



ENTECH
ENGINEERING, INC.

505 ELKTON DRIVE
COLORADO SPRINGS, CO 80907
PHONE (719) 531-5599

June 13, 2024

WD Construction
919 W. Cucharras Street, Suite 100
Colorado Springs, Colorado 80905

Attn: Bill Tibbit

Re: Infiltration Rate Testing (Percolation Test Method)
10707 Maltese Point
El Paso County, Colorado
Entech Job No. 240324

Dear Mr. Tibbit:

As requested, personnel of Entech Engineering, Inc. have performed percolation testing at the above referenced site to evaluate the site soils to determine the infiltration rates for the proposed infiltration garden.

The testing was performed on June 6, 2024. The test locations are shown on Figure 1. The profile hole was placed in the center of the proposed infiltration garden, and the percolation holes (P1 and P2) were placed in the eastern and western sides of the infiltration garden. The Site and Exploration Plan is shown on Figure 1, the profile hole log, laboratory test results, and percolation test results, and infiltration rates are shown in Figures 2 through 5. Soils encountered in the profile and percolation holes consisted of silty sand overlying sand clay. Bedrock and groundwater were not encountered in the profile hole which was drilled to approximately 10 feet.

P1 – Infiltration Rate: the average percolation rate was 27 minutes/inch for P1, the percolation rates correspond to adjusted Infiltration Rate of 0.325 inches/hour. P2 – Infiltration Rate: the average percolation rate was 20 minutes/inch for P2, the percolation rates correspond to adjusted Infiltration Rate of 0.390 inches/hour. An overall average infiltration rate of 0.358 inches/hour should be used for the design of the infiltration garden. To achieve higher infiltration rates the use of a sand filter (minimum depth of 2') could be considered. For material specifications refer to Mile High Flood District – Urban Storm Drainage Criteria Manual Volume 3, Table 4-5 (Gradation Specifications for AASHTO M 43 Fine Aggregate (Filter Sand) https://mhfd.org/wp-content/uploads/2024/06/01_USDCM-Volume-3.pdf .

We trust that this has provided you with the information you required. If you have any questions or need additional information, please do not hesitate to contact us.

Respectfully Submitted,

ENTECH ENGINEERING, INC.

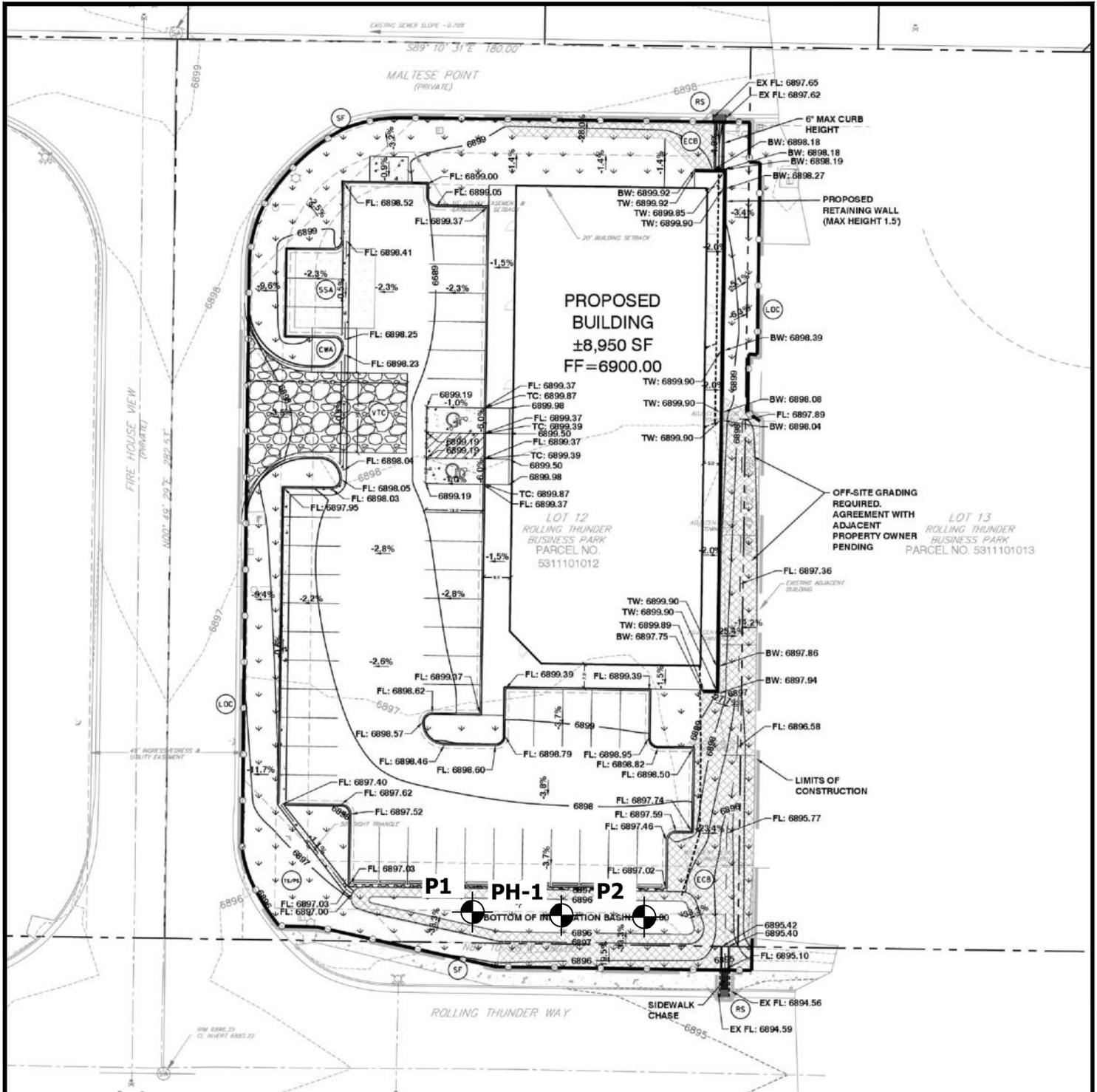
Logan L. Langford, P.G.
Sr. Geologist

Reviewed by:



Joseph C. Goode, Jr., P.E.
President

LLL
Encl.



 **PH-** APPROXIMATE PROFILE HOLE LOCATION AND NUMBER

 **P-** APPROXIMATE PERCOLATION TEST HOLE LOCATION



SITE AND EXPLORATION PLAN

10707 MALTESE POINT
WD CONSTRUCTION

JOB NO.
240324

FIG. 1

PROFILE HOLE 1
 DATE DRILLED 6/6/2024

REMARKS

DRY TO 10', 6/6/24

12" TOPSOIL

SAND, SILTY, BROWN to LIGHT
 BROWN, DENSE to MEDIUM
 DENSE, MOIST

CLAY, SANDY, GRAY, HARD,
 MOIST

Depth (ft)	Symbol	Samples	Blows per foot	Watercontent %
0 - 12"	(Dotted pattern)			
5	(Dotted pattern)		34	3.9
5	(Dotted pattern)		21	7.7
10	(Dotted pattern)		38	14.4
15				
20				



PROFILE HOLE LOG

10707 MALTESE POINT
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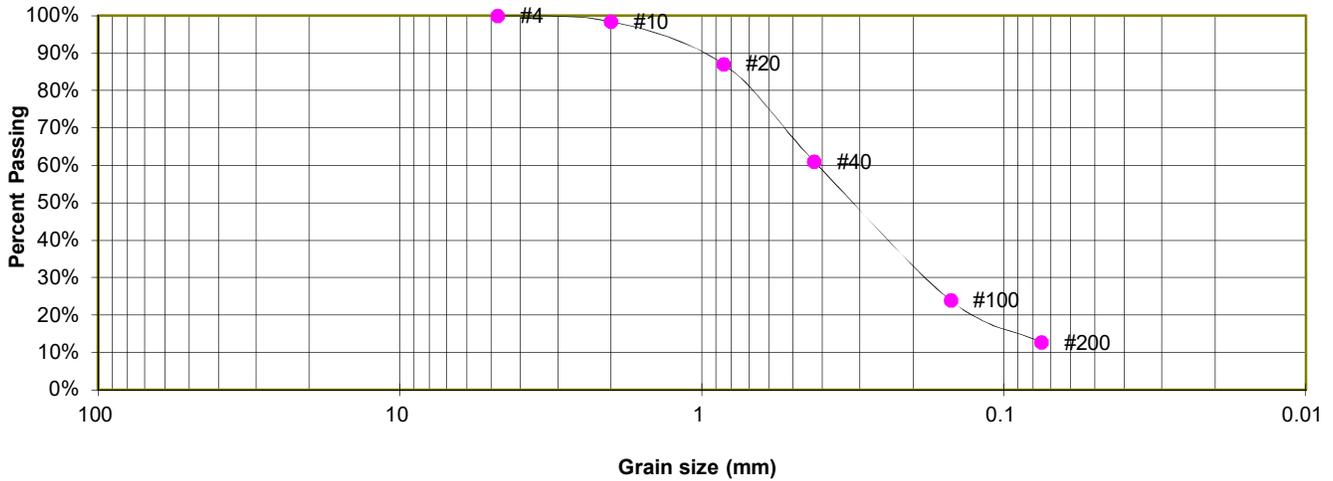
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FIG. 2

TEST BORING 1
DEPTH (FT) 2-3

SOIL DESCRIPTION SAND, SILTY

Sieve Analysis Grain Size Distribution



GRAIN SIZE ANALYSIS

U.S. Sieve #	Percent Finer
3"	
1 1/2"	
3/4"	
1/2"	
3/8"	
4	100.0%
10	98.5%
20	87.1%
40	61.1%
100	23.9%
200	12.7%

SOIL CLASSIFICATION

USCS CLASSIFICATION: SM

OL



LABORATORY TEST RESULTS

10707 MALTESE POINT
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FIG. 3

Client: WD Construction
Test Location: 10707 Maltese Point

Job Number: 240324

PERCOLATION HOLES

Date Holes Prepared: 6/6/2024

Hole No. 1

Depth: 29"

<u>Trial</u>	<u>Time (min.)</u>	<u>Water Level Change (in.)</u>
1	10	1/2
2	10	3/8
3	10	3/8

Hole No. 2

Depth: 29"

<u>Trial</u>	<u>Time (min.)</u>	<u>Water Level Change (in.)</u>
1	10	1/2
2	10	1/2
3	10	1/2

Perc Rate (min./in.): 27

Perc Rate (min./in.) 20

Average Perc Rate (min./in.) 24

PROFILE HOLE

Date Profile Hole Completed: 6/6/2024

Depth

0-9'

9-10'

Visual Classification

Sand, silty, brown to light brown

Clay, sandy, gray

Remarks

No Bedrock

No Groundwater

34 Blows / ft. @ 2'

21 Blows / ft. @ 4'

38 Blows / ft. @ 9'

Observer: L. Langford



PERCOLATION TEST RESULTS

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FIG. 4

Client: WD Construction
Test Location: 10707 Maltese Point

Job Number 240324

Infiltration Rate (I) = Percolation Rate (P) / Reduction Factor (R_f)
I = P / R_f

$$R_f = [(2d_1 - \Delta d) / \text{dia}] + 1$$

d₁ = initial water depth (in.)

Δd = final water level drop (in.)

dia = diameter of the percolation hole (in.)

Test No. P1 (PH-1)

Perc Rate 2.22 in/hr
diameter 8

P1 (inches)

d₁ = 23.5

Δd = 0.38

R_f = 6.8

Test No. P2 (PH-1)

Perc Rate 3 in/hr
diameter 8

P2 (inches)

d₁ = 27.0

Δd = 0.50

R_f = 7.7

I = 0.325 in/hr

I = 0.390 in/hr

I AVG = 0.358 in/hr



PERCOLATION TEST RESULTS
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FIG. 5