Sladden Engineering

45090 Golf Center Parkway, Suite F, Indio, CA. 92201 (760) 863-0713 Fax (760) 863-0847
6782 Stanton Avenue, Suite C, Buena Park, CA. 90621 (714) 523-0952 Fax (714) 523-1369
450 Egan Avenue, Beaumont, CA. 92223 (951) 845-7743 Fax (951) 845-8863
800 E. Florida Avenue, Hemet, CA. 92543 (951) 766-8777 Fax (951) 766-8778

March 17, 2015

Project No. 544-15032
15-03-114

Nolte Vertical Five
42-829 Cook Street, Suite 104
Palm Desert, California 92211

Attn: Mr. Stephen Crevoiserat

Project: Proposed Rancho Mirage Dog Park
SEC Key Largo Avenue and Via Vail
Rancho Mirage, California

Subject: Percolation/Infiltration Testing for On-Site Storm Water Retention

Ref: Geotechnical Investigation report prepared by Sladden Engineering dated March 17, 2015; Project No. 544-15032, Report No. 15-03-110

As requested, we have performed infiltration testing on the subject site to evaluate the infiltration potential of the near surface soil to assist in storm water retention system design. It is our understanding that on-site storm water retention will be required for the subject project. The infiltration rates determined should be useful in the assessment of on-site storm water retention needs. The approximate location of the tests are indicated on the attached Test Location Plan (Figure 1).

Infiltration testing was performed on March 9, 2014 utilizing double ring infiltrometers. Testing was performed in general accordance with the *Standard Test Method for Infiltration Rate of Soils in Field Using Double-Ring Infiltrometer* (ASTM D-3385). Testing indicated infiltration rates of approximately 11.4 inches per hour (in/hour) for P-1 and 12.6 inches per hour (in/hour) for P-2. The rates determined represent ultimate rates and an appropriate safety factor should be incorporated into design to account for long-term saturation and potential "silting" of the surface soil. The safety factor should be determined with consideration to other factors considered in the storm water retention system design (specifically storm water volume estimates) and the safety factors associated with the related design components.

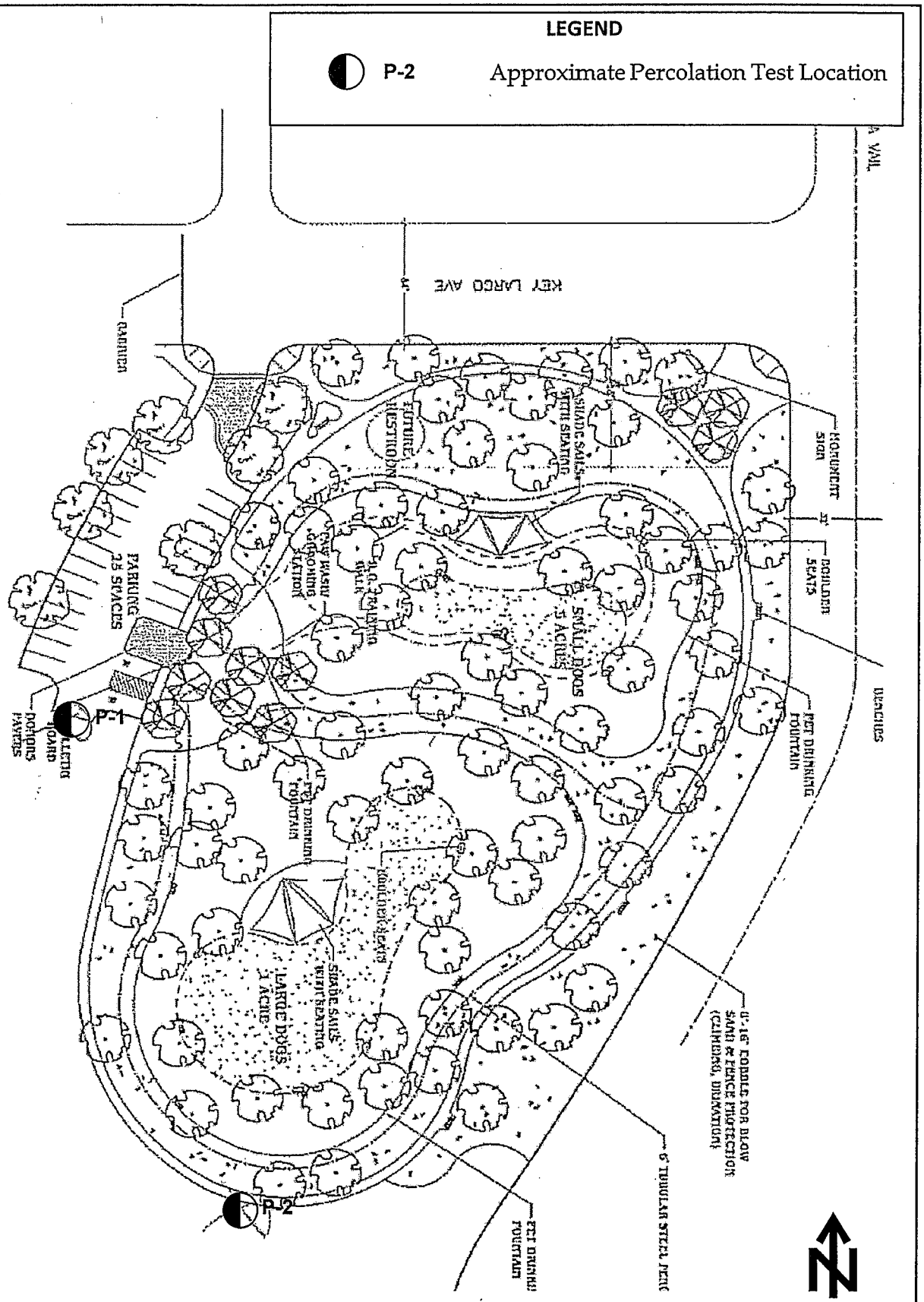
If you have any questions regarding this memo or the testing summarized herein, please contact the undersigned.

Respectfully submitted,
SLADDEN ENGINEERING

Brett L. Anderson
Principal Engineer

Copies: 4 / Addressee

REGISTERED PROFESSIONAL ENGINEER
BRETT L. ANDERSON
No. C45389
Exp. 9/30/16
CIVIL
ENGINEERING
STATE OF CALIFORNIA



BOREHOLE LOCATION PLAN

Project Number:	544-15032
Report Number:	15-03-114
Date:	March 16, 2015

FIGURE

1

Sladden Engineering

DOUBLE RING PERCOLATION RATE CALCULATIONS

Job No. 544-15032

Test Hole P-1

AVERAGE RATE* = 11.4 (in/hr)

INNER RING

Interval Number	Initial Water(cm)	Final Water(cm)	Con. Factor (cm to in)	Water (in)	Area Mar. (in2)	Volume (in3)	Area IR (in2)	Time (min)	Time (hr)	Vir (in/hr)
1	48.2	0.0	0.39	19.0	8.9	169.7	113.1	9	0.15	10.0
2	50.0	12.5	0.39	14.8	8.9	132.0	113.1	7	0.12	10.0
3	51.5	33.0	0.39	7.3	8.9	65.1	113.1	4	0.07	8.6
4	51.0	27.5	0.39	9.3	8.9	82.7	113.1	4	0.07	11.0
5	50.0	21.0	0.39	11.4	8.9	102.1	113.1	4	0.07	13.5
6	51.5	25.0	0.39	10.4	8.9	93.3	113.1	4	0.07	12.4
7	51.0	27.0	0.39	9.4	8.9	84.5	113.1	4	0.07	11.2
8	51.5	29.0	0.39	8.9	8.9	79.2	113.1	4	0.07	10.5
9	50.5	17.5	0.39	13.0	8.9	116.2	113.1	4	0.07	15.4
10	50.0	22.5	0.39	10.8	8.9	96.8	113.1	4	0.07	12.8
11	51.0	26.5	0.39	9.6	8.9	86.3	113.1	4	0.07	11.4
12	51.0	24.5	0.39	10.4	8.9	93.3	113.1	4	0.07	12.4
13	50.5	26.0	0.39	9.6	8.9	86.3	113.1	4	0.07	11.4
14	51.5	24.5	0.39	10.6	8.9	95.1	113.1	4	0.07	12.6
15	50.5	25.0	0.39	10.0	8.9	89.8	113.1	4	0.07	11.9
16	51.0	26.5	0.39	9.6	8.9	86.3	113.1	4	0.07	11.4
17	50.5	22.0	0.39	11.2	8.9	100.3	113.1	4	0.07	13.3
18	51.5	24.5	0.39	10.6	8.9	95.1	113.1	4	0.07	12.6
19	50.5	21.0	0.39	11.6	8.9	103.9	113.1	4	0.07	13.8
20	50.0	25.0	0.39	9.8	8.9	88.0	113.1	4	0.07	11.7
21	51.0	26.5	0.39	9.6	8.9	86.3	113.1	4	0.07	11.4
22	50.5	27.0	0.39	9.3	8.9	82.7	113.1	4	0.07	11.0
23	51.0	26.0	0.39	9.8	8.9	88.0	113.1	4	0.07	11.7
24			0.39	0.0	8.9	0.0	113.1		0.00	
25			0.39	0.0	8.9	0.0	113.1		0.00	

DOUBLE RING PERCOLATION RATE CALCULATIONS

Job No. 544-15032

Test Hole P-2

INNER RING

Interval Number	Initial Water(cm)	Final Water(cm)	Con. Factor (cm to in)	Water (in)	Area Mar. (in2)	Volume (in3)	Area IR (in2)	Time (min)	Time (hr)	Vir (in/hr)
1	50.0	6.0	0.39	17.3	8.9	154.9	113.1	8	0.13	10.3
2	49.5	20.0	0.39	11.6	8.9	103.9	113.1	4	0.07	13.8
3	49.0	20.5	0.39	11.2	8.9	100.3	113.1	4	0.07	13.3
4	50.0	20.5	0.39	11.6	8.9	103.9	113.1	4	0.07	13.8
5	50.5	25.0	0.39	10.0	8.9	89.8	113.1	4	0.07	11.9
6	49.5	22.5	0.39	10.6	8.9	95.1	113.1	4	0.07	12.6
7	50.0	20.0	0.39	11.8	8.9	105.6	113.1	4	0.07	14.0
8	51.0	24.0	0.39	10.6	8.9	95.1	113.1	4	0.07	12.6
9	50.5	19.0	0.39	12.4	8.9	110.9	113.1	4	0.07	14.7
10	50.5	22.0	0.39	11.2	8.9	100.3	113.1	4	0.07	13.3
11	50.0	17.0	0.39	13.0	8.9	116.2	113.1	4	0.07	15.4
12	51.0	23.5	0.39	10.8	8.9	96.8	113.1	4	0.07	12.8
13	50.0	26.0	0.39	9.4	8.9	84.5	113.1	4	0.07	11.2
14	51.0	24.0	0.39	10.6	8.9	95.1	113.1	4	0.07	12.6
15	51.5	24.0	0.39	10.8	8.9	96.8	113.1	4	0.07	12.8
16	49.5	22.0	0.39	10.8	8.9	96.8	113.1	4	0.07	12.8
17	50.0	24.0	0.39	10.2	8.9	91.5	113.1	4	0.07	12.1
18	50.0	21.5	0.39	11.2	8.9	100.3	113.1	4	0.07	13.3
19	51.0	25.5	0.39	10.0	8.9	89.8	113.1	4	0.07	11.9
20	50.0	24.5	0.39	10.0	8.9	89.8	113.1	4	0.07	11.9
21	51.0	24.0	0.39	10.6	8.9	95.1	113.1	4	0.07	12.6
22	50.5	23.0	0.39	10.8	8.9	96.8	113.1	4	0.07	12.8
23	51.0	22.5	0.39	11.2	8.9	100.3	113.1	4	0.07	13.3
24	50.0	25.0	0.39	9.8	8.9	88.0	113.1	4	0.07	11.7
25	49.5	22.0	0.39	10.8	8.9	96.8	113.1	4	0.07	12.8

AVERAGE RATE* = 12.6 (in/hr)