



GEOTECHNICAL ENGINEERING • ENVIRONMENTAL ENGINEERING
CONSTRUCTION TESTING & INSPECTION

March 5, 2021

KA No. 112-21009

Lee Overbeck, P.E.
InSite Real Estate, LLC
1400 16th Street, Suite 300
Oak Brook, IL 60523
(630) 617-9100
loverbeck@insiterealestate.com

RE: Results of Infiltration Testing
Proposed Fast Food Restaurant
NEC Palm Drive & Desert View Avenue
Desert Hot Springs, California

Dear Mr. Overbeck:

In accordance with your request and authorization we have performed supplemental infiltration testing at the subject site in Desert Hot Springs, California. Our services including performance of infiltration testing at locations specified by the project representatives. It is understood that the design and evaluation of a proposed infiltration system will be performed by others.

Infiltration testing was performed at four (4) locations within the proposed infiltration areas located at the subject site. The infiltration testing was performed in general accordance with the Riverside County Stormwater Quality Best Practice Design Handbook. The approximate test locations are identified on the attached site plan. In order to perform these tests, four eight (8) inch diameter borings were drilled to depths ranging from approximately 4 to 12 feet below existing site grades. Infiltration testing has been performed at each of the boring locations. Infiltration testing has been performed using open borehole percolation testing specified in the Riverside County Stormwater Quality Best Practice Design Handbook. The infiltration rates have been calculated from the percolation rates using the Inverse Borehole procedures. Infiltration rates presented represent vertical flow at each test location.

Prior to infiltration testing, approximately two inches of gravel was placed at the bottom of each borehole. The boreholes were pre-soaked prior to testing using clean water in accordance with the Riverside County Stormwater Quality Best Practice Design Handbook. The depth of the borehole was measured at each reading to verify the overall depth. The depth of water in the borehole was measured at each reading using a water level indicator or well sounder.

Infiltration Test Results

The estimated infiltration rates were determined using the results of open borehole percolation testing at each location at the subject site. The depth of each boreholes ranged from approximately 4 to 12 feet

below current site grades. The infiltration rates have been calculated from percolation rates using the Inverse Borehole procedures.

The conversion equation is used:

$$I_t = \frac{\Delta H(60r)}{\Delta t(r + 2H_{avg})}$$

The infiltration rates at the end of the tests indicated infiltration rates of approximately 0.66 and 0.86 inch per hour at a depth of approximately four (4) feet below current site grades and 1.41 and 1.87 inches per hour at a depth of approximately twelve (12) feet below current site grades. The soil infiltration rates are based on tests conducted with clean water. The infiltration rates may vary with time as a result of soil clogging from water impurities. A factor of safety should be incorporated into the design of the infiltration system to compensate for these factors as determined appropriate by the designer. In addition, routine maintenance consisting of clearing the system of clogged soils and debris should be expected.

It is recommended that the location of the infiltration systems not be closer than ten feet (10') as measured laterally from the edge of the adjacent property line, ten feet (10') from the outside edge of any foundation and five (5') from the edge of any right-of way to the outside edges of the infiltration system.

If the infiltration location is within ten feet (10') from the proposed foundation, it is recommended that this infiltration system should be impervious from the finished ground surface to a depth that will achieve a diagonal distance of a minimum of ten feet (10') below the bottom of the closest footing in the project.

If there are any questions or if we can be of further assistance, please do not hesitate to contact our office at (951) 273-1011.

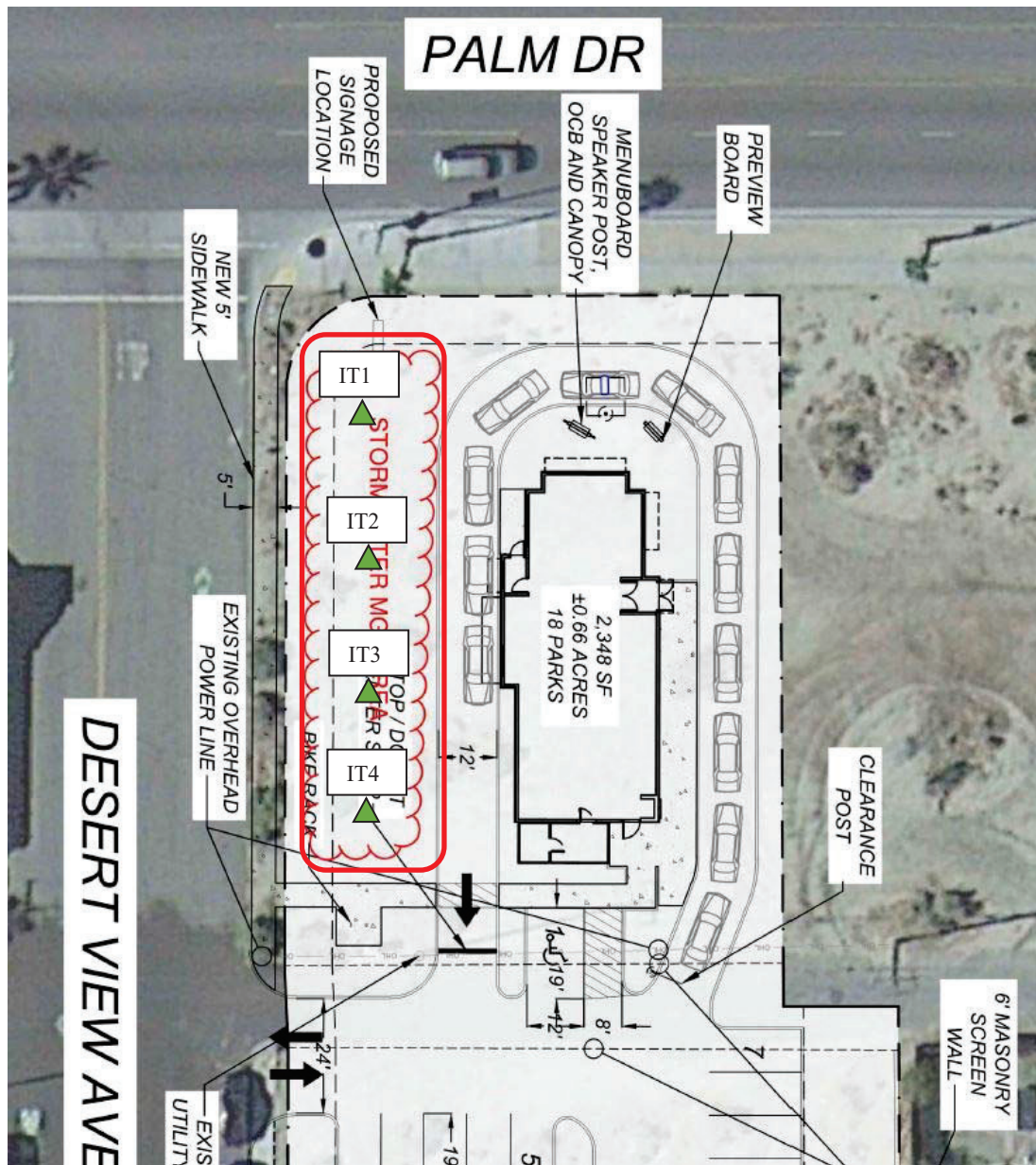
Respectfully submitted,
KRAZAN & ASSOCIATES, INC.



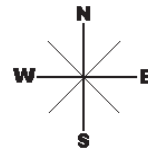
Jorge A. Pelayo, PE
Project Engineer
RCE No. 91269



Attachment: Infiltration Test Results and Site Map



▲ APPROXIMATE INFILTRATION TESTING LOCATION



TEST LOCATION MAP PROPOSED FAST FOOD RESTAURANT NEC PALM DRIVE & DESERT VIEW AVENUE DESERT HOT SPRINGS, CALIFORNIA	Scale: NTS	Date: March 5, 2021	
	Drawn by: JP	Approved by: JK	
	Project No. 112-21009	Figure No. 1	

RESULTS OF INFILTRATION TESTS - REVERSE BOREHOLE

Project #	11221009	Date	3/5/2021
Project Name	Proposed Fast Food Restaurant		
Project Address	NEC Palm Drive & Desert View Avenue, Desert Hot Springs, CA		

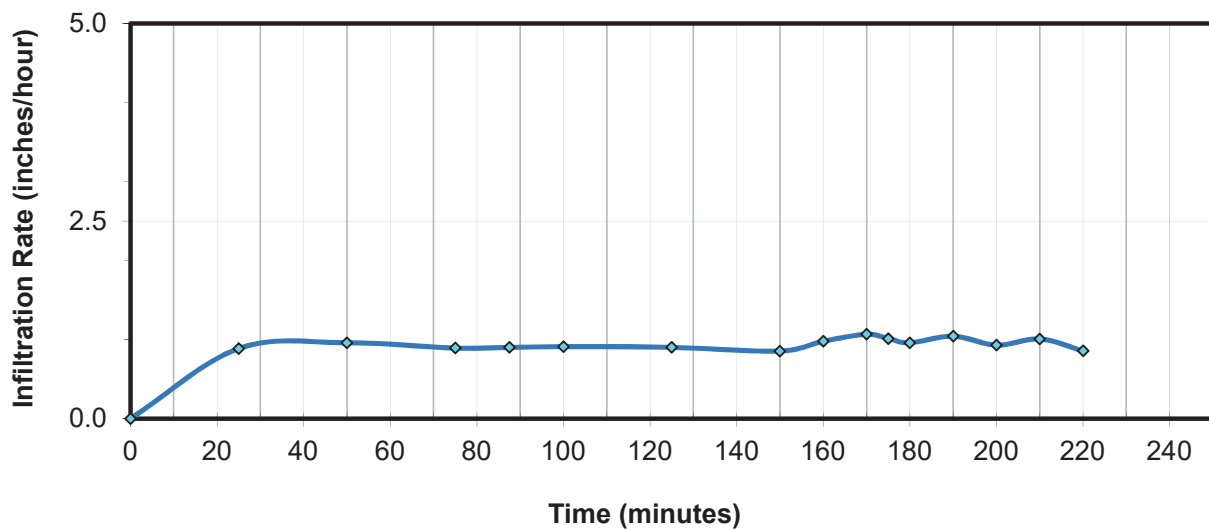
Test No:	IT-1	Total Depth (in.)	48	Test Size (in)	8
Depth To Water	>50'	Soil Classification	SM		

Reading	Elapsed Time(min.)	Incremental Time (min.)	Initial Depth To Water(in.)	Final Depth To Water(in.)	Incremental Fall of Water(in.)	Incremental Infiltration Rate (in/hr)
Start	0	0.00		12.0	--	--
1	25.00	25.00	12.0	17.5	5.50	0.89
2	50.00	25.00	17.5	22.5	5.00	0.96
3	75.00	25.00	22.5	26.5	4.00	0.89
Refill	87.50			6.0	5.25	0.90
4	100.00	25.00	6.0	12.5	6.50	0.91
5	125.00	25.00	12.5	18.0	5.50	0.90
6	150.00	25.00	18.0	22.5	4.50	0.86
7	160.00	10.00	22.5	24.5	2.00	0.98
8	170.00	10.00	24.5	26.5	2.00	1.07
Refill	175.00			8.0	2.50	1.01
9	180.00	10.00	8.0	11.0	3.00	0.96
10	190.00	10.00	11.0	14.0	3.00	1.04
11	200.00	10.00	14.0	16.5	2.50	0.93
12	210.00	10.00	16.5	19.0	2.50	1.01
13	220.00	10.00	19.0	21.0	2.00	0.86

Infiltration Rate in Inches per Hour

0.86

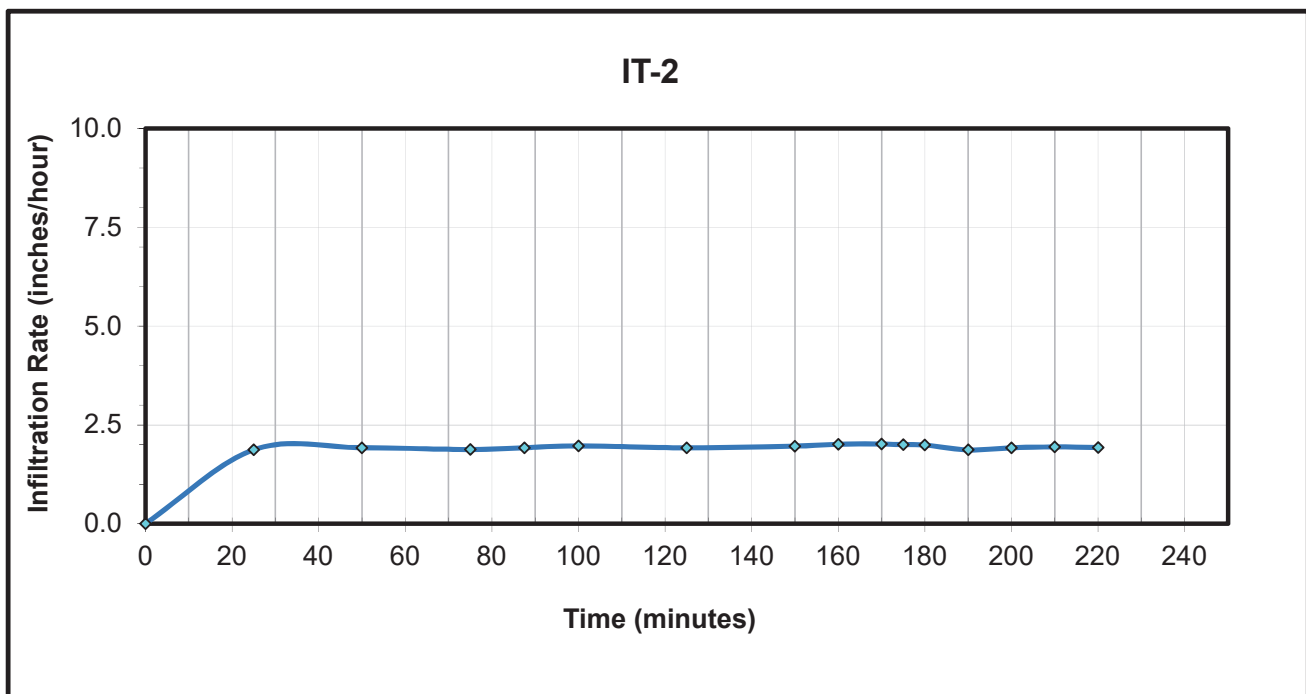
IT-1



RESULTS OF INFILTRATION TESTS - REVERSE BOREHOLE						
Project #	11221009				Date	3/5/2021
Project Name	Proposed Fast Food Restaurant					
Project Address	NEC Palm Drive & Desert View Avenue, Desert Hot Springs, CA					
Test No:	IT-2	Total Depth (in.)		144	Test Size (in)	8
Depth To Water	>50'	Soil Classification		SM		

Reading	Elapsed Time(min.)	Incremental Time (min.)	Initial Depth To Water(in.)	Final Depth To Water(in.)	Incremental Fall of Water(in.)	Incremental Infiltration Rate (in/hr)
Start	0	0.00		24.0	--	--
1	25.00	25.00	24.0	54.0	30.00	1.87
2	50.00	25.00	54.0	77.0	23.00	1.92
3	75.00	25.00	77.0	94.0	17.00	1.88
Refill	87.50			12.0	25.50	1.92
4	100.00	25.00	12.0	46.0	34.00	1.97
5	125.00	25.00	46.0	71.0	25.00	1.92
6	150.00	25.00	71.0	90.0	19.00	1.96
7	160.00	10.00	90.0	97.5	7.50	2.01
8	170.00	10.00	97.5	104.0	6.50	2.01
Refill	175.00			18.0	11.75	2.00
9	180.00	10.00	18.0	35.0	17.00	1.99
10	190.00	10.00	35.0	49.0	14.00	1.87
11	200.00	10.00	49.0	61.5	12.50	1.92
12	210.00	10.00	61.5	72.5	11.00	1.94
13	220.00	10.00	72.5	82.0	9.50	1.92

1.87



RESULTS OF INFILTRATION TESTS - REVERSE BOREHOLE

Project #	11221009	Date	3/5/2021
Project Name	Proposed Fast Food Restaurant		
Project Address	NEC Palm Drive & Desert View Avenue, Desert Hot Springs, CA		

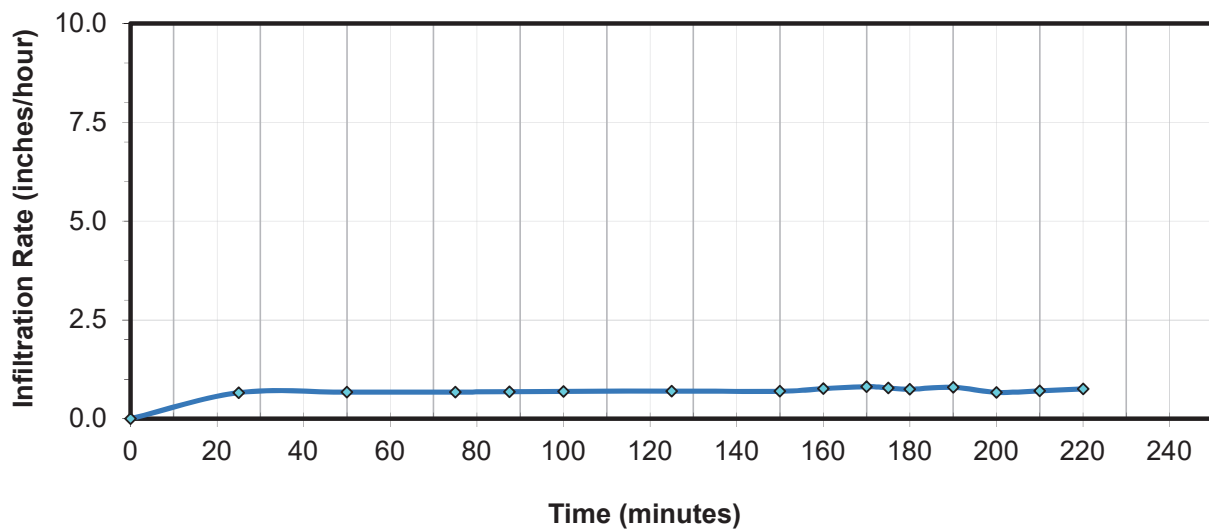
Test No:	IT3	Total Depth (in.)	48	Test Size (in)	8
Depth To Water	>50'	Soil Classification	SM		

Reading	Elapsed Time(min.)	Incremental Time (min.)	Initial Depth To Water(in.)	Final Depth To Water(in.)	Incremental Fall of Water(in.)	Incremental Infiltration Rate (in/hr)
Start	0	0.00		6.0	--	--
1	25.00	25.00	6.0	11.0	5.00	0.66
2	50.00	25.00	11.0	15.5	4.50	0.67
3	75.00	25.00	15.5	19.5	4.00	0.67
Refill	87.50			12.0	4.25	0.68
4	100.00	25.00	12.0	16.5	4.50	0.69
5	125.00	25.00	16.5	20.5	4.00	0.70
6	150.00	25.00	20.5	24.0	3.50	0.69
7	160.00	10.00	24.0	25.5	1.50	0.76
8	170.00	10.00	25.5	27.0	1.50	0.81
Refill	175.00			6.0	2.00	0.78
9	180.00	10.00	6.0	8.5	2.50	0.75
10	190.00	10.00	8.5	11.0	2.50	0.79
11	200.00	10.00	11.0	13.0	2.00	0.67
12	210.00	10.00	13.0	15.0	2.00	0.71
13	220.00	10.00	15.0	17.0	2.00	0.75

Infiltration Rate in Inches per Hour

0.66

IT-3



RESULTS OF INFILTRATION TESTS - REVERSE BOREHOLE						
Project #	11221009				Date	3/5/2021
Project Name	Proposed Fast Food Restaurant					
Project Address	NEC Palm Drive & Desert View Avenue, Desert Hot Springs, CA					
Test No:	IT-4	Total Depth (in.)		144	Test Size (in)	8
Depth To Water	>50'	Soil Classification		SM		

Reading	Elapsed Time(min.)	Incremental Time (min.)	Initial Depth To Water(in.)	Final Depth To Water(in.)	Incremental Fall of Water(in.)	Incremental Infiltration Rate (in/hr)
Start	0	0.00		6.0	--	--
1	25.00	25.00	6.0	34.5	28.50	1.41
2	50.00	25.00	34.5	57.5	23.00	1.43
3	75.00	25.00	57.5	76.0	18.50	1.46
Refill	87.50			6.0	23.75	1.45
4	100.00	25.00	6.0	35.0	29.00	1.44
5	125.00	25.00	35.0	59.0	24.00	1.54
6	150.00	25.00	59.0	78.0	19.00	1.56
7	160.00	10.00	78.0	85.5	7.50	1.59
8	170.00	10.00	85.5	92.0	6.50	1.54
Refill	175.00			12.0	10.25	1.51
9	180.00	10.00	12.0	26.0	14.00	1.49
10	190.00	10.00	26.0	38.5	12.50	1.48
11	200.00	10.00	38.5	50.0	11.50	1.53
12	210.00	10.00	50.0	60.0	10.00	1.48
13	220.00	10.00	60.0	69.5	9.50	1.59

1.41

