APPENDIX 4A

Interpretative Report for Infiltration System (Millcreek)

Earth Strata Geotechnical Services, Inc.
Geotechnical, Environmental and Materials Testing Consultants

November 28, 2017

Project No. 151015-70A
151064-70A

Mr. Dan Brose
31103 Rancho Viejo Road
Suite 535
San Juan Capistrano, CA 92675

Subject: **Response to Review Comments Regarding Preliminary Geotechnical Interpretive Report, Phase 1 Environmental Site Assessment, and Infiltration Report for the Proposed Millcreek Promenade, Assessor's Parcel Numbers 360-350-011 and 360-350-017, Parcels 2 and 3 of Parcel Map Number 13523, Located Southwest of Garbani Road and on the West Side of Haun Road, City of Menifee, Riverside County, California**

Introduction

Earth Strata Geotechnical Services, Inc., has prepared this response to the Review Comments letter for the above referenced project. The three (3) comments will be listed below followed by our response to each comment. The following changes and clarifications should be considered part of and attached to the report referenced above.

COMMENT NO. 1 (Preliminary Geotechnical Interpretive Report; May 4, 2016)

1. **"1. Unclear whether the report is missing analysis of 360-350-006.**
   a). The report states that it only evaluates APN 360-350-017, -011 and parcels 2 and 3 of Map 13523 and describes the subject area as 20 acres. This report should be updated to reflect the current scope of project. The draft PWQMP appendix includes Geotech for APN 360-350-006 and identifies the subject area as 17.04 acres. Perhaps, the entire area has been evaluated and the reference to 20 acres in the -017 and -011 docs is a typo."

Response – The project 151064-10A evaluates APNs 360-350-011 and 360-350-017, Parcels 2, and 3 of Parcel Map 13523. The total acres of the proposed Mill Creek Promenade are 38.46. Project 151015-10A evaluates APN 360-350-006. The total acreage for the proposed project is approximately 17.94 acres. The scope of work for the project remains the same. The proposed development is the Mill Creek Promenade. The updated geotechnical map, which includes APNs 360-350-006, 360-350-011, and 360-350-017, is attached.

COMMENT NO. 2 (Phase I Environment Site Assessment; April 8, 2016)

2. **"1. Unclear whether the report is looked at the entire site.**
   a). The title states that the Phase 1 only evaluates APN 360-350-017 and -011. The site described as 38.46 acres. Page 12 of the Phase 1 refers to the subject property as 360-350-006 only. Item B on Page 9 describes land to the south of that evaluated as vacant, but the subject map provided in Appendix A identifies the subject property as APN 360-350-017 and -011 and does not show land to the south of the study area as vacant. Appendix D identifies what appears to be APN as the subject property 360-0350-006. This report is internally inconsistent as to what subject sites are included and should be updated to reflect the current geographic scope of the project. Phase 1 for APN 360-350-006 is located in Appendix 4 of draft PWQMP."

Response – The Phase I for project 151064-60A evaluates APNs 360-350-011 and 360-350-017. The Phase I for project 151015-60A evaluates APN 360-350-006. For project 151064-60A, the site should be described as 38.46 acres, with commercial development to the south. The Phase I for project 151064-60A has been updated and is attached.

COMMENT NO. 3 (Infiltration Report; May 16, 2016)

3. **"1. Only evaluates APN 360-350-017. Does not look to analyze -006 or -011.**
   a). NOTE: The draft PWQMP provides the Infiltration Report for -006 in Appendix 3, so documents may have already been prepared for the entire site but just not shared or combine?"

Response – The infiltration location maps for project 151064-12A shows the evaluation of the proposed project as APNs 360-350-017 and -011. The Infiltration Report evaluates APNs 360-350-011 and 360-350-017. Project 151015-12A evaluates APN 360-350-006.

The opportunity to be of service is appreciated. Should you have any questions or require further clarification, please notify this office at your earliest convenience.

Respectfully submitted,

EARTH-STRATA, INC.

Stephen M. Poole, PE, GE
Principal Engineer

SMP/snj

Attachment: Review Comments Letter (Rear of Text)
Revised Phase 1 Environment Site Assessment (Rear of Text)
Revised Plate 1, Geotechnical Map (Rear of Text)

Distribution: (2) Addressee

EARTH STRATA GEOTECHNICAL SERVICES, INC.

May 16, 2016 Project No. 151064-12A

SHERMAN & HAUN, LLC
31103 Rancho Viejo Road
San Juan Capistrano, CA 92675

Subject: Interpretive Report for Infiltration System Design, Proposed Millcreek Promenade, Assessor's Parcel Number 360-350-017, Located South of Garbani Road and on the West Side of Haun Road, City of Menifee, Riverside County, California

Earth Strata Geotechnical Services, is pleased to present this interpretive report for the proposed commercial development, located South of Garbani Road and on the West Side of Haun Road, in the City of Menifee, Riverside County, California. The purpose of our study was to determine the infiltration rates and physical characteristics of the subsurface earth materials within the proposed development. We have provided guidelines for the design of onsite bio swale retention systems, where applicable. This study is intended to provide onsite infiltration rates for the earth materials at the approximate depth near the proposed retention basins.

PROPERTY DESCRIPTION

The subject property is located in the City of Menifee, Riverside County, California (see Figure 1). The subject property consists of an undeveloped parcel of land with relatively flat terrain. The subject property is underlain by alluvium and bedrock.

PROPOSED CONSTRUCTION

Based on information provided by you, the proposed development will consist of numerous 1 to 3 story buildings which includes interior driveways, utilities and on-site retention basins.

SUBSURFACE EXPLORATION AND INFILTRATION TESTING

SUBSURFACE EXPLORATION

Subsurface exploration of the subject site consisted of twelve (12) exploratory excavations to a depth of 15 feet, conducted on March 29, 2016. The exploratory holes were excavated to evaluate insitu permeability rates. The approximate locations of the exploratory excavations are shown on the attached Infiltration Location Map, Plate 1.

EARTH MATERIALS

A general description of the earth materials observed on site is provided below.

- Topsoil (no map symbol): Residual topsoil, encountered in the upper 1 to 3 feet, blankets the site and underlying bedrock. These materials were noted to be generally yellow brown, sandy clay and clayey sand which were very porous, slightly moist to moist and in a loose state.

- Quaternary Old Fan Deposits (map symbol Qof): Quaternary old fan deposits were encountered to a maximum depth of explored. These alluvial deposits consist predominately of interlayered reddish brown

to gray brown, fine to coarse grained clayey sand, silty sand, sandy clay, and occasional sandy silt. These deposits were generally noted to be in a slightly moist to moist, medium dense to dense state.

- Cretaceous Gabbro (map symbol Kgb): Cretaceous age plutonic rock consisting of gabbro was mapped within the site. The gabbro was observed to be pinkish gray to medium gray, medium to very coarse grained, and in a moderately hard to very hard state. Typically, the upper 1 to 3 feet of this unit is more weathered and not as hard.

- Cretaceous Heterogeneous Granitic Rocks (map symbol Khg): Cretaceous age granitic rocks composed of a wide variety of compositions make up this unit. Rock types typically include monzogranite, granodiorite, tonalite and gabbro, with the most common being tonalite (Morton, 2004). This rock unit was mapped within the site. These granitic rocks were observed to be reddish yellow and yellowish brown, medium to coarse-grained, and in a moderately hard to very hard state. Typically, the upper 1 to 3 feet of this unit is more weathered and not as hard.

GROUNDWATER

Groundwater was not observed within the exploratory excavations.

INFILTRATION TESTING

The continuous presoak test method was utilized to perform a total of six (6) infiltration tests on April 11, 2016 to evaluate near surface infiltration rates in order to estimate the amount of storm water runoff that can percolate into the onsite bio swale retention basins. The infiltration tests were performed in general accordance with the requirements of insitu infiltration testing.

The infiltration tests were performed within 8 inch diameter holes, 6.8 to 7.5 feet deep. The locations of the infiltration test holes are indicated on the attached Infiltration Location Map, Plate 1. The infiltration test holes were located by property boundary measurement on the site plan and by using geographic features. For the continuous presoak testing method, the pipe was filled with water and allowed to stand.

After the presoak, testing was performed by adjusting the water level to near the top of the pipe. The drop in water level was measured from a fixed initial reference point for more reliable readings, with measurements having an accuracy of 1/8-inch. After each measurement, the water level was brought up to the original test level. Infiltration test data recorded in the field is summarized in the following table and is included within Appendix A.

INFILTRATION TEST SUMMARY

TEST NUMBER	INFILTRATION HOLE DEPTH (ft.)	PERCOLATION RATE (mpi)	INFILTRATION RATE (in/hr)	DESCRIPTION
P-1	6.8	10	0.89	Silty SAND
P-2	7.5	10	0.96	Silty SAND
P-3	6.8	10	0.96	Silty SAND
P-4	7	5	0.96	Silty SAND
P-5	7	10	0.96	Silty SAND
P-6	7.3	10	0.96	Silty SAND

The percolation test rates ranged from 5 to 10 minutes per inch (mpi).

CONCLUSIONS AND RECOMMENDATIONS

Based on the data presented in this report and the recommendations set forth herein, it is the opinion of Earth Strata that the retention basin can be designed for a percolation rate of 10 mpi.

The following equation was used in order to convert the infiltration rates to infiltration rates.

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

The infiltration rate of 10 mpi is to be used for the design. This rate is used in the conversion equation utilizing the Porchet Method to obtain the infiltration rate of 0.96 inch/hour. See Attached Sheets

GRADING PLAN REVIEW AND CONSTRUCTION SERVICES

This report has been prepared for the exclusive use of **SHERMAN & HAUN, LLC** and their authorized representative. It likely does not contain sufficient information for other parties or other uses. Earth Strata should be engaged to review the final design plans and specifications prior to construction. This is to verify that the recommendations contained in this report have been properly incorporated into the project plans and specifications. Should Earth Strata not be accorded the opportunity to review the project plans and specifications, we are not responsibility for misinterpretation of our recommendations.

Earth Strata should be retained to provide observations during construction to validate this report. In order to allow for design changes in the event that the subsurface conditions differ from those anticipated prior to construction.

Earth Strata should review any changes in the project and modify and approve in writing the conclusions and recommendations of this report. This report and the drawings contained within are intended for design input purposes only and are not intended to act as construction drawings or specifications. In the event that conditions encountered during grading or construction operations appear to be different than those indicated in this report, this office should be notified immediately, as revisions may be required.

REPORT LIMITATIONS

Our services were performed using the degree of care and skill ordinarily exercised, under similar circumstances, by reputable soils engineers and geologists, practicing at the time and location this report was prepared. No other warranty, expressed or implied, is made as to the conclusions and professional advice included in this report.

Earth materials vary in type, strength, and other geotechnical properties between points of observation and exploration. Groundwater and moisture conditions can also vary due to natural processes or the works of man on this or adjacent properties. As a result, we do not and cannot have complete knowledge of the subsurface conditions beneath the subject property. No practical study can completely eliminate uncertainty with regard to the anticipated geotechnical conditions in connection with a subject property. The conclusions and recommendations within this report are based upon the findings at the points of observation and are subject to confirmation by Earth Strata during construction. This report is considered valid for a period of one year from the time the report was issued.

This report was prepared with the understanding that it is the responsibility of the owner or their representative, to ensure that the conclusions and recommendations contained herein are brought to the attention of the other project consultants and are incorporated into the plans and specifications. The owners' contractor should properly implement the conclusions and recommendations during grading and construction, and notify the owner if they consider any of the recommendations presented herein to be unsafe or unsuitable.

Respectfully submitted,

EARTH STRATA GEOTECHNICAL SERVICES, INC.

Stephen M. Poole, PE 40219
President
Principal Engineer

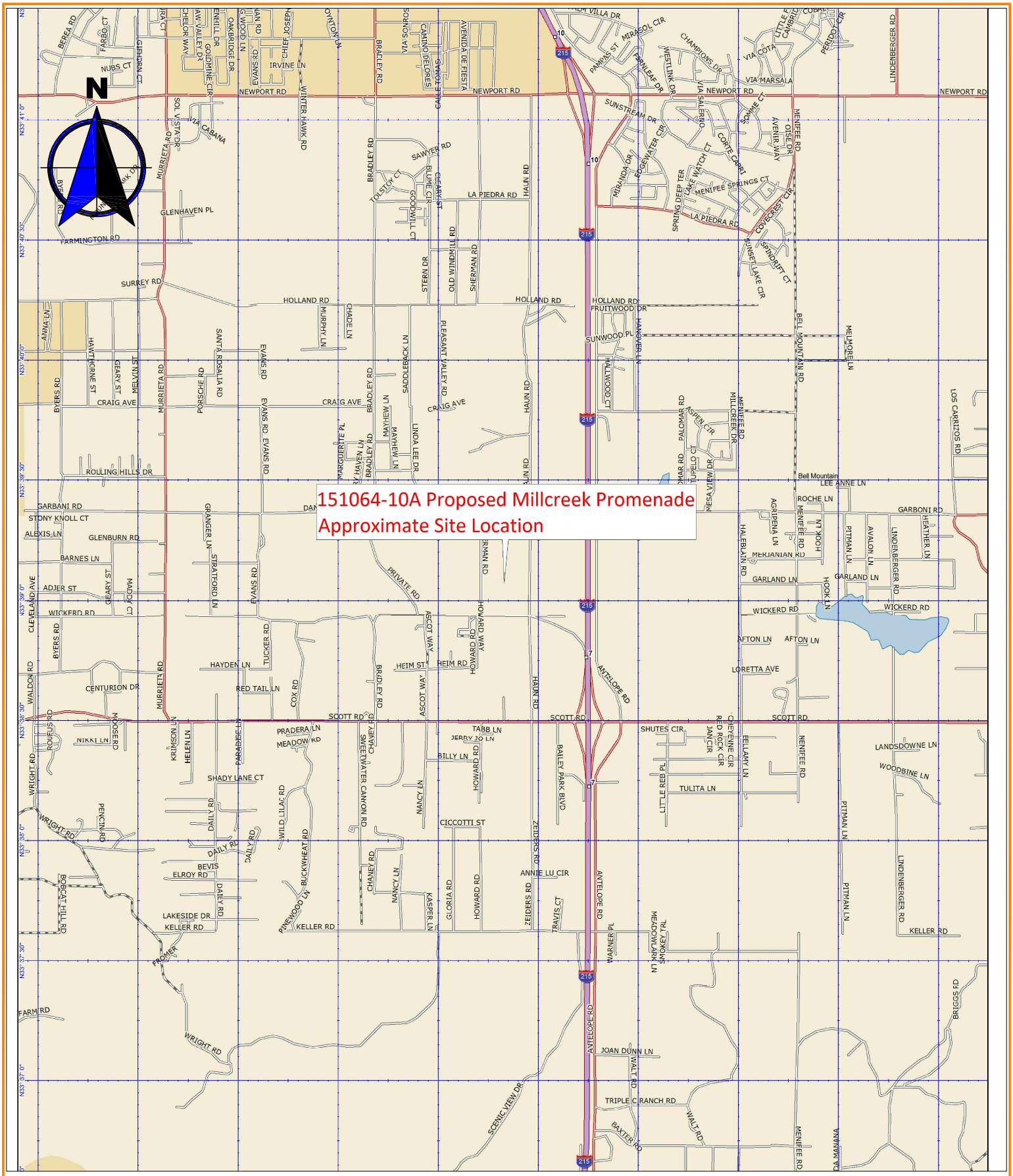
SMP/kp/mw

Distribution: (2) Addressee

Attachments: Figure 1 – Vicinity Map *(Rear of Text)*
Appendix A – Infiltration Test Sheets *(Rear of Text)*
Plate 1 – Infiltration Location Map *(Rear of Text)*

FIGURE 1

VICINITY MAP



ESGS INC.
Geotechnical, Environmental, and Materials Testing Consultants

PROPOSED MILLCREEK PROMENADE	151064-10A
VICINITY MAP	SCALE 1:40,625
MAY 2016	FIGURE 1

APPENDIX A

INFILTRATION TEST SHEETS

Job No.: 151064

Job Name: Millcreek Promenade

Test Hole Number: P-1

Soil Classification: Silty SAND

Test Hole Depth (ft): 6.8

Tested By: RCG

Test Hole Diameter (inches): 8

Date Excavated: 4/11/2016

Date Tested: 4/12/2016

Time Interval of Presoak

Date / Time

24 hours

Start 4/11/16 10:50

Stop 4/12/16 10:50

Amount of Water Used / Comments

20

"It" is the tested infiltration rate.

Time interval, Δt Initial Depth to Water, D_0

Final Depth to Water, D_f Total Depth of Test Hole, D_T

2Test Hole Radius, r

The conversion equation is used:

"Havg" is the average head height over the time interval.

$$It = \frac{\Delta H\ 60\ r}{\Delta t(r+2Havg)}$$

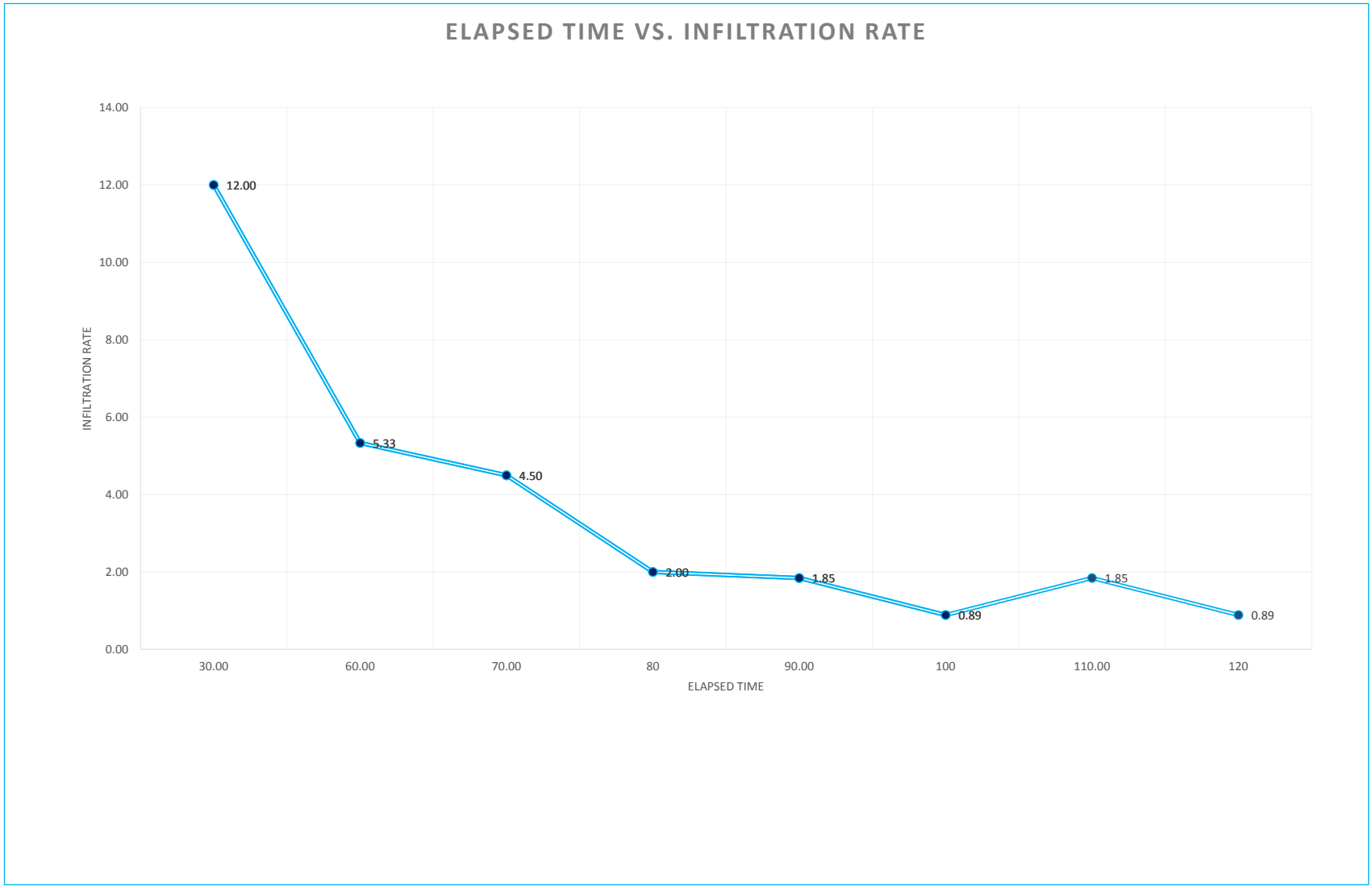
Time	*Time Interval (min.)*	*Initial Water Level (Inches)*	*Final Water Level (Inches)*	*Water Level Drop (Inches)*	*Percolation Rate (Min./Inch)*	*Total Depth of Percolation Hole*
10:53 11:23	30	70	82	12.00	3	78.00
11:23 11:53	30	70	78	8.00	4	78.00
11:53 12:03	10	66	60	6.00	2	77.00
12:03 12:13	10	66	68	2.00	5	77.00
12:13 12:23	10	65	67	2.00	5	77.00
12:23 12:33	10	65	66	1.00	10	77.00
12:33 12:43	10	65	67	2.00	5	77.00
12:43 12:53	10	65	66	1.00	10	77.00

Time interval Δt	*Initial Water* H_0	*Final Water* H_f	*Total Depth of Test Hole* D_t	*Raduis of Perc Hole* r	ΔH	*H Avg*		*ΔH 60 r)/(Δt (r+2Havg))* It		*ELAPSED TIME* Δt
30.00	8.00	-4.00	78.00	4.00	12.00	2.00		12.00		30.00
30.00	8.00	0.00	78.00	4.00	8.00	4.00		5.33		60.00
10.00	11.00	17.00	77.00	4.00	6.00	14.00		4.50		70.00
10.00	11.00	9.00	77.00	4.00	2.00	10.00		2.00		80.00
10.00	12.00	10.00	77.00	4.00	2.00	11.00		1.85		90.00
10.00	12.00	11.00	77.00	4.00	1.00	11.50		0.89		100.00
10.00	12.00	10.00	77.00	4.00	2.00	11.00		1.85		110.00
10.00	12.00	11.00	77.00	4.00	1.00	11.50		0.89		120.00

Job No.: 151064

Job Name: Millcreek Promenade

Test Hole Number: P-1



Job No.: 151064 | Tested By: RCG

Job Name: Millcreek Promenade

Test Hole Number: P-2 | Test Hole Diameter (inches): 8

Soil Classification: Silty SAND | Date Excavated: 4/11/2016

Test Hole Depth (ft): 7.5 | Date Tested: 4/12/2016

Time Interval of Presoak

24 hours

Date / Time

Start 4/11/16 10:50

Stop 4/12/16 10:50

Amount of Water Used / Comments

20

“It” is the tested infiltration rate.

Time interval, Δt Initial Depth to Water, D_0

Final Depth to Water, D_f Total Depth of Test Hole, D_T

2Test Hole Radius, r

The conversion equation is used:

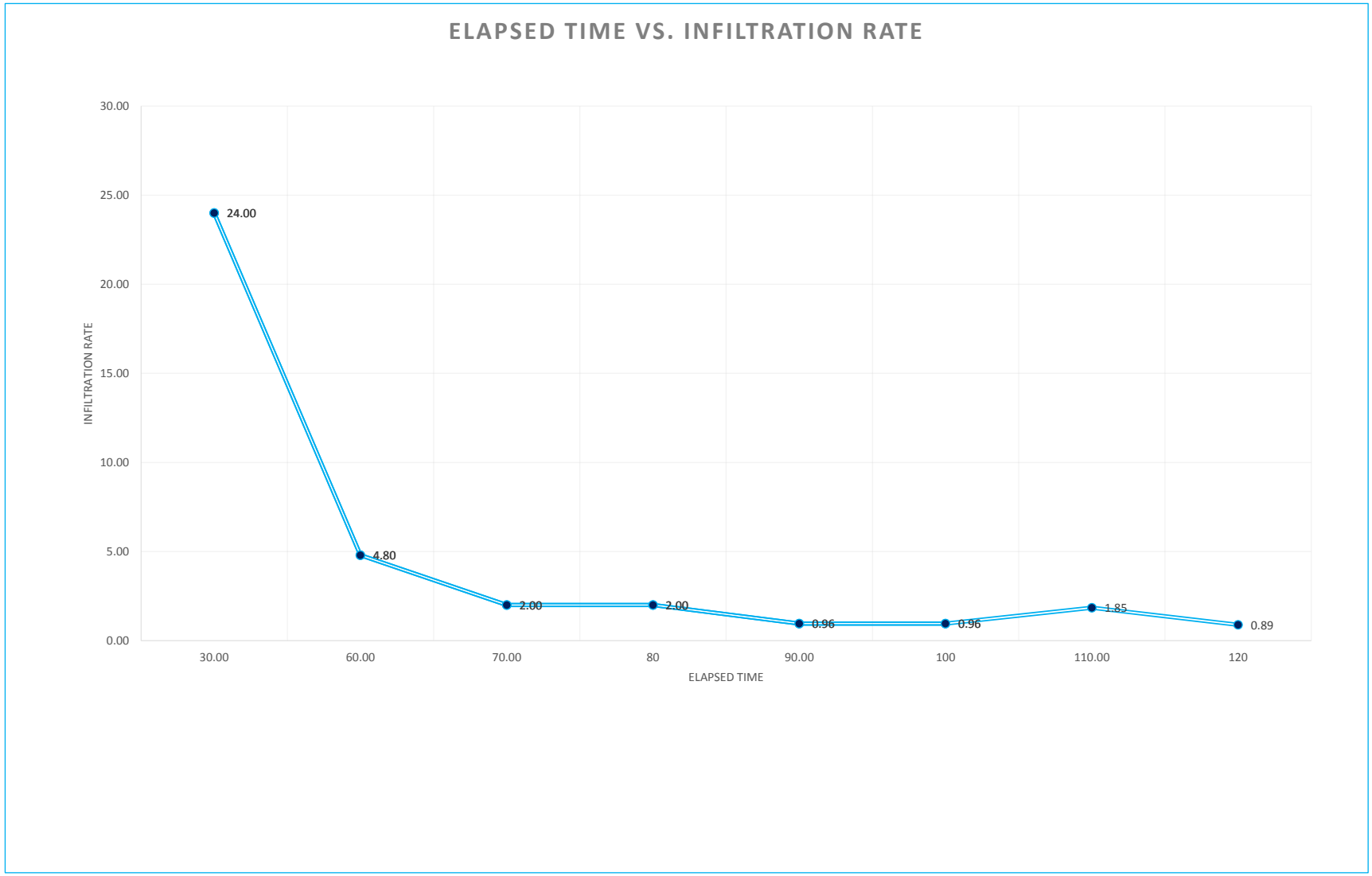
“Havg” is the average head height over the time interval.

$$It = \frac{\Delta H\ 60\ r}{\Delta t(r+2Havg)}$$

Time	*Time Interval (min.)*	*Initial Water Level (Inches)*	*Final Water Level (Inches)*	*Water Level Drop (Inches)*	*Percolation Rate (Min./Inch)*	*Total Depth of Percolation Hole*
10:54 11:24	30	81	93	12.00	3	87.00
11:24 11:54	30	81	87	6.00	5	87.00
11:54 12:04	10	75	77	2.00	5	86.00
12:04 12:14	10	75	77	2.00	5	86.00
12:14 12:24	10	74	75	1.00	10	85.00
12:24 12:34	10	74	75	1.00	10	85.00
12:34 12:44	10	73	75	2.00	5	85.00
12:44 12:54	10	73	74	1.00	10	85.00

Time interval Δt	*Initial Water H_0*	*Final Water H_f*	*Total Depth of Test Hole D_t*	*Raduis of Perc Hole r*	*ΔH*	*H Avg*	*ΔH 60 r)/(Δt (r+2Havg)) It*	*ELAPSED TIME Δt*
30.00	6.00	-6.00	87.00	4.00	12.00	0.00	24.00	30.00
30.00	6.00	0.00	87.00	4.00	6.00	3.00	4.80	60.00
10.00	11.00	9.00	86.00	4.00	2.00	10.00	2.00	70.00
10.00	11.00	9.00	86.00	4.00	2.00	10.00	2.00	80.00
10.00	11.00	10.00	85.00	4.00	1.00	10.50	0.96	90.00
10.00	11.00	10.00	85.00	4.00	1.00	10.50	0.96	100.00
10.00	12.00	10.00	85.00	4.00	2.00	11.00	1.85	110.00
10.00	12.00	11.00	85.00	4.00	1.00	11.50	0.89	120.00

Job No.: 151064
Job Name: Millcreek Promenade
Test Hole Number: P-2



Job No.: 151064

Job Name: Millcreek Promenade

Test Hole Number: P-3

Soil Classification: Silty SAND

Test Hole Depth (ft): 6.8

Tested By: RCG

Test Hole Diameter (inches): 8

Date Excavated: 4/11/2016

Date Tested: 4/12/2016

Time Interval of Presoak

24 hours

Date / Time

Start 4/11/16 10:50

Stop 4/12/16 10:50

Amount of Water Used / Comments

20

"It" is the tested infiltration rate.

Time interval, Δt

Initial Depth to Water, D_0

Final Depth to Water, D_f

Total Depth of Test Hole, D_T

2Test Hole Radius, r

The conversion equation is used:

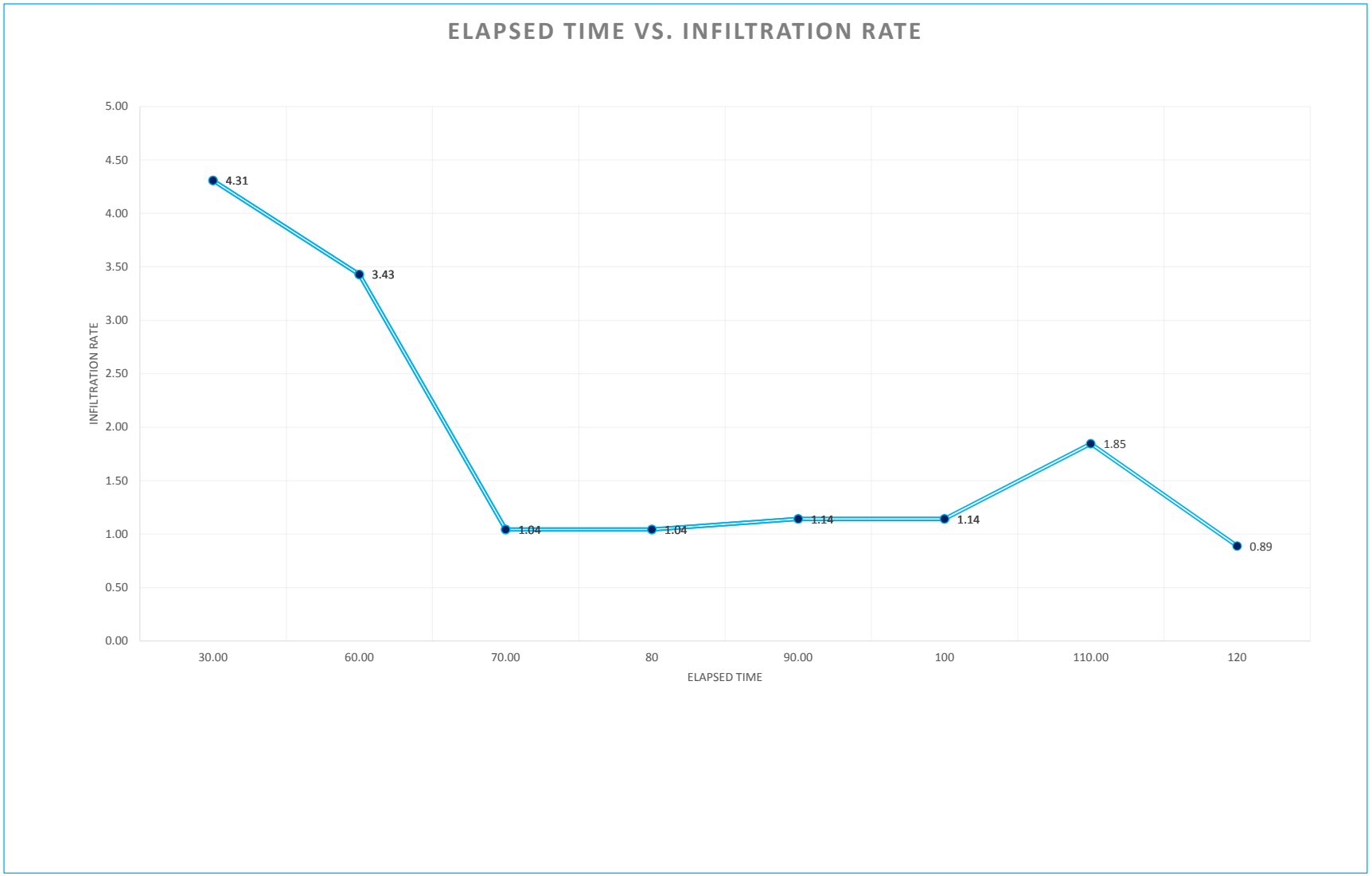
"Havg" is the average head height over the time interval.

$$It = \frac{\Delta H\ 60\ r}{\Delta t(r+2Havg)}$$

Time	Time Interval (min.)	Initial Water Level (Inches)	Final Water Level (Inches)	Water Level Drop (Inches)	Percolation Rate (Min./Inch)	Total Depth of Percolation Hole
10:55 11:25	30	70	77	7.00	5	78.00
11:25 11:55	30	70	76	6.00	5	78.00
11:55 12:05	10	66	67	1.00	10	76.00
12:05 12:15	10	66	67	1.00	10	76.00
12:15 12:25	10	64	65	1.00	10	73.00
12:25 12:35	10	64	65	1.00	10	73.00
12:35 12:45	10	61	63	2.00	5	73.00
12:45 12:55	10	61	62	1.00	10	73.00

Time interval Δt	Initial Water H_0	Final Water H_f	Total Depth of Test Hole D_t	Raduis of Perc Hole r	ΔH	H Avg	ΔH 60 r)/(Δt (r+2Havg)) It	ELAPSED TIME Δt
30.00	8.00	1.00	78.00	4.00	7.00	4.50	4.31	30.00
30.00	8.00	2.00	78.00	4.00	6.00	5.00	3.43	60.00
10.00	10.00	9.00	76.00	4.00	1.00	9.50	1.04	70.00
10.00	10.00	9.00	76.00	4.00	1.00	9.50	1.04	80.00
10.00	9.00	8.00	73.00	4.00	1.00	8.50	1.14	90.00
10.00	9.00	8.00	73.00	4.00	1.00	8.50	1.14	100.00
10.00	12.00	10.00	73.00	4.00	2.00	11.00	1.85	110.00
10.00	12.00	11.00	73.00	4.00	1.00	11.50	0.89	120.00

Job No.: 151064
Job Name: Millcreek Promenade
Test Hole Number: P-3



Job No.: 151064

Job Name: Millcreek Promenade

Test Hole Number: P-4

Soil Classification: Silty SAND

Test Hole Depth (ft): 7

Tested By: RCG

Test Hole Diameter (inches): 8

Date Excavated: 4/11/2016

Date Tested: 4/12/2016

Time Interval of Presoak

24 hours

Date / Time

Start 4/11/16 10:50

Stop 4/12/16 10:50

Amount of Water Used / Comments

20

"It" is the tested infiltration rate.

Time interval, Δt Initial Depth to Water, D_0

Final Depth to Water, D_f Total Depth of Test Hole, D_T

2Test Hole Radius, r

The conversion equation is used:

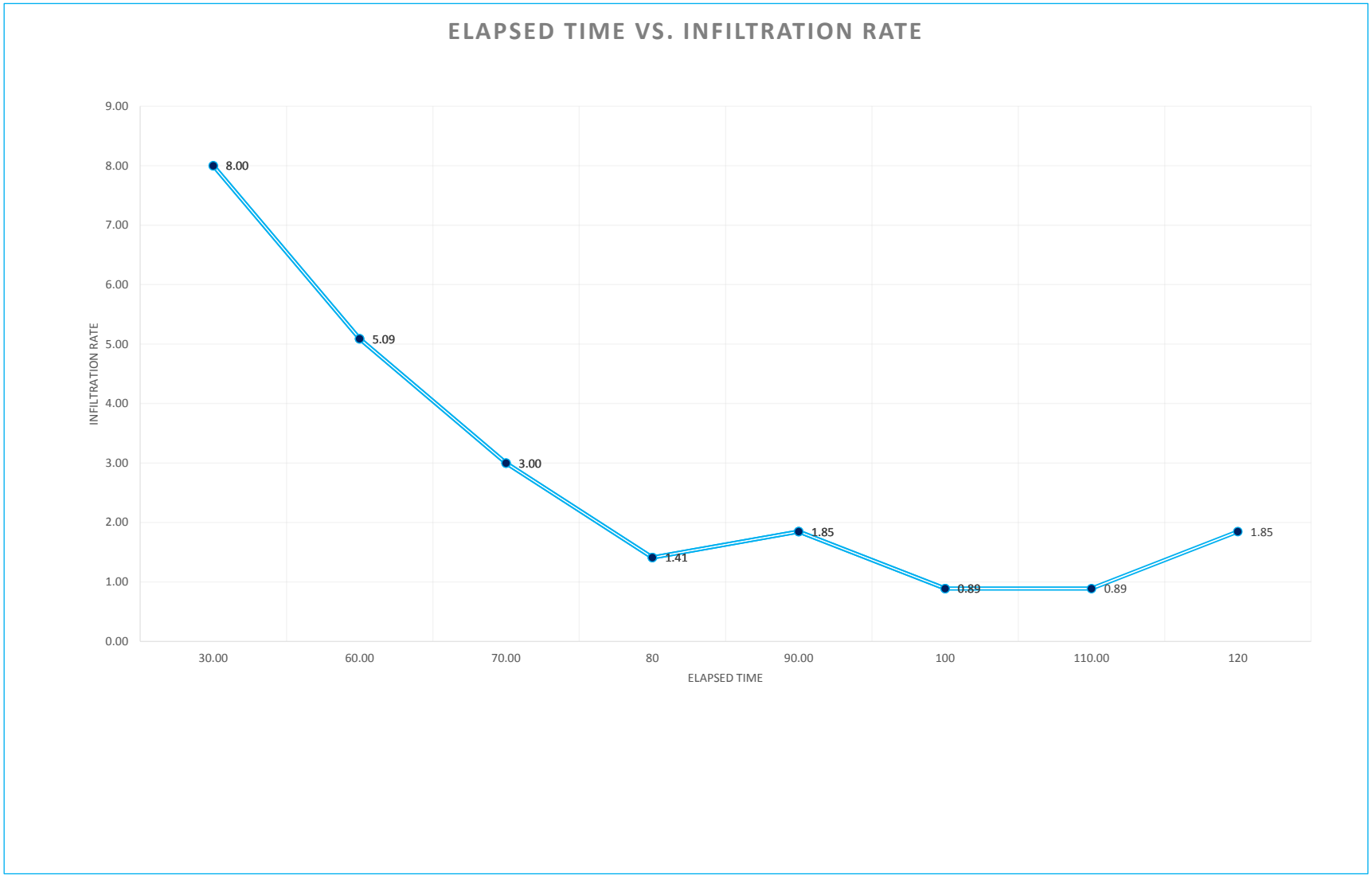
"Havg" is the average head height over the time interval.

$$It = \frac{\Delta H\ 60\ r}{\Delta t(r+2Havg)}$$

Time	*Time Interval (min.)*	*Initial Water Level (Inches)*	*Final Water Level (Inches)*	*Water Level Drop (Inches)*	*Percolation Rate (Min./Inch)*	*Total Depth of Percolation Hole*
10:56 11:26	30	72	81	9.00	4	79.00
11:26 11:56	30	72	79	7.00	5	79.00
11:56 12:06	10	67	69	2.00	5	74.00
12:06 12:16	10	67	68	1.00	10	74.00
12:16 12:26	10	62	64	2.00	5	74.00
12:26 12:36	10	62	63	1.00	10	74.00
12:36 12:46	10	62	63	1.00	10	74.00
12:46 12:56	10	62	64	2.00	5	74.00

Time interval Δt	*Initial Water* H_0	*Final Water* H_f	*Total Depth of Test Hole* D_t	*Raduis of Perc Hole* *r*	ΔH	*H Avg*	*ΔH 60 r)/(Δt (r+2Havg))* *It*	*ELAPSED TIME* Δt
30.00	7.00	-2.00	79.00	4.00	9.00	2.50	8.00	30.00
30.00	7.00	0.00	79.00	4.00	7.00	3.50	5.09	60.00
10.00	7.00	5.00	74.00	4.00	2.00	6.00	3.00	70.00
10.00	7.00	6.00	74.00	4.00	1.00	6.50	1.41	80.00
10.00	12.00	10.00	74.00	4.00	2.00	11.00	1.85	90.00
10.00	12.00	11.00	74.00	4.00	1.00	11.50	0.89	100.00
10.00	12.00	11.00	74.00	4.00	1.00	11.50	0.89	110.00
10.00	12.00	10.00	74.00	4.00	2.00	11.00	1.85	120.00

Job No.: 151064
Job Name: Millcreek Promenade
Test Hole Number: P-4



Job No.:	151064
Job Name:	Millcreek Promenade
Test Hole Number:	P-5
Soil Classification:	Silty SAND
Test Hole Depth (ft):	7
Tested By:	RCG
Test Hole Diameter (inches):	8
Date Excavated:	4/11/2016
Date Tested:	4/12/2016

Time Interval of Presoak

24 hours

Date / Time

Start	4/11/16 10:50
Stop	4/12/16 10:50

Amount of Water Used / Comments

20

"It" is the tested infiltration rate.

Time interval, Δt Initial Depth to Water, D_0

Final Depth to Water, D_f Total Depth of Test Hole, D_T

2Test Hole Radius, r

The conversion equation is used:

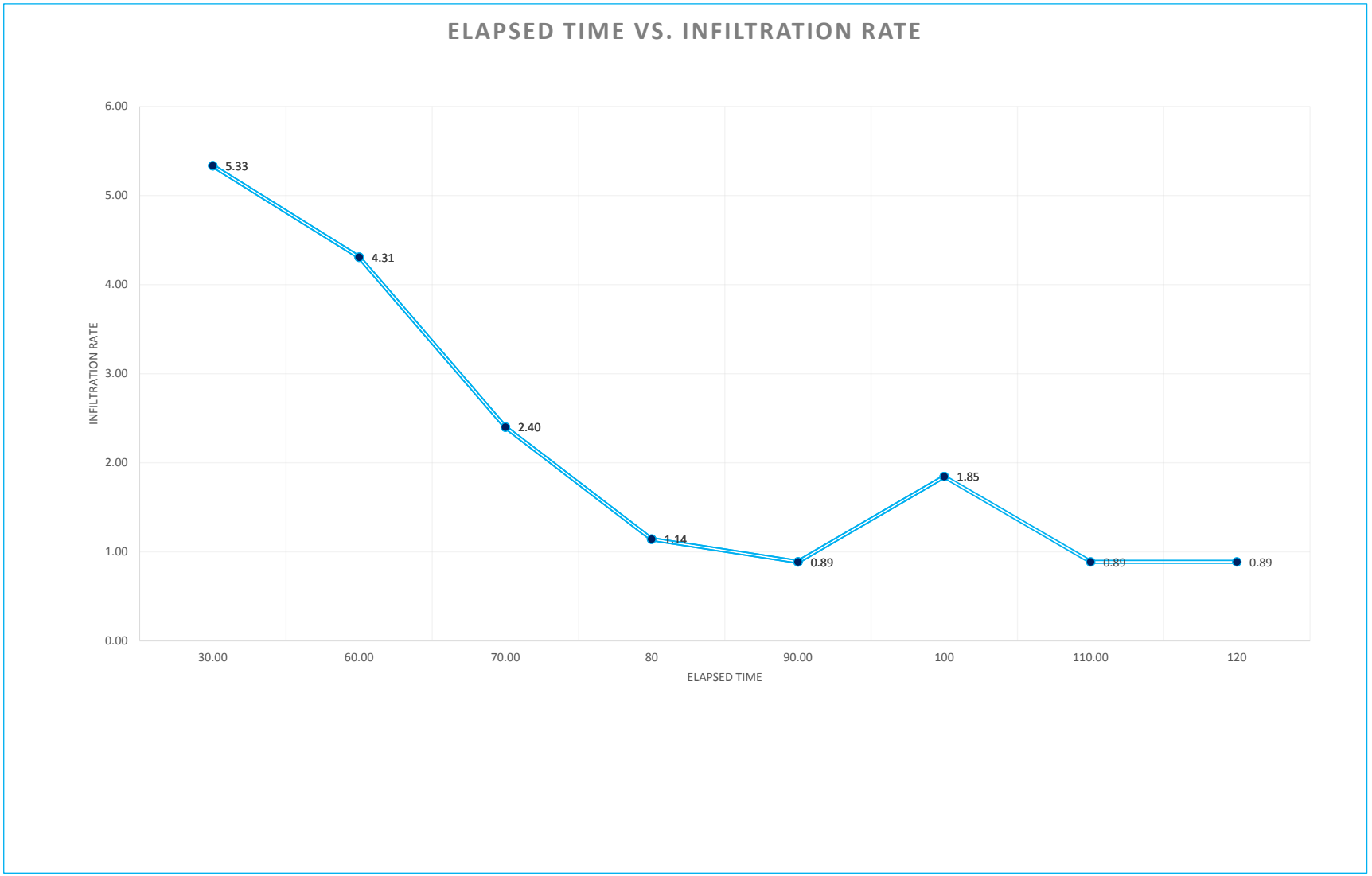
"Havg" is the average head height over the time interval.

$$It = \frac{\Delta H\ 60\ r}{\Delta t(r+2Havg)}$$

Time	Time Interval (min.)	Initial Water Level (Inches)	Final Water Level (Inches)	Water Level Drop (Inches)	Percolation Rate (Min./Inch)	Total Depth of Percolation Hole
10:57 11:27	30	72	80	8.00	4	80.00
11:27 11:57	30	72	79	7.00	5	80.00
11:57 12:07	10	68	70	2.00	5	77.00
12:07 12:17	10	68	69	1.00	10	77.00
12:17 12:27	10	65	66	1.00	10	77.00
12:27 12:37	10	65	67	2.00	5	77.00
12:37 12:47	10	65	66	1.00	10	77.00
12:47 12:57	10	65	66	1.00	10	77.00

Time interval Δt	Initial Water H_0	Final Water H_f	Total Depth of Test Hole D_t	Raduis of Perc Hole r	ΔH	H Avg		ΔH 60 r)/(Δt (r+2Havg)) It		ELAPSED TIME Δt
30.00	8.00	0.00	80.00	4.00	8.00	4.00		5.33		30.00
30.00	8.00	1.00	80.00	4.00	7.00	4.50		4.31		60.00
10.00	9.00	7.00	77.00	4.00	2.00	8.00		2.40		70.00
10.00	9.00	8.00	77.00	4.00	1.00	8.50		1.14		80.00
10.00	12.00	11.00	77.00	4.00	1.00	11.50		0.89		90.00
10.00	12.00	10.00	77.00	4.00	2.00	11.00		1.85		100.00
10.00	12.00	11.00	77.00	4.00	1.00	11.50		0.89		110.00
10.00	12.00	11.00	77.00	4.00	1.00	11.50		0.89		120.00

Job No.: 151064
Job Name: Millcreek Promenade
Test Hole Number: P-5



Job No.: 151064

Job Name: Millcreek Promenade

Tested By: RCG

Test Hole Number: P-6

Test Hole Diameter (inches): 8

Soil Classification: Silty SAND

Date Excavated: 4/11/2016

Test Hole Depth (ft): 7.3

Date Tested: 4/12/2016

Time Interval of Presoak

24 hours

Date / Time

Start 4/11/16 10:50

Stop 4/12/16 10:50

Amount of Water Used / Comments

20

"It" is the tested infiltration rate.

Time interval, Δt Initial Depth to Water, D_0

Final Depth to Water, D_f Total Depth of Test Hole, D_T

2Test Hole Radius, r

The conversion equation is used:

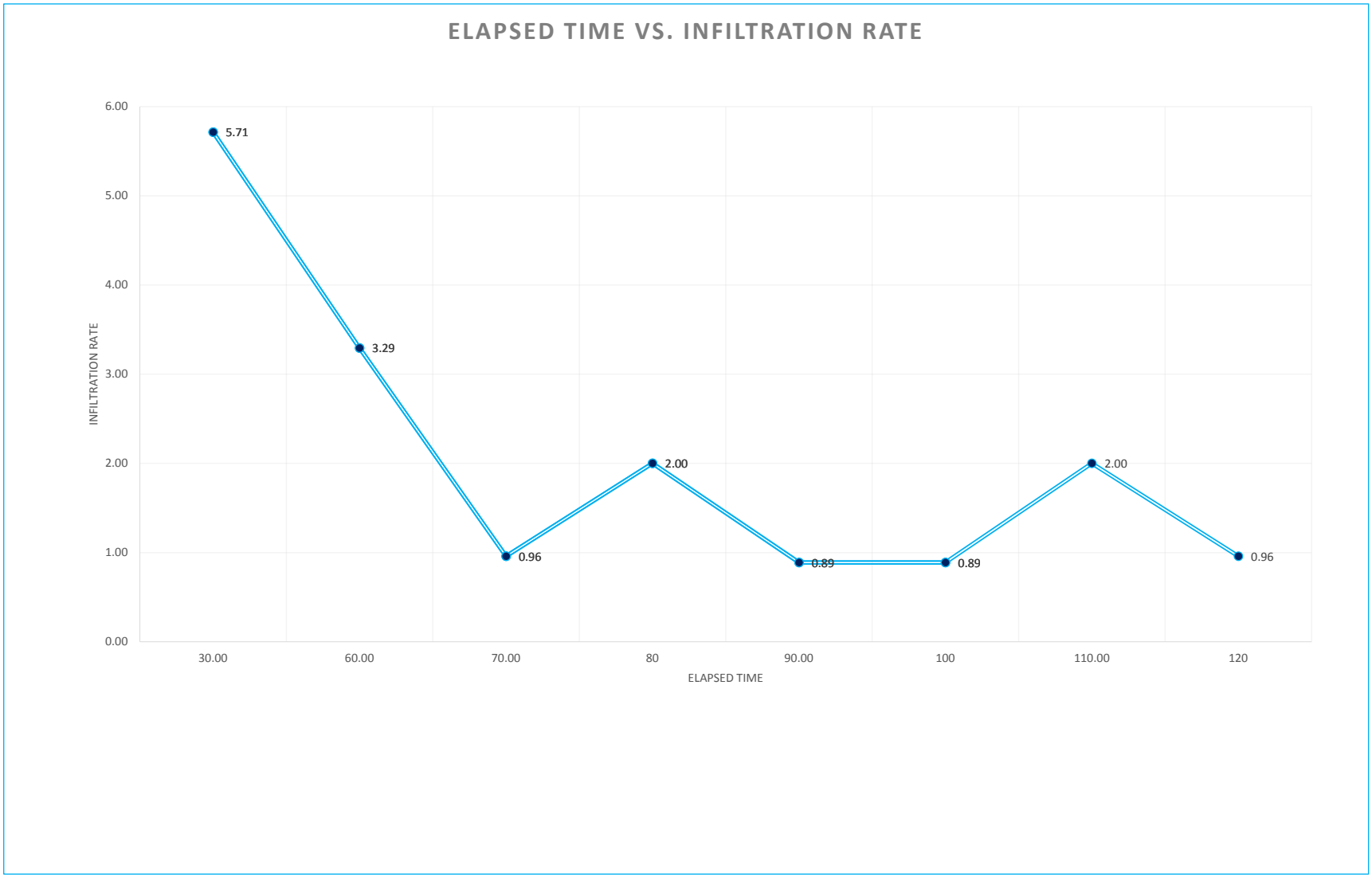
"Havg" is the average head height over the time interval.

$$It = \frac{\Delta H\ 60\ r}{\Delta t(r+2Havg)}$$

Time	*Time Interval (min.)*	*Initial Water Level (Inches)*	*Final Water Level (Inches)*	*Water Level Drop (Inches)*	*Percolation Rate (Min./Inch)*	*Total Depth of Percolation Hole*
10:58 11:28	30	76	86	10.00	3	86.00
11:28 11:58	30	76	83	7.00	5	86.00
11:58 12:08	10	74	75	1.00	10	85.00
12:08 12:18	10	74	76	2.00	5	85.00
12:18 12:28	10	73	74	1.00	10	85.00
12:28 12:38	10	73	74	1.00	10	85.00
12:38 12:48	10	73	75	2.00	5	84.00
12:48 12:58	10	73	74	1.00	10	84.00

Time interval Δt	*Initial Water H_0*	*Final Water H_f*	*Total Depth of Test Hole D_t*	*Raduis of Perc Hole r*	*ΔH*	*H Avg*		*ΔH 60 r)/(Δt (r+2Havg)) It*		*ELAPSED TIME Δt*
30.00	10.00	0.00	86.00	4.00	10.00	5.00		5.71		30.00
30.00	10.00	3.00	86.00	4.00	7.00	6.50		3.29		60.00
10.00	11.00	10.00	85.00	4.00	1.00	10.50		0.96		70.00
10.00	11.00	9.00	85.00	4.00	2.00	10.00		2.00		80.00
10.00	12.00	11.00	85.00	4.00	1.00	11.50		0.89		90.00
10.00	12.00	11.00	85.00	4.00	1.00	11.50		0.89		100.00
10.00	11.00	9.00	84.00	4.00	2.00	10.00		2.00		110.00
10.00	11.00	10.00	84.00	4.00	1.00	10.50		0.96		120.00

Job No.: 151064
Job Name: Millcreek Promenade
Test Hole Number: P-6



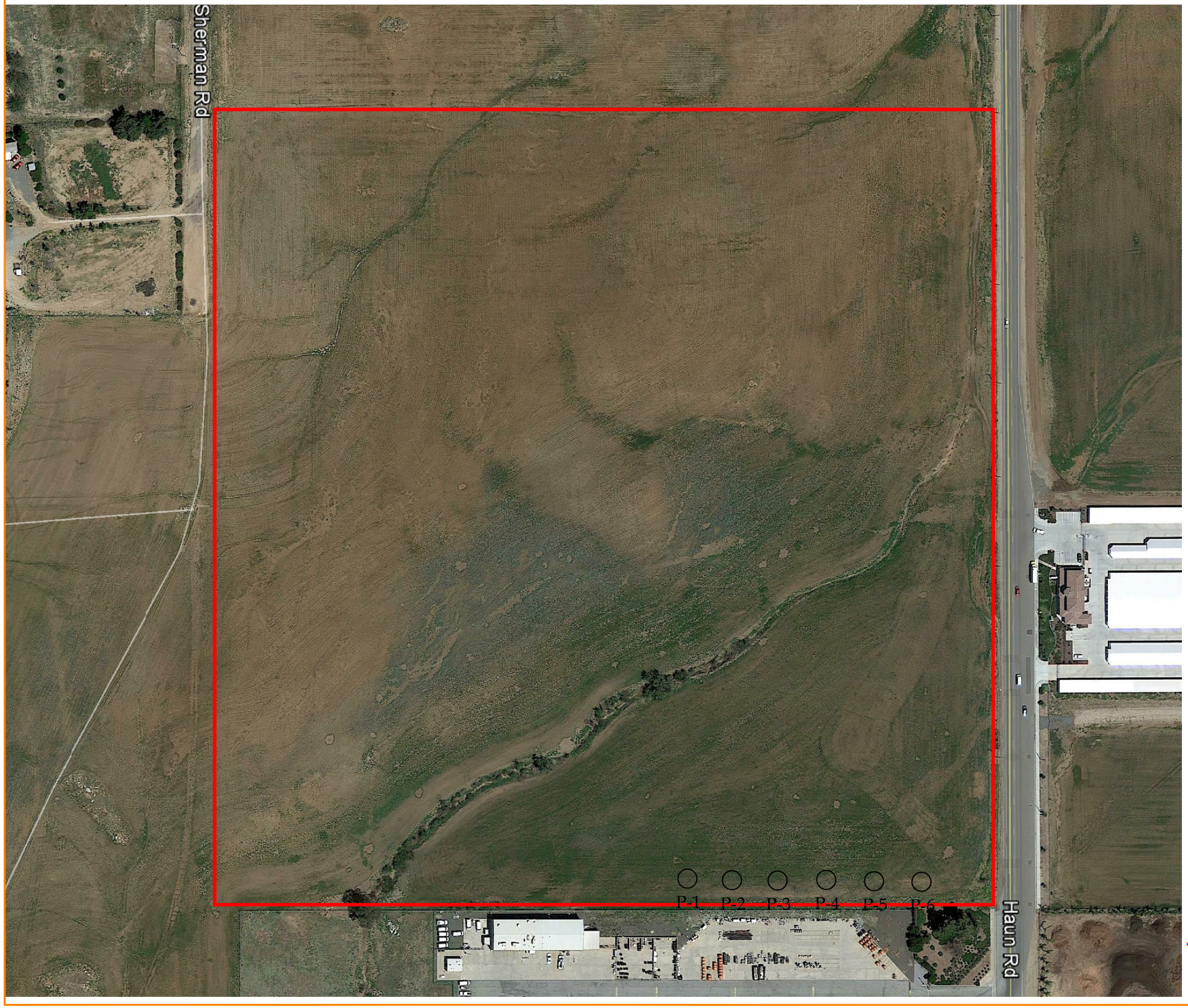
Geotechnical Boring Log MW-1

Date: March 16, 2016	**Project Name: Mill Creek Promenade** **Page: 1 of 1**
Project Number: 151064-11A	**Logged By: SNJ**
Drilling Company: Drilling It	**Type of Rig: CME45B**
Drive Weight (lbs): 140	**Drop (in): 30** **Hole Diameter (in): 8**
Top of Hole Elevation (ft): See Map	**Hole Location: See Percolation Location Map**

Depth (ft)	Blow Count Per Foot	Sample Depth	Dry Density (pcf)	Moisture (%)	Classification Symbol	MATERIAL DESCRIPTION
0						**<u>Quaternary Old Alluvial Deposits (Qof):</u>**
					SM	Silty SAND; dark brown, dry, dense, some coarse sand, mostly fine and medium sand,
						fine gravel
5						Orange/reddish brown, trace clay
10						
					SC	Clayey SAND; reddish brown, slightly moist, fine sand and clay nodules,
						some medium sand, gravel
15						Refusal
						End of Boring 15 feet
						No Groundwater
20						
25						
30						

42217 Rio Nedo Road, Suite A-104, Temecula, CA 92590

EARTH STRATA GEOTECHNICAL SERVICES, INC.



LEGEND

Locations are Approximate

Symbols

○ P-6 - infiltration Test Location

North

INFILTRATION LOCATION MAP

LOCATED SOUTHWEST OF GARBANI ROAD AND ON WEST SIDE OF HAUN ROAD

CITY OF MENIFEE, RIVERSIDE COUNTY, CALIFORNIA

APN 360-350-011 AND 360-350-017

PROJECT	PROPOSED MILLCREEK PROMENADE		
CLIENT	SHERMAN & HAUN, LLC		
PROJECT NO.	151064-12A		
DATE	JULY 2016		
SCALE	1:160		
DWG XREFS			
REVISION			
DRAWN BY	JDG	PLATE	1 OF 1

ESGS INC.

Geotechnical, Environmental, and Materials Testing Consultants