El Paso County, CO
Public Health
Prevent • Promote • Protect

Environmental Health Division

1675 W. Garden of the Gods Rd., Suite 2044
Colorado Springs, CO 80907
(719) 578-3199 *phone*
(719) 575-8664 *fax*
www.elpasocountyhealth.org

ENGINEERED ON-SITE WASTEWATER TREATMENT SYSTEM
FINAL INSPECTION FORM

P

On-site ID: ON0049966 | Tax schedule(APN) #: 6136004013 | Permit Type: New
Environmental Health Specialist: Neil Mayes | Final Inspection Date: 9/13/2019 | Approved: Yes

Residential Property Information:

Owner: Saddletree Holdings Inc Address: 15291 Longwall CT, Colorado Springs CO 80908 Approved No. Bedrooms: 4
Water supply: Well Well Installation verified: 9/13/2019 Well Location GPS: 39 03.115'N, 104 44.076'W

Approval will be revoked if in the future any well is found to be within 50 feet of the septic tank and/or 100 feet of the soil treatment area.

Minimum System Requirements:

High Rock Content: N/A **Soil (in-situ) Type**: 4 **LTAR (In-situ soil)**: 0.2 **Limiting Layer:** Groundwater: NONE Bedrock: 90"
OWTS Tank: Capacity (gallons): 1250 **OWTS Pump Tank:** Capacity (gallons): N/A
Soil Treatment Area (STA): Sq. Ft. (10-1): 2625 Sq. Ft. (10-2): 2625 Sq. Ft. (10-3): 1838 Sq. Ft. (with Diverter Valve): N/A
NDDS (STA): Sq. Ft. (10-1): N/A NDDS Factor: N/A Sq. Ft. (NDDS adjustment): N/A
Mound (STA): LTAR (imported soil): 0.8 Chamber adjustment: 0.7 Distribution Area: 525 Basal Area: 2178 (66' X 33')

Engineering:

Design Engineer: RMG Engineers **Engineer design #:** 168864
Date engineer record drawing/certification letter recieved: 12/9/2019
Tier II Licensesd Installer: Kunau Drilling, LLC

Final system installation:

Treatment Level: 1
Annual Operation and Maintenance Inspection: Not Required
OWTS Tank: GPS Location: 39 03.116'N, 104 44.110'W
Tank Type: New Concrete Capacity (gallon): 1500
OWTS Pump Tank:
Tank Type: NA Capacity (gallon): N/A Audio/Visual Alarm: N/A
OWTS Pump: N/A
Gal/dose: Flow(gpm): Click or tap here to enter text. Total Dynamic Head: Click or tap here to enter text.
Soil Treatment Area (STA): GPS Location: 38 03.125'N, 104 44.126'W Total Sq. Ft installed: 540
Configuration: Trench Distribution: Gravity
Distribution Media: Chambers Infiltrative Surface Depth: 12 – 36"
Distribution Area Length: 616' Distribution Area Width: 3'
Basal Area Length: N/A Basal Area Width: N/A
Media Type: Q4 LP (12 sq/ft) Total installed: 154 chambers

Notes:

E
ON0049966
6136004013
9/13/2019

Architecture
Structural
Geotechnical

RMG

Materials Testing
Forensic
Civil/Planning

ROCKY MOUNTAIN GROUP
EMPLOYEE OWNED

Job No. 168864

November 19, 2019

El Paso County Health Department
1675 Garden of the Gods Road, Suite 2044
Colorado Springs, Colorado 80907

Re: Final Onsite Wastewater Observations
15291 Longwall Ct
Lot 45, Flying Horse North, Filing No. 1
El Paso County, Colorado

Ref: OWTS Design plan by RMG, last dated February 28, 2019 Job No. 168864.
OWTS Record Drawing by RMG, last dated November 19, 2019 Job No. 168864
Drain Trench plan by RMG, last dated November 5, 2019 Job No. 168864.

To Whom It May Concern:

Personnel of RMG – Rocky Mountain Group have observed the visible components used to construct the engineered Onsite Wastewater Treatment System (OWTS) on August 13, 2019 and the final grading observation on November 15, 2019 at the above referenced site.

The OWTS design referenced above indicated the use of Infiltrator Quick4 Standard chambers. The contractor elected to install Infiltrator Quick4 Plus (low profile) chambers. These substitute chambers are considered to be generally equivalent in treatment area size and function. As such, it is our opinion that this field modification is acceptable.

The OWTS components observed by RMG were found to be installed in substantial conformance with the engineered plans and specifications (referenced above), as well as any engineer approved field modifications described herein.

At the time of the August 13 observation, active ground water seepage was observed in the side wall of the upper most trench. A Drain Trench plan (referenced above) was completed by RMG. The drain trench was observed on November 15, 2019 and was found to be in substantial conformance with the plans and specifications.

At the time of our observations, the downspouts were installed and are discharging to locations that are not anticipated to adversely affect the soil treatment area. The placement of topsoil/landscaping had not been completed. This remains the responsibility of the owner and/or builder. Erosion of the backfill may occur until vegetative cover is established. Future

landscaping should be installed in such a way that all surface water is directed away from the soil treatment area.

Also at the time of our final observation, the backfill materials were relatively unconsolidated. Settlement of these unconsolidated materials may occur over time. Corrective actions remain the responsibility of the owner/builder.

This letter is provided as documentation of RMG's review of the installed system and recommendations for approval. However, determination of final acceptance of the system is to be made by the El Paso County Health Department, based on their review of the system and the recommendations contained within this report.

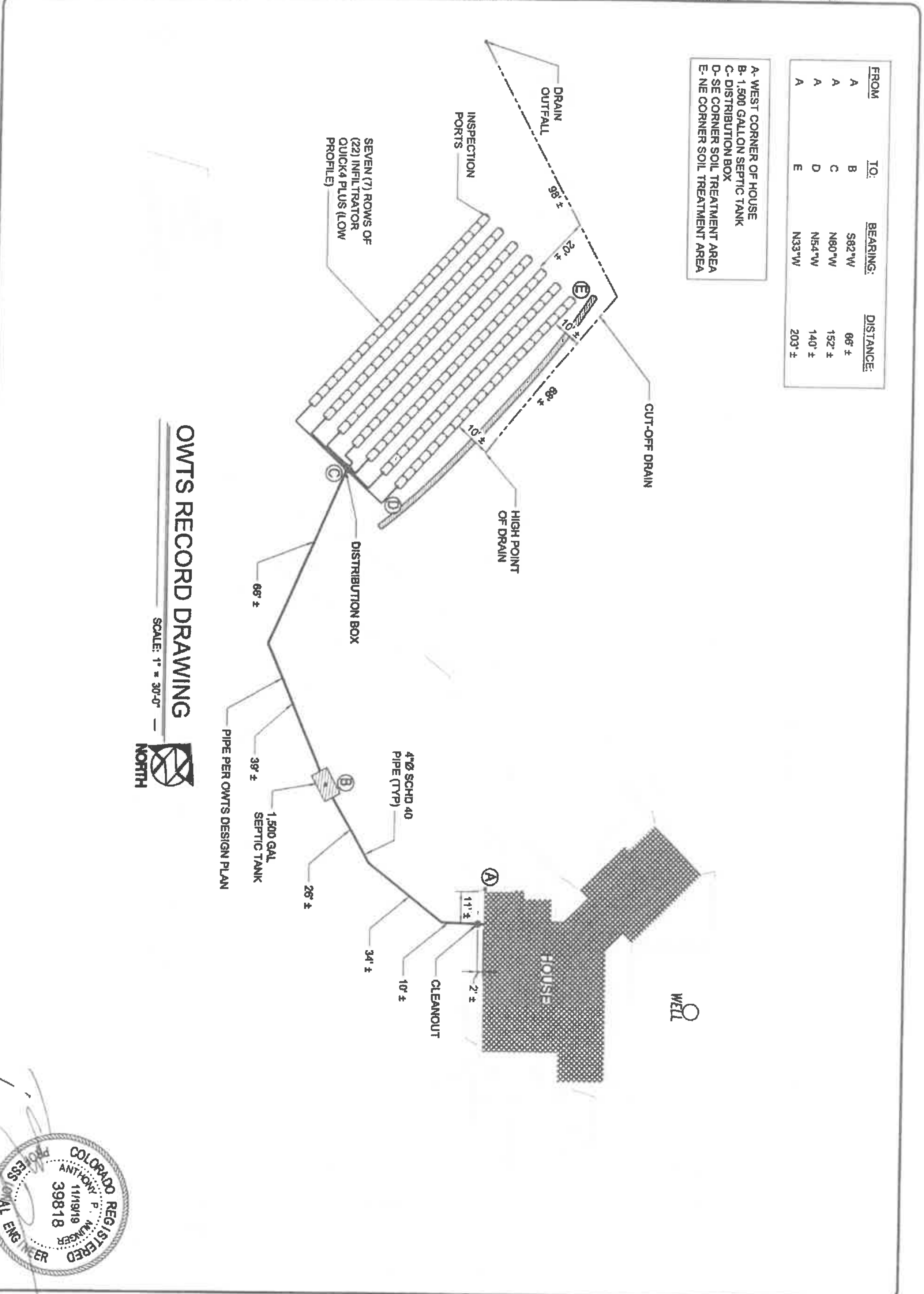
I hope this provides the information you have requested. Should you have questions, please feel free to contact our office.

Cordially,

RMG – Rocky Mountain Group

Tony Munger, P.E.
Geotechnical Project Manager

CC: Saddletree Holdings, Inc
1821 Austin Bluffs Pkwy
Colorado Springs, CO 80918


FROM: TO: BEARING: DISTANCE:
A B S82°W 66' ±
A C N60°W 152' ±
A D N54°W 140' ±
A E N33°W 203' ±
A- WEST CORNER OF HOUSE
B- 1,500 GALLON SEPTIC TANK
C- DISTRIBUTION BOX
D- SE CORNER SOIL TREATMENT AREA
E- NE CORNER SOIL TREATMENT AREA
DRAIN OUTFALL
INSPECTION PORTS
SEVEN (7) ROWS OF (22) INFILTRATOR QUICK4 PLUS (LOW PROFILE)
CUT-OFF DRAIN
HIGH POINT OF DRAIN
DISTRIBUTION BOX
98' ±
20' ±
10' ±
88' ±
10' ±
68' ±
39' ±
26' ±
34' ±
10' ±
11' ±
2' ±
4"Ø SCHD 40 PIPE (TYP)
1,500 GAL SEPTIC TANK
PIPE PER OWTS DESIGN PLAN
CLEANOUT
HOUSE
WELL
OWTS RECORD DRAWING
SCALE: 1" = 30'-0"
NORTH
COLORADO REGISTERED PROFESSIONAL ENGINEER
ANTHONY P. MUNGER
11/19/19
39818

ARCHIVING:	TPM
DRAWN:	FHZ
CHECKED:	JGL
# REVISION	DATE
DATE	11-19-19
JOB NO.	168864
SHEET NAME	OWTS RECORD DRAWING
SHEET NO.	S1 of 1

OWTS RECORD DRAWING

15291 LONGWALL COURT
LOT 45, FLYING HORSE NORTH FILING No.1
EL PASO COUNTY, COLORADO

SADDLETREE HOMES

ROCKY MOUNTAIN GROUP
Architectural Structural Forensics
ARCHITECTS RMG ENGINEERS
Geotechnical Materials, Testing Civil, Planning
SOUTHERN COLORADO
2910 AUSTIN BLUFFS PKWY, SUITE 100, COLORADO SPRINGS, CO 80918
(719) 548-0600 ~ WWW.RMGENGINEERS.COM
SOUTHERN COLORADO, DENVER METRO, NORTHERN COLORADO

Notify Environmental Health of any change of ownership, type of business activity, business name, or billing address by calling (719) 578-3199. Failure to notify Environmental Health may result in late penalties, Permit/License denial or revocation, and business closure. PERMITS/LICENSES TO OPERATE AND ANNUAL FEE PAYMENTS ARE NOT TRANSFERABLE. Permits become void on change of ownership. New owners must apply and pay for a new Permit(s)/License(s) prior to beginning operation.

Attn: SADDLETREE HOLDINGS INC
15291 LONGWALL CT
COLORADO SPRINGS, CO 80908

El Paso County, CO
Public Health
Prevent • Promote • Protect

EL PASO COUNTY PUBLIC HEALTH
ENVIRONMENTAL HEALTH DIVISION
1675 W. GARDEN OF THE GODS ROAD, SUITE 2044
COLORADO SPRINGS, CO 80907
PHONE: (719) 578-3199 FAX: (719) 578-3188
www.elpasocountyhealth.org

NEW SYSTEM PERMIT - OWTS

Valid From 3/22/2019 To 3/22/2020

PERMITEE : SADDLETREE HOLDINGS INC
15291 LONGWALL CT
COLORADO SPRINGS, CO 80908

OWNER NAME : SADDLETREE HOLDINGS INC

Onsite ID: ON0049966
Tax Schedule # : 6136004013
Permit Issue Date: 03/22/2019
Dwelling Type: RESIDENTIAL
# of Bedrooms (if Res): 4
Proposed Use (if Comm):
Designed Gallons/Day:
Water Source: PRIVATE WELL

System Installation Requirements:

Thursday, March 21, 2019 11:29 AM - BRYAN MONTOYA
- An Engineered OWTS system to be installed on site due to encountering bedrock at 90" and USDA Soil Type 4, requiring a Tier II licensed installer.
- System installation to include gravity chambers in trenches, max installation depth of 42" due to bedrock. Minimum tank requirements 1250 gallon and 1838 sq ft of soil treatment area (154 Q4 / 123 ARC 36 required).
- The system must be installed per approved Rocky Mountain Group (RMG) design document #168864 stamped and dated 28 Feb. 2019, changes to the approved design document must be submitted and approved by both the engineer and Public Health prior to installation.
- All horizontal setbacks must be maintained through system installation. In addition, system must remain completely uncovered, including the tank size, for final inspection.
- The well must be installed at time of final inspection, or final approval will not be given until well installation is verified. Must maintain 100' set back to all wells on property or neighboring property.
- Engineered systems require the as built drawing and certification letter from the engineer be submitted to Public Health prior to final approval and Regional Building sign off
- Ensure that all work is completed prior to contacting and requesting final line for inspection, otherwise additional fees may be incurred.

Notify Environmental Health of any change of ownership, type of business activity, business name, or billing address by calling (719) 578-3199. Failure to notify Environmental Health may result in late penalties, Permit/License denial or revocation, and business closure. PERMITS/LICENSES TO OPERATE AND ANNUAL FEE PAYMENTS ARE NOT TRANSFERABLE. Permits become void on change of ownership. New owners must apply and pay for a new Permit(s)/License(s) prior to beginning operation.

Attn: SADDLETREE HOLDINGS INC
15291 LONGWALL CT
COLORADO SPRINGS, CO 80908

El Paso County, CO
Public Health
Prevent • Promote • Protect

EL PASO COUNTY PUBLIC HEALTH
ENVIRONMENTAL HEALTH DIVISION
1675 W. GARDEN OF THE GODS ROAD, SUITE 2044
COLORADO SPRINGS, CO 80907
PHONE: (719) 578-3199 FAX: (719) 578-3188
www.elpasocountyhealth.org

This permit is issued in accordance with 25-10-106 Colorado Revised Statutes. The PERMIT EXPIRES upon completion/installation of the Onsite Wastewater Treatment System, or at the end of twelve (12) months from date of issue, whichever occurs first. If both a Building Permit and an Onsite Wastewater Treatment System Permit are issued for the same property and construction has not commenced prior to the expiration date of the Building Permit, the Onsite Wastewater Permit shall expire at the same time as the Building Permit. This permit is revocable if all stated requirements are not met. The Onsite Wastewater Treatment System must be installed by an El Paso County Licensed System Contractor, or the property owner.

The Health Officer shall assume no responsibility in case of failure or inadequacy of an Onsite Wastewater Treatment System, beyond consulting in good faith with the property owner or representative. Access to the property shall be authorized at reasonable time for the purpose of making such inspections as are necessary to determine compliance with the requirements of this law (permit).

Inspection request line: Call (719) 575-8699 before 3:30 p.m. the business day prior to the requested inspection date.

Authorized By: Environmental Health Specialist

El Paso County, CO
Public Health
Prevent • Promote • Protect

Environmental Health Division

1675 W. Garden of the Gods Rd., Suite 2044
Colorado Springs, CO 80907
(719) 578-3199 *phone*
(719) 578-3188 *fax*
www.elpasocountyhealth.org

SB0011249 AB0015237 ON0049966

APPLICATION FOR AN ON-SITE WASTEWATER TREATMENT SYSTEM PERMIT

Property Information:

Property Address: 15291 Longwall Ct City and Zip: Colo Spgs, 80908
Legal Description: Lot 45 Flying Horse N Fil no 1
Tax Schedule #: 6136004013 Lot size: 3.73
Is the property gated: ☐ Yes ☒ No Please provide a gate code if necessary: _____
Site Located Inside City Limits: ☐ Yes ☒ No Proposed Use: ☒ Residential ☐ Commercial
Water Supply: ☒ Well ☐ Cistern ☐ Municipal *Potential* Number of Bedrooms: 4
Has a Conditional Acceptance Document been issued for this property: ☐ Yes ☐ No ☒ Unsure

Owner Information: ☒ Primary Contact

Owner: Saddletree Holdings Inc Daytime Phone: 719-351-6870
Owners Mailing Address: 1821 Austin Bluffs Pkwy
Email Address: vincent@saddletreehomes.com Fax #: _____
General Contractor: Vincent Grabowski Phone/Email: 719-351-6870

OWTS Installer Information: ☒ Primary Contact

System Installer: Kunau Daytime Phone: 719-683-3720
Email Address: mskunau@gmail.com Licensed installer: ☐ Tier 1 ☒ Tier 2

All engineer-design systems *must* be installed by a Tier 2 licensed installer

CURRENT FEES AS APPROVED BY THE El PASO COUNTY BOARD OF HEALTH

All Payments are due at the time of application submittal; by cash, check or major credit card (Visa / MC)

- ☐ **New Permit:** $750.00 (EPCPH Charge) + $147.00 (EPC Planning Dept. Surcharge) + $23.00 (CDPHE Surcharge) = **$920.00**
- ☐ **Modification Permit:** $675.00 (EPCPH Charge) + $23.00 (CDPHE Surcharge) = **$698.00**
- ☐ **Major Repair Permit:** $535.00 (EPCPH Charge) + $23.00 (CDPHE Surcharge) = **$558.00**
- ☐ **Minor Repair Permit:** $245.00 (EPCPH Charge) + $23.00 (CDPHE Surcharge) = **$268.00**

Permits expire one year from date of issuance, unless otherwise noted

***REQUIRED:* Provide a complete written scope of work to be performed on the property.**

Septic system will be installed for new residential construction.

The following documents MUST be included with your application.

- A soils report: including at least 1 soil profile excavation pit, in accordance with section 8.5 A-F of OWTS regulations
- A clear and legible design document: including the proposed and alternate locations, as well as system layout, labeled with all setbacks to pertinent structures and features in table 7-1.
- Provide directions to property, from a main highway, on the backside of application.

Failure to provide the above listed documents may result in denial of the permit application

I certify that the information provided on this application is in compliance with Section 8.3, Chapter 8 of the Onsite Wastewater System (OWS) Regulations of the El Paso County Board of Health. I also authorize the assigned representative of El Paso County Public Health to enter onto this property in order to obtain information necessary for the issuance of a permit.

Applicants Signature: _____ Date: 3-11-19

Bryan

- Property address or lot number must be clearly marked and visible from the road.
- Profile excavation test pit and/or soil profile holes must be clearly marked
- Proposed and alternate soil treatment areas must be protected from compaction and disturbance
- Locked gates require the gate code or lock combination be provided on front of application
- Please provide directions to the property from a main highway, by text or picture, below.

Failure to comply with the above information may result in an additional charge for a return trip.

Permit #: ON00049966 Site Inspection date: 26 MARCH 2019

Date Approvals Rcvd: Development Services: 15 MARCH 2019 Floodplain/enumerations: 18 MARCH 2019

Design: ☐ Conventional ☒ Engineer Design Engineer: Rocky Mountain Group (RMR)

Engineer Job #: 168864 Engineer Date Stamped: 28 FEB. 2019

LTAR/Soil Type: 0.24 / Groundwater: — PP1/ — PP2 Bedrock: 96" PP1/ 96" PP2

Minimum Requirements: Tank Capacity: 1250 Soil Treatment Area: 1838 ft²

System Feed: ☒ Gravity ☐ Pump to Gravity ☐ Pressure Dosed ☐ Other:

System Media: ☒ Chambers ☐ Rock and Pipe ☐ Other Soil Treatment Area: ☒ Trenches ☐ Bed

Pump specs: Tank capacity: ____ gal Gal/dose: ____ Flow: ____ gpm Total Dynamic Head: ____'

Additional Comments: $Q = (3\ \text{BED} \times 2\ \text{PPL}) \times 75\ \text{GPD} + 75\ \text{GPD} = 525\ \text{GPD}$ $A = Q/\text{LTAR} = \frac{525}{0.24} = 2,625\ \text{ft}^2$

ADJUSTMENTS: (1.4 TRENCH)(0.7 CHAMBERS) $\times 2,625\ \text{ft}^2 = 1837.5 \approx 1838\ \text{ft}^2$

INFILTRATORS: 12 ft²/CHAMBER $1838\ \text{ft}^2 / 12\ \text{ft}^2 = 153.167$ USE: 154 INFILTRATOR 4/4+

E.H. Specialist: NEITS/RS Date: 21 MARCH 2019 ☒ Approved ☐ Denied

Reviewed 1.3.2019 approved fee (12/19/2018)

ARCHITECTS RMG ENGINEERS

ROCKY MOUNTAIN GROUP

Job No. 168864

Date: February 28, 2019

Saddletree Holdings, Inc
1821 Austin Bluffs Pkwy
Colorado Springs, CO 80918

Re: Onsite Wastewater Treatment System Evaluation
15291 Longwall Ct.
Lot 45, Flying Horse North, Filing No.1
El Paso County, Colorado

Dear Saddletree Holdings Inc.:

As requested, personnel of RMG – Rocky Mountain Group have performed a preliminary investigation, reconnaissance, and site evaluation at the above referenced address. The purpose of this preliminary investigation and the site evaluation is to provide recommendations for an Onsite Wastewater Treatment System (OWTS). During the inspection, a total of two 8-foot deep test pits (TP) were excavated in the vicinity of the proposed treatment area and as indicated on sheet S2 of the OWTS design.

PRELIMINARY INVESTIGATION:

The purpose of our preliminary investigation was to review publically available and documented information related to the site. RMG has reviewed the above referenced site plan, identified the soil conditions anticipated to be encountered during construction of the proposed OWTS, and included a review of documented National Resource Conservation Service (NRCS) data provided by websoilsurvey.nrcs.usda.gov.

It is our understanding that a 4 bedroom single family residence is proposed at this site.

Based on the information provided by the client, the proposed treatment area is to be located to the north and west of the proposed residence.

The soil conditions as indicated by the NRCS data referenced above are anticipated to consist of Elbeth sandy loam. The Elbeth sandy loam designation has a typical profile of sandy loam to loamy sand from 0 to 23 inches overlying sandy clay loam from 23 to 74 inches below the existing ground surface.

A review of FEMA Map No. 08041C0315G indicates that the proposed treatment area is not located within an identified flood plain.

21 MARCH 2019

Based on the preliminary information available for review, an estimated treatment size of 1,800 square feet is anticipated. This estimate was used in locating the field and profile pit excavations only and should not be considered part of the final design. Refer to the OWTS Design document for treatment area, size, and location.

Site conditions exposed during the Reconnaissance Visit and Detailed Soil Evaluation may vary from the preliminary investigation.

RECONNAISSANCE VISIT:

Personnel of RMG performed a reconnaissance visit on February 6, 2019. The purpose of this reconnaissance visit was to evaluate the site surface characteristics including landscape position, topography, vegetation, natural and cultural features, and current and historic land uses.

The site surface characteristics were observed to consist of low lying grasses, weeds and moderately dense to dense pine forest. The site generally slopes down to the west at approximately 6 to 10 percent from the location of the proposed residence. The proposed treatment area is to be located approximately 180 feet to the north and west of the proposed residence.

No significant drainage swales, man-made cuts, or streams or waterways that would impact the treatment area were observed in the immediate vicinity of the treatment area.

The proposed well is located approximately 35 feet to the east of the proposed residence and is indicated on sheet S2 of the OWTS Design document. The proposed soil treatment area is located over 200 feet from the proposed well location. No existing wells were observed within 100 feet of the proposed soil treatment area.

DETAILED SOIL EVALUATION:

Personnel of RMG performed a detailed soil evaluation of two 8-foot deep test pit excavations, on February 6, 2019 (Test Pits TP-1 and TP-2), utilizing the visual and tactile method for the evaluation of the site soils. The soil profiles observed in the test pits are presented in the attached Figure 1. The location of the test pit excavations are shown on sheet S2 of the OWTS Design document.

Bedrock was encountered at a depth of 7.5 feet in both test pits. The bedrock is considered a limiting layer. Groundwater was not encountered in the test pits. If groundwater and/or bedrock are encountered at shallower depths during construction of the OWTS, RMG should be contacted prior to proceeding.

Redoximorphic features indicating the fluctuation of groundwater or higher ground water levels were not observed in the test pits.

The depth of the infiltrative surface is provided in the recommendations section of this report.

There are no foreseeable or stated construction related issues or land use changes at this time.

21 March 2019

RECOMMENDATIONS:

It is recommended that the treatment area be located in the vicinity of the test pits. Based on our observations, a long-term acceptance rate (LTAR) of 0.20 shall be used for the design of a Treatment Level 1 OWTS. The infiltrative surface shall be placed 2 to 3 feet below the existing grade to maintain separation from any potential bedrock. There shall be a minimum cover of 1 foot (12 inches) over all OWTS components. If the minimum or maximum depth to infiltrative surface cannot be maintained, the contractor/owner shall contact this office for revised recommendations prior to proceeding with the construction of the OWTS. Reference manufacturer's installation instructions for all components specified in the engineer designed OWTS Design document.

LIMITATIONS:

This report is only valid in conjunction with the OWTS Design document engineered by RMG. The recommendations provided in this report are based upon the subsurface conditions observed in the profile pit excavations and accepted engineering procedures. The subsurface conditions encountered in the excavation for the treatment area may vary from those encountered in the profile pit excavations. Therefore, depth to limiting or restrictive conditions, bedrock, and groundwater may be different from the results reported in this letter. If subsurface conditions encountered in the OWTS treatment area differ from those indicated in this report, or problems arise, RMG should be retained to review the subsurface conditions prior to any work being performed or completed.

Should you have questions or require additional information, please do not hesitate to call.

Cordially,

RMG – Rocky Mountain Group

Tony Munger, P.E.
Geotechnical Project Manager

21 March 2019

TEST PIT TP-1

DATE OBSERVED: 2/6/19

SOIL DESCRIPTION	DEPTH (FT)	SYMBOL	SOIL TYPE
0 - 1.5 FT SANDY LOAM (MODERATE)			2
1.5 FT - 3FT CLAY (MODERATE)	2ft		4
3FT - 6 FT SANDY CLAY LOAM (MODERATE)	4ft		3
6 FT - 7.5 FT SANDY CLAY	6ft		4
7.5 FT - 8 FT LIMITING LAYER	8ft		

TEST PIT TP-2

DATE OBSERVED: 2/6/19

SOIL DESCRIPTION	DEPTH (FT)	SYMBOL	SOIL TYPE
0 - 1.5 FT SANDY LOAM (STRONG)			2
1.5 FT - 4 FT CLAY (MODERATE)	2ft		4
4 FT - 7.5 FT SANDY CLAY (MODERATE)	4ft 6ft		4
7.5 FT - 8 FT LIMITING LAYER	8ft		

SOIL DESCRIPTIONS

- SANDY LOAM
- SANDY CLAY
- SANDY CLAY LOAM
- CLAY
- LIMITING LAYER

21 MARCH 2019

ARCHITECTS RMG ENGINEERS
ROCKY MOUNTAIN GROUP

Southern Office
Colorado Springs,CO
80918
(719) 548-0600
Central Office:
Englewood, CO 80112
(303) 688-9475
Northern Office:
Greeley / Evans, CO 80620
(970) 330-1071

PROFILE PIT LOGS

15291 LONGWALL COURT
LOT 45
FLYING HORSE NORTH, FILING No.1
EL PASO COUNTY, COLORADO

JOB No. 168864
DATE 02/27/2019
FIGURE NO. 1
SHEET 1 of 1

GENERAL NOTES

1. APPLICABLE CODES

A. These general notes apply to all OWTS drawings. This project is designed in accordance with the **El Paso County Environmental Health Department** and The State of Colorado most current codes and standards.

B. All materials and workmanship shall be in accordance with applicable provisions of the codes specified above.

2. COORDINATION

A. DO NOT SCALE. The design is based on the **OWTS Site Evaluation and Report** by **RMG** for Saddletree Homes , Job No. **167061**, last dated **February 27, 2019** and **Preliminary Site Inspection** performed on **February 6, 2019**. All changes to the design and layout are required to be approved by the Engineer / Designer for inclusion into these plans. Any discrepancies shall be brought to the attention of the Engineer / Designer immediately.

B. Builders/owners shall review covenants to verify setback or land-clearing restrictions and requirements that might affect the system installation **PRIOR** to construction.

C. **RMG** has provided this design in accordance with the standards of general construction practices. However, as with all underground absorption fields, guarantee against failure is impossible. With proper installation, as outlined for this proposed construction, there remain many uncertainties, and difficulties that can still arise in the operation of the system in the future. Proper design, construction, and maintenance can assist in minimizing uncertainties, but cannot entirely eliminate them. **RMG** provides no warranty of this design or installation.

3. INSPECTIONS

A. The Engineer / Designer inspections are separate from that which is required by the County Health Department. The homeowner/contractor must ensure all **COUNTY** and **ENGINEER / DESIGNER** inspections are completed.

B. Contact Engineer / Designer a minimum of **48 hours** prior to schedule required inspections.

C. The Engineer inspections shall be as follows:

1. The Engineer / Designer shall inspect the installation of all components of the septic system before backfill.
2. The Engineer / Designer shall inspect the components of the septic system, after backfill, to insure min cover, crowned top of field components, & proper drainage away from field.

4. OWTS

A. Maintain a minimum 2.0% and maximum 3.0% grade on pipe feeding septic tank and on pipe from field back to sump pit or pump station.

B. The homeowner/contractor is responsible for permit. The contractor must obtain approval of the engineered / designed system from the County Health Department. The homeowner/contractor must verify all setbacks and obtain utility clearances prior to construction.

C. Vehicular and/or hoofed animal traffic of any kind over any part of system may cause premature failure and is prohibited. The use of so-called "septic remedies" can result in severe damage to the system. We specifically recommend against their use.

D. Septic and pump tanks shall be concrete and have a minimum of two (2) compartments unless noted otherwise.

E. Provide a drainage swale or berm on the uphill slope of the absorption field or treatment area.

F. **Do not** locate the absorption field or treatment area within **100ft** of ANY well per **El Paso County Environmental Health Department** recommendations.

G. The field laterals may be angled or turned to fit land contours with a maximum of 45 degree bends or less.

H. The field laterals may be curved to fit land contours. The maximum radius shall not exceed 100ft.

I. Maintain all minimum setbacks and distances stated in this design and county codes and standards.

J. Refer to all manufacturer specification prior to ordering and installation of components.

CALCULATIONS FOR ABSORPTION BED

TREATMENT LEVEL 1

DESIGN PARAMETERS

NO. OF BEDROOMS (#BD):	4
LTAR:	0.20
Q (GPD):	525 GPD
CHAMBER AREA (CHA):	12 SQ. FT.

ADJUSTMENTS

CHAMBERS (CH): 0.7

REQUIRED AREA (A)

FORMULA / CALCULATIONS

$$A = \frac{(Q)(CH)}{LTAR}$$

$$A = \frac{(525)(0.7)}{0.2}$$

TOTAL

A = MIN 1,837.5 SQ. FT.

REQUIRED CHAMBERS

FORMULA/CALCULATION

$$\text{No. OF CHAMBERS} = \frac{(A)}{(CHA)}$$

$$\text{No. OF CHAMBERS} = \frac{(1,837.5)}{12 \text{ SQ. FT.}} = 153.1$$

TOTAL

CHAMBERS: USE 154 CHAMBERS

REQUIRED FIELD SIZE

A SOIL TREATMENT AREA CONSISTING OF SEVEN (7) 3FT WIDE BY 88 FT LONG TRENCHES EACH CONTAINING 22 CHAMBERS, RESULTING IN 154 CHAMBERS, TOTALING 1,848 SQ.FT. OF TREATMENT AREA.

COMPONENTS LIST

A. TANK(S):

1. SEPTIC TANK: 1,250 GAL
2. EFFLUENT FILTER REQUIRED AT OUTLET OF SEPTIC TANK

B. FIELD:

1. CHAMBER MANUF: INFILTRATOR QUICK4 (STANDARD)
2. TOTAL CHAMBERS: 154
3. TOTAL FIELD TRENCHES: 7
4. LENGTH OF TRENCH: 88ft MIN
5. WIDTH OF TRENCH: 3ft MAX
6. CLEAN OUTS & INSPECTION PORTS PER PLAN AND AS REQUIRED
7. DISTRIBUTION BOX (7 OUTLET SET LEVEL FOR EVEN DISTRIBUTION)

C. PIPE:

1. ALL PIPE TO BE SCHEDULE 40 (U.N.O.)
2. CLEAN OUT A MAX OF 5ft-0in FROM HOUSE
3. FROM HOUSE TO TANK: 4in Ø SCHD 40
4. FROM TANK TO FIELD: 4in Ø SCHD 40

COLORADO REGISTERED ANTHONY P. MUNGER 2/28/19 39818 PROFESSIONAL ENGINEER

ROCKY MOUNTAIN GROUP

ARCHITECTS RMG ENGINEERS

Architectural Structural Forensics

Construction Management Testing Civil Planning

SOUTHERN COLORADO

2910 AUSTIN BLUFFS PKWY, SUITE 100, COLORADO SPRINGS, CO 80918

(719) 548-0600 ~ WWW.RMGENGINEERS.COM

SOUTHERN COLORADO, DENVER METRO, NORTHERN COLORADO

OWTS DESIGN

15291 LONGWALL COURT

LOT 45, FLYING HORSE NORTH FILING No.1

EL PASO COUNTY, COLORADO

SADDLETREE HOMES

ARCH/ENG:	TM
DRAWN:	MJP
CHECKED:	JGL
DATE	02-28-19

#	REVISION	DATE

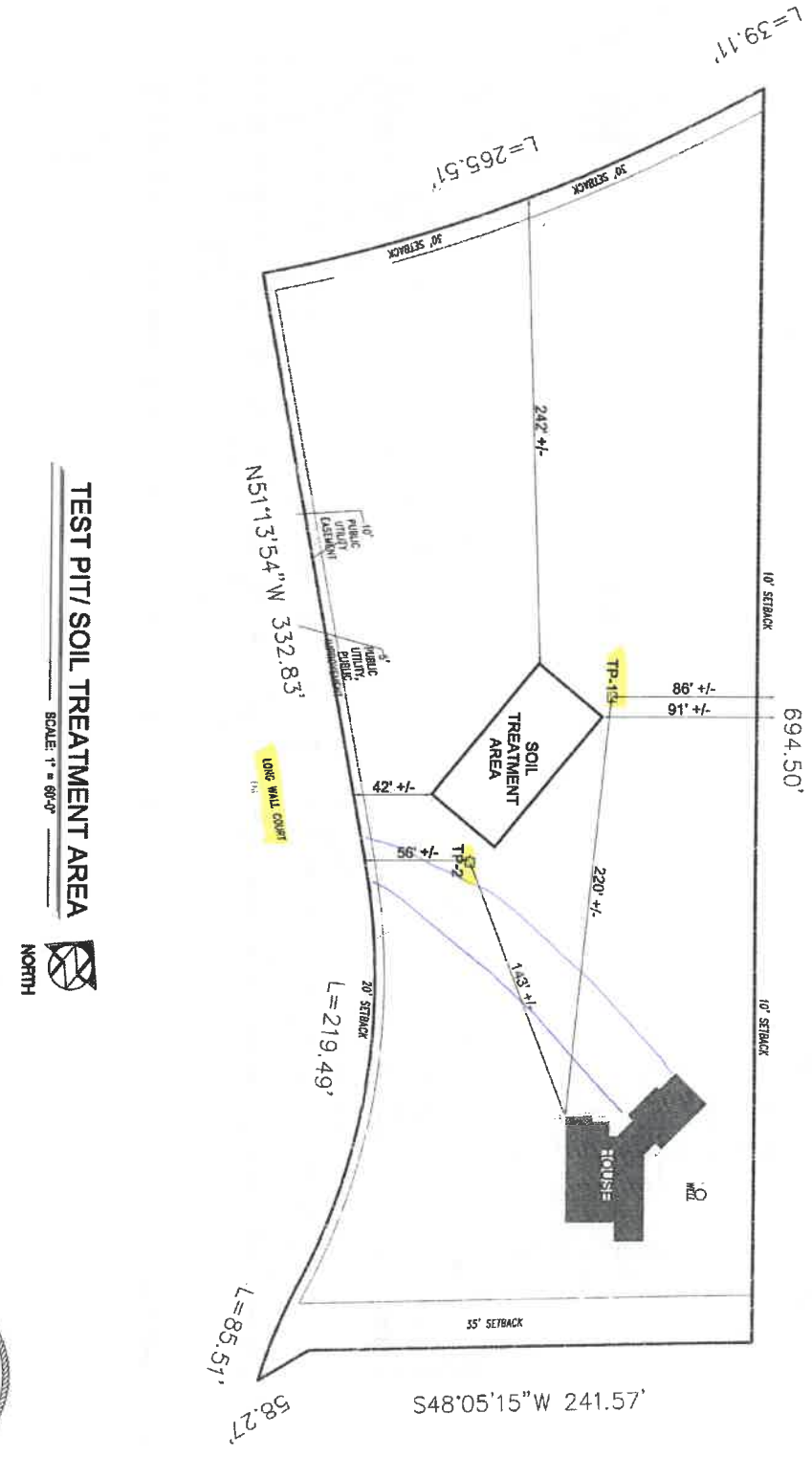
JOB NO. 168864

SHEET NAME: GENERAL NOTES, CALCULATIONS, & COMPONENTS LIST

SHEET NO. S1 of 6

21 MARCH 2019

T:\Projects\Site Specific\2019\r-z\Saddletree Holdings, Inc-13138\15291 Longwall Ct-168864\Geotechnical\Drawings\From RMG\168864 OWTS.dwg Feb 28, 2019 - 1:56pm



TEST PIT/ SOIL TREATMENT AREA

SCALE: 1" = 60'-0"

NORTH

COLORADO REGISTERED PROFESSIONAL ENGINEER
ANTHONY P. MUNGER
39818
2/28/19

21 March 2019

ARCH/ENG:	TM
DRAWN:	MJP
CHECKED:	JGL
DATE	02-28-19
# REVISION	DATE
JOB NO.	168864
SHEET NAME	TEST PIT AND SOIL TREATMENT LOCATION PLAN
SHEET NO.	S2 of 6

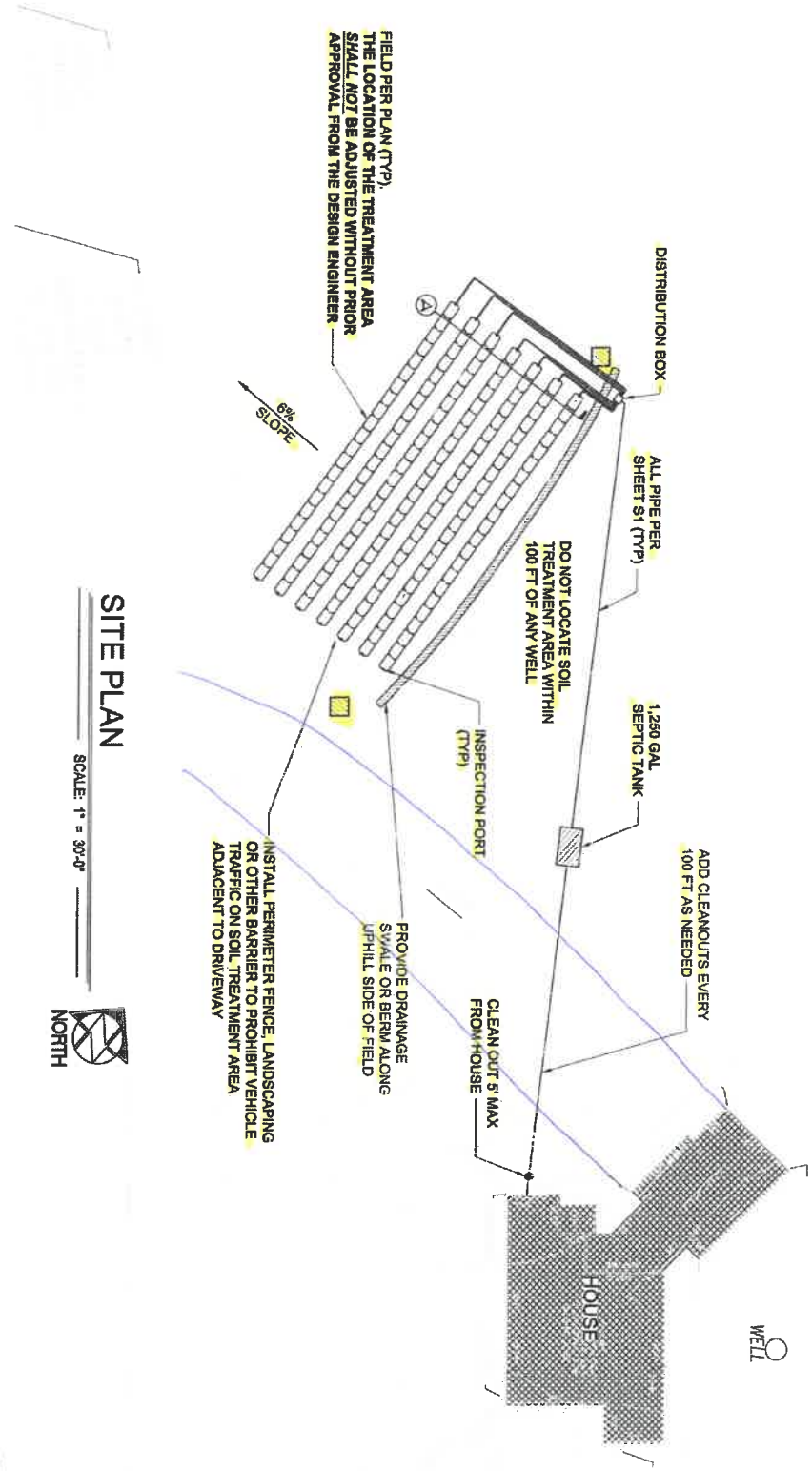
OWTS DESIGN

15291 LONGWALL COURT
LOT 45, FLYING HORSE NORTH FILING No.1
EL PASO COUNTY, COLORADO

SADDLETREE HOMES

ROCKY MOUNTAIN GROUP
ARCHITECTS RMG ENGINEERS
Architectural Structural Forensics
Geotechnical Materials, Testing Civil, Planning
SOUTHERN COLORADO
2910 AUSTIN BLUFFS PKWY, SUITE 100, COLORADO SPRINGS, CO 80918
(719) 548-0600 ~ WWW.RMGENGINEERS.COM
SOUTHERN COLORADO, DENVER METRO, NORTHERN COLORADO

T:\Projects\Site Specific\2019\r-z\Saddletree Holdings, Inc-13138\15291 Longwall Ct-168864\Geotechnical\Drawings\From RMG\168864 OWTS.dwg Feb 28, 2019 - 1:56pm



SITE PLAN

SCALE: 1" = 30'-0"

NORTH

COLORADO REGISTERED PROFESSIONAL ENGINEER
ANTHONY P. MANNER
39818
2/28/19

OWTS DESIGN

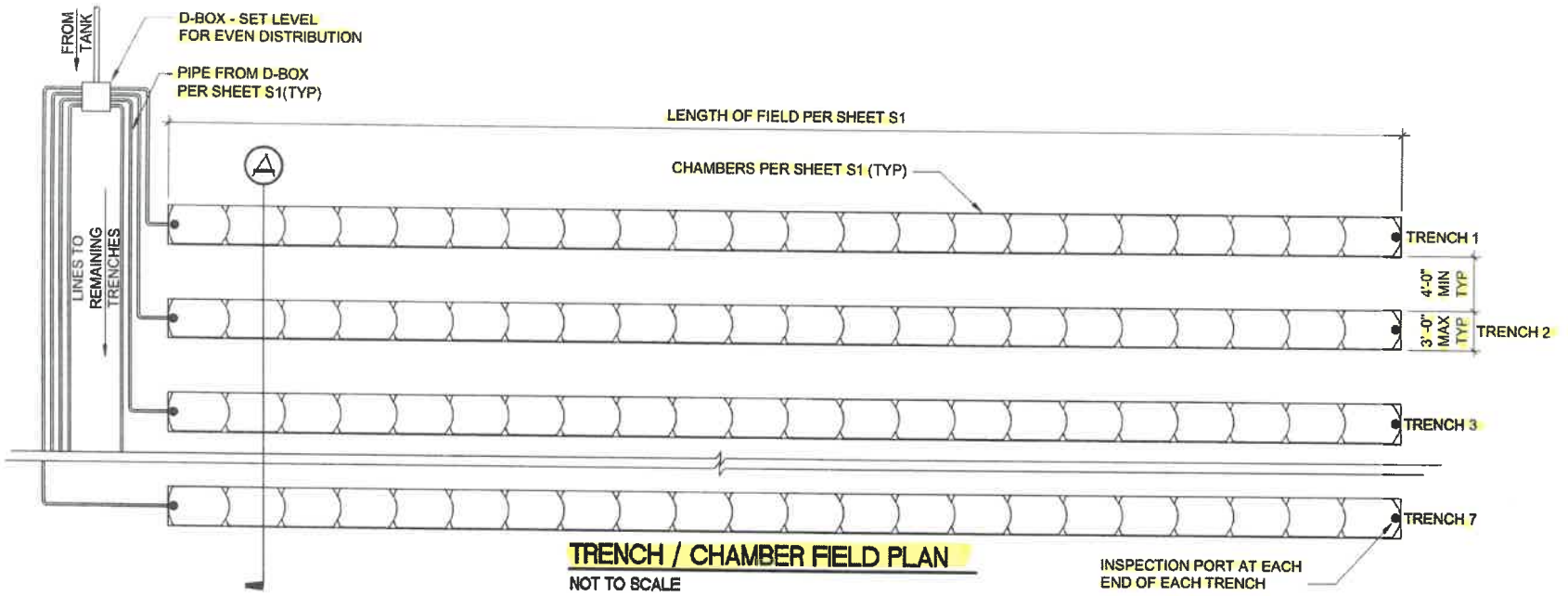
15291 LONGWALL COURT
LOT 45, FLYING HORSE NORTH FILING No.1
EL PASO COUNTY, COLORADO

SADDLETREE HOMES

ROCKY MOUNTAIN GROUP
Architectural Structural Forensics
ARCHITECTS RMG ENGINEERS
Geotechnical Materials, Testing Civil, Planning
SOUTHERN COLORADO
2910 AUSTIN BLUFFS PKWY, SUITE 100, COLORADO SPRINGS, CO 80918
(719) 548-0600 ~ WWW.RMGENGINEERS.COM
SOUTHERN COLORADO, DENVER METRO, NORTHERN COLORADO

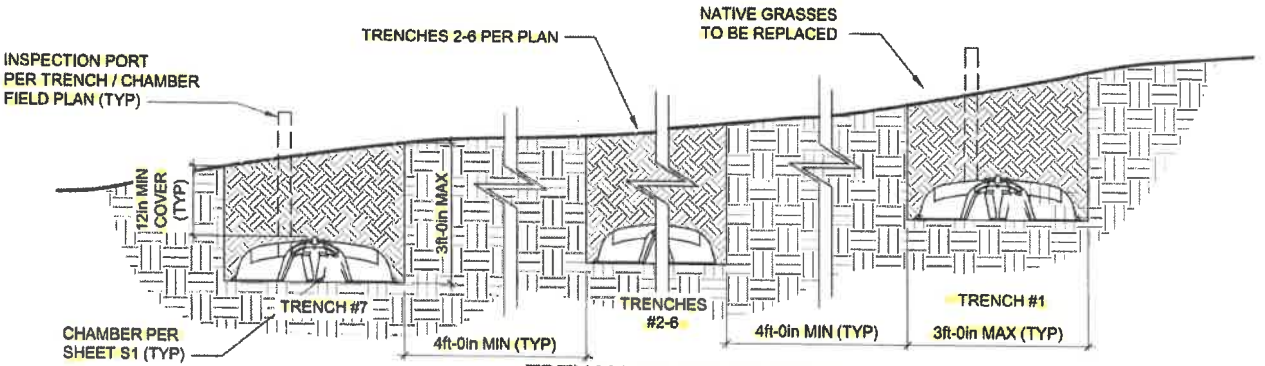
ARCH/ENG:	TM
DRAWN:	MJP
CHECKED:	JGL
DATE	02-28-19
# REVISION	DATE
JOB NO	168864
SHEET NAME	SITE PLAN
SHEET NO.	S3 of 6

21 MARCH 2019



TRENCH / CHAMBER FIELD PLAN

NOT TO SCALE



TRENCH CROSS SECTION

(A) (CHAMBERS)

NOT TO SCALE

REFERENCE SHEET S1 FOR GENERAL NOTES, CALCULATIONS, AND COMPONENT SPECIFICATIONS AND DESIGNATIONS

COLORADO REGISTERED PROFESSIONAL ENGINEER
ANTHONY P. MUNGER
2/28/19
39818

ROCKY MOUNTAIN GROUP
Geotechnical Materials Testing Civil Planning
ARCHITECTS RMG ENGINEERS
Architectural Structural Forensics
SOUTHERN COLORADO
2910 AUSTIN BLUFFS PKWY, SUITE 100, COLORADO SPRINGS, CO 80918
(719) 548-0600 -- WWW.RMGENGINEERS.COM
SOUTHERN COLORADO, DENVER METRO, NORTHERN COLORADO

OWTS DESIGN

15291 LONGWALL COURT
LOT 45, FLYING HORSE NORTH FILING No.1
EL PASO COUNTY, COLORADO

SADDLETREE HOMES

ARCH/ENG:	TM
DRAWN:	MJP
CHECKED:	JGL
DATE	02-28-19

#	REVISION	DATE

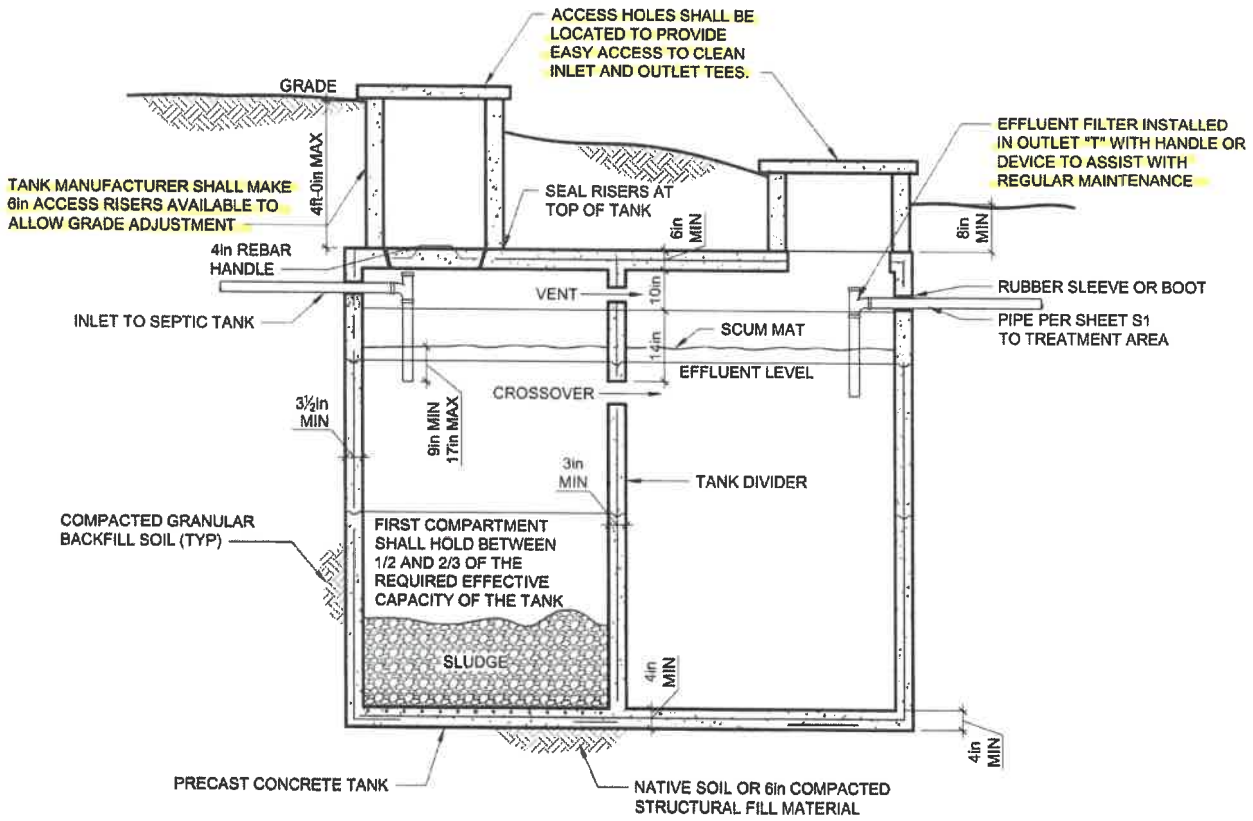
JOB NO. 168864

SHEET NAME

FIELD PLAN & CROSS SECTION

SHEET NO. S4 of 6

21 MARCH 2019



B **SEPTIC TANK CROSS SECTION (DUAL TANK)**
NOT TO SCALE

REFERENCE SHEET S1 FOR GENERAL NOTES, CALCULATIONS, AND COMPONENT SPECIFICATIONS AND DESIGNATIONS

COLORADO REGISTERED ANTHONY P. MUNGER 2/28/19 39818 PROFESSIONAL ENGINEER

ROCKY MOUNTAIN GROUP
ARCHITECTS RMG ENGINEERS
Architectural Structural Forensics
Geotechnical Materials, Testing Civil, Planning
SOUTHERN COLORADO
2910 AUSTIN BLUFFS PKWY, SUITE 100, COLORADO SPRINGS, CO 80918
(719) 548-0600 ~ WWW.RMGENGINEERS.COM
SOUTHERN COLORADO, DENVER METRO, NORTHERN COLORADO

OWTS DESIGN
15291 LONGWALL COURT
LOT 45, FLYING HORSE NORTH FILING No.1
EL PASO COUNTY, COLORADO
SADDLETREE HOMES

ARCH/ENG:	TM
DRAWN:	MJP
CHECKED:	JGL
DATE	02-28-19

#	REVISION	DATE

JOB NO. 168864

SHEET NAME
SEPTIC TANK CROSS SECTION DETAIL

SHEET NO. S5 of 8

21 MARCH 2019

INTRODUCTION: A residential On-site Wastewater Treatment System (OWTS) significantly differs from municipal sewer connections and services. Connections to public utilities, such as municipal sewer systems, provides a virtual guarantee that a homeowner will be able to send a large volume of water or sewage down the municipal sewer system with no particular problem. However, with an On-site Wastewater Treatment System (OWTS) (formerly known as septic systems), homeowners should be aware that system is distinctly limited as to the quantity and constituents of water or sewage (also known as effluent) sent. Limiting factors of a system are primarily the size and distribution method of the system and the Long-Term Acceptance Rate (LTAR) of the soils in the soil treatment area (commonly referred to as an absorption or leach field).

INSTALLATION: Proper installation of an OWTS is crucial to developing a successful OWTS. Careful or conservative design and proper operation and maintenance of a system cannot substitute for improper installation or poorly built components and systems. Typically, a licensed or certified installer will be familiar with the current regulations in the area where the OWTS is to be installed. Homeowner installation is not recommended. If the homeowner desires to perform the installation of the OWTS, they must become familiar with the specific county regulations prior to proceeding with the installation process. Consult with the Health Department for the regulating county prior to beginning installation to obtain the proper information and permits required. An OWTS design does not comprise of a detailed, step-by-step guide to installation and many details relating to proper construction are omitted because they are already required by county regulations. If uncertain, contact an engineer or the regulating Health Department for further clarification. During installation, careful observation of several items will aid in ensuring the OWTS is properly installed. The subgrade below the septic tank should be well and evenly compacted prior to installation to help limit future settling of the tank. Conveyance pipes should only slope uphill if a pump is installed at the bottom of the slope and an air release valve is installed at the top of the slope. The lines in the distribution field should be installed level. If multiple fields or different levels in the field are used, a device that will effectively distribute the effluent shall be installed. The soil comprising the soil treatment area should never be mechanically compacted. After installation of the distribution lines, media, and other pertinent components, the covering soil should not be compacted and minimal to no grading should be performed above the soil treatment area. If a mound system is installed, the mound sand should be allowed to consolidate naturally by sprinkling or lightly spraying with water to reduce settlement after the system is placed into operation. The area surrounding the OWTS, especially uphill of the soil treatment area, if applicable, should be graded to divert surface water or runoff away from the system. This can often be accomplished by construction of a berm or a swale around the uphill side and along the sides of the system's components.

GENERAL OPERATION: Implementing water conservation practices will help in preserving the lifespan of an OWTS. Reducing the amount of excess water that is fed to the system will help prevent it from overflowing, backing up to the house or otherwise disrupting the proper functioning of the system. We recommend that leaking faucets and toilets be repaired immediately, taking long showers should be avoided, and dishwashers or washing machines should be run only when full and at reduced water settings when possible. We also recommend against sending unnecessary materials into the system. Do not dispose of or dump non-biodegradable materials (e.g. greases, plastics, rubber based materials) into the OWTS. These substances will not break down as desired in the septic tank and can lead to clogging or needing to pump the tank more frequently than would be ordinarily necessary. Do-not dispose of harmful or caustic chemicals (e.g. pesticides, paint thinner, oils, and antifreeze) into the OWTS. These chemicals can kill the beneficial bacteria that contribute to treating the effluent in the system and also damage the system, shortening the lifespan of the system and causing an increase in required maintenance. We recommend the homeowner limit the use of common household cleaning products (e.g. bleaches, disinfectants, and toilet bowl cleaners) that may reach the OWTS, as they can also kill the beneficial bacteria and disrupt the functioning of the system. The proper functioning of an OWTS can also be affected by the presence or introduction of surface water or runoff or from outlets from sump pumps and foundation drains. Care and attention should be given to diverting or preventing unnecessary water from reaching the system and ongoing maintenance is essential to preventing future, premature failure of a system.

CAUSES OF FAILURE: Most On-site Wastewater Treatment Systems can function for years if installed, operated, and maintained appropriately. However, wastewater treatment systems do fail and may fail earlier than anticipated. Because the engineering or design of any OWTS relies on many variables, some of which are uncontrollable, systems may fail unexpectedly and earlier than could have been predicted. There are many factors that may contribute to the failure of an OWTS. Proper installation, operation, and maintenance, as described previously, will help prevent system failure. However, common factors that can contribute to system failure are listed below. We cannot address all causes to system failure and this list should not be considered completely inclusive.

--EXCESS WATER USE: Sizing of On-site Wastewater Treatment Systems is partially dependent on the design flow determined by the governing county health department. If the amount of wastewater or effluent that is sent to the system exceeds this design flow, it can shorten the lifespan of an OWTS. Frequently exceeding the design flow can add significant stress to a system. Sending large amounts of water in a short time (e.g. draining hot tubs, multiple appliances draining water at once, multiple showers running at once) can also shorten the lifespan of an OWTS. Doing so can disturb the settlement process in septic tanks, flood soil treatment areas, and otherwise damage or overwhelm individual components in the system.

--SURFACE DRAINAGE/RUNOFF: Allowing outside water sources (e.g. sprinklers, discharge from downspouts or subsurface drains) to flow into the soil treatment area should be avoided. Surface flows should be directed away from the treatment area. It is important to maintain the surface grading uphill from the treatment area to ensure that surface water is directed away from the treatment area. Any landscaping improvements should also maintain positive drainage away from the treatment area.

--CLOGGING: Soil treatment areas are designed to accommodate liquids only. They are not meant to handle solid or greasy, semi-solid substances. These substances are intended to be separated from the wastewater in the septic tank before it is sent to the soil treatment area. Disrupting this separation process can cause these substances to enter the soil treatment area and settle in or clog the pipes. If the pipes become clogged, entire sections can become inoperable and unusable, adding additional stress to the remaining soil treatment area. If clogging occurs, it is often hard to detect and fix. Clogging can be prevented by monitoring the water use, regulating the disposal of inappropriate materials, and regularly having the septic tank pumped by a professional.

--COMPACTION: The effective treatment of wastewater in the soil treatment area also relies on the area's ability to breathe and receive fresh air. This allows the effluent to more effectively be treated and breakdown. Compaction of the soil above the soil treatment area can hamper the soil's ability to treat the effluent by restricting the air flow to the treatment area. Refer to the INSTALLATION guidelines for more information on placement of soils above the components in the treatment area during installation. After installation, care should be taken to prevent additional compaction to the soils above the treatment area. Small animals (such as cats and dogs) and human traffic are unlikely to cause significant additional compaction. However, larger animals, especially hoofed animals, can cause sufficient compaction to the soils and should not be allowed on the surface directly above the treatment area. Vehicular traffic will cause addition compaction and can quickly shorten the lifespan of systems. Vehicular traffic can also cause the wastewater treatment system to fail by crushing components. Vehicles should not be allowed on the surface directly above the soil treatment area. We also discourage the installation of light structures (e.g. playgrounds, sheds) above the treatment area, as these structures may cause additional compaction and encourage additional traffic over the treatment area.

SUMMARY: On-Site Wastewater Treatment Systems differ greatly from public sewer systems and require the homeowner to monitor and maintain the condition of the system and the components. On-site Wastewater Treatment Systems are complex systems that are designed to handle a limited amount of wastewater from a household and cannot handle many of the materials that often make it into the public sewer systems. It is an installer's responsibility to carefully install the components of a system to both the design's specifications and the governing county health department regulations. It is a homeowner's responsibility to care for and maintain the system. The previously discussed items regarding installation, care and maintenance are not inclusive and do not cover all aspects of an On-site Wastewater Treatment System. Following the previously discussed recommendations will not guarantee that the system will not fail. These items cover the common sources of failure and can help to preserve the lifespan of the system, but will not prevent all possible sources of failure. We recommend regular inspections by qualified professionals to help monitor the system and prevent premature failure.

COLORADO REGISTERED
ANTHONY P. MUNGER
2/28/19
39818
PROFESSIONAL ENGINEER

ROCKY MOUNTAIN GROUP
ARCHITECTS RMG ENGINEERS
Architectural Structural Forensics
Geotechnical Materials Testing Civil Planning
SOUTHERN COLORADO
2910 AUSTIN BLUFFS PKWY, SUITE 100, COLORADO SPRINGS, CO 80918
(719) 548-0600 ~ WWW.RMGENGINEERS.COM
SOUTHERN COLORADO, DENVER METRO, NORTHERN COLORADO

OWTS DESIGN

15291 LONGWALL COURT
LOT 45, FLYING HORSE NORTH FILING No.1
EL PASO COUNTY, COLORADO

SADDLETREE HOMES

ARCH/ENG:	TM
DRAWN:	MJP
CHECKED:	JGL
DATE	02-28-19

#	REVISION	DATE

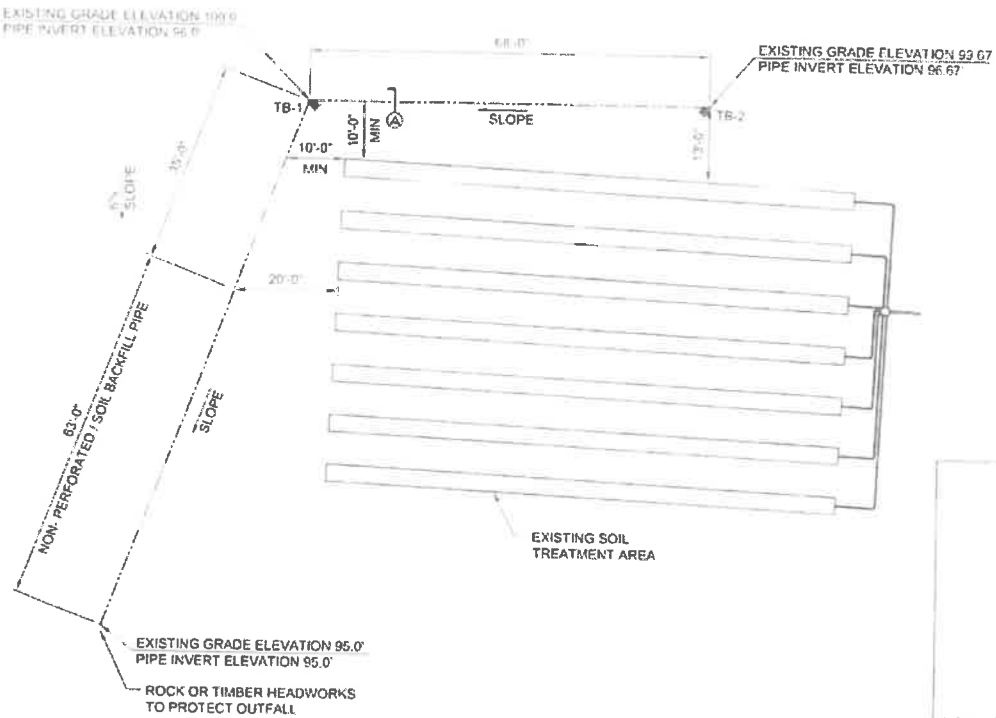
JOB NO. 168864

SHEET NAME
OPERATION & MAINTENANCE SPECIFICATIONS

SHEET NO. S6 of 6

T:\Projects\Site Specific\2019\z-z\Saddletree Holdings, Inc-13136115291 Longwall Ct-168864\Geotechnical\Drawings\From RMG\168864 OWTS.dwg Feb 28 2019 - 1:56pm

21 MARCH 2019

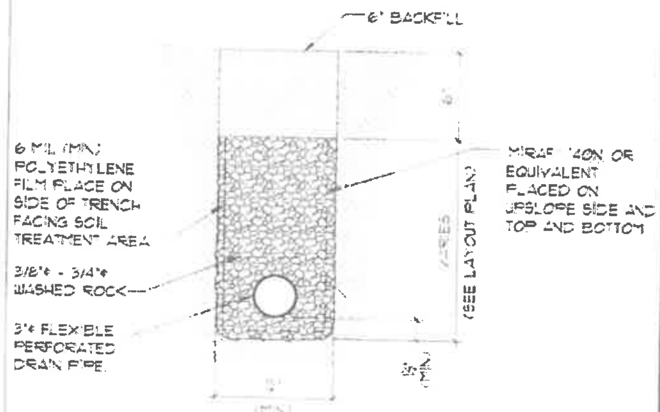

EXISTING GRADE ELEVATION 100.0
PIPE INVERT ELEVATION 96.0
68'-0"
EXISTING GRADE ELEVATION 93.67
PIPE INVERT ELEVATION 96.67
TB-1
TB-2
A
SLOPE
10'-0" MIN
10'-0" MIN
13'-0"
35'-0"
SLOPE
20'-0"
63'-0"
NON-PERFORATED / SOIL BACKFILL PIPE
SLOPE
EXISTING SOIL TREATMENT AREA
EXISTING GRADE ELEVATION 95.0'
PIPE INVERT ELEVATION 95.0'
ROCK OR TIMBER HEADWORKS TO PROTECT OUTFALL
NORTH
10' 0 10' 20' 40'

DRAIN LAYOUT PLAN

SCALE: 1" = 20'-0"

TEST BORING 1		TEST BORING 2	
SOIL DESCRIPTION	DEPTH (ft)	SOIL DESCRIPTION	DEPTH (ft)
SANDY LOAM	0-2	CLAYEY SAND	0-4
CLAY	2-35		
SANDY CLAY	35-40		

ALL DRAIN COMPONENTS SHALL BE RATED / APPROVED BY THE MANUFACTURER FOR THE INSTALLED DEPTH AND APPLICATION. DRAIN SYSTEM, INCLUDING THE OUTFALL OF THE DRAIN SHALL BE OBSERVED PRIOR TO BACKFILLING TO VERIFY INSTALLATION.



A TRENCH DRAIN

SCALE: 1 1/2" = 1'-0"

COLORADO REGISTERED PROFESSIONAL ENGINEER
ANTHONY P. MUNGER
11/01/19
39818

ROCKY MOUNTAIN GROUP

RMG ARCHITECTS ENGINEERS

Architectural
Structural
Forensics

Geotechnical
Materials Testing
Civil, Planning

SOUTHERN COLORADO
2910 AUSTIN BLUFFS PKWY, SUITE 100, COLORADO SPRINGS, CO
(719) 548-0600 ~ WWW.RMGENGINEERS.COM
SOUTHERN COLORADO, DENVER METRO, NORTHERN COLORADO

DRAIN TRENCH

15291 LONGWALL COURT
EL PASO COUNTY, COLORADO

SADDLETREE HOMES

ARCH/ENG:	JGL
DRAWN:	CL
CHECKED:	TPM
DATE	11-05-19
# REVISION	DATE
JOB NO	168864
SHEET NAME	DRAIN LAYOUT
SHEET NO	S1