



December 13, 2024

**El Paso County**  
Planning and Community Development Department  
2880 International Circle, Suite 110  
Colorado Springs, CO 80910

Attn: Brad Walters  
Inspection Supervisor

**Re: Gulf Eagle Supply Site Development Plan – 1455 Selix Grove ((PPR1911, CON203)  
Stormwater Permanent Control Measure – Rain Garden Infiltration Letter  
M.V.E. Project No. 61078**

Dear Mr. Walters:

The stormwater Permanent Control Measure (PCM) for Gulf Eagle Supply Site located at 1455 Selix Grove, consists of three (3) private Rain Gardens (RG) with associated outlet structures. The information completed by Entech Engineering, Inc. concerning their percolation testing to determine infiltration rates for the existing Rain Gardens is attached. This Entech Engineering, Inc. letter report dated May 28, 2024 shows the average calculated Infiltration Rate (IR) to be 0.313 In/hr.

The Mile High Flood District , Chapter 3, 2.3 Attenuation of WQCV (BMP Drain Time) reads:

*'When pollutant removal is achieved primarily through filtration such as in a sand filter or rain garden BMP, MHFD still recommends an extended drain time to promote stability of the receiving stream. In addition to coneracting hydromodification, attenustion in filtering BMPs can also improve pollutant removal by increasing contact time, which aids adsorbtion/absorbtion processes. The minimum recommended drain time for post-construction BMP is 12 hours; however, this minimum value should only be used for BMPs where filtration is the primary treatment process, sometimes referred to as "filtration" BMPs.'*

The average IR used was 0.313 In/hr for the RG depth of each pond.

P1 (Middle Pond) Depth = 13 In @ 0.313 In/hr = 42 hr drain time

P2 (North Pond) Depth = 12 In @ 0.313 In/hr = 38 hr drain time

P3 (South Pond) Depth = 14 In @ 0.313 In/hr = 45 hr drain time.

**Engineers • Surveyors**  
**1903 Lelaray Street, Suite 200 • Colorado Springs, CO 80909 • Phone 719-635-5736**  
**Fax 719-635-5450 • e-mail mve@mvecivil.com**

The average IR is 42 hours for the RG's. This satisfies the recommended extended drain time to promote stability of the receiving stream and improves pollutant removal by increasing contact time which aids in adsorption/absorption processes. The average IR of 42 hours does not exceed the El Paso County Criteria mandated 72 hour maximum drain time.

The spillways shown on the approved Grading and Erosion Control Plans were removed during construction since the grades did not allow for the originally designed spillway depth. Excess flows that do not infiltrate and leave the rain gardens do so by sheet flow across the length of the walls acting as level spreaders. Numerous storm events over the last several years have not caused any erosion or damage to the rock between the rain gardens and the back of curb. It is MVE, Inc.'s determination that the removal of the spillways does not have an adverse effect and the intent of the original design is still met.

Statement Of Engineer In Responsible Charge:

I, Charles C. Crum, a registered Professional Engineer in the State of Colorado, in accordance with Sections 5.2 and 5.3 of the Bylaws and Rules of the State Board of Registration for Professional Engineers and Professional Land Surveyors, do hereby state and declare that I or a person under my responsible charge periodically observed the construction of the above mentioned project. Final Maintenance Items for ESQCP Closure of the Final Acceptance Punchlist by El Paso County – Department of Public Works – Storm Water Section dated 12-04-2023 have been completed and inspected by El Paso County and M.V.E., Inc. with the final constructed pond volumes field verified. All site storm water runoff enters the rain gardens pursuant to final grading and therefore the existing UD spread sheet was not changed for the as-built. My professional opinion is that the required Permanent Control Measures have been installed and are in general compliance with the approved Grading and Erosion Control Plan as filed with the El Paso County. Furthermore, the Rain Gardens are constructed with adequate Water Quality Capture Volumes (WQCV) as specified on the approved plans and Final Drainage Report for the project.

Respectfully Submitted,



Charles C. Crum, P.E. Colorado No. 13348  
For and on Behalf of M.V.E., Inc.

Enclosures: *Entech Engineering, Inc. - Infiltration Rate Testing - Letter*

cc: *Gulf Eagle Supply*

CCC:sh

Z:\61078\Documents\Correspondance\61078 - Rain Garden Infiltratin-20241213.odt



**ENTECH**  
ENGINEERING, INC.

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

May 28, 2024  
Revised October 31, 2024

Gulf Eagle Supply  
1455 Selix Grove  
Colorado Springs, Colorado 80915

Attn: Jeff Barnes

Re: Infiltration Rate Testing (Percolation Test Method)  
Gulf Eagle Supply  
1455 Selix Grove  
Colorado Springs, Colorado  
Entech Job No. 240644

Dear Mr. Barnes:

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 existing infiltration gardens.

The testing was performed on May 9, 2024. The test locations are shown on Figure 1. The southern infiltration garden (PH-1) and the northern infiltration garden (PH-2). Percolation test results, infiltration rates, and laboratory test results are shown in Figures 2 through 5. Soils encountered in the profile and percolation holes consisted of sand with silt. Bedrock was not encountered in PH-1 or PH-2. Groundwater was not encountered in the percolation holes which were drilled to approximately 3 feet.

Southern Infiltration Garden – 1455 Selix Grove

The average percolation rate was 26 minutes/inch for PH-1, The percolation rates correspond to adjusted Infiltration Rate of 0.28 inches/hour.

Northern Infiltration Garden – 1455 Selix Grove

The average percolation rate was 20 minutes/inch for PH-2, The percolation rates correspond to adjusted Infiltration Rate of 0.345 inches/hour.

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,

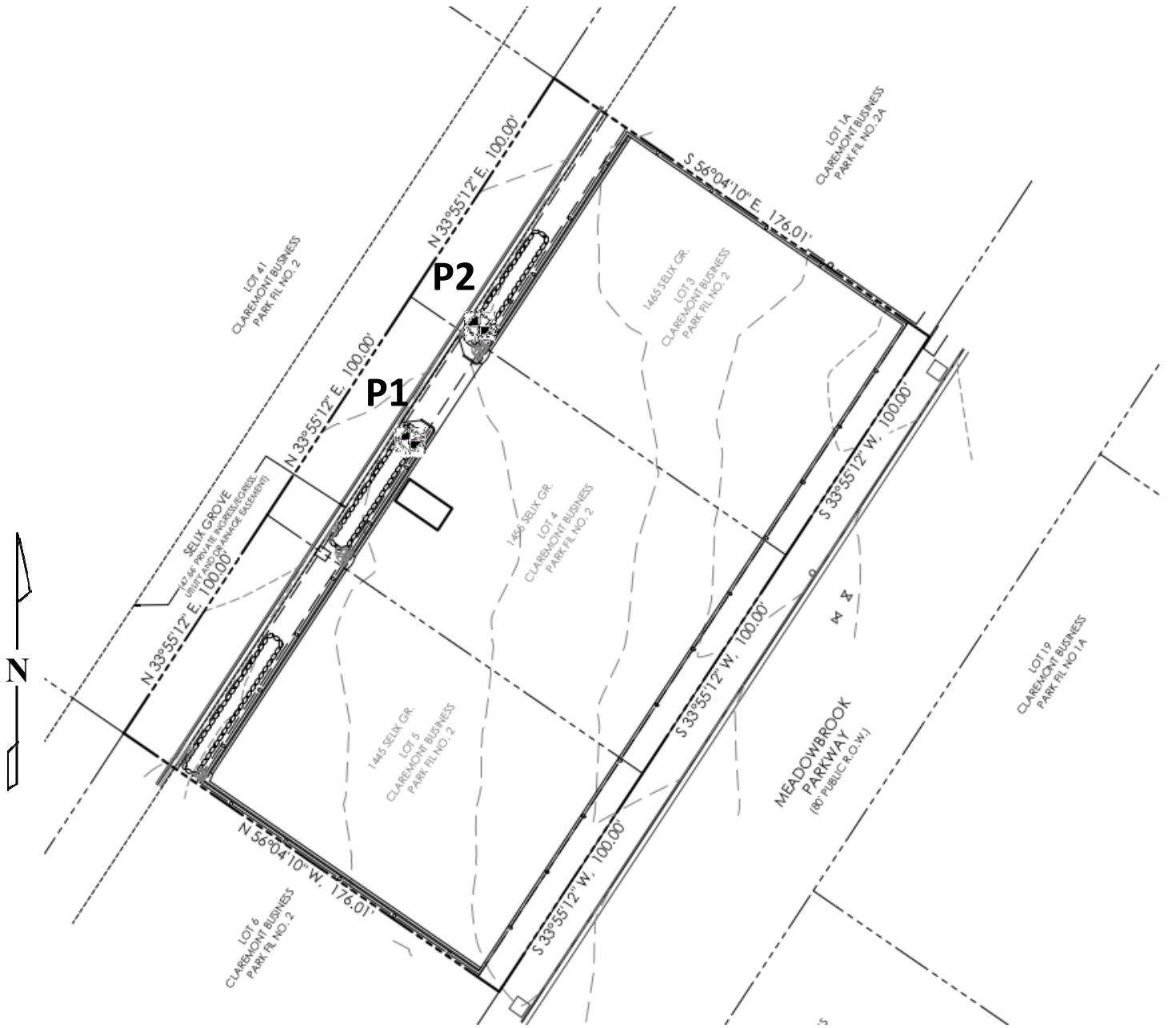
ENTECH ENGINEERING, INC.

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

Reviewed by:



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



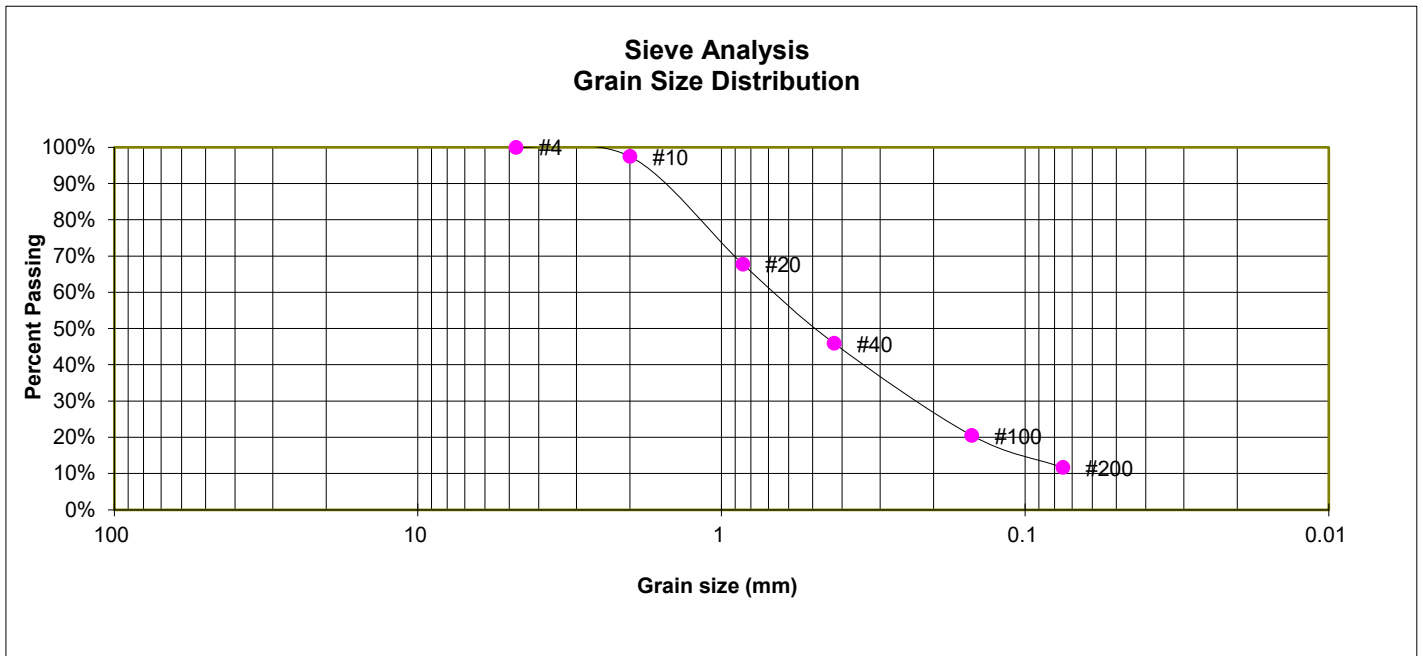
**INFILTRATION TEST RESULTS**

JOB NO.  
240644

**FIG. 1**

TEST BORING P1  
DEPTH (FT) 2

SOIL DESCRIPTION SAND, WITH SILT



**GRAIN SIZE ANALYSIS**

U.S. Sieve #	Percent Finer	
3"		
1 1/2"		
3/4"		
1/2"		
3/8"		
4	100.0%	
10	97.5%	
20	67.8%	
40	45.9%	SW-SM
100	20.5%	
200	11.7%	

**SOIL CLASSIFICATION**



**LABORATORY TEST RESULTS**

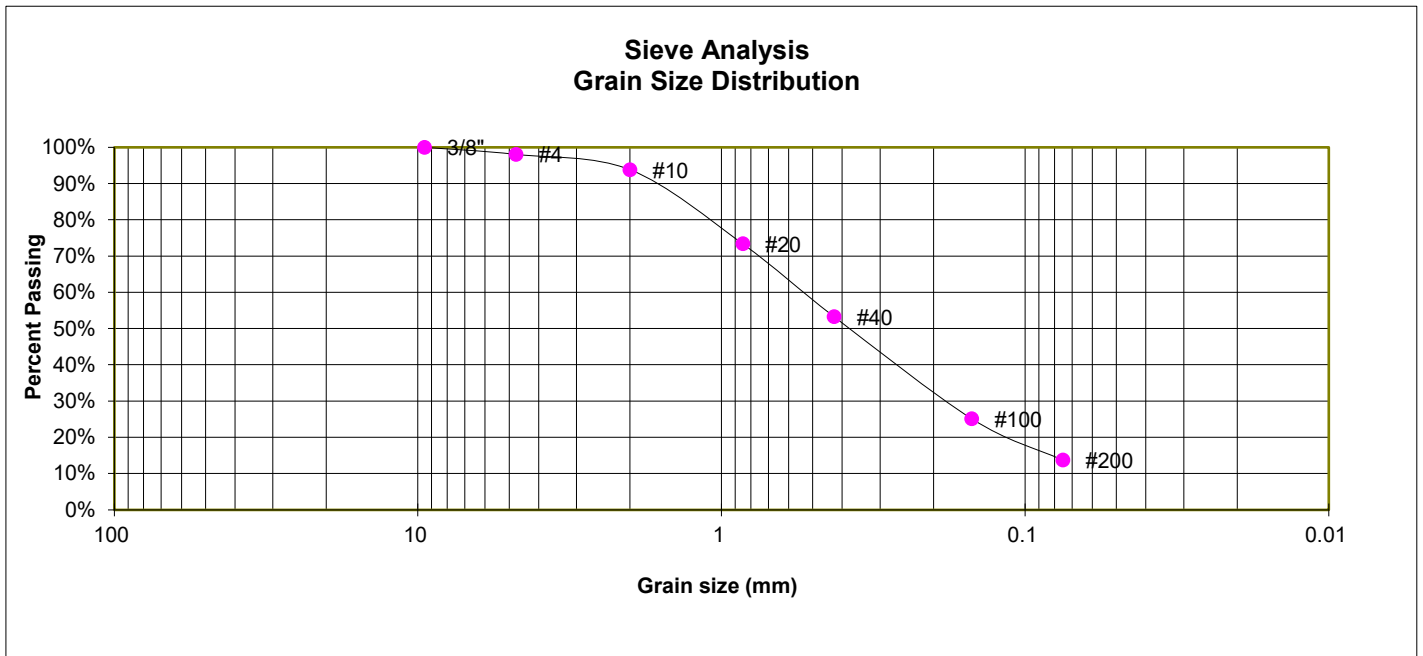
1455 SELIX GROVE  
GULF EAGLE SUPPLY

JOB NO.  
240644

**FIG. 2**

TEST BORING P2  
DEPTH (FT) 1

SOIL DESCRIPTION SAND, SILTY



**GRAIN SIZE ANALYSIS**

U.S. Sieve #	Percent Finer	
3"		
1 1/2"		
3/4"		
1/2"		
3/8"	100.0%	
4	98.1%	
10	93.8%	
20	73.4%	
40	53.2%	SM
100	25.2%	
200	13.7%	

**SOIL CLASSIFICATION**



**LABORATORY TEST RESULTS**

1455 SELIX GROVE  
GULF EAGLE SUPPLY

JOB NO.  
240644

**FIG. 3**

Client: Gulf Eagle Supply  
Test Location: 1455 Selix Gove

Job Number: 240644

### PERCOLATION HOLES

Date Holes Prepared: 5/9/2024

Date Hole Completed: 5/10/2024

Hole No. 1

Depth: 29"

Hole No. 2

Depth: 31"

<u>Trial</u>	<u>Time (min.)</u>	<u>Water Level Change (in.)</u>	<u>Trial</u>	<u>Time (min.)</u>	<u>Water Level Change (in.)</u>
1	10	3/8	1	10	3/4
2	10	5/8	2	10	1/4
3	10	1/8	3	10	1/2

Perc Rate (min./in.): 26

Perc Rate (min./in.): 20

Average Perc Rate (min./in.) 23

Observer: Lucas Morrison



PERCOLATION TEST RESULTS

JOB NO.  
240644  
**FIG. 4**

Client: Gulf Eagle Supply  
Test Location: 1455 Selix Grove

Job Number: 240644

**Infiltration Rate (I) = Percolation Rate (P)/ Reduction Factor(Rf)**  
**I=P/Rf**

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

$d_1$  = initial water depth (in.)

$\Delta d$  = final water level drop (in.)

dia = diameter of the percolation hole (in.)

**Test No. P1 (PH-1)**

Perc Rate 2.31 in/hr  
diameter 8

**P1** (inches)

$d_1 =$  29.0

$\Delta d =$  1/8

$R_f =$  8.2

**Test No. P2 (PH-2)**

Perc Rate 3.00 in/hr  
diameter 8

**P2** (inches)

$d_1 =$  31.0

$\Delta d =$  1/2

$R_f =$  8.7

**I = 0.280 in/hr**

**I = 0.345 in/hr**

**I AVG= 0.313 in/hr**



INFILTRATION TEST RESULTS

JOB NO.  
240644

**FIG. 5**