NC DEPARTMENT OF HEALTH AND HUMAN SERVICES

ROY COOPER • Governor
KODY H. KINSLEY • Secretary
HELEN WOLSTENHOLME • Interim Deputy Secretary for Health
MARK T. BENTON • Assistant Secretary for Public Health
Division of Public Health

COMMON FORM FOR LICENSED SOIL SCIENTIST COVID-19 PERMIT OPTION FOR NON-ENGINEERED SYSTEMS
See Instructions for Use in Appendix A

Except for "Date received", this Section to be completed by the LSS in accordance with S.L. 2020-97, Section 3.19 and G.S. 130A-336.2

LHD USE ONLY: Initial submittal of this NOI received: 10/25/2022 (Date) by BB (Initials)

PART 1: Notice of Intent to Construct (NOI) - Please check all that apply

☒ Single System or ☐ Multiple Systems

AND

☒ New ☐ Expansion ☐ Relocation of all or part of the Existing System ☐ Relocation of Repair Area

☐ Repair – LHD Permit Number_____ ☐ Repair – EOP/LSS COVID 19/AOWE Permit Number _____

1. Facility Owner's name: (Owner, Company Name, Utility, Partnership, Individual, etc.): Jason Field

Mailing address: 900 W. Wilson Avenue, Apt. 307 City: Mooresville State: NC Zip: 28117

Telephone number: 815-243-0112 E-mail Address: jmf1337@gmail.com

2. Licensed Soil Scientist (LSS) name: Larry Thompson, LSS LSS License number: 1287

Mailing address: PO Box 541 City: Midland State: NC Zip: 28107

Telephone number: 704-301-4881 E-mail Address: larry@thompsonenv.com

3. Licensed Geologist (LG) (if applicable) name: N/A License Number: _____

Mailing address: _____ City: _____ State: _____ Zip: _____

Telephone number: _____ E-mail Address: _____

4. Proof of Errors and Omissions or other appropriate liability insurance for the following persons is attached that includes the name of the insurer, name of the insured and the effective dates of coverage:

☒ LSS ☐ LG

5. Property location (physical address, tax parcel identification number or subdivision lot, block number of the property to be permitted): Lot 87-Harbor Landing, 226 Harbor Landing Drive, Mooresville, NC 28117

County Name: Iredell Parcel: 4638882534.000

6. Type of facility: ☒ Place of residence No. Bedrooms: 2 No. Occupants: 4

☐ Place of business Basis for flow calculation: _____

☐ Place of public assembly Basis for flow calculation: _____

7. Factors that would affect the wastewater load: Design is for domestic strength wastewater only.

8. Type and located of proposed wastewater system: Pump to non-treated drip dispersal system located behind the proposed house site. System type V(a).

9. Design wastewater flow: 240 gpd

   Design wastewater strength: ■ domestic ☐ high strength ☐ industrial process *(For industrial process wastewater, a Professional Engineer licensed in accordance with G.S. 89C shall design the on-site wastewater system.)*

10. A plat as defined in G.S. 130A-334(7a) is attached: ☐ Yes ■ No

    A site plan as defined in G.S. 130A-334(13a) is attached: ■ Yes ☐ No

11. Location of proposed or existing wells (drinking water, irrigation, geothermal, groundwater monitoring, sampling, etc.) and any potable and non-potable water conveyance lines is indicated on attached plans and complies with 15A NCAC 18A .1950: ■ Yes ☐ No

    This is a saprolite system. ☐ Yes ■ No

12. Evaluation(s) of soil conditions and site features in accordance with G.S. 130A-335(a1) signed and sealed by a LSS is attached: ■ Yes ☐ No

13. Evaluation of geologic and hydrogeologic conditions signed and sealed by a LG is attached ☐ Yes ■ NA

14. Proposed landscape, site, drainage, or soil modifications are attached: ☐ Yes ■ NA

Attestation by LSS pursuant to S.L. 2020-97, Section 3.19 and G.S. 130A-336.2

I, Larry Thompson, LSS hereby attest that the information required to be included with
Licensed Soil Scientist (Print Name)
this Notice of Intent to Construct is accurate and complete to the best of my knowledge and that the proposed system shall meet applicable federal, State, and local laws, regulations, rules and ordinances, and that the proposed system does not require a Professional Engineer, licensed in accordance with G.S. 89C, and in accordance with 15A NCAC 18A .1938 and activities determined to be engineering as determined by the North Carolina Board of Examiners for Engineers and Surveyors.

Signature of Licensed Soil Scientist 10-06-22 *Date*

Owner self-submittal of NOI:

I, _____ hereby submit this NOI prepared by _____
Print Name of Owner *Print Name of Licensed PE*

pursuant to G.S. 130A-336.1.

_____ _____
Signature of Owner *Date*

NOTES:

LIABILITY: The Department, the Department's authorized agents, or local health departments shall have no liability for wastewater systems designed, constructed, and installed pursuant to an LSS COVID-19 Permit Option [S.L. 2020-97, Section 3.19(d) and G.S. 130A-336.2(f)]

RIGHT OF ENTRY: The submittal of this **Notice of Intent to Construct** *grants right of entry to the Local Health Department and the State to the referenced property.*

ISSUANCE OF BUILDING PERMIT: Once the LHD deems that the Notice of Intent to Construct is complete via signature in the section below, the owner may apply to the local permitting agency for a permit for electrical, plumbing, heating, air conditioning or other construction, location, or relocation activity under any provision of general or special law pursuant to G.S. 130A-338.

This section for Local Health Department use only.

PART 2: *LHD Completeness Review of the Notice of Intent to Construct*

"(c) Completeness Review for Notice of Intent to Construct. –The local health department shall determine whether the notice of intent to construct required pursuant to subsection (b) of this section is complete within five business days after receiving the notice of intent to construct. A determination of completeness means that the notice of intent to construct includes all of the required components. If the local health department determines that the notice of intent to construct is incomplete, the local health department shall notify the owner and list the information needed to complete the notice. The owner may then submit additional information to the local health department to cure the deficiencies in the initial notice. The local health department shall make a final determination as to whether the notice of intent to construct is complete within five business days after the department receives the additional information. If the local health department fails to act within any time period set out in this subsection, the owner may treat the failure to act as a determination of completeness. The owner shall be able to apply for the building permit for the project upon the decision of completeness of the notice of intent by the local health department or if the local health department fails to act within the five business day time period."

The review for completeness of this Notice of Intent was conducted in accordance with G.S. 130A-336.2(c). This NOI is determined to be:

☐ INCOMPLETE (If box is checked, Information in this section is required.)

Based upon review of information submitted in Part 1, the following items are missing: _____

_____

Copies of this form listing missing items were sent to the LSS and the Owner on _____
Date

via _____ with directions to re-submit missing items using Page 5 of this form.
Email, FAX, USPS, hand-delivered

_____	_____	_____
Print Name of Authorized Agent of the LHD	*Signature of Authorized Agent of the LHD*	*Date*

☒ COMPLETE (If box is checked, information in this section is required.)

Based upon review of information submitted in Part 1 of this form, this NOI is deemed COMPLETE.

Copies of this signed form were sent to the LSS and the Owner on 11/7/2022 via Email.
Date *Email, FAX, USPS, hand-delivered*

A copy of this NOI and tracking information was sent to the State on 11/7/2022 via Email.
Date *Email, FAX, USPS, hand-delivered*

Benjamin A Botkins	Benjamin A Botkins	11/7/2022
Print Name of Authorized Agent of the LHD	*Signature of Authorized Agent of the LHD*	*Date*

Re-submittal of NOI with missing items included

This Section is for use by owner to submit items noted as missing during LHD Completeness Review above. Resubmittals must be accompanied by a cover letter from the LSS.

LHD USE ONLY: This NOI resubmittal received: _____ by _____
Date *Initials*

Item # from initial NOI	Resubmittal description

Attestation by LSS pursuant to S.L. 2020-97, Section 3.19

I, _____ hereby attest that the information required to be included with
Licensed Soil Scientist (Print Name)
this Notice of Intent to Construct is accurate and complete to the best of my knowledge and that the proposed system shall meet applicable federal, State, and local laws, regulations, rules, and ordinances.

_____ _____
Signature of Licensed Soil Scientist *Date*

The section below is for Local Health Department use after submittal of items noted as missing above.

LHD Follow-up Completeness Review of Notice of Intent to Construct

This follow-up review for completeness of this Notice and Intent was conducted in accordance with G.S. 130A-336.2(c). This NOI is determined to be:

☐ INCOMPLETE
Based upon review of information submitted in the RESUBMITTAL above, this Notice of Intent remains INCOMPETE because the following items from Part 1 of this form remain missing: _____
_____.

Copies of this signed form were sent to the LSS and the Owner on _____ via _____.
Date *Email, FAX, USPS, Hand-delivered*

_____ _____ _____
Print name of authorized Agent of the LHD *Signature of authorized Agent of the LHD* *Date*

☐ COMPLETE
Based upon review of information submitted in the RESUBMITTAL above in addition to information provided in Part 1 of this form, this NOI is deemed complete.

Copies of this signed form were sent to the LSS and the Owner on _____ via _____.
Date *Email, FAX, USPS, Hand-delivered*

A complete copy of this form with tracking information was sent to the State: _____ via _____.
Date *Email, FAX, USPS, hand-delivered*

_____ _____ _____
Print name of authorized Agent of the LHD *Signature of authorized Agent of the LHD* *Date*

PART 3: Authorization to Operate (ATO)

Except for date received, the Section below is to be completed by the Owner.

LHD USE ONLY: Initial submittal of request for ATO received: _____ by _____
Date *Initials*

Date of Post-construction Conference: _____

The following items are included in this submittal for an Authorization to Operate under an LSS COVID-19 permit:

1. Signed and sealed copy of the LSS's report that includes the information in G.S. 130A-336.2(k) ☐ Yes ☐ No
2. Operation and management program ☐ Yes ☐ No
3. Fee (as applicable) ☐ Yes ☐ No
4. Notarized letter documenting Owner's acceptance of the system from the LSS ☐ Yes ☐ No
5. On-site Wastewater Contractor name: _____ License number: _____

   Mailing address: _____ City: _____ State: _____ Zip: _____

   Telephone number: _____ E-mail Address: _____
6. Proof of Errors and Omissions or other appropriate liability insurance for the On-site Wastewater Contractor is attached and includes the name of the insurer, name of the insured, and the effective dates of coverage.
   ☐ Yes ☐ No

Attestation by the Owner for Authorization to Operate

I, _____ hereby attest that all items indicated above have been provided to the
Print name of Owner
_____ County LHD and the system shall meet applicable federal, State, and local laws, regulations, rules, and ordinances.

_____ _____
Signature of Owner *Date*

This section for LHD Use Only.

LHD Review of required information for the ATO

☐ INCOMPLETE

Based upon review of information submitted in the Section above, the following items are missing from the information required for an Authorization to Operate for an LSS COVID-19 permit: _____

_____.

Copies of this signed form were sent to the LSS and the Owner on _____ via _____.
Date *Email, FAX, USPS, Hand-delivered*

_____ _____ _____
Print name of authorized Agent of the LHD *Signature of authorized Agent of the LHD* *Date*

☐ COMPLETE

Based upon review of information submitted in the Section above, this Authorization to Operate is hereby issued in accordance with G.S. 130A-336.2(m).

A copy of this complete NOI/ATO with tracking information was sent to the State on _____ via _____.
Date *Email, FAX, USPS, Hand-delivered*

_____ _____ _____
Print name of authorized Agent of the LHD *Signature of authorized Agent of the LHD* *Date*

ISSUANCE OF CERTIFICATE OF OCCUPANCY: Once the LHD determines completeness based upon the ATO submission, the owner may apply to the local permitting agency for permanent electrical service to a residence, place of business or place of public assembly pursuant to G.S. 130A-339.

226 Harbor Landing Drive

State of NC LSS Permit Option COVID-19 LHD Reference: OSWP-2022-6359

PART 3: Authorization to Operate (ATO)

Except for date received, the Section below is to be completed by the Owner.

LHD USE ONLY: Initial submittal of request for ATO received: 9/18/23 (Date) by BB (Initials)

Date of Post-construction Conference: _____

The following items are included in this submittal for an Authorization to Operate under an LSS COVID-19 permit:

1. Signed and sealed copy of the LSS's report that includes:
   a. Signed and sealed evaluation of soil conditions and site features — [X] Yes [ ] No
   b. Drawings, specifications, plans — [X] Yes [ ] No
   c. Reports on special inspections and final inspection — [X] Yes [ ] No
   d. Management Program manual — [X] Yes [ ] No
   e. On-site Wastewater Contractor's signed statement — [X] Yes [ ] No
2. Fee (as applicable) — [X] Yes [ ] No
3. Notarized letter documenting Owner's acceptance of the system from the LSS — [X] Yes [ ] No
4. On-site Wastewater Contractor name: Carlos Rocha License number: 5240

   Mailing address: 2602 Goldmine Road City: Monroe State: NC Zip: 28110

   Telephone number: 704-242-3402 E-mail Address: carlosseptic@gmail.com
5. Proof of Errors and Omissions or other appropriate liability insurance for the On-site Wastewater Contractor is attached and includes the name of the insurer, name of the insured, and the effective dates of coverage.
   [X] Yes [ ] No

Attestation by the Owner for Authorization to Operate

I, Jason Field (Print name of Owner) hereby attest that all items indicated above have been provided to the Iredell County LHD and the system shall meet applicable federal, State, and local laws, regulations, rules and ordinances.

Jason Field (Aug 2, 2023 13:01 EDT) (Signature of Owner) Aug 2, 2023 (Date)

This section for LHD Use Only.

LHD Review of required information for the ATO

[ ] INCOMPLETE

Based upon review of information submitted by the Owner in the Section above, the following items are missing from the information required for an Authorization to Operate for an LSS COVID-19 permit: _____.

Copies of this signed form were sent to the LSS and the Owner on _____ (Date) via _____ (Email, FAX, USPS, Hand-delivered).

_____ (Print name of authorized Agent of the LHD) _____ (Signature of authorized Agent of the LHD) _____ (Date)

[X] COMPLETE

Based upon review of information submitted by the Owner in the Section above, this Authorization to Operate is hereby issued in accordance with G.S. 130A-336.2(m).

A copy of this complete NOI/ATO with tracking information was sent to the State on 9/21/23 (Date) via email (Email, FAX, USPS, Hand-delivered).

Bryant White (Print name of authorized Agent of the LHD) Bryant C White (Signature of authorized Agent of the LHD) 9/21/23 (Date)

ISSUANCE OF CERTIFICATE OF OCCUPANCY: Once the LHD determines completeness based upon the ATO submission, the owner may apply to the local permitting agency for permanent electrical service to a residence, place of business or place of public assembly pursuant to G.S. 130A-339.

August 2, 2023

Subject: Septic System Installation
226 Harbor Landing Drive
Mooresville, NC 28117

The septic system installed on the above-referenced property was specified by Larry Thompson, LSS, with the final installation work being performed by Carlos Rocha.

The owner does hereby accept the septic system installed for the aforementioned property.

(signature) 8-2-23 Date

NORTH CAROLINA NOTARY ACKNOWLEDGMENT

THE STATE OF NORTH CAROLINA

COUNTY OF Iredell

I, Shane Marks, Notary Public, do hereby certify that Jason Field (name of individual(s) whose acknowledgment is being taken) personally appeared before me this day and acknowledged the due execution of the foregoing instrument.

Witness my hand and official seal this 2 day of 8, 2023.

Notary Public Signature

Print Shane Marks

My commission expires: 4-4-2028

(Official Seal)

Shane Marks
Notary Public
Catawba County
North Carolina
My Commission Expires 4/4/2028

August 2, 2023

RE: Septic System Installation
226 Harbor Landing Drive
Mooresville, NC 28117

The purpose of this letter is to confirm that the septic system installation for 226 Harbor Landing Drive, Mooresville, NC 28117 was installed in general accordance with the LSS COVID-19 proposal submitted to your office by Larry Thompson, LSS.

Sincerely,

Juan Carlos Rocha (Aug 5, 2023 06:52 EDT)

Carlos Rocha
Lago Vista Septic

THOMPSON ENVIRONMENTAL CONSULTING, INC.
WATER ♦ WASTEWATER ♦ WETLANDS

August 2, 2023

RE: Septic System Installation
226 Harbor Landing Drive
Mooresville, NC 28117

The purpose of this letter is to confirm that the septic system installation for 226 Harbor Landing Drive, Mooresville, NC 28117 was installed in general accordance with the permit package submitted to your office. The system has been inspected for the LSS COVID-19 permit closeout process.

Sincerely,

Larry B. Thompson, Jr.

PO BOX 541 • MIDLAND, NC • 28107
PHONE: 704-301-4881 • EMAIL: LARRY@THOMPSONENV.COM
WEB: WWW.THOMPSONENV.COM

IREDELL COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH

DOCUMENTATION TO AUTHORIZE AN OWNER'S LEGAL REPRESENTATIVE

(Check and sign only ONE of the options below)

☐ **1. * APPLICANT AND OWNER ARE THE SAME. *** (*Sign here*) _____

Applications for permits require the "signature of the owner or owner's legal representative" (15A NCAC 18A .1937). If the owner does not sign the application himself or herself, they can submit any one of the following documents to designate their legal representative: *Power of Attorney; Real Estate Contract; Estate executor; Bankruptcy trustee; Court ordered guardianship*

In the absence of the above documentation, the property owner may provide the local health department with documentation that designates a legal representative. A property owner may:

Complete this form to document his or her legal representative, or provide his or her own form that contains the information in this form. If there are multiple property owners, then all property owners must sign the form that designates a legal representative.

By signing a form that designates a legal representative for purposes of 15A NCAC 18A .1937, the property owner authorizes that representative to act on their behalf in matters pertaining to the application and permitting process, including signing or receiving any application, document or permit. The owner retains full responsibility to meet all permit conditions specified by the local health department.

☒ **2.** I, Jason Field, am the legal owner(s) of the property located at 226 Harbor Landing Drive, Mooresville, NC 28117, identified as PIN (Parcel Identification Number) 4638882534.000, located in Iredell County, North Carolina.

I do hereby authorize (**print legal representative/company name**)

Larry Thompson, Thompson Environmental Consulting, Inc., to act as an agent on my behalf in applying for/signing/obtaining any of the documents described below.

- Application for Improvement Permit (IP) / Authorization to Construct (AC)
- Improvement Permit (IP) / Authorization to Construct (AC)
- Application for soil-site evaluation (new/repair)
- Application/permit for private drinking water well/well abandonment
- Application for Compliance Inspection

I agree to abide by all decisions and/or conditions between the legal representative acting on my behalf and the Iredell County Department of Public Health, Environmental Health Division.

Jason Field
Jason Field (Oct 6, 2022 12:53 EDT)

Signature of Owner(s)

Oct 6, 2022
Date

Mooresville - Environmental Health
barbara.nebel@co.iredell.nc.us
Fax: 704-662-3239
610 E. Center Avenue, Mooresville, NC 28115

Statesville - Environmental Health
ronda.hart@co.iredell.nc.us
Fax: 704-871-3483
349 N. Center Street, Statesville, NC 28677

CERTIFICATE OF LIABILITY INSURANCE

DATE (MM/DD/YYYY): 9/7/2022

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AFFIRMATIVELY OR NEGATIVELY AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW. THIS CERTIFICATE OF INSURANCE DOES NOT CONSTITUTE A CONTRACT BETWEEN THE ISSUING INSURER(S), AUTHORIZED REPRESENTATIVE OR PRODUCER, AND THE CERTIFICATE HOLDER.

IMPORTANT: If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must have ADDITIONAL INSURED provisions or be endorsed. If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

PRODUCER Higginbotham Insurance Agency, Inc. 500 W. 13th Street Fort Worth TX 76102 License#: 2081754	**CONTACT NAME:** David Vaughan **PHONE (A/C, No, Ext):** 9187797880 **FAX (A/C, No):** 817-882-9284 **E-MAIL ADDRESS:** dlvjr@higginbotham.net
INSURED Thompson Environmental Consulting, Inc. PO Box 541 Midland NC 28107-0541 THOMENV-01	**INSURER(S) AFFORDING COVERAGE** — **NAIC #** **INSURER A :** Mid-Continent Casualty Company — 23418 **INSURER B :** Hartford Underwriters Insurance Company — 30104 **INSURER C :** **INSURER D :** **INSURER E :** **INSURER F :**

COVERAGES **CERTIFICATE NUMBER:** 1600075032 **REVISION NUMBER:**

THIS IS TO CERTIFY THAT THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	ADDL INSD	SUBR WVD	POLICY NUMBER	POLICY EFF (MM/DD/YYYY)	POLICY EXP (MM/DD/YYYY)	LIMITS	
A	X **COMMERCIAL GENERAL LIABILITY** CLAIMS-MADE [X] OCCUR X Professional GEN'L AGGREGATE LIMIT APPLIES PER: X POLICY [ ] PRO-JECT [ ] LOC OTHER:			04-GL-001086672	9/25/2022	9/25/2023	EACH OCCURRENCE DAMAGE TO RENTED PREMISES (Ea occurrence) MED EXP (Any one person) PERSONAL & ADV INJURY GENERAL AGGREGATE PRODUCTS - COMP/OP AGG $	$ 1,000,000 $ 100,000 $ Excluded $ 1,000,000 $ 3,000,000 $ 3,000,000 $
	AUTOMOBILE LIABILITY ANY AUTO OWNED AUTOS ONLY HIRED AUTOS ONLY SCHEDULED AUTOS NON-OWNED AUTOS ONLY						COMBINED SINGLE LIMIT (Ea accident) BODILY INJURY (Per person) BODILY INJURY (Per accident) PROPERTY DAMAGE (Per accident) $	$ $ $ $ $
	[ ] **UMBRELLA LIAB** [ ] OCCUR [ ] **EXCESS LIAB** [ ] CLAIMS-MADE [ ] DED [ ] RETENTION $						EACH OCCURRENCE AGGREGATE $	$ $ $
B	**WORKERS COMPENSATION AND EMPLOYERS' LIABILITY** ANY PROPRIETOR/PARTNER/EXECUTIVE OFFICER/MEMBER EXCLUDED? (Mandatory in NH) Y/N [N] If yes, describe under DESCRIPTION OF OPERATIONS below	N / A		38WECNW6175	10/17/2021	10/17/2022	X PER STATUTE [ ] OTH-ER E.L. EACH ACCIDENT E.L. DISEASE - EA EMPLOYEE E.L. DISEASE - POLICY LIMIT	 $ 1,000,000 $ 1,000,000 $ 1,000,000

DESCRIPTION OF OPERATIONS / LOCATIONS / VEHICLES (ACORD 101, Additional Remarks Schedule, may be attached if more space is required)

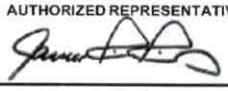
CERTIFICATE HOLDER

For Informational Purposes

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, NOTICE WILL BE DELIVERED IN ACCORDANCE WITH THE POLICY PROVISIONS.

AUTHORIZED REPRESENTATIVE



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Residential Subsurface Wastewater Treatment and Disposal System LSS COVID-19 Proposal

for

Lot 87 – Harbor Landing
226 Harbor Landing Drive
Mooresville, NC 28117

Iredell County Parcel: 4638882534.000
October 6, 2022

Prepared for:

Jason Field
900 W. Wilson Avenue, Apt. 307
Mooresville, NC 28117
815-243-0112



Prepared by:

Larry Thompson, REHS, LSS
Thompson Environmental Consulting, Inc.
PO Box 541
Midland, NC 28107-0541
Phone: 704-301-4881
larry@thompsonenv.com



Details

Mr. Jason Field has contracted with Thompson Environmental Consulting, Inc. (TEC) to develop a LSS COVID-19 Permit Option package for an on-site wastewater treatment and disposal system that would allow for the construction of a 2-bedroom single family residence served by public water located on Lot 87 – Harbor Landing, 226 Harbor Landing Drive, Mooresville, North Carolina.

Based upon a soil and site investigation conducted by Thompson Environmental Consulting, Inc. (TEC), it was determined that the subject property is "Provisionally Suitable" for the installation of a Type V(a) Non-Treated Drip Dispersal under the Laws and Rules for Sewage Treatment, and Disposal Systems 15A NCAC 18A .1900 (North Carolina Department of Environment and Natural Resources, Division of Environmental Health, On-Site Wastewater Section). TEC proposes to utilize the American Perc-Rite® Subsurface Drip Dispersal System for both the initial system as well as the proposed repair system for this property.

The enclosed Licensed Soil Scientist Evaluation is being submitted pursuant to and meets the requirements of SL 2020-97 Section 3.19. The property owner requests that Iredell County Environmental Health issue an Improvement Permit and Construction Authorization for a 2-bedroom residence based upon the following proposal and the enclosed Licensed Soil Scientist Evaluation.

Location

From Mooresville, take NC-115 N, turn left onto Connector Road, left onto Perth Road, left onto Erne Drive/Harbor Landing Drive, left onto Harbor Landing Drive, and lot will be located on the right.

References

Laws and Rules for Sewage Treatment and Disposal Systems, 15A NCAC 18A, Section .1900, Department of Environment and Natural Resources, Division of Environmental Health, On-Site Wastewater Section, April 2017.

Innovative Wastewater System No. IWWS-1993-1-R7A; American Perc-Rite® Subsurface Drip System, North Carolina Department of Environment and Natural Resources, Division of Environmental Health, On-Site Wastewater Section, September 26, 2013.

Primary Investigator's Credentials

NC Registered Sanitarian No. 1208
NC Licensed Soil Scientist No. 1287
NC Authorized On-Site Wastewater Evaluator No. 10016E
NC Subsurface Septic System Operator No. 22199
NC Grade IV Wastewater System Installer No. 1762

NC Certified Wastewater System Inspector No. 17621

Plans and Specifications

System installer must be approved by Thompson Environmental Consulting, Inc, prior to the installation.

Any addition or removal of soil or other site alterations in the designated active and/or repair drip dispersal areas shall receive prior approval from the local health department or On-Site Water Protection Section. After installation of the drip lines, no disturbances such as tilling, plowing, digging or other potentially destructive activity shall occur in the drip dispersal fields without prior approval from the local health department or On-Site Water Protection Section.

The property owner/builder should visibly mark the drainfield area and isolate it from construction traffic. The proposed drainfield area must be left undisturbed to prevent the septic and building permits from being revoked.

Zone supply and returns lines to be installed below frost line and at a depth to provide that conveyance lines will be filled at pump shut off at the location where they go up to the top feed manifolds.

A. Septic Tank

1. The septic tank shall be State approved (Section .1953 of 15A NCAC 18A), watertight, structurally sound, and 1,000 gallons in capacity.
2. The septic tank will be fitted with an approved effluent filter (Polylok PL-68 or equivalent) and riser for easy access and periodic maintenance.
3. If septic tank risers are utilized, they must be provided by the septic tank manufacturer and will have been previously approved by the Septic Tank Program.
4. It is the responsibility of the septic contractor to thoroughly inspect the septic tank prior to accepting delivery to assure that the tank has had time to properly cure and is free of cracks or other structural deficiencies.
5. All pipe penetrations into the tank shall be booted (i.e., C-293 boot with a stainless-steel strap).
6. Connecting pipe between the septic tank and the pump tank shall be a 4-inch SCH 40 PVC pipe.

B. Drainfield Dosing Tank

1. The pump tank shall be State approved, of one-piece construction, watertight, structurally sound and 1,000 gallons in capacity. Again, it is the responsibility of the septic tank contractor to thoroughly inspect each pump tank prior to accepting delivery.
2. All pipe penetrations into the tank shall be booted (i.e., C-293 boot with a stainless-steel strap).

3. The pump tank shall have access risers that extend, at a minimum, 6 inches above finished grade and must have less than 36 inches of fill over its top once finished grade has been established.
4. Floats, pump and control circuits, and the control panel shall meet the requirements of Rule .1952(c). Panel and control equipment shall include lightning protection, be protected from unauthorized access, and always remain accessible to the system operator.
5. The pump and alarm controls shall be provided with manual circuit disconnects within a watertight, corrosion resistant, Nema 4x rated Perc-Rite® drip system control panel (**ASD151-S122 2 ZONE SIMPLEX DRIP, 2 FILTER, 2 ZONE CONTROL**). The control panel must be securely mounted outside, adjacent to the pump tank riser and at a minimum of 32 inches above finished grade. Pump and float control wiring should be long enough to reach from the tank to the control panel without splicing, routed through wire conduit, and sealed at the openings within the pump tank as well as the control panel enclosure. It is paramount that the conduit is properly sealed to prevent the escape of flammable gases from the pump tank. Furthermore, there must be two electrical circuits for the pump tank controls: one for the pump and one for the alarm controls.
6. Controls shall provide for delivery of designer-specified preprogrammed volumes of effluent to the sand filter and each zone (adjustable and variable between zones) at designer-specified time intervals (flow equalization); automatic flushing of integral unit filters (filter flushing), initiated by a timer (adjustable duration); automatic flushing (at least weekly) of the drip laterals (field flushing) with filtered effluent for designer-specified duration; and monitor pump cycles and run times (for each pump and field zone) and flow (with totalizing flow meter, or equal).
7. Float switch tie downs must be made of a corrosion resistant material (per OWPS, all metal in the tanks shall be stainless steel). Floats should be mounted on a separate "float tree" rather than the pump supply line (see pump tank detail).
8. Unit shall include an effluent pump capable of delivering **8.92 GPM at 51 Feet TDH** (use **PUTURB1512112W or American Manufacturing equivalent**).
9. The pump removal system will be via a pump tether made of nylon rope or its equivalent. The tether material should be resistant to mildew and rot.

C. Hydrostatic Tank Check

1. All tanks (septic and dosing tank) shall undergo a 24-hour static water check after installation and backfill (Vacuum testing the tanks at the time of delivery is a suitable alternative to the hydrostatic check).
2. If utilizing a hydrostatic check, the tanks must be filled with water to a level that is at a minimum of 2 inches over the riser/tank seam, the water level will then be measured and measured again after 24-hours has elapsed. If there is more than a ½ inch change (or 1-percent of the liquid capacity of the tank) in the water level the tank(s) must be rejected. It is recommended that the initial water level be measured the same day that the drainfield is inspected and a second measurement taken after 24 hours have elapsed.

D. Two Filter ASD 15GPM Hydraulic Unit

1. The system headworks (**DH2-21SKIT 1 ZONE HYD UNIT KIT**) are self-contained within a fiberglass vault and include a flow meter, solenoids, and self-cleaning disc filters capable of filtering particles larger than or equal to 115 microns (American Perc-Rite® Filters, or approved equal, shall be used).
2. The hydraulic unit must be placed on a bed of gravel for drainage.

E. Pipe and Fittings

1. All discharge piping, supply lines, valves and disconnects should be made of Schedule 40 PVC TYPE 1 rated for pressure applications, unless otherwise noted.
2. All joints must be properly "welded" utilizing the appropriate PVC cement for each application unless otherwise noted by the parts manufacturer.
3. The supply lines (see attached detail) shall be 1-inch Schedule 40 PVC. Ball valves required at headworks unit along with check valves at drainfield.
4. Laterals shall be ½ inch Schedule 40 PVC with connections to the drip line made via a PVC reducing tee.
5. Loops between runs of drip lines shall be ½ inch flex PVC with connections to the drip line being made via PVC FIP adapters.
6. The common return line (see attached detail) shall be 1-inch Schedule 40 PVC. Ball valve required at headworks unit.
7. The return manifolds shall have check valves.

F. Netafim PC Drip Line

1. The field network shall utilize 1/2-inch (0.67-inch O.D., 0.57-inch I.D.) nominal size NETAFIM PC polyethylene dripline. Pressure compensating emitters containing a biocide shall be spaced uniformly along the dripline on a maximum of two-foot centers and designed to deliver 0.61 to 0.65 gallons per hour per emitter (+ or - 5%) at internal tubing pressures of 7 to 60 pounds per square inch.
2. Individual drip lines shall be designed and installed level, following the naturally occurring ground contour (allow maximum variance of + or - two inches within any linear segment), on at least two-foot centers. Solvent welded heavy duty non-perforated flexible PVC pipe shall be used to connect the supply and return manifolds with the driplines, or to connect common driplines installed at varying depths or locations (e.g.: in step downs or to connect looped drip line segments). The connection lines shall be made to the driplines by solvent welded American Perc-Rite® compression or insert adapters or fittings or approved equal. Connection lines shall be conveyed over earthen dams constructed at least 2-inches higher than the driplines served, to retain effluent in the lines at the end of each dose cycle.

G. Air Vacuum Relief Valves/Field Appurtenances

1. Field appurtenances include an air vent at the high point(s)/outlet of each zone and check valve at the high point/outlet of each zone; cleanout at each end of the supply and return manifolds; a separate cleanout at the distal end of the supply line to each zone; and pressure monitoring fittings at the field inlet and outlet points, and at the headworks for measuring dead-head and operating pressures. The operator must be able to service all valves and air vents and check pressures without effluent discharging from the network in preparation for the maintenance/testing procedures. Valves, pressure monitoring fittings, and cleanouts shall be provided with protective vaults or boxes that extend at least to finished grade (shall always be accessible).

H. Drainfield Installation

1. A preconstruction conference shall be held on-site with the system installer, a representative(s) from the local health department prior to any construction taking place.
2. NOTE TO CONTRACTOR: Conveyance lines (Supply / Return piping) to be installed below frost depth. All portions of conveyance lines below frost is to be below the elevation of all tubing manifolds such that the conveyance lines remain full at pump shut off.
3. Remote zones will be required for this installation.
4. The proposed dripfield shall be installed with a chisel plow or vibratory plow. If the installer wishes to utilize another installation method, he or she must seek approval from the local health department and the consultant prior to making plans to install this system.
5. The proposed drainfield area is relatively free of trees.
6. The drip lines are flagged on the site and are marked on contour.
7. Under no circumstances shall any construction take place within the drainfield area while the soil is in a wet condition. If the installer has doubts as to whether the drainfield area is dry enough to begin construction, the UCEH should be contacted for permission to proceed with the installation.
8. The proposed drainfield is a Type V non-treated drip dispersal field, specifically the **American Perc-Rite® Subsurface Drip System**.
9. The drainfield consists of **800 linear feet** of **NETAFIM PC** drip tubing (emitters are 24-inch on centers).
10. Refer to zone detail **Z133** for details regarding manifolds, supply lines, remote zone valves, air release valves and check valves.
11. The drip zones are top-fed.
12. The maximum trench depth for this system shall be **6 inches**.
13. There shall be, at a minimum, 6 inches or more of cover over all drip lines at the time of the final inspection.
14. All force mains shall be tested for leaks prior to drip tubing installation and prior to system startup. Uncovered force mains shall be visibly inspected for leaks.
15. Install ball valves (at grade) for each supply line and the return line at the headworks unit.

16. All cutting of PVC pipe, flexible PVC, and drip tubing of size 1 ½" or smaller shall be accomplished with pipe cutters approved by American Manufacturing Company, Inc. No sawing of PVC, flexible PVC, or drip tubing of size 1 ½" or smaller is allowed.
17. The drip line is to be installed on contour with the land. Prior to beginning construction, layout the individual drip lines using an engineer's level and maintaining two-foot centers.
18. Run force main and distribution manifolds as per design specifications. Guidelines for Dripper Line Installation recommend that the drip tubing runs have a minimum spacing of 18". Do not exceed 300' on any lateral. Install air release/vacuum breaker with gravel in 6" valve box at the highest point of the field or elevated zone returns. One breaker per dripper zone is provided. Install dripper line with vibratory plough, trencher, or by hand without any kinks and without any rocks or debris in direct contact. Connect BioLine® dripper line to flexible P.V.C. assembly. Flexible PVC must extend a minimum of 12" into the run trench before connecting to dripper line to protect tubing from crimping. Connect field flush return manifold in same manner as the supply manifold. Continue to run P.V.C. from manifold back to the unit so that the dripper lines can be flushed automatically. DO NOT CONNECT return line air valves until the system has been flushed. Dripper line should always be run parallel to ground contours and field flush from the highest point.
19. All automatic valves (zone valves and field flush return valves) shall be installed to allow for manual field operation during field maintenance events. All valves must be provided with at-grade access.
20. When connecting flexible pipe (i.e., loops) to adjacent drip tubing runs to combine into a single lateral, the loops should be constructed to drain to each individual run to prevent freezing and drain down to the lowest run.
21. **Never leave the dripper line or PVC lines with open ends during the construction process. Duct tape may be used to close all exposed ends until permanent connections are made. Care must be taken to keep all construction debris from entering force mains, manifolds, and dripper line.**

I. System Startup

1. Manufacturer's recommendations shall be followed for system startup. All leaks in pipe network or from emitters exhibiting excessive emission rates as evidenced by wet spots during dosing cycles comparable to normal operating conditions shall be repaired. Normal dosing and flushing flow rates and flushing pressure at the ends of each zone supply and return manifold shall be measured and determined to be in accordance with design criteria.
2. All mechanical components, pumps, pump cycling, filter flushing, high water alarm must be demonstrated to be fully operable in accordance with their design.

J. Drainfield Protection

1. **This is a shallow placed drip dispersal system and extreme care must be taken not to damage the drip tubing. There shall be no traffic on or within the**

drainfield and repair areas before and after system installation. It is recommended that orange barrier fencing be used to delineate and protect these areas prior to construction and permanent fencing be considered post construction.

2. Any addition or removal of soil or other site alterations in the designated active and/or repair drip dispersal areas shall receive prior approval from the local health department or On-Site Water Protection Section. After installation of the drip lines, no disturbances such as tilling, plowing, digging or other potentially destructive activity shall occur in the drip dispersal fields without prior approval from the local health department or On-Site Water Protection Section.
3. Damage incurred to the drainfield area due to rutting, soil removal, etc. can lead to permit revocation.

K. Utility Conflicts

1. The builder and property owner must take special care in planning for water, power, gas, telephone, and cable lines. These utilities shall be kept clear of all parts of the septic system and its proposed repair area. Improper planning for underground utilities can negatively impact the installation and, in some cases, cause irreparable damage and lead to permit revocation. If there are any questions regarding preferred routes, contact system designer as soon as possible.
2. Lawn irrigation must not be installed in the septic drainfield area.

Maintenance

L. Operation and Maintenance

The designed system is classified as a Type V(a) wastewater treatment and disposal system and requires ongoing maintenance. State regulations require that a system of this type be managed by a person certified by the North Carolina Department of Environment and Natural Resources to operate subsurface wastewater systems (Section .1961 Maintenance of Sewage Systems). A "Maintenance Contract" between the system owner and a Certified Operator will be required by the system designer and ICEH prior to the issuance of a final system approval or Operation Permit.

1. System management entity, inspection/maintenance and reporting frequency requirements shall be comparable to at least Type V(a) systems in Rule .1961(b), Table V(b), except that the maximum inspection interval for systems up to 1500 gallons per day shall be quarterly for the first year of operation (more frequently as required for advanced pretreatment units, where applicable). During the first operational inspection after system start-up, an American Manufacturing representative will meet with the Operator in Responsible Charge (ORC) and the property owner to explain the system and answer any questions. In the event any system is found to be out of compliance, American Manufacturing will assist in the development of an action plan to bring the system back into compliance. The maximum inspection/maintenance/inspection frequency shall revert to quarterly for a period of one year after a system found to be out of compliance is repaired.

2. The ORC shall provide monitoring reports to the local health department which include a log of all malfunction incidences/notifications, maintenance activities and wastewater volume delivered to each zone between each required monitoring period. Minimum maintenance during each required inspection shall include visual observations of the dripfield(s), checking/cleaning filter screen(s), measured dosing flow rate to each zone, and recording of flow meter reading, pump run times and cycle counts. Flushing flow rates and pressure head measurements during flushing at the inlet and outlet of each field zone shall be taken at least once per year. The ORC shall report inspection findings and measurements on the report form and spreadsheet provided by American Manufacturing and Appended to the IWWS-93-1-R7A approval.
3. At each inspection the ORC shall, at a minimum, observe and monitor:
    - Wastewater level in the tanks,
    - The septic tank outlet filter or screened pump vault for clogging,
    - Operation of pumps, floats, valves, electrical controls and alarms,
    - Pumping frequency from pump impulse counters and elapsed run time meters,
    - The sand filter surface for wastewater ponding,
    - Physical integrity of the pipe network,
    - Vegetative growth over the drainfield,
    - The drainfield area for surfacing effluent, and
    - A sample of the sand filter effluent collected from the sampling port to check for effluent clarity.
4. At least twice per year the ORC shall, at a minimum, measure and report to the health department:
    - Sludge and scum levels in the septic tank,
    - Sludge level in the pump tank,
    - Pressure head in the distribution network,
    - Pump delivery rate at the design pressure head and calculate the average pump run time, and
    - Number of turns the gate valves were opened when pressure head was set.
5. Notification and performance of maintenance and repairs:
    - The ORC shall alert the system owner in a timely fashion if there are any needed maintenance or repair activities including, but not limited to, landscaping, tank sealing, tank pumping, lateral pipe desludging, pipe or control system repairs, sand media replacement, and adjustments to any other system component. The ORC shall notify the system owner and local health department whenever the pump delivery rate efficiency or average pump run time are not within 25% of initial measurements conducted prior to system startup.
    - The ORC shall keep the septic tank outlet filter or screened pump vault clean and in proper working condition.
    - System troubleshooting and needed maintenance (flushing lines, etc.) must be provided to maintain the pump delivery rate efficiency and average

pump run time within 25% of initial measurements conducted prior to system startup.

- The septic tank will be pumped as needed upon recommendation of the ORC. However, at minimum the septic tank will be pumped whenever the solids level exceeds 25% of the tank's total liquid capacity or the scum layer is more than 4 inches thick.
- The ORC shall notify the local Health Department and system owner in writing whenever repairs are required. All maintenance activities shall also be logged and recorded in the ORC reports provided to the local health department.

6. Reporting:
    - After each required ORC system inspection, the ORC shall provide a completed written report to the system owner and the local health department within 30 days. At a minimum this report must specify:
        (1) The date and time of the inspection.
        (2) System operating conditions observed,
        (3) System operating conditions measured,
        (4) Results from any laboratory analyses of any effluent samples,
        (5) Maintenance activities performed since the last inspection report,
        (6) An assessment of overall system performance, and
        (7) A determination of whether the system is malfunctioning, and the specific nature of the malfunction.

Design Specifics

Daily Design Flow:	240 GPD
Effluent Loading Rate:	0.15 GPD per Sq. Ft.
Septic Tank Size:	1,000 Gallons
Drainfield Dosing Tank Size:	1,000 Gallons
Drainfield Pump Requirements:	8.92 GPM at 51-ft. TDH American PUTURB1512112W
Control Panel:	Simplex 1-Zone American ASD151-S122
Length of Drip Line:	800 Linear Feet
Number of Zones:	1 Zone Detail (Z133)
Remote Zone Valves Required:	NO
Manifold Type:	Top Feed American DH-TOPFEEDKIT1

Number of Emitters:	400 (2 foot-on-centers)
Supply/Return Line Length and Diameter:	(1) 1" SCH 40 Supply (1) 1" SCH 40 Return

Perc-Rite® Operating Parameters

* See attached "Perc-Rite® Disposal Flow Equalization/Time Dosing Sequence of Operation" for an explanation regarding PLC programming and fractional dosing.

Peak Gallons per Day:	240
Average Gallons per Day:	144
Flow Rate through System:	4.12 GPM
Flushing Flow:	8.92 GPM
Dosing Volume:	52.65 Gallons per Dose
Peak Design Doses:	4.56
Run Time:	668.9 Seconds
Default Standard Rest Time:	160 Minutes
Default Peak Rest Time:	90 Minutes
Pump Rest Time (calculated standard):	526.5 Minutes
Pump Rest Time (calculated peak):	315.9 Minutes
Doses per Day (calculated standard):	2.7 Doses
Doses per Day (calculated peak):	4.6 Doses

*See drainfield layout and Z133 PercRite® zone detail and PercRite® design sheets for additional information.

NORTH CAROLINA PERC-RITE®

DESIGN SUBMITTAL

Perc-Rite® CalcTool version 3.1

American Manufacturing Company, Inc.

1-800-345-3132 www.americanonsite.com

JOB NAME:
226 Harbor Landing

DATE:
10/5/2022

OWNER:
Jason Field
900 W. Wilson Avenue, Apt. 307
Mooresville, NC 28117

DESIGNER:
Larry Thompson, LSS
PO Box 541
Midland, NC 28107

SITE ADDRESS:
226 Harbor Landing
Mooresville, NC

SIGNATURE:

	SELECT ONE
Site Plan Attached:	yes
Zone Detail Attached:	yes
Model Number Specs:	yes

SITE DIRECTIONS:

From Mooresville, take NC-115 N, turn left onto Connector Road, left onto Perth Road, left onto Erne Drive/Harbor Landing Drive, left onto Harbor Landing Drive, and lot will be located on the right.

SYSTEM INFORMATION: (Automatically Computed based on Worksheet)

Effluent Quality :	Anaerobic	Total LF Tubing Provided :	810
Zone Detail :	Z 1 3 3	# Bedrooms x 120 :	240

ELECTRICAL REQUIREMENTS:

Pump :	1/2 HP, 115V, 1 PHASE
Control :	15 AMP, 115V, 1 PHASE
Other :	

SYSTEM MODEL NUMBER: You may use either drop-down list. SELECT ONLY ONE.

Aerobic OR Anaerobic:	ASD151-S122: 1 Zone Drip w/ Simplex 2 Filter, 2 Zone Control Panel
Aerobic Only:	None

OPTIONS

1.	DH-INSKIT225: Insulation & Heater Kit for Large Enclosure (208W)	no
2.	BIOLINE500: Drip Tubing per 500 ft Roll	0
3.	BIOLINE1000: Drip Tubing per 1000 ft Roll	1

Click link below to access PDF for selected model number.

~ Contains Installation Instructions, Specifications, & Standard Details

Anaerobic Pump Curve

Click link below to access Bill of Materials for selected model number.

ASD151-S122

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NORTH CAROLINA WORKSHEET - Dispersal system design worksheet for residential systems.

line #	INPUTS	Select One	You must be able to answer **YES** to both questions in order to continue.
		yes	Are supply and return pipes 1"?
		yes	Is the lift to the HU <8' and the run to the HU<30' with 1-1/2" pipe?
1	Anaerobic	Select One: Anaerobic or Aerobic?	ASD15 Units are septic or secondary. Washdown units are secondary or better.
2	Soil Group III.	Select One: Soil or Saprolite Group?	Found in column 1 on the Loading Rate Chart. (given by site evaluator)
3	240	Select One # Bedrooms x 120	Design quantity of wastewater to disperse. This row equals the total number of GPD. **Remember to multiply # Bedrooms by 120.**
4	90	Contour Run Length	Enter the tubing length along contour. If run length is not on table, use the actual run length. Example: 85 ft.
5	100	Supply LF	Length of supply line between hydraulic unit and farthest zone.
6	14	Lift Ft.	Vertical lift from off level in the pump chamber and highest zone elevation.
7	0.15	Area (gpd/ft^2) per code — Tab over from **Soil Group III.** in **Loading Rate Chart**	Area loading rate required to treat and disperse wastewater. **This line is to be input from Loading Rate Chart.** (See Loading Rate Chart)
8	1600	Area Calculation	Total land area needed to disperse wastewater.
9	800	Total LF Tubing	**Required** total linear feet of tubing to treat and disperse wastewater.
10	8.89	Calculated Runs	Determines number of runs (Total LF / Contour RL). **Rounds up to the next whole number**. Found on Zone Detail Table.
	9	Min. # Runs	
11	Z 1 L 3 R 3	Zone Detail — **ASD 15: Z133** Input the appropriate Zone Detail # into the drop-down list to the left.	On **Zone Detail Table**, cross the next highest **Run Length** (ft) from **90** with the row for at least **9** **runs** — **Use the ASD 15 Zone Detail Table.** Select zone detail from column with next higher **Contour Run Length** and with equal or greater **# Runs.** You may input your Zone Detail # in the indicated cell next to the chart. It will then appear in the second column to the left on this worksheet.
11	9	Actual # Runs	Determined from selected Zone Detail.
12	24	Proposed Spacing (inches)	Based on available area and site condition.
13	18	Down Slop Width (ft)	Calculated from runs and run spacing.
14	1620	Area Calculated (ft^2)	Calculated from runs, run spacing, and contour run length.
12	51	Max. Lift Allowed — **ASD 15: 51** Select which Lift & Distance table you used in the box to the left.	On **Lift & Distance Table**, cross the **Supply/Return** **100** with the column for **3** **laterals** — **Use the ASD 15 Lift & Distance Table.** You may input your Lift in the indicated cell next to the chart. It will then appear in the second column to the left on this worksheet.
13	810	LF Provided	Total linear feet of tubing **Provided** to disperse wastewater.
14	810	LF/Zone	Total linear feet per zone.
15	YES	Will zone flush?	Reference Lift & Distance Table for pump capacity determined by the length of run to the farthest field and the number of laterals. For 1" supply and return only.
	37	Residual TDH Available	

*In line **# 11**, **Z** = # of zones, **L** = laterals per zone, **R** = runs per lateral

	given by engineer	1
	auto-computed	1
	looked up on tables	3
	user select	

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OPERATING PARAMETERS

16	**240**		**Peak Gallons per day**	Maximum or design gallons per day.
17	**144**		**Average Gallons per day**	Average gallons per day. (calculated as 60% of Peak)
18	**4.12**		**Dosing Flow (gpm)**	Based on .61 gph per emitter.
19	**8.92**		**Flushing Flow (gpm)**	Flow to generate 2 fps at the distal end of each lateral.
20	**52.65**		**Gallons per dose**	The zone dose volume is 5 times the volume of the pipe.
21	**4.56**		**Peak Design Doses per day**	The total number of zone doses. Individual zone doses is this number divided by the number of zones.
22	**668.9**		**Run Time (Seconds)**	Estimated run time for dose gallons based on filtration capacity, flushing flow, and dosing rate
23	**Zone**	**min**	**Default Standard Rest Time**	This is the rest time at average flow. The rest time is independent of run time. (60 min. rest = 24 doses per day)
	1	**160**		
24	**Zone**	**min**	**Default Peak Rest Time**	This is the rest time at peak flow. The rest time is independent of run time. (60 min. rest = 24 doses per day)
	1	**90**		
25	**Zone**	**min**	**(Recommended) Calculated Standard Rest**	This is the rest time at average flow. The rest time is independent of run time. (60 min. rest = 24 doses per day)
	1	**526.5**		
26	**Zone**	**min**	**(Recommended) Calculated Peak Rest Time**	This is the rest time at peak flow. The rest time is independent of run time. (60 min. rest = 24 doses per day)
	1	**315.9**		
27	**Zone**	**doses/ day**	**(Recommended) Calculated Standard doses per day**	This is the total number of doses per day independent of the number of zones. The rest time is independent of run time. (450 gal. per day / 50 gal per dose = 9 doses per day) for a 2, 3, or 4 zone system.
	1	**2.7**		
28	**Zone**	**doses/ day**	**(Recommended) Calculated Peak doses per day**	This is the total number of doses per day independent of the number of zones. The rest time is independent of run time. (450 gal. per day / 50 gal per dose = 9 doses per day) for a 2, 3, or 4 zone system.
	1	**4.6**		

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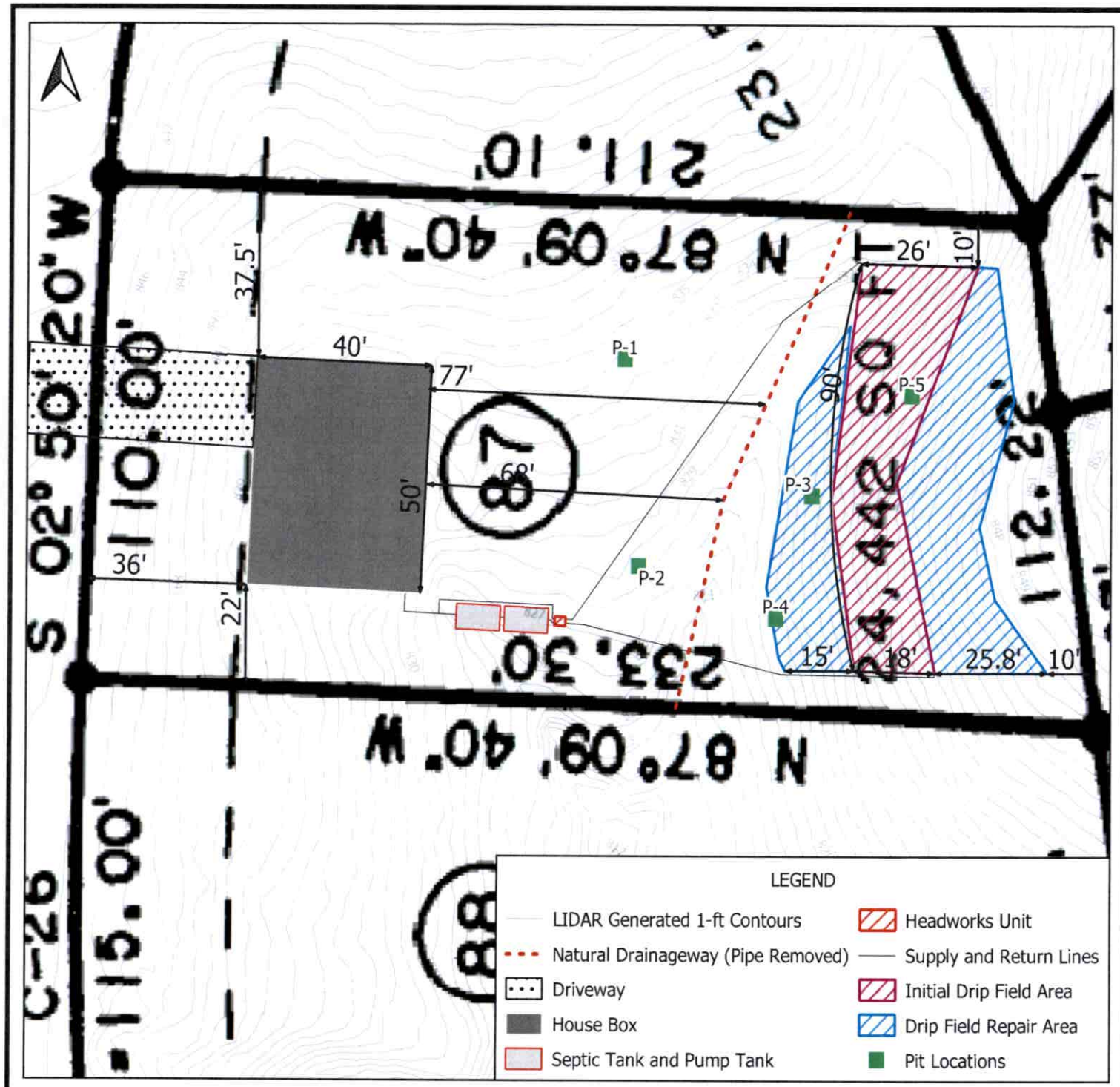


FIGURE 1

Prepared For:

Jason Fields

Proposed Septic Layout

Lot 87 - Harbor Landing
226 Harbor Landing Dr.
Mooresville, NC 28117

Iredell County

Scale:
0 15 30 ft

TEC Job No.
22-347

Date:
October 2022

Thompson Environmental Consulting
WATER · WASTEWATER · WETLANDS

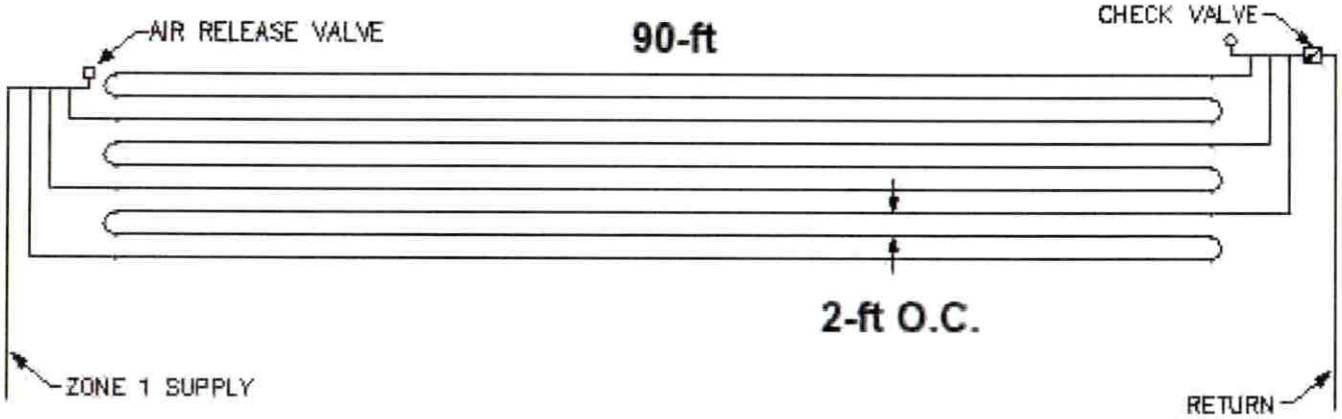


FIGURE 2

Prepared For:

Jason Fields

Z133 Zone Detail

Lot 87 - Harbor Landing
226 Harbor Landing Dr.
Mooresville, NC 28117

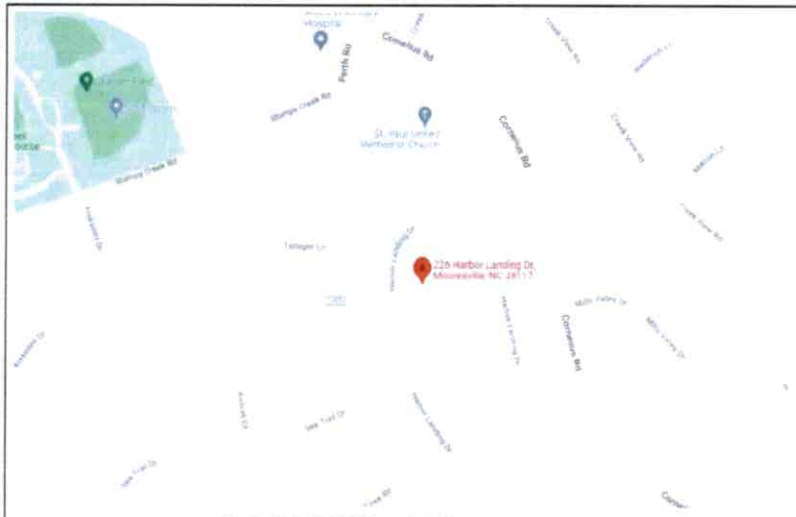
Iredell County

Scale:
Not to Scale

TEC Job No.
22-347

Date:
October 2022

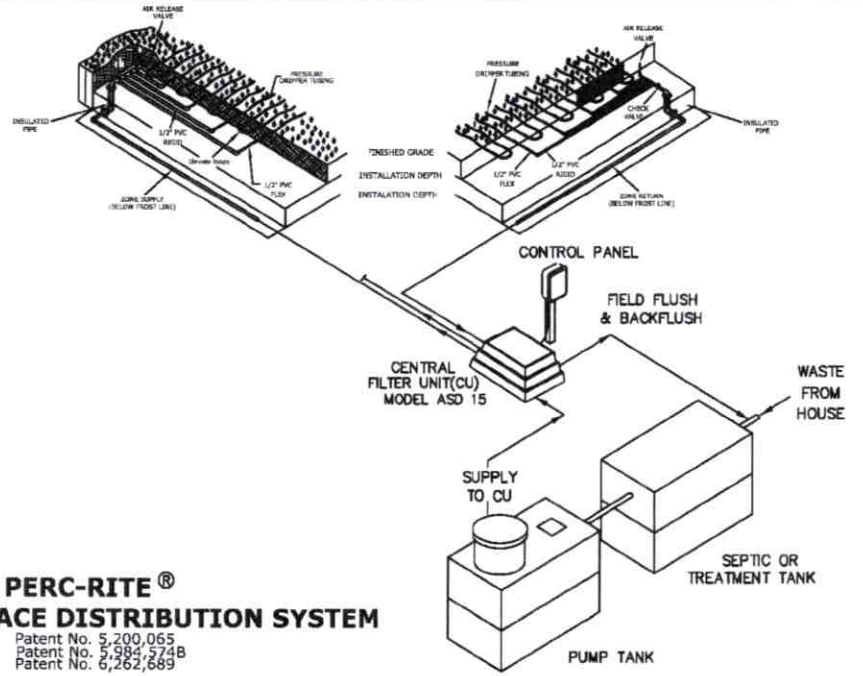
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LOCATION MAP

SITE DIRECTIONS

From Mooresville, take NC-115 N, turn left onto Connector Road, left onto Perth Road, left onto Erne Drive/Harbor Landing Drive, left onto Harbor Landing Drive, and lot will be located on the right.



PERC-RITE ®
SUBSURFACE DISTRIBUTION SYSTEM

Patent No. 5,200,065
Patent No. 5,984,574B
Patent No. 6,262,689

SCOPE: Household Sewage will flow by gravity through a septic/treatment tank, then to a drip dispersal equalization pump tank. From the drip pump tank the effluent is filtered through 115 micron disc filters and dispersed through a drip dispersal piping network. The network is composed of pressure compensating drip tubing laid on contour and managed by the Perc-Rite® process.

_____ has designed the drip dispersal system for the specific site in accordance with findings recommendations with the site evaluator/soils evaluator, who is the consultant for the owner. American's pre-engineered system has been selected for the site by the owners representative. American only certifies the system mechnical application for this site and makes no representation for soil suitability or other site engineering code requirements.

CONTENTS:

Page 1 . . . . . Cover Sheet
Page 2 . . . . . Site Layout Plan
Page 3 . . . . . Hydraulic Profile, Pump Tank, & Zone Details
Page 4 . . . . . Control Details, Pump Curve, & Cool Guide
Page 5 . . . . . Drip Detail Schematics
Page 6 . . . . . Calculation Sheet
Page 7 . . . . . Construction Notes

I hereby certify that the evaluations and designs contained herein (refer to subdivision , lot, etc.) were conducted in accordance with the *"Regulations"* Furthermore, I certify that the evaluations and designs comply with the minimum requirements of the *Regulations*.

I recommend a _____ be _____

Licensed PE: _____ Date _____

Seal

AMERICAN MANUFACTURING CO.
22011 Greenhouse Road, Elkwood, Va. 22718 540-825-7234

PROJECT NAME :	DRAFTER:	DATE:
	CHECKED:	DATE:
	APPROVED:	DATE:
226 Harbor Landing Drive	TITLE : COVER SHEET PERC-RITE ® DRIP DESIGN	
COUNTY : Iredell County		

FILE: S:\Residential Plans\01dripres15.dwg | SCALE : NTS | SHEET: 1 OF 7

SITE PLAN (SYSTEM LAYOUT SKETCH)

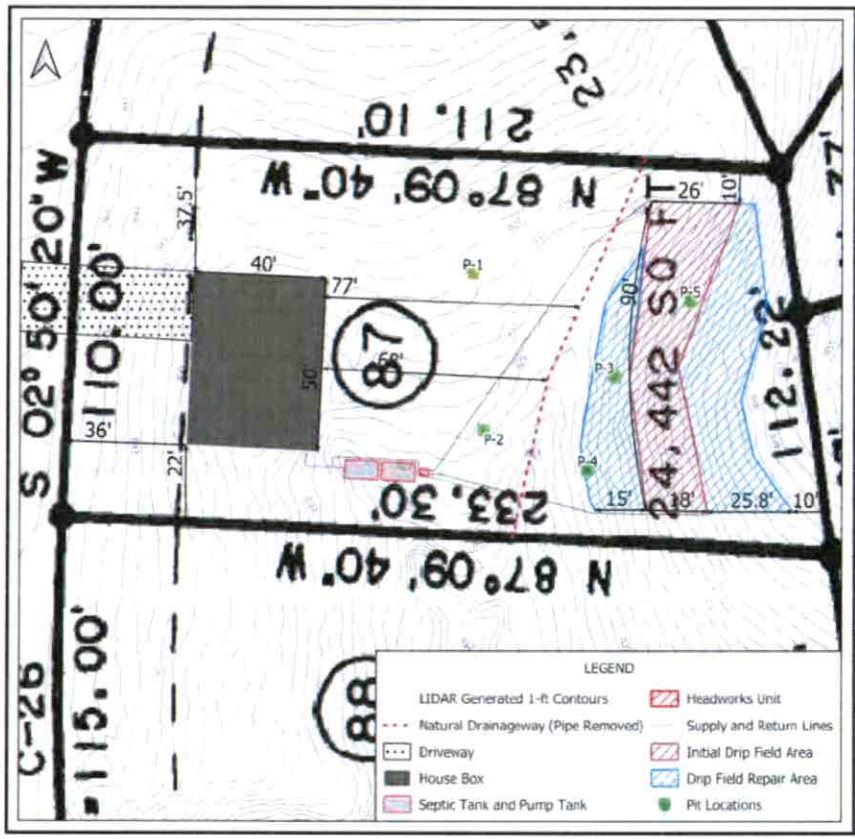


FIGURE 1

Prepared For:
Jason Fields

Proposed Septic Layout

Lot 87 - Harbor Landing
226 Harbor Landing Dr
Mooresville NC 28117

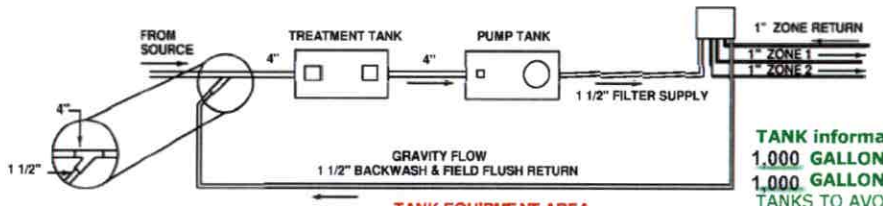
Iredell County

Scale:

TEC Job No.
22-347

Date:
October 2022

Thompson Environmental Consulting

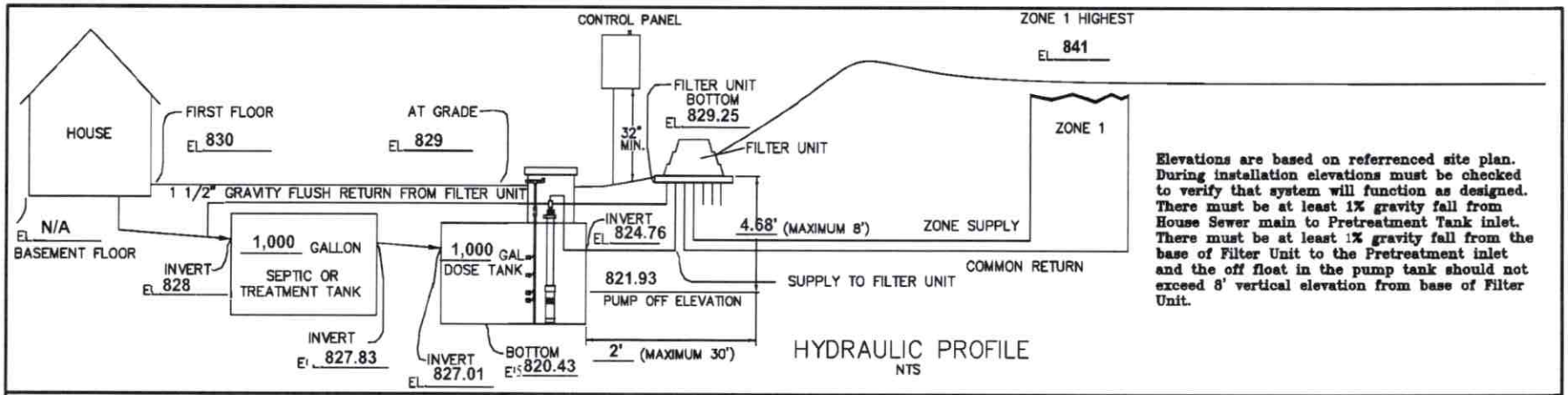


TANK EQUIPMENT AREA
SCHEMATIC PLAN
NOT TO SCALE

TANK information:
1,000 GALLON Septic TANK,
1,000 GALLON DRIP DOSE TANK. INSTALL TANKS TO AVOID SWALES OR LOW LYING AREAS!

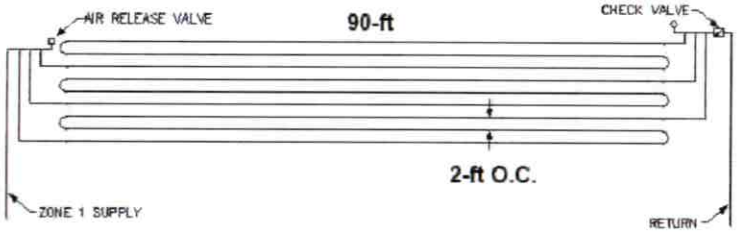
AMERICAN MANUFACTURING CO.
22011 Greenhouse Road, Elkwood, Va. 22718 540-825-7234

PROJECT NAME : 226 Harbor Landing Drive	DRAFTER:	DATE:
	CHECKED:	DATE:
	APPROVED:	DATE:
COUNTY : Iredell County	TITLE : SITE LAYOUT PLAN	
	SCALE : NTS	SHEET: 2 OF 7



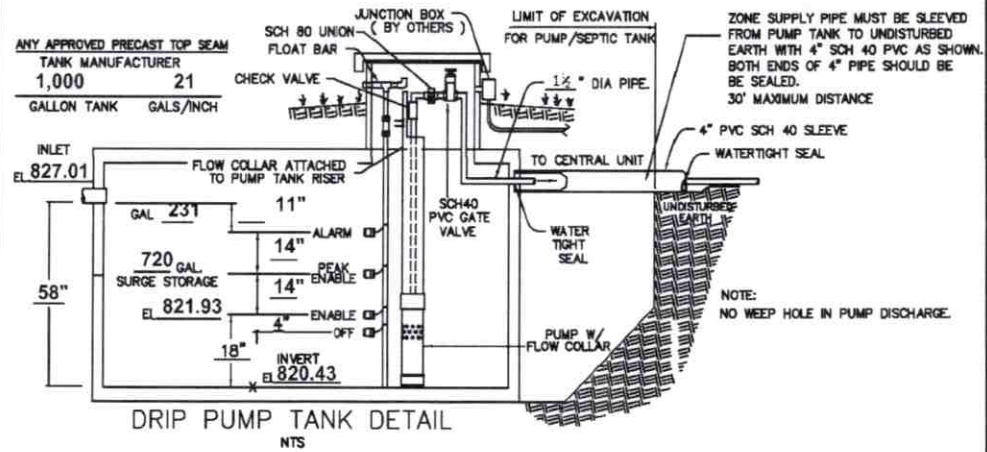
Elevations are based on referrenced site plan. During installation elevations must be checked to verify that system will function as designed. There must be at least 1% gravity fall from House Sewer main to Pretreatment Tank inlet. There must be at least 1% gravity fall from the base of Filter Unit to the Pretreatment inlet and the off float in the pump tank should not exceed 8' vertical elevation from base of Filter Unit.

ZONE DETAIL Z 254
(NOT TO SCALE)



NOTE: Install tubing on contour at 6" depth. Install Supply and Return Lines at 1.5 - 2' (Below frost line) Minimize site activity, NO machinery on site except minimum required to install tubing. SITE PROTECTION IS VERY IMPORTANT!

NOTE: 1 -Zone drip detail (Z133) with 3 laterals, 3 tubing runs per lateral for a total of 9 tubing runs @ 90 ' length = 800 total LF tubing.



DRIP PUMP TANK DETAIL
NTS

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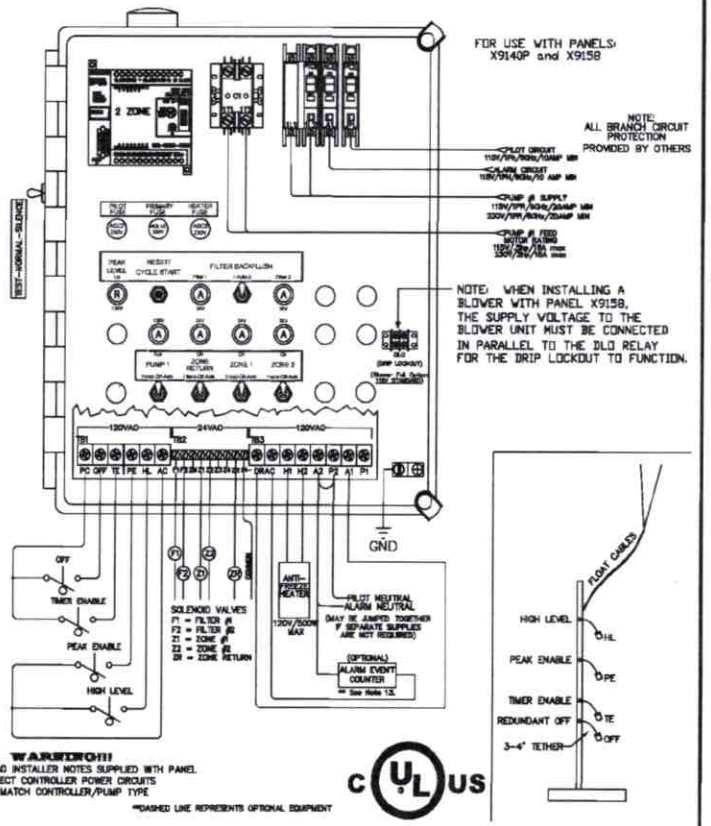
PROJECT NAME :	DRAFTER:	DATE:
	CHECKED:	DATE:
	APPROVED:	DATE:
226 Harbor Landing Drive	TITLE : HYDRAULIC PROFILE, DRIP & ZONE DETAILS	
COUNTY : Iredell County	SCALE : NTS	SHEET: 3 OF 7

AMERICAN PERC-RITE® CONTROLS

American Manufacturing Co., Inc. P.O. Box 549, Manassas, VA, 20108

Simplex 2 Zone PERC-RITE Drip System

INSTALLATION GUIDE FOR "DP1" SERIES DRIVE SYSTEM



WARNING!!!
READ INSTALLER NOTES SUPPLIED WITH PANEL
SELECT CONTROLLER POWER CIRCUITS TO MATCH CONTROLLER/PUMP TYPE

*DASHED LINE REPRESENTS OPTIONAL EQUIPMENT

MODEL #:

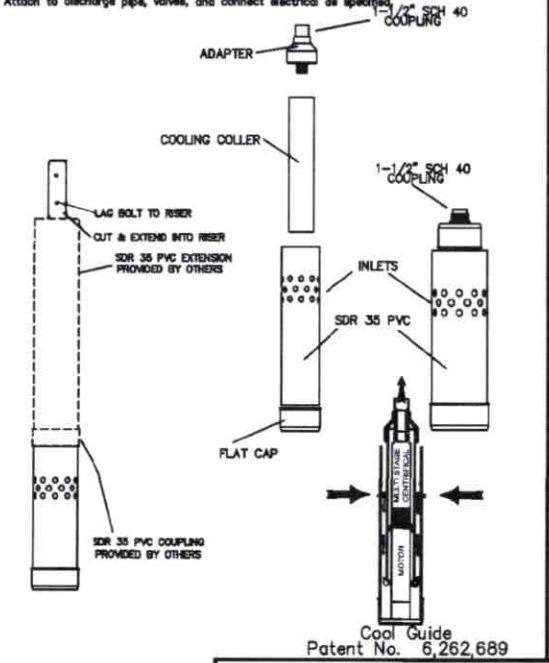
COOL GUIDE

FLOW COLLAR (COOL GUIDE) SPECIFICATION

The laminar flow collar shall be made of non-corrosive, glueable PVC and have sufficient holes in the outer guide tube to assure laminar flow for the rated capacity. The inner flow collar shall extend near the bottom to provide sufficient cooling flow for the motor. The dimension between the inner collar and the pump motor shall not restrict flow to the pump intake, but will provide for scouring of surfaces. The laminar flow collar shall be a "Cool Guide" as manufactured by American Manufacturing Company, Inc. Patent # 6,262,689.

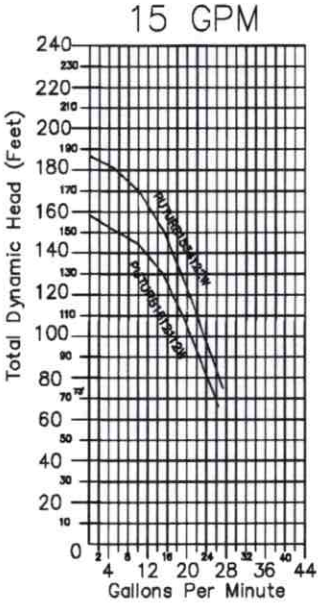
"COOL GUIDE" INSTALLATION INSTRUCTIONS

1. Measure the distance from the bottom of the tank to 6" down from the top of the riser. Cut the extension pipe (by others) to the length necessary to reach this height. Cut 1/2 of the pipe down 12" to 18" away from the top of the pipe for pump discharge pipe.
3. Glue the extension coupling (by others) to the extension pipe and to the Cool Guide.
4. For repairs: glue on the Cool Guide flat cap and place the Cool Guide firmly in the the tank. Attach the extension to the riser, with the anchors as shown.
5. For new construction: Anchor the flat cap to the bottom of the tank in the proper location to hold Cool Guide and extension. The cap may or may not be glued to the device. Attach the extension to the riser with the anchors as shown.
6. Place the pipe dope on the Cool Guide adapter threads and thread them into pump discharge.
7. Attach cooling collar to adapter with set screw provided.
8. Glue pipe into flow collar and with pump attached, lower into the guide tube.
9. Attach to discharge pipe, valves, and connect electrical as specified.



Cool Guide
Patent No. 6,262,689

PUMP CURVE



PUTURB1512112W 1/2HP, 115V, 1PH, 2WIRE
PUTURB1512122W 1/2HP, 230V, 1PH, 2WIRE
PUTURB1534122W 3/4HP, 230V, 1PH, 2WIRE

15 GPM @ 125 FT
BACKWASH TDH

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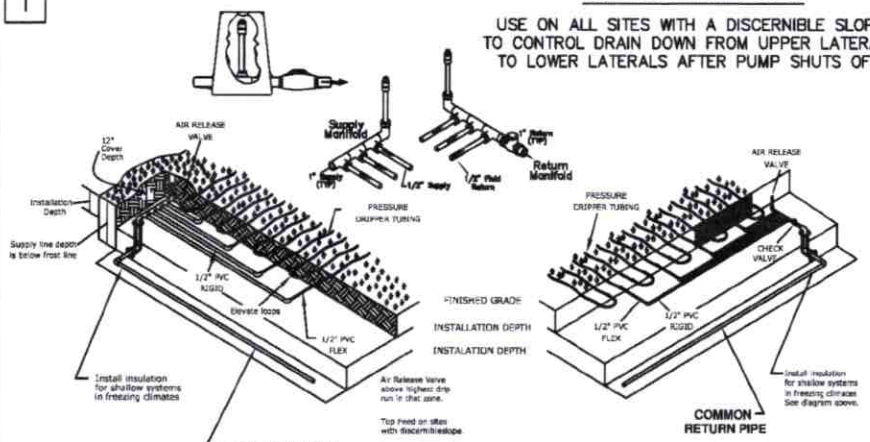
PROJECT NAME : 226 Harbor Landing Drive	DRAFTER:	DATE:
	CHECKED:	DATE:
	APPROVED:	DATE:
COUNTY : Iredell County	TITLE : CONTROL, COOL GUIDE & PUMP CURVE DETAILS	
	SCALE : NTS	SHEET: 4 OF 7

STANDARD RESIDENTIAL DRIP SYSTEM DETAILS

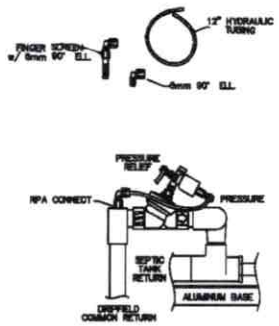
1

TOP FEED MANIFOLDS

USE ON ALL SITES WITH A DISCERNIBLE SLOPE TO CONTROL DRAIN DOWN FROM UPPER LATERALS TO LOWER LATERALS AFTER PUMP SHUTS OFF.

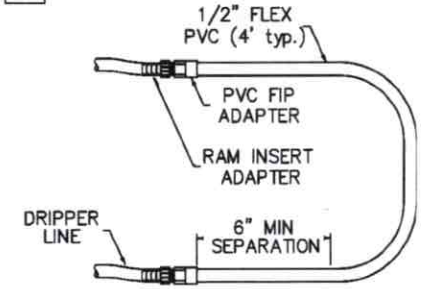


RESIDENTIAL Patent No. 5,984,574B



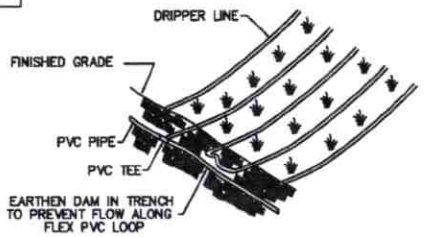
RETURN PRESSURE ASSEMBLY (RPA)
NTS

3



BURIED DRIP LOOP CONNECTION
NTS

4

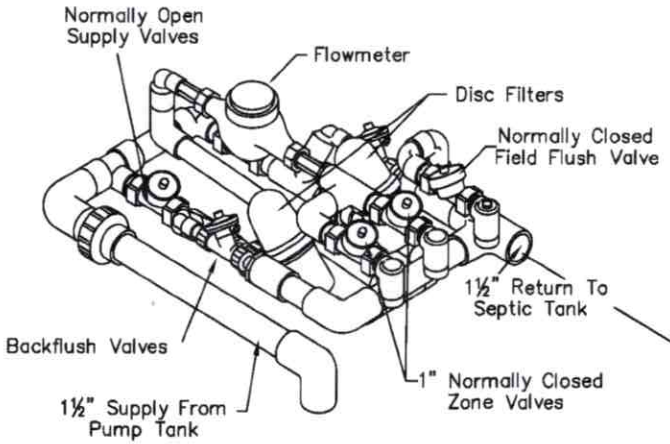


DRIPPER LINE SECTION DETAIL
NTS

SIDE FEED OPTION
FLAT SITES ONLY.

2

AMERICAN MFG. COMPANY
TWO-FILTER - 15 GPM
HYDRAULIC UNIT



NOTE:
IN THE EVENT THE DRIP ZONES ARE A DISCERNIBLE VERTICAL ELEVATION ABOVE THE HYDRAULIC UNIT, INSTALL A "RETURN PRESSURE ASSEMBLY." THE ASSEMBLY IS TO BE USED TO PREVENT THE RETURN LINE FROM DRAINING AFTER OR DURING A DOSE. REMOVE THE ZONE RETURN CONNECTION AND REINSTALL A SHORT 1" NIPPLE IN THE RETURN VALVE. INSTALL ASSEMBLY AS SHOWN ABOVE. THE HYDRAULIC TUBING PROVIDING PRESSURE FOR THE REST OF THE UNIT MUST BE PLUGGED AND THE NEW TUBING FROM THE ASSEMBLY CONNECTED TO THE PRESSURE SIDE OF THE SILENOID.

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PROJECT NAME :	DRAFTER:	DATE:
	CHECKED:	DATE:
	APPROVED:	DATE:
226 Harbor Landing Drive	TITLE : DRIP DETAIL SCHEMATICS	
COUNTY : Iredell County	SCALE : NTS	SHEET: 5 OF 7

COLD WEATHER INSTALLATION NOTES

Minimum construction techniques for all American "Perc-Rite" Drip systems in cold weather climates:

"Top feed" manifolds should be used on all sites with a discernible slope to allow for proper drainage of the manifolds and the 3/4" and 1/2" lateral connectors into the drip tubing.
The main supply and return lines shall be installed below the frost line and shall feed the shallow "top feed" manifolds with a single vertical section of insulated sch 40 PVC pipe. Insulation shall be minimum 1/2" thick foam insulation (or equivalent).
On flat sites where "top feed" manifolds will not drain therefore requiring the use of side feed manifolds, 12" cover is recommended between highest point of 1/2" black flexible PVC pipe (non loop connections) and final grade. On drip tubing installations less than 12" this would require additional cover over the header ditch area to create the 12" separation. Any additional cover is it to be graded and tapered into landscape. Please see note on loop connections below.
Dense vegetation turf cover to be established over supply trench, return trench and tubing prior to 1st exposure to cold weather. If vegetation cannot be established, then trenches and tubing to be covered with a thick layer (minimum 6") of mulch, straw/hay, etc. until such turf cover is established. Cover must be stabilized and maintained until dense vegetative turf is established. Amount of cover may need to be adjusted to account for settling.
All valve boxes that house "remote zone valves" shall be insulated by contractor. Insulation to consist of either blue board, bagged Styrofoam peanuts or equivalent. If fiberglass insulation is used it must be sealed to prevent it from becoming saturated.
The "remote valves" shall be placed on a bed of gravel or screenings (4"-6"). Positive grade away from valve boxes is encouraged to reduce the volume of groundwater that may collect in valve box. Certain sites may require positive drains to daylight.
All loops connecting drip runs with 1/2" flexible PVC shall be slightly elevated (minimum 1"-2") so that they drain into the drip tubing after the pump shuts off. It is contractors responsibility to ensure these loops stay elevated during and after the loops are backfilled.
All main supply and return trenches to be installed below the local frost line. If this is not possible due to site restrictions then adequate soil must be added over the top of the trenches so that the effective depth remains below the frost line after settling occurs. The added soils must be prepared for turf cover and stabilized. If vegetation cannot be established then trenches are to be covered with an additional layer (minimum 6") of mulch, straw/hay, etc. until such turf cover is established.
Sufficient ground cover around the hydraulic unit is required to insulate the unit. All pipes entering and leaving the hydraulic unit shall elbow vertically down 90 degrees to a depth below the frost line prior to extending away from the unit horizontally.
Additional insulation inside the hydraulic unit is encouraged. Insulation to consist of either blue board, bagged Styrofoam peanuts or equivalent. If fiberglass insulation is used it must be sealed to prevent it from becoming saturated.
All conduit entering into the control panel shall be sealed to prevent condensation inside the panel.
Established vegetation height shall be minimum 4"-6" throughout winter months.
Air release valves shall be placed below the ground surface inside a valve box but at an elevation above the highest drip line in that particular zone.

SITE CLEARING GUIDELINES

General guidelines for preparing/clearing a site for installation of an American Mfg. "Perc-Rite®" Drip System:

GENERAL REQUIREMENTS:
The preservation of the original structure of the soil in the absorption area is essential to maintaining the percolative capacity of the soil. **No** activity other than the construction of the system is permitted within the absorption area. On sites where a majority of the vegetation needs to be removed, care must be taken to minimize the impact on the soils natural permeability. There shall be **no** cutting, filling, or storage of material on or within 20' of the adsorption area. Site clearing and preparation shall be performed by the installation contractor for the wastewater dispersal system.
The absorption system is **not** to be constructed during periods of wet weather when the soil is sufficiently wet at the depth of installation to exceed its plastic limit. The plastic limit is exceeded when the soil can be rolled between the palms of the hands to produce threads 1/8 inch in diameter without breaking and crumbling.
After installation of the dispersal system, or if after clearing installation is not to be performed for 60 days, seed the area liberally with native grasses. The standard Department Of Transportation specification is acceptable consisting of perennial rye and fescue. At all times protect the installation area from erosion. Local codes shall apply for best management practices to control runoff.

SHALLOW INSTALLATIONS (surface to 8"):
Clearing and removal should be by hand with minimal machine assistance and under optimum soil moisture conditions. Track machines are preferred to those with rubber tires and should only be used around edges of installation. Soil moisture conditions need to be confirmed prior to beginning clearing and system installation by the soil scientist of record.

MID RANGE INSTALLATIONS (12" TO 24"):
All trees and brush, as necessary, should be "pulled out" (grubbed out) or cut flush with the ground surface. Stumps may be ground to two inches below the installation depth and the hole backfilled with sandy material to 6" above installation depth and the remainder with natural soil. When the soil is disturbed at the installation depth by pulling a stump, backfill the hole with sandy material to 6" above installation depth and the remainder with natural soil. Digging and pushing over trees may be more detrimental to the soils infiltrative characteristics. Track machines are preferred to those with rubber tires and should only be used during optimal soil moisture conditions. Soil moisture conditions need to be confirmed prior to beginning clearing and system installation by the soil scientist of record.

DEEP INSTALLATIONS (30" and deeper):
All trees and brush, as necessary, should be removed. When the soil is disturbed at the installation depth, backfill the hole with sandy material to 6" above installation depth and the remainder with natural soil. Stumps may be ground to two inches below the installation depth and the hole backfilled with sandy material to 6" above installation depth and the remainder with natural soil. Digging and pushing over trees may be more detrimental to the soils infiltrative characteristics than "pulling" and are **not** recommended. Track machines are preferred to those with rubber tires and should only be used during optimal soil moisture conditions. Soil moisture conditions need to be confirmed prior to beginning clearing and system installation by the soil scientist of record.

LARGE SCALE INSTALLATION TESTING:
Larger systems typically do not have water available for zone installation testing on a timely manner. It is desirable to water test an installed zone while the supply and return manifold header ditches are exposed to better inspect for leaks. In order to facilitate site and equipment protection and erosion control, the installation contractor shall provide sufficient water and the means to deliver and monitor the water to both flush and leak test each zone or subzone prior to backfill. The flushing volume shall be five times the volume of the piping network being flushed. The flushing velocity shall be in excess of 2-1/2 feet per second. The leak testing volume shall be at least 3 times the volume of the pipe. The leak test shall continue until steady state flow is achieved and the flow rate is within 6 % of the design flow rate or as approved by the manufacturer or engineer. After successful testing and inspection the supply and return pipe connection points shall be sealed and protected from dirt and debris from entering prior to final connection.

General Construction Notes
American Manufacturing "Perc-Rite®" Drip

1. All installation and construction techniques shall conform to state and county codes pertaining to on site sewage systems and the permit for this site.
2. The installation of this system shall be in accordance with specifications and procedures as supplied by the Manufacturer of the equipment.
3. The drip tubing shall be installed using a vibratory plow, trencher, or by hand.
4. **All tubing to be installed along contour.**
5. All PVC pipe and fittings shall be PVC SCH 40 Type 1 rated for pressure applications. All glued joints shall be cleaned and primed with purple (dyed) PVC primer prior to being glued.
6. All cutting of PVC pipe, flexible PVC and dripper tubing of size 1 1/2" or smaller shall be accomplished with pipe cutters approved by American Manufacturing Company, Inc. No sawing of PVC, flexible PVC or dripper tubing of size 1 1/2" or smaller allowed.
7. All PVC pipe, flexible PVC and dripper tubing in the work area shall have the ends covered with duct tape to prevent construction debris from entering the pipe. Prior to gluing, all joints shall be inspected for and cleared of any construction debris.
8. All automatic valves (zone valves & field flush return valves) shall be installed with isolation valves, bypass valves, and disconnects (i.e. unions, flanges) for manual field operation during field maintenance events. All valves must be provided with at-grade access.
9. Drain field supply and return lines and manifolds to be installed at adequate depth to prevent freezing. Horizontal spacing between the dripper lines and the installation depth to be as specified.
10. **No activity on drain field area other than minimum required to install system. Do not park equipment, drive large equipment over or store materials on drain field area.**
11. **No wet weather installation is permitted.**
12. The contractor shall be certified by American Manufacturing Company, Inc. to install this type of system and shall hold a pre-construction meeting with the individuals responsible for soil evaluation, permitting and inspections prior to site work beginning to insure protection of the site conditions and to ensure the system is installed according to design.
13. If site conditions are determined to require the installation of the system to deviate from these plans, all work shall stop immediately and the designer shall be notified. Any ongoing work shall be at the sole responsibility of the contractor.
14. All force mains shall be tested for leaks prior to drip tubing installation and prior to system startup. Uncovered force mains shall be visibly inspected for leaks. If a leak is suspected in covered force mains then the force main shall be re-tested at a minimum pressure of at least percent above the design operating pressure, for at least 30 minutes. There shall be no discernible leakage.
15. ASD15 & 25 Hydraulic units to be placed on a bed of gravel for drainage.
16. If standing groundwater is a problem a screened drain to daylight is required.

AMERICAN MANUFACTURING CO.
22011 Greenhouse Road, Elkwood, Va. 22718 540-825-7234

PROJECT NAME :	DRAFTER:	DATE:
	CHECKED:	DATE:
	APPROVED:	DATE:
226 Habor Landing Drive	TITLE : GENERAL CONSTRUCTION, COLD WEATHER INSTALLATION & SITE CLEARING NOTES	
COUNTY : Iredell, County		
	SCALE : NTS	SHEET: 6 OF 7

Thompson Environmental Consulting, Inc.
PO Box 541
Midland, NC 28107

Sheet 1 of 2
PROPERTY ID #: 4638882534.000
COUNTY: Iredell

SOIL/SITE EVALUATION
***for* ON-SITE WASTEWATER SYSTEM**

OWNER: Jason Field
ADDRESS: 900 W Wilson Ave, Apt 307 Mooresville
PROPOSED FACILITY: SFR PROPOSED DESIGN FLOW (.1949): 240 gpd
LOCATION OF SITE: 226 Hudson Lane Drive, Mooresville
WATER SUPPLY: ☐ Private ☒ Public ☐ Well ☐ Spring ☐ Other LOT 87 Taylor Landing
EVALUATION METHOD: ☐ Auger Boring ☒ Pit ☐ Cut
DATE EVALUATED: 6-28-22
PROPERTY SIZE: 0.56ac
PROPERTY RECORDED:
TYPE OF WASTEWATER: ☒ Sewage ☐ Industrial Process ☐ Mixed

PROFILE #	.1940 LANDSCAPE POSITION/ SLOPE %	HORIZON DEPTH (IN.)	SOIL MORPHOLOGY (.1941) .1941 STRUCTURE/ TEXTURE	SOIL MORPHOLOGY (.1941) .1941 CONSISTENCE/ MINERALOGY	OTHER PROFILE FACTORS .1942 SOIL WETNESS/ COLOR	.1943 SOIL DEPTH	.1956 SAPRO CLASS	.1944 RESTR HORIZ	PROFILE CLASS & LTAR
1	LS 8%	0-40	FILL		Chroma II	—			US —
2	LS 9%	0-24	FILL		Chroma II	—			US —
		24-34	SBk/c	FI/S/P/Sap					
3	LS 39%	0-10	SBk/cL	FI/SS/P/Sap	—	36"	II CL	36" CL&P & R	PS 0.15
		10-36	SBk/c	FI/S/P/Sap					
4	LS 36%	0-12	SBk/cL	FI/SS/P/Sap	—	25"	II CL		PS 0.15
		12-20	SBk/c	FI/S/P/Sap					

DESCRIPTION	INITIAL SYSTEM	REPAIR SYSTEM
Available Space (.1945)	PS	PS
System Type(s)	Drip	Drip
Site LTAR	0.15	0.15

OTHER FACTORS (.1946): Provisional
SITE CLASSIFICATION (.1948):
EVALUATED BY: L. Thompson
OTHER(S) PRESENT: Carlos Rodriguez

LICENSED SOIL SCIENTIST — LARRY B. THOMPSON — 1287 — STATE OF NORTH CAROLINA

COMMENTS:

Updated February 2014

SOIL/SITE EVALUATION

(Continuation Sheet-Complete all field in full)

PROPERTY ID #: 4638882534.000
DATE OF EVALUATION: 6.28.22
COUNTY: Iredell

PROFILE #	.1940 LANDSCAPE POSITION/ SLOPE %	HORIZON DEPTH (IN.)	SOIL MORPHOLOGY (.1941)		OTHER PROFILE FACTORS				PROFILE CLASS & LTAR
			.1941 STRUCTURE/ TEXTURE	.1941 CONSISTENCE/ MINERALOGY	.1942 SOIL WETNESS/ COLOR	.1943 SOIL DEPTH	.1956 SAPRO CLASS	.1944 RESTR HORIZ	
S	LS 38%	0-10	SGL/CL	FI/SS/SP/SCAP	—	26"	—	26" RM	PS 0.15
		10-26	SGL/C	FI/S/P/SCAP					

LEGEND

use the following standard abbreviations

LANDSCAPE POSITION	GROUP	SOIL TEXTURE	CONVENTIONAL .1955 LTAR*	LPP .1957 LTAR*	MINERALOGY/ CONSISTENCE	STRUCTURE
CC (Concave Slope)	I	S (Sand)	1.2 - 0.8	0.6 - 0.4	SEXP (Slightly Expansive)	G (Single Grain)
CV (Convex Slope)		LS (Loamy Sand)			EXP (Expansive)	M (Massive)
D (Drainage Way)						CR (Crumb)
DS (Debris Slump)	II	SL (Sandy Loam)	0.8 - 0.6	0.4 - 0.3		GR (Granular)
FP (Flood Plain)		L (Loam)				SBK (Subangular Blocky)
FS (Foot Slope)						ABK (Angular Blocky)
H (Head Slope)	III	Si (Silt)	0.6 - 0.3	0.3 - 0.15		PL (Platy)
L (Linear Slope)		SiCL (Silty Clay Loam)				PR (Prismatic)
N (Nose Slope)		CL (Clay Loam)				
R (Ridge)		SCL (Sandy Clay Loam)			**MOIST**	**WET**
S (Shoulder Slope)		SiL (Silt Loam)				
T (Terrace)					VFR (Very Friable)	NS (Non-sticky)
	IV	SC (Sandy Clay)	0.4 - 0.1	0.2 - 0.05	FR (Friable)	SS (Slightly Sticky)
		SiC (Silty Clay)			FI (Firm)	S (Sticky)
		C (Clay)			VFI (Very Firm v. Very Sticky)	VS (Very Sticky)
		O (Organic)	None	None	EFI (Extremely Firm)	NP (Non-plastic)
						SP (Slightly Plastic)
						P (Plastic)
						VP (Very Plastic)

*Adjust LTAR due to depth, consistence, structure, soil wetness, landscape, position, wastewater flow and quality

NOTES

HORIZON DEPTH	In inches below natural soil surface
DEPTH OF FILL	In inches from land surface
RESTRICTIVE HORIZON	Thickness and depth from land surface
SAPROLITE	S(suitable) or U(unsuitable)
SOIL WETNESS	Inches from land surface to free water or inches from land surface to soil colors with chroma 2 or less - record Munsell color chip designation
CLASSIFICATION	S (Suitable), PS (Provisionally Suitable), or U (Unsuitable)

Evaluation of saprolite shall be by pits.

Long-term Acceptance Rate (LTAR): gal/day/ft^2

Show profile locations and other site features (dimensions, reference or benchmark, and North).

SEE FIGURE 1

HYDRAULIC ASSESSMENT

Lot 87 – Harbor Landing
226 Harbor Landing Drive
Mooresville, NC 28117

Prepared For:

Jason Field
900 W. Wilson Avenue, Apt. 307
Mooresville, NC 28117

Prepared By:

Thompson Environmental Consulting
WATER • WASTEWATER • WETLANDS

Thompson Environmental Consulting, Inc.
PO Box 541
Midland, NC 28107

September 10, 2022



INTRODUCTION

A previous soil investigation performed by Thompson Environmental Consulting, Inc (TEC) at 226 Harbor Landing Drive, Mooresville, North Carolina, identified potentially useable areas for a subsurface drip dispersal system installation. To determine if subsurface a drip dispersal system is feasible at a higher loading rate for the proposed project, saturated hydraulic conductivity tests (K_{SAT}) were performed to assist in determining a long-term acceptance rate (LTAR) for the site.

The system long-term acceptance rate (LTAR), in this case, is based on the most hydraulically limiting soil horizon within 12 inches of the drip tubing installation. Based on the previous soil investigations the soil horizons throughout the study area were consistent, with a clay subsurface horizon (Bt) noted as likely the most hydraulically limiting. The K_{SAT} tests were performed at the treatment zone bottoms, of the naturally occurring soil as shown in the Soil Boring Location Figure.

HYDRAULIC CONDUCTIVITY MEASUREMENTS

A constant head permeameter (Amoozemeter) was used to measure the K_{SAT} at various locations within the study area. Tests were conducted in accordance with the "Recommended Guidance for In-situ Measurements of Saturated Hydraulic Conductivity by the Constant Head Well Permeameter Method and for Reporting Results, August 19, 2014." The soils of the proposed system area consistently exhibited one diagnostic subsurface horizon within and immediately beneath the proposed treatment zone. As such, three K_{SAT} measurements were performed within the proposed drainfield areas. Tests were performed at 24-inch depths.

Table 1 presents the results for the individual tests. The Appendix contains the results of the K_{SAT} tests. K_{SAT} data provided in the Appendix were logged only after providing sufficient time for the Amoozemeters to generally reach steady state. The value of the K_{SAT} must be modified by an appropriate design factor to determine loading rates. This factor reflects the influence of several parameters including inherent uncertainty of test values, variation of permeability within a soil, rooting habits of vegetation, drainage characteristics of the site, and long-term changes in soil permeability due to wastewater application.

The adjusted geometric mean of the measured K^{sats} for the bottom of the treatment zone is 2.50. A design factor up to 10 percent of the measured K_{SAT} can be used for non-treated systems. TEC is proposing a loading rate of 0.15 gal/ft^2/day for the system, .006% of the measured K^{sat}.

Table 1: Hydraulic conductivity tests results and depth of tests

Test number	Depth of test (inches)	Measured K_{sat} (gal/ft^2/day)
K1	12	1.873991939
K2	12	2.623588714
K3	12	3.185786296
Geometric Mean (ALL)		**2.502034943**

CONCLUSIONS

The findings presented herein represent Thompson Environmental Consulting's professional opinion based upon our site evaluation and knowledge of the current laws and regulations governing on-site wastewater systems in North Carolina (Section .1900 of the North Carolina Administrative Code - NCAC).

This hydraulic assessment and report have been provided to assist with a septic system design for the subject property.

SATURATED HYDRAULIC CONDUCTIVITY STUDY
226 Harbor Landing Drive

Date: 9/8/2022
Location: KSAT 1
Number: 1
Horizon: 0
Depth(inches): 24.0

Weather Condition: overcast
Temperature (F): 85F

SET UP

		cm	in
Hole Depth:		30.5	12.0
Reference:	+	10.2	4.0
Head:	-	15.2	6.0
CHT Tube(s) setting:	=	25.4	10.0

Valve Setting: x
1-ON 2-ON

Coversion Factor (C.F.): 105.0

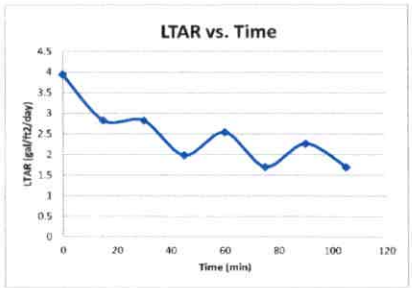
	cm	in
Target Water Level:	15.2	6.0
Beginning Water Level:	15.2	6.0
Ending Water Level:	15.2	6.0

Hole diameter (d): 5.0 cm
Hole radius (r): 2.5 cm
coefficient A: 0.001136

NOTE: Readings based on Ending Water Level

Water Reading	Change in Water Level	Chamber C.F.	Clock Time (min)	Elapsed Time (min)	Flow Volume (cm3)	Q (cm3/hr)	K (cm/hr)	K (in/hr)	K gal/ft2/day
38	0.0	105.0	0.0						
36.6	1.4	105.0	15.0	15.00	147.000	588.0	0.6681	0.2630	3.935
35.6	1.0	105.0	30.0	15.00	105.000	420.0	0.4772	0.1879	2.811
34.6	1.0	105.0	45.0	15.00	105.000	420.0	0.4772	0.1879	2.811
33.9	0.7	105.0	60.0	15.00	73.500	294.0	0.3341	0.1315	1.968
33	0.9	105.0	75.0	15.00	94.500	378.0	0.4295	0.1691	2.530
32.4	0.6	105.0	90.0	15.00	63.000	252.0	0.2863	0.1127	1.687
31.6	0.8	105.0	105.0	15.00	84.000	336.0	0.3818	0.1503	2.249
31	0.6	105.0	120.0	15.00	63.000	252.0	0.2863	0.1127	1.687
						Final Ksat	**0.318**	**0.125**	**1.874**

*Note: 10L of water run through meter before taking readings.



SATURATED HYDRAULIC CONDUCTIVITY STUDY
226 Harbor Landing Drive

Date: 9/8/2022
Location: KSAT 2
Number: 2
Horizon: 0
Depth(inches): 24.0

Weather Condition: overcast
Temperature (F): 85F

SET UP

		cm	in
Hole Depth:		30.5	12.0
Reference:	+	10.2	4.0
Head:	-	15.2	6.0
CHT Tube(s) setting:	=	25.4	10.0

Valve Setting: x
1-ON 2-ON

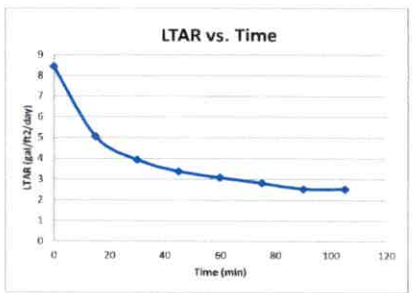
Coversion Factor (C.F.): 105.0

	cm	in
Target Water Level:	15.2	6.0
Beginning Water Level:	15.2	6.0
Ending Water Level:	15.2	6.0

Hole diameter (d): 5.0 cm
Hole radius (r): 2.5 cm
coefficient A: 0.001136

NOTE: Readings based on Ending Water Level

Water Reading	Change in Water Level	Chamber C.F.	Clock Time (min)	Elapsed Time (min)	Flow Volume (cm3)	Q (cm3/hr)	K (cm/hr)	K (in/hr)	K gal/ft2/day
36	0.0	105.0	0.0						
33	3.0	105.0	15.0	15.00	315.000	1260.0	1.4316	0.5636	8.433
31.2	1.8	105.0	30.0	15.00	189.000	756.0	0.8590	0.3382	5.060
29.8	1.4	105.0	45.0	15.00	147.000	588.0	0.6681	0.2630	3.935
28.6	1.2	105.0	60.0	15.00	126.000	504.0	0.5727	0.2255	3.373
27.5	1.1	105.0	75.0	15.00	115.500	462.0	0.5249	0.2067	3.092
26.5	1.0	105.0	90.0	15.00	105.000	420.0	0.4772	0.1879	2.811
25.6	0.9	105.0	105.0	15.00	94.500	378.0	0.4295	0.1691	2.530
24.7	0.9	105.0	120.0	15.00	94.500	378.0	0.4295	0.1691	2.530
						Final Ksat	**0.445**	**0.175**	**2.624**



SATURATED HYDRAULIC CONDUCTIVITY STUDY
226 Harbor Landing Drive

Date: 9/8/2022
Location: KSAT 3
Number: 3
Horizon: 0
Depth(inches): 24.0

Weather Condition: overcast
Temperature (F): 85F

SET UP

		cm	in
Hole Depth:		30.5	12.0
Reference:	+	10.2	4.0
Head:	-	15.2	6.0
CHT Tube(s) setting:	=	25.4	10.0

Valve Setting: 0 x
1-ON 2-ON

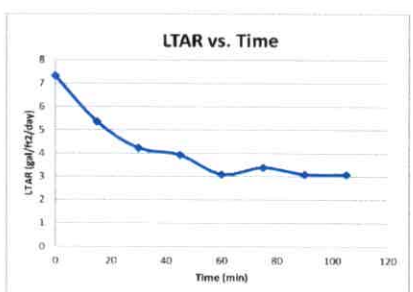
Coversion Factor (C.F.): 105.0

	cm	in
Target Water Level:	15.2	6.0
Beginning Water Level:	15.2	6.0
Ending Water Level:	15.2	6.0

Hole diameter (d): 5.0 cm
Hole radius (r): 2.5 cm
coefficient A: 0.001136

NOTE: Readings based on Ending Water Level

Water Reading	Change in Water Level	Chamber C.F.	Clock Time (min)	Elapsed Time (min)	Flow Volume (cm3)	Q (cm3/hr)	K (cm/hr)	K (in/hr)	K gal/ft2/day
38.4	0.0	105.0	0.0						
35.8	2.6	105.0	15.0	15.00	273.000	1092.0	1.2408	0.4885	7.309
33.9	1.9	105.0	30.0	15.00	199.500	798.0	0.9067	0.3570	5.341
32.4	1.5	105.0	45.0	15.00	157.500	630.0	0.7158	0.2818	4.216
31	1.4	105.0	60.0	15.00	147.000	588.0	0.6681	0.2630	3.935
29.9	1.1	105.0	75.0	15.00	115.500	462.0	0.5249	0.2067	3.092
28.7	1.2	105.0	90.0	15.00	126.000	504.0	0.5727	0.2255	3.373
27.6	1.1	105.0	105.0	15.00	115.500	462.0	0.5249	0.2067	3.092
26.5	1.1	105.0	120.0	15.00	115.500	462.0	0.5249	0.2067	3.092
						Final Ksat	**0.541**	**0.213**	**3.186**



Test #	Location	Number	Horizon	Depth	IN/HR	LTAR
1	KSAT 1	1	0	24	0.125253	1.873992
2	KSAT 2	2	0	24	0.175355	2.623589
3	KSAT 3	3	0	24	0.212931	3.185786

Geomean for all: 2.502035

Proposed LTAR of 0.15 = .006% of Measured Ksat