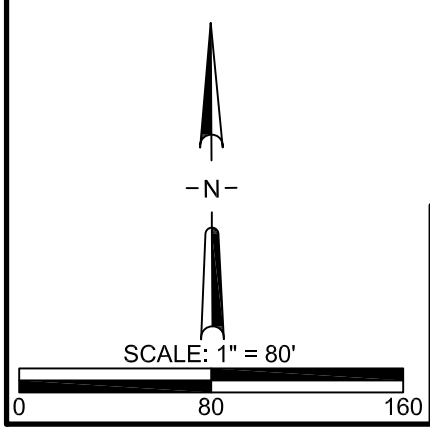
SCALE: 1" = 2000'

INDEX MAP

FOR: MJW INVESTMENTS, LLC	INFILTRATION INVESTIGATION PROPOSED 28-LOT RESIDENTIAL DEVELOPMENT WEST OF SAN DIMAS AVENUE BETWEEN WEST GLADSTONE STREET AND ALLEN AVENUE SAN DIMAS, CALIFORNIA	ENCLOSURE "A-1"
DATE: AUGUST 2015		JOB NUMBER 15369-2

CHJ Consultants





LEGEND:

P-2 DOUBLE RING INFILTROMETER TEST LOCATION

SITE PLAN

FOR: MJW INVESTMENTS, LLC

DATE: AUGUST 2015

INFILTRATION INVESTIGATION
PROPOSED 28-LOT RESIDENTIAL DEVELOPMENT
WEST OF SAN DIMAS AVENUE BETWEEN WEST
GLADSTONE STREET AND ALLEN AVENUE
SAN DIMAS, CALIFORNIA

ENCLOSURE "A-2"

JOB NUMBER 15369-2

CHJ Consultants

EXPLORATORY TEST PIT NO. 1

Date Excavated: 8/5/15 | Client: MJW Investments

Equipment: Rubber Tire Backhoe | Bucket Size: N/A

Surface Elevation(ft): N/A | Logged by: JMcK | Station No.: N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DENSITY	SAMPLES BULK	RELATIVE COMP. (%)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine to medium, brown	Fill with debris						
1									
2									
3									
		(SM) Silty Sand, fine to medium, brown	Native						
4									
5		(SW-SM) Well-graded Sand, fine to coarse, with silt and gravel, light brown							SA
		END OF BORING							
6		NO REFUSAL, NO BEDROCK NO GROUNDWATER NO CAVING, NO FILL							
7									
8									
9									

TEST PIT - 10 FT 15369-2.GPJ CHJ.GDT 8/10/15

EXPLORATORY TEST PIT NO. 2

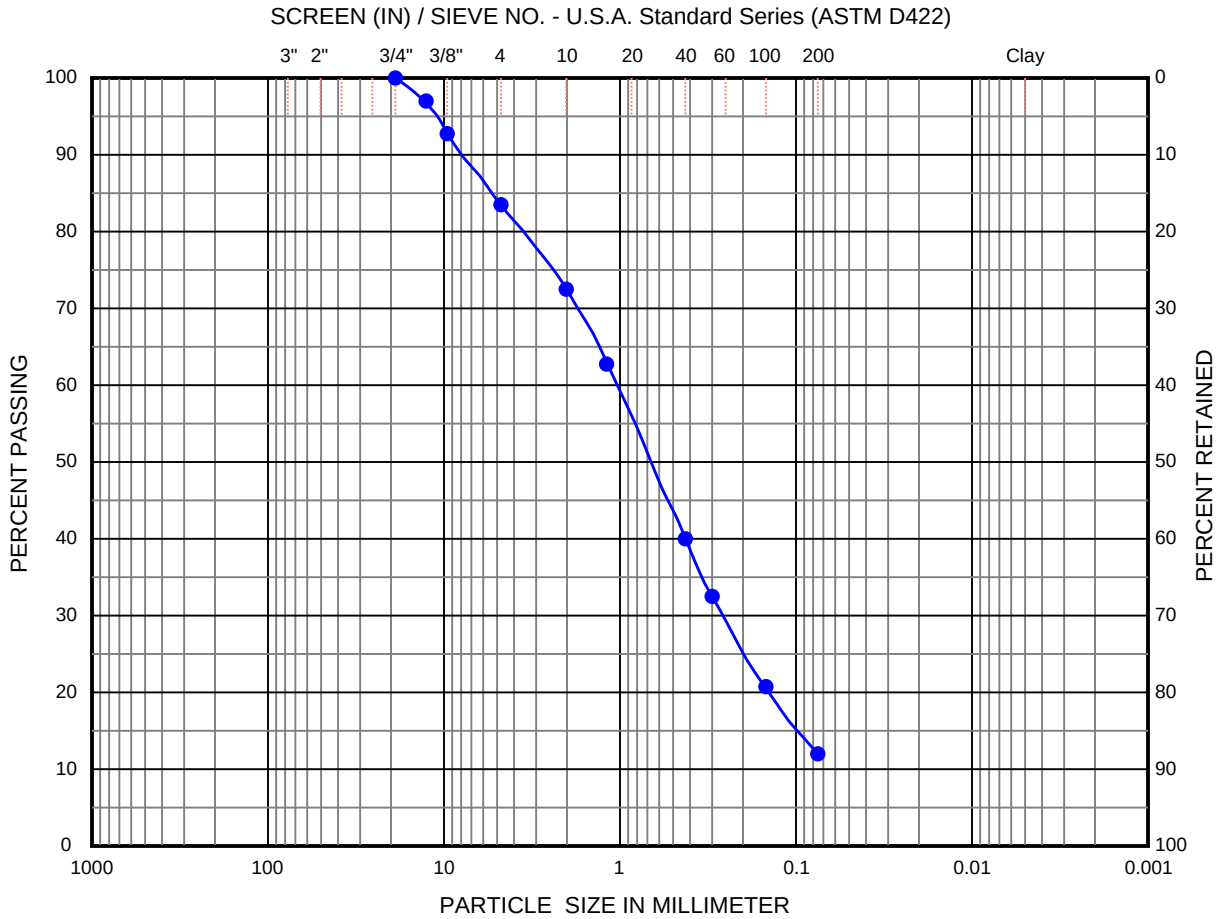
Date Excavated: 8/5/15 | Client: MJW Investments

Equipment: Rubber Tire Backhoe | Bucket Size: N/A

Surface Elevation(ft): N/A | Logged by: JMcK | Station No.: N/A

DEPTH (ft)	GRAPHIC LOG	VISUAL CLASSIFICATION	REMARKS	SAMPLES DENSITY	SAMPLES BULK	RELATIVE COMP. (%)	FIELD MOISTURE (%)	DRY UNIT WT. (pcf)	LAB/FIELD TESTS
		(SM) Silty Sand, fine to medium, brown	Fill with debris						
1									
2									
3									
		(SM) Silty Sand, fine to medium, brown	Native						
4									
5		(SW-SM) Well-graded Sand, fine to coarse, with silt and gravel, light brown							
		END OF BORING							
6		NO REFUSAL, NO BEDROCK NO GROUNDWATER NO CAVING, NO FILL							
7									
8									
9									

TEST PIT - 10 FT 15369-2.GPJ CHJ.GDT 8/10/15



Cobbles & Boulders	Gravel		Sand			Silt	Clay
	Coarse	Fine	Coarse	Medium	Fine		

	Sample No.	Gravel	Sand	Fines	Clay	D_{10}	D_{30}	D_{50}	D_{60}	C_u	C_c
●	1 (4 ft)	16.5	71.6	11.9		0.0647	0.262	0.662	1.034	16.0	1.0
	(SW-SM) Well-graded sand with silt and gravel										

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PARTICLE SIZE DISTRIBUTION (ASTM D422)

Project:	San Dimas Residential Development				
Location:	San Dimas, California				
Job Number:	15369-2	Engineer:	JMcK	Enclosure:	C-1

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Double Ring Infiltrometer Test Data Log

Job No.	15369-2		Test Location:	P-1	Date	8/6/2015	Tested by:	GA			
Interval No.	Start or End	Time	Elapsed Time (min)	Total Time (min)	Inner Ring Level (cm^3)	Annular Space (cm^3)	Time (hr)	Incremental Infiltration (cm/hr)	Incremental Infiltration (in/hr)	Annular Space Incremental Infiltration (cm/hr)	Annular Space Incremental Infiltration (in/hr)
	Start	7:30 AM			0	0					
1	End	7:45 AM	15	15	2150	10400	0.25	11.79	4.64	19.00	7.48
	Start	7:45 AM			0	0					
2	End	8:00 AM	15	30	1800	8800	0.25	9.87	3.88	16.08	6.33
	Start	8:00 AM			0	0					
3	End	8:15 AM	15	45	1825	9150	0.25	10.00	3.94	16.72	6.58
	Start	8:15 AM			0	0					
4	End	8:30 AM	15	60	1875	9400	0.25	10.28	4.05	17.18	6.76
	Start	8:30 AM			0	0					
5	End	8:45 AM	15	75	1900	9500	0.25	10.42	4.10	17.36	6.83
	Start	8:45 AM			0	0					
6	End	9:00 AM	15	90	1800	8500	0.25	9.87	3.88	15.53	6.12
	Start	9:00 AM			0	0					
7	End	9:15 AM	15	105	1975	9550	0.25	10.83	4.26	17.45	6.87
	Start	9:15 AM			0	0					
8	End	9:30 AM	15	120	2050	9700	0.25	11.24	4.42	17.73	6.98
	Start	9:30 AM			0	0					
9	End	9:45 AM	15	135	2000	9300	0.25	10.96	4.32	16.99	6.69
	Start	9:45 AM			0	0					
10	End	10:00 AM	15	150	2075	9700	0.25	11.38	4.48	17.73	6.98
	Start	10:00 AM			0	0					
11	End	10:15 AM	15	165	1950	9100	0.25	10.69	4.21	16.63	6.55
	Start	10:15 AM			0	0					
12	End	10:30 AM	15	180	2000	9400	0.25	10.96	4.32	17.18	6.76
	Start	10:30 AM			0	0					
13	End	10:45 AM	15	195	1975	9100	0.25	10.83	4.26	16.63	6.55
	Start	10:45 AM			0	0					
14	End	11:00 AM	15	210	2000	9400	0.25	10.96	4.32	17.18	6.76
	Start	11:00 AM			0	0					
15	End	11:15 AM	15	225	1925	8950	0.25	10.55	4.15	16.35	6.44
	Start	11:15 AM			0	0					
16	End	11:30 AM	15	240	1950	9000	0.25	10.69	4.21	16.45	6.47
	Start	11:30 AM			0	0					
17	End	11:45 AM	15	255	1950	9200	0.25	10.69	4.21	16.81	6.62
	Start	11:45 AM			0	0					
18	End	12:00 PM	15	270	1950	9300	0.25	10.69	4.21	16.99	6.69
	Start	12:00 PM			0	0					
19	End	12:15 PM	15	285	2000	9250	0.25	10.96	4.32	16.90	6.65
						0					
			Average Rate:	4.2	(Inches/hour)						
			Average Rate:	10.8	(cm/hour)						

Double Ring Infiltrometer Test Data Log

Job No.	15369-2		Test Location:	P-2	Date	8/6/2015	Tested by:	GA			
Interval No.	Start or End	Time	Elapsed Time (min)	Total Time (min)	Inner Ring Level (cm^3)	Annular Space (cm^3)	Time (hr)	Incremental Infiltration (cm/hr)	Incremental Infiltration (in/hr)	Annular Space Incremental Infiltration (cm/hr)	Annular Space Incremental Infiltration (in/hr)
	Start	7:35 AM			0	0					
1	End	7:50 AM	15	15	4100	12500	0.25	22.48	8.85	22.84	8.99
	Start	7:50 AM			0	0					
2	End	8:05 AM	15	30	4350	13000	0.25	23.85	9.39	23.76	9.35
	Start	8:05 AM			0	0					
3	End	8:20 AM	15	45	4150	12600	0.25	22.75	8.96	23.02	9.06
	Start	8:20 AM			0	0					
4	End	8:35 AM	15	60	4250	13200	0.25	23.30	9.17	24.12	9.50
	Start	8:35 AM			0	0					
5	End	8:50 AM	15	75	4100	12200	0.25	22.48	8.85	22.29	8.78
	Start	8:50 AM			0	0					
6	End	9:05 AM	15	90	4175	12300	0.25	22.89	9.01	22.48	8.85
	Start	9:05 AM			0	0					
7	End	9:20 AM	15	105	4150	12000	0.25	22.75	8.96	21.93	8.63
	Start	9:20 AM			0	0					
8	End	9:35 AM	15	120	4225	12200	0.25	23.16	9.12	22.29	8.78
	Start	9:35 AM			0	0					
9	End	9:50 AM	15	135	4075	11800	0.25	22.34	8.79	21.56	8.49
	Start	9:50 AM			0	0					
10	End	10:05 AM	15	150	4075	11650	0.25	22.34	8.79	21.29	8.38
	Start	10:05 AM			0	0					
11	End	10:20 AM	15	165	4050	11500	0.25	22.20	8.74	21.01	8.27
	Start	10:20 AM			0	0					
12	End	10:35 AM	15	180	4225	11800	0.25	23.16	9.12	21.56	8.49
	Start	10:35 AM			0	0					
13	End	10:50 AM	15	195	3950	11000	0.25	21.65	8.53	20.10	7.91
	Start	10:50 AM			0	0					
14	End	11:05 AM	15	210	4000	11100	0.25	21.93	8.63	20.28	7.99
	Start	11:05 AM			0	0					
15	End	11:20 AM	15	225	3925	11200	0.25	21.52	8.47	20.47	8.06
	Start	11:20 AM			0	0					
16	End	11:35 AM	15	240	3950	11000	0.25	21.65	8.53	20.10	7.91
	Start	11:35 AM			0	0					
17	End	11:50 AM	15	255	4125	11350	0.25	22.61	8.90	20.74	8.17
	Start	11:50 AM			0	0					
18	End	12:05 PM	15	270	4000	11200	0.25	21.93	8.63	20.47	8.06
	Start	12:05 PM			0	0					
19	End	12:20 PM	15	285	3950	11100	0.25	21.65	8.53	20.28	7.99
			Average Rate:	8.6	(Inches/hour)						
			Average Rate:	21.8	(cm/hour)						