ICHD - ENVIRONMENTAL HEALTH DIVISION

Statesville Office (704) 878-5305 Mooresville Office (704) 660-3625

SEPTIC: IMPROVEMENT PERMIT / AUTHORIZATION TO CONSTRUCT / OPERATION PERMIT / EXISTING SYSTEM

PERMIT # AP-241752

PIN # 4761 -- 59 -- 4404

APPLICANT/OWNER: ADAMS HOMES AEC, LLC. APPLICANT ADDRESS: 3401 SAINT VARDELL LANE, SUITE B, CHARLOTTE, N.C. 28217

SITE ADDRESS: 169 NORTHLAKE DRIVE, STATESVILLE, N.C 28677 PHONE: 704-361-5437 ALT. PHONE 704-621-4664

SITE DIRECTIONS: (E) ON 70, (R) ON BETHESDA, (L) ON NORTHLAKE, LOT ON (L)

SUBDIVISION: ✓ NORTH LAKE SECTION: 1 LOT # 54 LOT AREA: 0.62AC

SAP CONTROLLED: ☐ YES ☑ NO

DESIGN FLOW: 360GPD L.T.A.R.: 0.15

Septic Tank	1000 (gal)	STB	SHOAF 760	Date	9/15		
Pump Tank	1000 (gal)	PT	ORENCO	Date			
Pump Make	ORENCO	Model	PF300511	Serial #			
# Nitrification Fields	1	# Lines	16	Linear Ft	1358 FT		
Trench Width	1 IN	Trench Bottom Depth(Low side)	19 IN	Gravel Depth	—		

☑ New System ☐ Repair ☐ Expansion System Type: I II III IV (V) VI

System Description: TSI: DRIP IRRIGATION

Repair System Description: TSI DRIP IRRIGATION

Maintenance Agreement Required: ☑ YES ☐ NO

☐ GRAVITY ☑ PRESSURE

☑ Residence No. Bedrooms 3

☐ Business No. Persons 6

☐ Other No. Employees —

☐ Slab ☑ Crawl Space

☐ Basement w/plumbing ☐ Basement w/o plumbing

Water Supply: ☐ Private ☑ Public ☐ Community

Comments / Conditions: INSTALL AT 19 IN

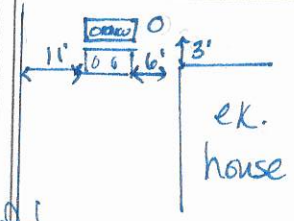
Orenco Advantex Tank S/N ORD 511677-6

INITIAL SITE SKETCH

SEE ATTACHED PLAN
BY: PIEDMONT DESIGN ASSOCIATES, P.A. AND AGRIWASTE TECHNOLOGY, INC.
APPROVED: 8-25-2021

AS BUILT SKETCH

FOR SEPTIC FINAL INSPECTION CALL: 704-664-3703 between 8am-9am the day the inspection is needed. Be sure to speak with an inspector to confirm your time.



As Built: Septic Tank (NTS)

9/24/21 DW

- Vacuum Seal checked 5" Hg for 2min
- Need foundation drain removed beside ST

- Foundation drain removed
- Trench depth checked

10/11/21 DW

Lines checked 10/12/21

Permit can be suspended or revoked if any false information is supplied toward securing the permit / any unauthorized changes are made to the site / any unauthorized changes are made in the installation of the system. CONTACT A LOCATOR SERVICE PRIOR TO ANY EXCAVATION

☐ IMPROVEMENT PERMIT *with plot* valid without expiration ☑ IMPROVEMENT PERMIT *with site plan* valid for 60 mos. ☑ AUTHORIZATION TO CONSTRUCT valid for period equal to IMPROVEMENT PERMIT--not to exceed 60 mo.

Owner / Applicant Signature: [signature] Date: 8/27/21 Installed by: Precision Excavation

IMPROVEMENT PERMIT by: Bryant C. White Date: 8-25-2021 OPERATION PERMIT by: D. Mebey Date: 10/21/21

AUTHORIZATION TO CONSTRUCT by: Bryant C. White Date: 8-25-2021 Existing System Inspected by: Date:

FOR SEPTIC FINAL INSPECTION: CALL 704-664-3703 between 8am-9am the day the inspection is needed.

169 Northlake : Lot 54

Item	Date	Initials
Drain Lines Checked	10/12/21	DW
Tanks Checked	10/12/21	DW
Pressure Manifold or Valve Box Checked	10/20/21	DW
Pressure Head Set (Schrader valve)	10/20/21	DW
Electrical Checked	10/20/21	DW
Floats Set	—	—
Alarm Checked	10/20/21	DW
Maintenance Contract Needed? (Y)/ N	10/4/21	BW
Comments: Engineer letter	10/21/21	DW
Foundation Drains Removed Beside Tank	10/11/21	DW

Repairs Only	
	State Code
Failing System Code	
Type of Distribution	G or P
Type of Failure/Malfunction	
Primary Cause of Failure/Malfunction	
Age of System?	
Initial or Repair?	

Septic Tank Seal checked: 9/24/21 DW

Trench bottom verified: 10/11/21 DW

David DeCaron okd substitution of Meter Master flow meter for the Geo Flow meter 10/20/21

	Date	Initials
Drain Lines Checked	10/12/21	DW
Tanks Checked	10/12/21	DW
Pressure Manifold or Valve Box Checked	10/20/21	DW
Pressure Head Set	10/20/21	DW
Electrical Checked	10/20/21	DW
Floats Set	—	—
Alarm Checked	10/20/21	DW
Maintenance Contract (Y)/ N	10-4-21	BW
Comments: Engineer letter	10/21/21	DW

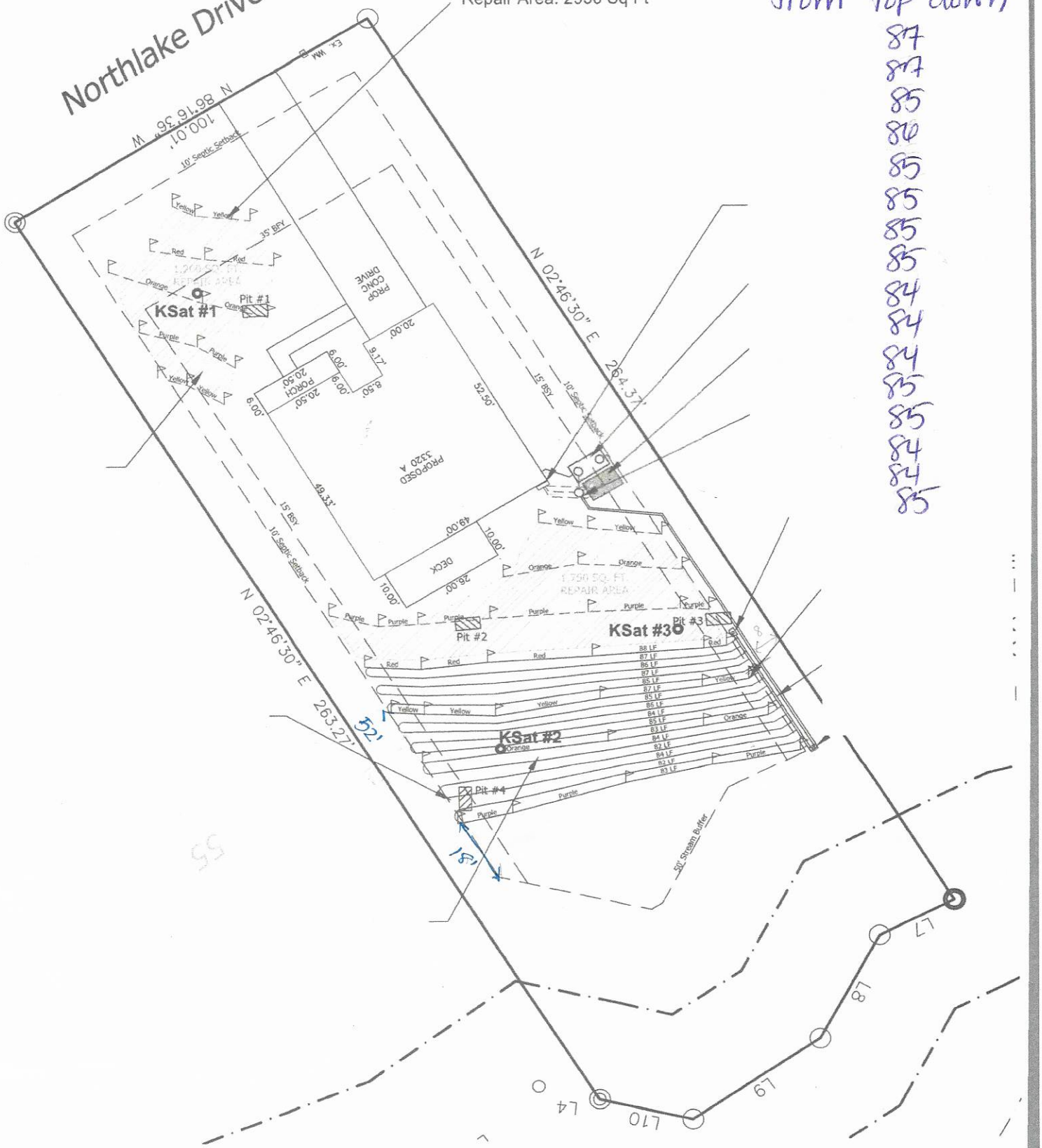
As Built

1169 Northlake

Primary 1,358 LF Drip Tubing
Repair Area: 2950 Sq Ft

Line lengths from top down

87
87
85
86
85
85
85
85
84
84
84
84
85
85
84
84
85



Danielle Wieberg

From: Jimmy Shoaf <jimmy@shoafprecast.com>
Sent: Monday, September 27, 2021 10:04 AM
To: Danielle Wieberg
Subject: certification for 169 Northlake and 173 Northlake

Danielle

I certify the tanks delivered to 169 Northlake dated 9/15/21 and 173 Northlake dated 9/11/21 and installed by Precision Excavation was poured with 5000# psi concrete and was in excess of 4000# psi when delivered to jobsites.

Regards

Jimmy Shoaf

Shoaf Precast
Lexington, NC 27295
Email: Jimmy@ShoafPrecast.com
Phone: 336-787-5826
Web:
https://urldefense.com/v3/__http://www.shoafprecast.com__;!!EhkxsyMbvmag3wIL!cx19_qoHJugni1u5BWBimAi3T100udqRfl_9tenDm0eDMzO6L1m895hMbW5vbH4rydeXfo0LLhXk$

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ExchangeDefender Message Security: Click below to verify authenticity
https://urldefense.com/v3/__http://www.exchangedefender.com/verify.asp?id=18RDwU8E006168&from=jimmy@shoafprecast.com__;!!EhkxsyMbvmag3wIL!cx19_qoHJugni1u5BWBimAi3T100udqRfl_9tenDm0eDMzO6L1m895hMbW5vbH4rydeXfuSPFO5-$

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PIEDMONT DESIGN ASSOCIATES, P.A.
125 East Plaza Drive | Suite #101
Mooresville, NC 28115
Phone: 704-664-7888 | Fax: 704-664-1778
Email: dmunday@pdapa.com

Engineering
Surveying
Planning

October 21, 2021

Iredell County Environmental Health Department
610 East Center Avenue
Mooresville, NC 28115
Attn: Mrs. Danielle Wieberg, REHS

RE: TS-I Subsurface Drip Effluent Disposal System
Lot 54 Northlake Subdivision, Iredell County, North Carolina

Dear Mrs. Wieberg:

ENGINEERS CERTIFICATION

I, **Donald L. Munday**, as a duly registered Professional Engineer in the State of North Carolina, having been authorized to observe periodically the construction of the referenced project, a TS-I subsurface drip effluent disposal system; serving a new 3 bedroom residence, located on Lot 54 Northlake Subdivision, Iredell County, NC, hereby state that, to the best of my abilities, due care and diligence was used in the observation of the construction such that the construction was observed to be built within substantial compliance and intent of the approved plans and specifications.

Sincerely,

PIEDMONT DESIGN ASSOCIATES, P.A.

Donald L. Munday, P.E.
N.C. Registration No. 17327



10/21/2021

Cc: Patrick Vanhook, AQWA
Bob Cashion, Adams Homes

SPECIFICATIONS, CALCULATIONS, & SUPPORTING MATERIAL FOR A GROUND ABSORPTION SEWAGE DISPOSAL SYSTEM USING SEPTIC TANK, TS-I ADVANCED TREATMENT AND SUBSURFACE DRIP DISPOSAL TO SERVE A 3 BEDROOM RESIDENCE

LOT 54 NORTHLAKE SUBDIVISION

Iredell County, North Carolina

July 6, 2021
Revised August 16, 2021

APPROVED AUG 25 2021
Bryant C. White ICHD

Prepared for:
Adams Homes
10115 Kincey Ave, #160
Huntersville, NC 28078
Phone: (704) 361-5437

Prepared by:
PIEDMONT DESIGN ASSOCIATES, P.A.
125 East Plaza Drive, Suite 101
Mooresville, NC 28115
Phone: 704-664-7888
Fax: 704-664-1778
NCBELS No.: C-1007



SECTION I -GENERAL

Adams Homes is seeking a septic system permit to construct a new 3-bedroom residence on lot located at Lot 54 Northlake Subdivision in Iredell County, North Carolina. Due to limited available space, soil conditions and limiting topography, a TS-I advanced treatment system with low pressure subsurface drip effluent disposal system is currently proposed. The treatment and disposal system will consist of a baffled septic tank with effluent filter, Orenco AX-20RT with pumps and controls. Other components include drip headworks and subsurface disposal. The design flow has been set at 360 GPD.

Trevor Hackney with AWT evaluated the lot for an onsite septic system. They found enough area to support a 3-bedroom septic system utilizing subsurface drip disposal for the primary and repair. An application rate of 0.15 G/D/SF has been recommended for both the primary and repair areas. The effluent will be pretreated using a septic tank, Orenco Advantex AX-20RT Module recirculating textile-media enclosed filter bed and pressure dosed using subsurface drip irrigation technology.

The system is designed to accept and treat domestic waste only. No other discharge is allowed, including condensate water from HVAC systems, etc.

The Engineer has designed a textile-media filter and drip irrigation system that dispenses treated effluent through drip irrigation using design criteria intended to comply with NC DEM Administrative Code 15A NCAC 2H.0200 and 15A NCAC 18A .1969, and NC DEH Onsite Section Innovative Waste Water System IWWS – 2000-02R (Geoflow Sub-Surface Drip System) & OSI Advantex Recirculating Textile-Media Filter. (IWWS-2015-01-R1).

Until plan acceptance and construction, the drip field and repair field shall be maintained undisturbed. This shall include placement of signs, ribbons and barricades to avoid traffic, storage, or parking in the area. Encroachment by any utility or others is not permitted.

The Contractor shall be prohibited from working while the site is wet. The Contractor shall contact the Engineer or the Soil Scientist prior to commencement of work after rainfall.

The Engineer and/or the Soil Scientist have the right to suspend work until soil moisture conditions are favorable to optimal installation.

The installer shall be knowledgeable of the type of system to be installed and shall have prior instruction on the installation of the various components of the system and shall have the prior approval of the component manufacturers, (Orenco) and (Geoflow), and the approval of the Design Engineer.

The Engineer and Field Representative of treatment and disposal shall provide written acceptance of the system installation prior to issuance of operation permit.

Scope of the Project: The scope of this project is to construct a system to collect the domestic waste from the proposed 3-bedroom residence and convey it via gravity to a properly sized two-compartment septic tank. The outlet at the second compartment of the tank will have a slotted wastewater effluent filter. From the septic tank the effluent flows to a two-compartment module that contains the treatment unit and recirculation chamber. After treatment, effluent passes through headworks assembly. A timer-controlled turbine pump will dose treated effluent to the drip field.

The drip dosing system will have solenoid valves, spin clean filter, flow meter, air release valves and other apparatus and controls to allow the automatic dosing and maintenance of the system.

The pump controls will have a 24-hour clock, programmable as determined by the operator. Controls shall also have elapsed run time clock and cycle counter for each pump. Unless alternately provided with the advanced Pretreatment System, the drip system control panel shall enable the daily, 7-day and 30-day monitoring requirements of Rule .1970 to be met, such as by data logging the field dosing times or field flow meter readings. The controls shall also have manual operating capabilities and alarms. The controls are to be located at a readily accessible location at the residence.

DIRECTIONS TO THE PROPERTY:
Take Interstate 77 North to Exit 42. Turn left at end of ramp onto Highway 21. Turn right on Oswalt Amity Road. Go past Amity Hill Road. Turn left on Bethesda Road. Turn right on Northlake Drive. Lot is located on left before Cul de sac.

SECTION II - REGULATIONS

In addition to compliance with laws, rules and regulations as required under the General Conditions of these Documents, the Contractor shall comply with the following specific regulations as applicable to the nature of work included under this Contract.

Reference Material:

(1) GEOFLOW SUBSURFACE DRIP SYSTEMS. Design and Installation Manual, October, 2007, Geoflow, Inc.

(2) LAWS AND RULES FOR GROUND ABSORPTION SEWAGE DISPOSAL SYSTEMS. SECTION .1900 OF THE N.C. Administrative Code: Title 10 Health Services; Environmental Health; Subchapter 10a; Sanitation. Published by: N.C. Dept. of Human Resources; Amended effective January 10, 1997.

(3) EPA 625/R-00/008 Design Manual - On-site Wastewater Treatment and Disposal System; February, 2002; Chapter 7.

(4) NC DEM Administrative Code: 15A NCAC 2H.0200, 15A NCAC T15A Section .1900

(5) OSI ADVANTEX Treatment System, Manual including performance information, OSI, Inc.

(6) EPA: Technology Assessment of Intermittent Sand Filter, April 1985.

(7) NC DHHS-OSWPS – Innovative Approvals for Geoflow, Inc. & Orenco Systems, Inc.

SECTION III - BASIS OF DESIGN

DEVELOPMENT DESCRIPTION

Location	Lot 54 Northlake Subdivision Iredell County, NC
Water Supply	Community Water Supply
Sewage Disposal	On-Site Septic System with One TS-I Recirculating Textile Media Filter & Subsurface Drip Irrigation
Application Rate	0.15 G/D/Sq. Ft. (0.15 G/D/Sq. Ft. Repair)

PROJECTED WASTEWATER FLOWS

Proposed Use	3 Bedroom Residence
Base Design Flow	360 G/D

DESIGN BASIS - TREATMENT SYSTEM

Septic Tank	1,000-gallon precast baffled concrete tank w/ OSI 4" Biotube Filter at outlet (Top Seam Tank Only)
Effluent Filter	(1) Orenco Model FTPS0436-28-NC
Pretreatment	(1) Orenco Advantex AX20RT Textile packed bed media filter module
Pretreatment Control Panel	VCOM-AX20B1/PTHTUVSA

DESIGN BASIS - DRIP SYSTEM

Design Flow	360 G/D
Application Rate	0.15 G/D/SF
Area	2,400 SF Minimum (2,400 Sq. Ft. Repair Minimum)
Force Main	(1) +/-130 LF 1-Inch Dia. SCH 40 PVC
Flush Return Main	(1) +/-130 LF 1-Inch Dia. SCH 40 PVC
Drip Lines	Single zone with a minimum total of 1,200 LF Geoflow Wasteflow PC; Drip Line with constant flow rate pressure compensating emitters at 2' centers;
Emitters	Zone 1 – 679 emitters @ 0.53 G/H = 6.00 G/M
Operating Pressure Range	10 – 60 PSI
Drip Field Pump	Orenco Systems, Inc. PF Series Pump Model PF2010-12 1 HP/230 V/1 Ph (17.8 G/M @ 183.2 Ft TDH)
Drip Field Dosing Pump Controller	VCOM-AX20B1/PTHTUVSA programmable controller •Pump run timer •Pump run contacts •Elapsed pump run clock •Pump cycle counter •Zone valve contacts •Filter flush valve contacts •Alarm Features •Float input functions

System Dosing Rate	6.00 G/M
Dosing Time per Day	60 Minutes per Day
Pump Run	12 times per day for 5.00 minutes per dose
Flush Time	Every 37th cycle, system to be flushed.
Discharge Volume	12 Doses x 5.00 min x 6.00 G/M = 360 G/D
Headworks	AQWA Single Zone Headworks
Solenoid Valves	(2) Geoflow Model SVLV-B-100 (1 Supply | 1 Return)
Filter	1.5" Spin Filter Geoflow Model AP4E-1.5F Vortex spin clean filter (w/automatic backwash cycle: 3 minute, 15 seconds)
Flow Meter	3/4" Geoflow Model FM-DDS-075 Flow Meter with Flow Rate/Totalizer Master Meter S/N 21217270I
Air Vents	(1) Geoflow Model APVBK-1

SECTION IV - COMPONENTS OF SYSTEM

- Three Bedroom residence collection system
- 1,000-gallon septic tank with slotted filter and access port
- Pretreatment – One OSI Advantex Textile filter containing module with cover & appurtenances
- Single zone offsite subsurface drip system (pump tank, force mains, pump, pump control with audiovisual alarm, spin clean filter, meter, valves, shelter, drip lines and appurtenances.)

A. TREATMENT SYSTEM

1. General Requirements - The Contractor shall furnish, install, test, and place into service and warrant the complete system. The major system components including septic tank, slotted filter, textile filter (pretreatment) module, headworks assembly, drip field and controls. Accessories shall be supplied by a single operating entity and shall be equal to that as specified.
2. Five sets of submittal documents and shop drawings for all mechanical equipment and major materials including piping, tanks, and all other accessories shall be furnished to the Engineer for approval. No equipment shall be installed prior to approval by the Engineer.
3. Precast Structures - General: This section shall apply to all precast tanks as shown on the Contract Drawings.
4. Approvals: The tank designs shall have been approved by the Division of Environmental Health of NC DHHS and shall have the approval number imprinted on the delivered tank. The tank shall be State Approved and equal to that manufactured by Shoaf Precast, Inc. Openings or inserts shall be cast in during manufacture. Concrete shall have a minimum compressive strength of 4,000 PSI @ 28 days. Shop drawings shall be submitted to the Engineer for approval. If tanks are to be located in traffic area, then tanks shall be constructed to meet H-20 highway loadings. All tanks shall be top seam only.
5. Precast Tank Installation: Installer shall excavate for and install the precast concrete tank as per plans. Installer shall ensure that the tank remains level and true to grade after placement and filling with water. The precast tanks shall be tested for water tightness by an approved method such as 24-hour water tightness test with maximum allowable leakage not to exceed a maximum of 1/2-inch rise or fall in 24 hours or vacuum test. Contractor shall use clean, potable water free of any sediment for water testing. Either test method shall be run with risers/and inlet/outlet pipes in place. Testing shall begin after the water level in the tank has stabilized. Each tank shall be installed in the location and to the elevations shown on the plans. A 6" undercut shall be made to allow for washed stone leveling course for the tank to rest on.

   Once testing of the tank has been completed, the tanks shall be backfilled in lifts with well compacted, debris free earth to a level, which directs surface water away from the tanks. Tank access holes in the yard shall be installed and grouted watertight and the earth raked smooth for grassing. All tank lids shall be lockable or constructed to prevent easy removal. Tank access in traffic area shall be 24" cast iron manhole frame and lid. Tanks shall not be pumped during extremely wet conditions.
6. Septic Tank shall consist of a 1,000-gallon capacity, reinforced, precast concrete tank with full baffle and shall have easy access to each chamber from ground level for checking and pumping. The first chamber of the septic tank shall consist 2/3 to 3/4 of the volume of the total tank and the baffle shall contain a horizontal opening across the tank at about midway its height. The PVC outlet tee shall extend one-fourth depth of liquid level and contain an effluent filter. Locate the septic tank at such height as to provide approximately 15" of cover soil over top of the tank or as necessary to receive gravity flow from the collection system from the residence. Provide access at each end of the tank. All metal installed in tank shall be stainless steel.
7. Slotted Effluent Filter: An Orenco 4" Biotube effluent filter shall be installed in the PVC outlet tee of the septic tank. The filter shall be manufactured by Orenco System Incorporated. Filter shall be Orenco model FTPS0436-28-NC.
8. Advantex Textile Bio-Filter: One textile-containing packed bed media filter module with cover shall be used, one module for a maximum of 4 bedrooms or 480 gallons per module per day. The module shall be as described in manufacturer's literature attached herein.

   The module shall be pressure dosed with effluent filtered from the septic tank. Discharge from the module shall spill over via gravity to the drip field-dosing chamber of the Orenco AX-20RT Module.

Treatment Performance Standards (TS-I): Tertiary treatment without nitrogen reduction.

The Advantex Textile packed bed media filter module shall be designed installed and operated to meet the following standards:

1. Biochemical Oxygen Demand, 5-day (BOD_5) < 15 mg/l
2. Total Suspended Solids (TSS) < 15 mg/l
3. Ammonium-nitrogen (NH_4-N) < 10 mg/l
4. Fecal coliform bacteria densities < 10,000 colonies/100 mL

Standards are arithmetic means, except fecal coliforms is a geometric mean.

Advantex Unit and all associated appurtenances are available through AQWA at (888) 552-2792.

9. Control Panel: Control panel for the advanced treatment unit shall be mounted 36" or more above grade and readily accessible. The unit shall be as manufactured by Orenco Systems, Inc. The treatment system control panel shall be designed to control the treatment unit dosing pump. The control panel shall be provided factory pre-wired and tested in a NEMA 4X lockable fiberglass enclosure which shall contain the following components. Motor contactors and circuit breakers for use with 230V AC 1 Ph current using a max 1½ HP motor, programmable logic unit shall include time functions, elapsed pump run clock and pump cycle counter, motor function, valve controls and float input function and fused transformer for valves. An audiovisual alarm condition light and siren shall be mounted on the top of the panel and include a separately fused transformer. The unit shall have a hand-off-auto (H-O-A) switch. Product shall be as supplied by AQWA at (888) 552-2792.

   The controller shall be able to perform the following functions: receive input for floats and provide operator set timer-controlled pump operation.

   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.

   The activation of any alarm shall result in the activation of a dry and a 120 V powered alarm contacts. These contacts may be used to activate externally mounted alarm devices and telemetry systems. The alarm contacts will automatically reset when the R/O-N Switch for the activated alarm is placed in the reset / off position.

   Panel Operation:
   - High Level Alarm Float: When lifted this float will activate the audible alarm and the illuminated pushbutton.
   - Pump Enable Float: When lifted this float will activate the normal dose function.
   - Redundant Off & Low-Level Alarm Float: When lowered this float will activate the audible alarm and illuminated pushbutton. This float will also deactivate the pump in both auto and manual.
   - Pump Operation: The pump dosing cycles will be controlled by the liquid level in the tank.

   Components Include:
   - Motor contractor & circuit breaker rated for use with 230VAC, 1Ph and 1 Ph max
   - Top mounted audiovisual alarm (360 degree flashing red light and 90dB minimum)

10. Float Switches: Water level float control switches shall be equal to Orenco System, Inc., mechanically activated switches, with cable of adequate length to terminate in the pump control panel. No splicing of wire allowed between switches and control box. Use mercury switched on control circuits and properly rated mechanical switches on power circuits. Conduit between the pump tank and he control panel shall be sealed to prevent sewer gas from entering the control panel. The dosing tanks shall have 4 float switches, a low-level "pump off" switch, a "pump enabling" float "timer override" and at "high water alarm" float. Floats shall be hung from a stainless-steel float bracket attached to the riser and be within 12 inches of lid of riser. Float bracket shall be attached to riser so that no damage is made to riser and any bolt penetrations into riser shall be sealed watertight with a silicon caulk or manufacturer approved equal. Float clamps or brackets shall be supplied by the manufacturer. The lower level control or "pump-off" must be positioned above the pump, so that the pump remains submerged at all times. The upper level control "pump-enabling" is positioned to pump a specified volume of effluent or assures that a full dose is available for timer-controlled dosing. The "high water alarm" control float is mounted at same level the

"timer override" float control. (Note: Care must be taken to insure that floats do not become fouled by other components in the tank such as the electric power cord or the lifting rope.)

DRIP SYSTEM

1. Piping and Valves: All supply and return manifold piping and fittings shall be Schedule 40 PVC conforming to ASTM D1785 as shown on plans and other pressure sewer pipe shall be Class 200 PVC (ASTM D2241) (SDR 21). All couplings and fittings shall be of polyvinyl chloride compounds (ASTM D1784, Type I, Grade I).

2. Wasteflow PC Dripline: The dripline shall consist of nominal sized 1/2" linear low-density polyethylene tubing, with turbulent flow, drip emitters bonded to the inside wall. The tubing shall have an outside diameter (O.D.) of approximately 0.63 inches. The tubing shall consist of three layers; the inside layer shall be a bactericide protection; the middle layer shall be black and the outside layer shall be purple striped for ease of identification as effluent water. The dripline shall have emitters spaced at 24" centers along the full length of the tubing. Tubing shall be installed at a minimum of 19 inches below ground surface to a maximum of 32 inches. The emitters shall be pressure compensating to ensure equal dosing from pressure ranges of 10 to 60 PSI. The emitters shall be molded from virgin polyethylene with silicon rubber diaphragms. The emitter shall have a nominal discharge rate of 0.53 gallons per hour within the system design operating pressure. Each emitter shall be impregnated with Treflan to inhibit root intrusion and shall be guaranteed by the manufacturer to inhibit root intrusion for a period of ten (10) years. Wasteflow PC pressure compensating wasteflow dripline shall be Geoflow Model Number WFPC 16-4-24 as available through AQWA at (888) 552-2792.

3. Ball Valves: All thermoplastic ball valves shall be constructed from PVC Type I Cell Classification 12454 or CPVC Type IV Cell Classification 23447. All o-rings shall be Viton. All valves shall have Safe-T-Shear stem and double stop polypropylene or CPVC handle. All valve union nuts shall have Buttress threads for structural integrity. All seal carriers shall be Safe-T-Blocked. All valve components shall be replaceable for valve serviceability using rebuild kits. All valves shall be warranted against defects in material and workmanship for a period of one year. All valves shall be listed for potable water use by the National Sanitation Foundation (NSF). All 1/2" through 2" valves shall be pressure tested at 235 PSI and all 2-1/2" through 6" valves shall be pressure rated at 150 PSI for water at 73 degrees Fahrenheit, as manufactured by Spears Manufacturing Company or approved equal.

4. Swing Check Valves: Swing check valves shall be flow control PVC swing check valves with rubber flapper and PVC cap as manufactured by Geoflow Model CV-S-10 as supplied by AQWA at (888) 552-2792.

5. Air Vacuum Relief Valve: The air vacuum relief valve provides instant and continuous vacuum relief and non-continuous air relief. Both the body and the removable dirt cover shall be constructed of molded plastic. The body and the dirt cover shall be connected with a 1-inch pipe thread. The ball shall be constructed of a low-density plastic and the internal seal shall be constructed of vinyl. The air vacuum relief valve shall seal at 5 PSI. Inlet size shall be 1-inch male pipe thread. The air vent shall be Geoflow Item Number APVBKV-1 with attached Schrader valve as supplied by AQWA at (888) 552-2792.

6. Drip System Dosing Pump: For the drip field, an Orenco PF Series Model 2010-12 1 HP/230 V/1 Ph, capable of pumping 17.8 GPM @ 183.20' TDH for the drip irrigation. Details of pump installation are shown on the plan. Product shall be as supplied by AQWA at (888) 552-2792.

7. Drip System Controller shall be mounted 36" or more above grade and readily accessible. The unit shall be as manufactured by Orenco Systems, Inc. The panel model number shall be VCOM AXB2PTROUVSA. The Orenco Treatment System Control Panel is designed to control the irrigation pump, floats, UV, headworks as well as the dosing of the treatment unit. The control panel shall be provided factory pre-wired and tested in a NEMA 4X lockable fiberglass enclosure which shall contain the following: Components shall include motor contactors and circuit breakers for use with 230V AC 1 Ph current using a max 1½ HP motor. Programmable logic unit shall include time functions, motor function, valve controls and float input function. Unit shall include fused transformer for valves. An audiovisual alarm condition light and siren shall be mounted on the top of the panel and include a separately fused transformer. The unit shall have a hand-off-auto (H-O-A) switch. Product shall be as supplied by AQWA at (888) 552-2792.

   The controller shall be able to perform the following functions: receive input for floats and rain sensors, provide operator set timer-controlled pump operation, timer-controlled contacts for zone valves, scour valves and flush valves. The controller shall have an event counter, which shall count the number of moisture sensor overrides. The controller shall have an elapsed pump run clock and pump cycle counter.

Unless alternately provided with the Advanced Pretreatment System, the drip system control panel shall enable the daily, 7-day and 30-day monitoring requirements of Rule .1970 to be met, such as by data logging the field dosing times or field flow meter readings.

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 remain accessible at all times to the system operator.

The activation of any alarm shall result in the activation of a dry and a 120 V powered alarm contacts. These contacts may be used to activate externally mounted alarm devices and telemetry systems. The alarm contacts will automatically reset when the R/O-N Switch for the activated alarm is placed in the reset / off position.

Panel Operation:

- High Level Alarm Float: When lifted this float will activate the audible alarm and the illuminated pushbutton. *Note: This function can be combined with the Override Timer On & Off Function.*
- Override Timer & Off Float: When lifted this float will activate the normal timer function. This timer is capable of cycling at a faster rate to accommodate high flow conditions. This float being enabled will force the pump to dose at twice the operating cycle until the effluent is at normal levels in the pump tank again.
- Timer On & Off Float: When lifted this float will activate the normal timer function. This timer will begin with its 'off' cycle.
- Redundant Off & Low Level Alarm Float: When lowered this float will activate the audible alarm and illuminated pushbutton. This float will also deactivate the pump in both auto and manual.
- Pump & Valve Operation: The pump dosing cycles will be controlled by the timer. During high flow conditions, the pump dosing cycles will be controlled by the override timer. Zone valves (if provided) will open as programmed and the pump comes on. The spin filter valve will open for 1 minute (field adjustable) to allow for drainage of the return line. After an operator defined number of cycles (field adjustable prime numbers), the field flush valve and the zone valve will open for one cycle. At the end of the dose, the field flush valve closes and normal operation resumes. Since the flush cycle is to be set at an odd interval (prime number), the next flush cycle will fall on the opposite zone (if provided).

Components Include:

- Motor contractor & circuit breaker rated for use with 230VAC, 1Ph and 1 Ph max
- Programmable logic unit
- Timer Functions
- Valve control
- Transformer for the valves
- Fuse for the transformer
- Top mounted audiovisual alarm (360 degree flashing red light and 90dB minimum)

8. Headworks: The system headworks shall contain the filter flow meter, the solenoid valves, gauges, fittings, and other apparatus as called for. The headworks shall be located as indicated on the plans. It shall be installed to allow easy access to all components for testing, servicing or replacement. The unit shall be enclosed in a suitable protective insulated shelter (i.e. Large meter box), secured from tampering. All valves located within this box shall be located a minimum of 18" below the box lid. Adequate freeze protection shall be provided. Headworks shall be AQWA Single Zone model. Product shall be as supplied by AQWA at (888) 552-2792.
9. Electric Solenoid Valve: All solenoid valves shall be Contamination Resistant Remote Control Valves. All solenoid valves shall be electrically operated and shall be provided with a 24-volt AC solenoid coil. All valves shall be provided with an auxiliary manually operated internal bleed lever and flow control. Valves shall be globe type with 150 PSI pressure rating. Solenoid valves shall be provided with iron pipe sized female pipe thread end connections. All valves shall be treated for sewage effluent. Solenoid valve model shall be SVLV-B as manufactured by Geoflow, Inc. Electrical wiring to solenoid valves shall be type UF wire, UL listed. Product shall be as supplied by AQWA at (888) 552-2792.
10. Spin Clean Filter: The Y filter body shall be molded from glass reinforced black plastic with a 1.5" inch male pipe thread (MPT) inlet and outlet. The two-piece body shall be capable of being serviced by unscrewing and shall include an O-ring seal. An additional 1.5" MPT outlet shall be capable of periodic flushing. The 150-mesh filter screen is all stainless, providing a 28.4 square inch filtration area. The outer support shell shall be woven stainless steel cloth. The inner and outer screens shall be soldered together. The screen collar shall be molded from vinyl. The 1.5-inch filter shall be Geoflow Model Number AP4E-1.5F. Product shall be as supplied by AQWA at (888) 552-2792.

11. Flow Meter: The Contractor shall install a turbine style ¾" flow meter with rate/totalizer equal to Geoflow series with flow setter mount. Installed in headworks box. The flow meter model FM-DDS-075 is manufactured by Geoflow. Product shall be as supplied by AQWA at (888) 552-2792

SECTION V - SYSTEM INSTALLATION

The field's perimeter shall be flagged by the General Contractor's Surveyor. The areas shall be barricaded to be protected from unauthorized vehicular traffic.

Site shall be cleared of large diameter and small diameter trees at the hub and other vegetation and debris by system installer only. If a tree is unable to be removed, the contractor shall raise the canopy on tree to a minimum of 8 feet above the existing ground surface so that sunlight can reach the ground surface. If shown on the plan, areas shall be filled with an approved material approved by the consulting Soil Scientist and/or the Consulting Engineer. Drip irrigation lines shall be installed on contour. Drip irrigation lines shall be installed in the ground after the ground surface has been scarified and raked smooth as directed herein. The tubing shall be installed at a minimum depth of 19 inches to a maximum of 32 inches with care to be certain that tubing is not kinked or deformed. After installation, the area shall be raked smooth to drain and to prepare for stabilization. Drip tubing that cannot go through an obstacle such as a root shall be routed around or below the obstacle and not over and exposed on the ground surface.

No work shall be performed on the drip field under wet conditions. "If it is too wet to plow," it is too wet to work on drip field. The Contractor shall avoid the smearing of the wetted surface and should this occur, work shall be suspended. After installation of the lines, the ground surface shall be shaped to allow good surface drainage to prevent ponding of surface water. All disturbed areas shall be raked smooth and stabilized according to specifications.

Drip Irrigation Tubing Storage and Handling

The drip irrigation tubing should be kept in the shade due to temperature sensitivity of the tubing and away from exposure to direct sunlight except during the actual installation process.

Construction Sequence

Rule of Thumb: "If soil is too wet to plow," it is too wet to install the system.

1. Lay out drip irrigation field network area with stakes and flagging to ten feet (minimum) beyond the limits of the line. As soon as the absorption area is designated, it should be flagged, roped off and isolated from construction traffic. This barrier should be maintained until the Owner accepts the system. Refer to site plan for the size of absorption area and field locations. Observe all side yard, building, and other setback restrictions.
2. Clear site of any and all man-made debris, construction materials, etc. Dispose of legally. Cut all trees in the area of the nitrification field flush with the ground. Do not remove any stumps with any earth moving equipment. Stumps shall be ground up with minimal distribution to surrounding soil. Fill areas shown on the plan with an approved soil material approved by the Consulting Soil Scientist and/or the Consulting Engineer.
3. Prior to actually beginning construction of the system, verify invert elevations of all tanks, carefully locate, lay out and identify disposal site, manifolds and the drip piping networks, using a tripod mounted engineer's leveling instrument to accurately establish each lateral along a level contour. (A 2' minimum drip line separation must be maintained centerline to centerline.)
4. Install drip lines, piping, valves, and headworks. Ensure good bedding and cover and uniform slope as specified. All valve boxes shall be flush or slightly above the ground and clear of debris. Install washed stone in bottom to cover exposed soil.
5. Install septic tank, filter module and pump tank at elevations to allow proper operation. The recirculation and pump tank will each contain a pump and a pump enabling float switch, a pump disabling float switch and a high-water alarm float switch. The pump tank will be set at elevation to receive gravity from the filter. All components shall be checked and proper flow verified.
6. Perform leak test on tanks as called for herein. Provide riser access as called for.
7. Carefully backfill tanks, module and trenches to finish grade with clean debris free earth (no stone).
8. Install pumps, filters, fittings and floats.
9. Install control system and wire per NC Building Code and NEC. Contractor shall verify available electrical power before ordering components. Provide and connect to properly sized and number of breakers in the main panel board.
10. Seed all disturbed areas except for the drip field. Drip field shall be stabilized only until leaf litter covers area. Follow seeding specifications.

Final Landscaping: After the system is installed, the following should be checked to ensure that the system will not be overloaded with excess rainwater and run-off.

(a) The drip field is shared to shed rainwater and is free of low area.

(b) Curtain drains, grassy swales or ditches for diverting ground and surface water are properly installed.

(c) Gutter and downspout drains are directed away from the system.

Any problems should be corrected before approving the system.

Finally, drip field shall be stabilized and all other disturbed areas shall be planted with grass according to specifications.

Seeding: After completion of the drip fields, the site shall be stabilized with tall fescue grass. This should be seeded at the rate of 25 lbs. per acre each for a total of 50 lbs. per acre. Before seeding, lime should be added at the rate of 1.5 tons per acre. Fertilizer should be added at the rate of 100 units of Nitrogen, 120 lbs. of P_2O_5 and 120 lbs. of K_2O. Both the lime and fertilizer should be lightly incorporated into the soil before adding seed. After seeding, the area should be mulched until stand is established. Due to the erosion potential of this soil, this is an important part of the system.

SECTION VI - OPERATING CHECKS AND ADJUSTMENTS (START-UP)

The system shall consist of one 1,000-gallon septic tank with slotted filter, Orenco Advantex AX-20RT textile containing module with cover with recirculation pump and drip field with pump, headworks, controls and other apparatus.

All components of the system shall be checked and taken through a complete test cycle in the presence of the Owner's Engineer and to his satisfaction. If the test fails, adjustments shall be made and the test repeated until the system is determined to operate properly.

Septic Tank: Check water level, inlet pipe, outlet pipe and slotted filter. Verify that the filter can be removed for service and handle is within 12" from top of riser.

Textile Filter: Using manufacturer's instruction, become familiar with filter components and operation.

Drip System Dosing Tank Pump Chamber - Sequence of Operation: Effluent fills pump tank to level that will activate the "Pump Enabling" float. Pump can now operate. The control panel will be set to allow the prescribed pump cycles per day based on customer setting of the programmable timer. When a pump is called for service, and the level in the dosing tank permits, the zone valve (if provided) and filter flush valve will open. After an adjustable time, the filter flush valve will close, and the system will continue to dose the active drip zone for the operator selectable time. If the timer override float is activated, the pump will be allowed to dose for 5.00 minutes and disable for one hour. Then the pump will activate again until the water level in thank reaches normal again.

Dosing Cycle: If the system is equipped with multiple zones, all zones are dosed individually on an alternating basis so that each field is dosed once every other dosing cycle. The appropriate zone valve opens, the pump doses the field for 5.00 minutes and then the zone valve closes and the pump stops.

After an operator defined number of cycles (field adjustable prime numbers), the field flush valve and one zone valve will open for one cycle. At the end of the dose, the pump stops and the field flush and zone valves close. Since the flush cycle is to be set at an odd interval (prime number), the next flush cycle will fall on the opposite zone.

The pump shall operate delivering a timer controlled predetermined dose to the designated drip field. The pump shall also shut off when the low water level "pump off" switch is activated.

If the "high water alarm" float switch is activated, the controller shall activate audible and flashing alarm systems. Once energized, the flashing and audible alarm unit must be shut-off manually. After installation, each field shall be independently pressurized and the function and operating pressure checked to verify compliance with the specifications and required wetted area shown on the Plans. System pressure is to be obtained at the Schrader Valves located at the ends of the manifolds as shown on the plans. **The pressure and flow reading shall be recorded for comparison with future readings. The owner/operator cannot tell if the system is operating properly unless he has this info.**

SEEDING SPECIFICATIONS

SLOPES 3:1 or FLATTER

1. Apply agricultural lime at the rate of 90 LB/1000 SF.
2. Apply 10-10-10 commercial fertilizers at the rate of 20 LB/1000 SF.
3. Seed in accordance with the following schedule and application rate:

DATE	TYPE	PLANTING RATE
Aug 15 - Nov 1	Tall Fescue	200 LB/AC or 7 LB/1000 SF
Nov 1 - Mar 1*	Tall Fescue And	200 LB/AC or 7 LB/1000 SF
	Abruzzi Rye	25 LB/AC or 2 LB/1000 SF
Mar 1 - Apr 15	Tall Fescue	200 LB/AC or 7 LB/1000 SF
Apr 15 - Jul 30	Hulled Common Or Bermuda	30 LB/AC or 1 LB/1000 SF
Jul 15 - Aug 15	Tall Fescue And	200 LB/AC or 7 LB/1000 SF
	Brown Millet Or	35 LB/AC or 3 LB/1000 SF
	Sorghum-Sudan Hybrids	30 LB/AC or 3 LB/1000 SF

4. Mulch with straw applied at the rate of 75-100 LB/1000 SF.

* Heavily mulched during January - March period.

SLOPES GREATER THAN 3:1 TO 2:1

1. Apply agricultural lime at the rate of 90 LB/1000 SF.
2. Apply 10-10-10 commercial fertilizers at the rate of 20 LB/1000 SF.
3. Seed in accordance with the following schedule and application rate.

DATE	TYPE	PLANTING RATE
Mar 1 - Jun 1	Sericea Lespediza (scarified) &	50 LB/AC or 11 LB/1000 SF
Mar - Apr	Add Tall Fescue or	150 LB/AC or 32 LB/1000 SF
Mar - Jun	Add Weeping Lovegrass	5 LB/AC or 1 LB/1000 SF
Jun - Sep 1**	Tall Fescue and	60 LB/AC or 12 LB/1000 SF
	Brown Top Millet	35 LB/AC or 3 LB/1000 SF
	Sorghum Sudan Hybrids	30 LB/AC or 1 LB/1000 SF
Sep - Mar 1	Sericea Lespediza (unhulled-unscarified)	70 LB/AC or 14 LB/1000 SF
	Tall Fescue	150 LB/AC or 32 LB/1000 SF
	Millet or Sudan	20 LB/AC or 1 LB/1000 SF

** Temporary - Reseed September 1 at recommended rates.

4. Mulch with 3" straw applied at the rate of 50-90 LB/1000 SF.

CALCULATIONS

FOR A GROUND ABSORPTION SEWAGE DISPOSAL SYSTEM

USING SEPTIC TANK, TS-I ADVANCED TREATMENT AND

SUBSURFACE DRIP DISPOSAL TO SERVE A 3 BEDROOM

RESIDENCE

LOT 54 NORTHLAKE SUBDIVISION

Iredell County, North Carolina

July 6, 2021

Prepared for:
Adams Homes
10115 Kincey Ave, #160
Huntersville, NC 28078
Phone: (704) 361-5437

Prepared by:
PIEDMONT DESIGN ASSOCIATES, P.A.
125 East Plaza Drive, Suite 101
Mooresville, NC 28115
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Fax: 704-664-1778
NCBELS No.: C-1007



GEOFLOW
SUBSURFACE DRIP

Updated Mar 2015

FIELD FLOW

Job Description:	*Lot 54 Northlake Subdivision*
Contact:	*Adams Homes (Bob Cashion)*
Prepared by:	*PDAPA, David DeCaron*
Date:	*6-Jul-21*

Please fill in the shaded areas and drop down menus:
This spreadsheet is a **guide** for **small** systems with **residential** waste & is not a co

Worksheet 1- Field Flow

Total field

	Total Quantity of effluent to be disposed per day	360	gallons / day
	Hydraulic loading rate	0.15	gallons / sq.ft. / da
	Minimum Dispersal Field Area	2,400	square ft.
	Total Dispersal Field Area	2,716	square ft.

Flow per zone

	Number of Zones	**1**	zone(s)
	Dispersal area per zone	2,716	square ft.
	Choose line spacing between WASTEFLOW lines	2	ft.
	Choose emitter spacing between WASTEFLOW emit	2	ft.
	Total linear ft.per zone (minimum required)	1,358	ft. per zone
	Total number of emitters per zone	679	emitters per zone
	Select Wasteflow dripline (16mm)	Wasteflow PC - 1/2gph	dripline
		Wasteflow Classic	
		Wasteflow PC - 1/2gph	
		Wasteflow PC - 1 gph	
	Pressure at the beginning of the dripfield	45	psi
	Feet of Head at the beginning of the dripfield	103.95	ft.
	What is the flow rate per emitter in gph?	0.53	gph
	Dose flow per zone	**6.00**	**gpm**

Note: A few States or Counties require additional flow for flushing. Please check your local regulatio
Flush velocity calculation below is for PC dripline. Classic dripline requires less flow to flush than P
Please refer to Geoflow's spreadsheet "Design Flow and Flush Curves" at www.geoflow.com or call

	If required, choose flush velocity	2	ft/sec
	How many lines of WASTEFLOW per zone?	8	lines
	Fill in the *actual* length of longest dripline lateral	175	ft.
	Flush flow required at the end of each dripline	1.48	gpm
	Total Flow required to achieve flushing velocity	11.84	gpm
	Total Flow per zone- worst case scenario	**17.84**	**gpm**

Select Filters and zone valves

	Select Filter Type	Vortex Screen Filter	
	Recommended Filter (item no.)	AP4E-1.5F	Screen Filter 0-20
	Select Zone Valve Type	Electric Solenoid	-
	Recommended Zone Valve (item no.)	0	0

-

Dosing

	Number of doses per day / zone:	12	doses
	Timer ON. Pump run time per dose/zone:	5.00	mins:secs
	Timer OFF. Pump off time between doses	1:54	hrs:mins
	Per Zone - Pump run time per day/zone:	1:00	hrs:mins
	All Zones - Number of doses per day / all zones	12	doses / day
	Allow time for field to pressurize	0:00:30	hrs:mins:secs
	Filter flush timer	0:00:20	hrs:mins:secs
	Drain timer	0:05:00	hrs:mins:secs
	Field flush timer	0:01:00	hrs:mins:secs
	Field flush counter	37	cycles
	Time required to complete all functions per day	**2:22**	hrs:mins
Dose volume per zone		30	gallons per dose

GEOFLOW
SUBSURFACE DRIP

PUMP SIZING

Job Description:	*Lot 54 Northlake Subdivision*
Contact:	*Adams Homes (Bob Cashion)*
Prepared by:	*PDAPA, David DeCaron*
Date:	*7/6/2021*

Please fill in the shaded areas and drop down menus:
This spreadsheet is a guide for small systems with residential waste & is not a complete
Pressure losses may be grossly overstated, particularly if designing with WASTEFLOW
The letters on the diagram(right) match the letters in section 2 below.

Worksheet - Pump Sizing

Section 1 - Summary from Worksheet 1		
Flow required to dose field	6.00	gpm
Flow required to flush field	11.84	gpm
Flow required to dose & flush field	17.84	gpm
Filter	AP4E-1.5F	
No. of Zones	1	zones
Zone valve	-	
Dripline	Wasteflow PC - 1/2gph	
Dripline longest lateral	175.00	ft.

Section 2	Ft of head	Pressure
A. Flush line - Losses through return line		
Select Pipe from dropdown menu	PVC schedule 40	
Select Flush Line Diameter	1" inch	
Length of return line	130 ft.	
Equivalent length of fittings	26 ft.	
Elevation change. (if downhill enter 0)	**16.5** ft.	
Pressure loss in 100 ft of pipe	8.61 ft.	3.73 psi
Total pressure loss from end of dripline to return tank	*29.9 ft.*	12.96 psi
B. Dripline - Losses through Wasteflow dripline		
Length of longest dripline lateral	**175** ft.	
Minimum dosing pressure required at end of dripline	29.93 ft.	12.96 psi
Loss through dripline during flushing	2.59 ft.	1.12 psi
Total minimum required dripline pressure	*32.52 ft.*	14.08 *psi*
A+B. Minimum Pressure required at beginning of dripfield		
CALCULATED pressure required at beginning of dripf	*62.45 ft.*	27.03 *psi*
SPECIFIED pressure at beginning of dripfield (from wc	**104.0 ft.**	45.00 *psi*
Great! SPECIFIED Pressure is greater than CALCULATED Pressure requirement. Go to next step		
C. Drip components - Losses through headworks		
Filter	19.1 ft.	8.25 psi
Zone valve pressure loss (not in diagram)	- ft.	- psi
Flow meter pressure loss (not in diagram)	4.04 ft.	1.75 psi
Other pressure losses	5.00 ft.	2.16 psi
Total loss through drip components	**28.10 ft.**	12.16 psi
D. Supply line - Minimum Pressure head required to get from pump tank to top of dripfield		
Select Pipe from dropdown menu	PVC schedule 40	
Select Supply line diameter	1" inch	
Length of supply line	130 ft.	
Equivalent length of fittings	26 ft.	
Height from pump to tank outlet	6 ft.	
Elevation change. (if downhill enter 0)	16.5 ft.	
Pressure loss/gain in 100 ft. of pipe	18.39 ft.	7.96 psi
Total gain or loss from pump to field	***51.2 ft.***	22.16 psi
Total dynamic head	**183.2 ft.**	79.32 *psi*
Pump capacity * - Field Flush Flow	**17.8 gpm**	79.32 *psi*
- Field Dose Flow	**6.0 gpm**	
- Filter Flush Flow	**- gpm**	- *psi*
Pump Model Number	**Orenco PF 2010-12**	
Voltz / Hp / phase	**230V - 1 HP - 1 Phase**	

Engineers and Soil Scientists

Agri-Waste Technology, Inc.
501 N. Salem Street, Suite 203
Apex, North Carolina 27502
919-859-0669
www.agriwaste.com



Soil Suitability for Domestic Sewage Treatment and Disposal Systems
169 Northlake Drive (Lot 54), Statesville, NC. 28677 (Iredell County, NC)

PREPARED FOR: Adams Homes, (Attention: Bob Cashion)

PREPARED BY: Jeff Vaughan
Trevor Hackney

DATE: July 6, 2021

The following report is a summary of saturated hydraulic conductivity tests (K_{sat}) and soil profile evaluations conducted at 169 Northlake Drive (Lot 54), Statesville, NC, on June 24, 2021 (Attachment 1). The tests/evaluations were performed by Trevor Hackney of Agri-Waste Technology, Inc., (AWT) using a Johnson Permeameter. The lot was previously evaluated by Bryant White of the Iredell County Environmental Health Department, Jeff Vaughan, and Trevor Hackney. The proposed septic system is to serve an existing three-bedroom home on the property. A subsurface drip with pretreatment septic system is proposed for the initial and repair system. The system is proposed to be partially in the back yard and a partially in the front yard.

A map of the property showing the septic system layout and K_{sat} test locations is available as Attachment 1. Three in-field K_{sat} tests were conducted within the proposed septic system drainfield area as delineated by Iredell County Environmental Health Department and AWT. A summary of the computational spreadsheets, field datasheets, soil profile descriptions, and pictures are provided as Attachment 2. The purpose of the tests is to provide an estimated loading rate for a subsurface drip with pre-treatment septic system, with the understanding that the final loading rate will be set by the Iredell County Environmental Health Department. Results from the K_{sat} tests are detailed in Table 1 below.

Based on the pit evaluations performed by Bryant White and AWT the minimum trench bottom should be at a of 19 inches with a maximum of 32 inches at this site due to the disturbed soil surface. AWT recommends installing the trench at 19 inches. The major treatment zone will be identified as 19-28 inches. The K_{sat} tests were performed at various depths within this treatment zone on the site.

Table 1. K_{sat} Results for 169 Northlake Drive (Lot 54), Statesville, NC.

Adams Homes; 169 Northlake (Lot 54), Statesville, NC.
K_{SAT} Summary

Ksat #	Ksat Test Depth (in)	Permeability (in/hr)	Permeability (gal/day/ft^2)
1	26	0.482	7.209
2	24	2.721	40.711
3	21	0.176	2.631

	(in/hr) 100%	(gal/day/ft^2) 100%	(gal/day/ft^2) 25%	(gal/day/ft^2) 10%
Geomean Treatment Zone (14-26")	0.29	4.36	1.089	0.436

Comments: Excluded KSAT 2 due to the irregularly high readings

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Results of the K_{sat} tests within the proposed lot showed that the soil would support a loading rate of up to 0.44 GPD/ft^2 based on the geomean of the two tests used for the calculation. However, due to the nature of the underlying soils in the area and given the type of system expected for installation, we do not recommend a loading rate exceeding 0.15GPD/ft^2. At a loading rate of 0.15GPD/ft^2, 1,200' of drip tubing will be needed per system. The attached drawing shows that 1,358' of drip tubing can be installed for the primary system with 2,950 sq. ft. of space left over the repair area (Attachment 1). The attached drawing accounts for 158' of blanking. If it is determined the blanking is not necessary during installation AWT recommends the additional 158' of drip tubing be installed as a part of the primary system.

We appreciate the opportunity to assist you in this matter. Please contact us with any questions, concerns, or comments.

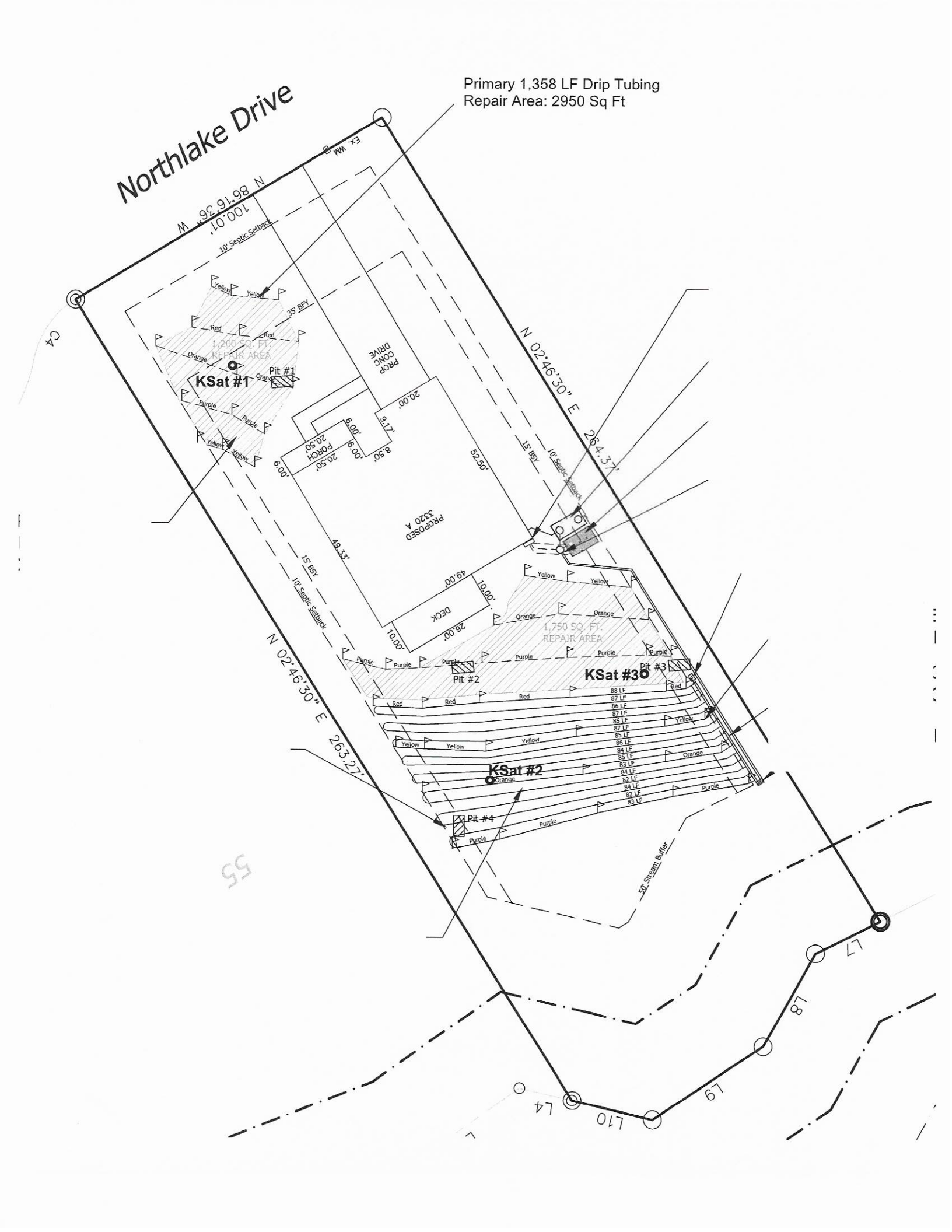
Sincerely,

Jeff Vaughan

Jeff V

Trevor Hackney

Trevor Hackney


Primary 1,358 LF Drip Tubing
Repair Area: 2950 Sq Ft
Northlake Drive
N 86°16'36" W
100.01'
Ex. WM
10' Septic Setback
35' BFY
Yellow
Red
Orange
Purple
1,200 SQ. FT.
REPAIR AREA
KSat #1
Pit #1
PROP CONC DRIVE
20.00'
9.17'
8.50'
6.00'
20.50'
PORCH
52.50'
PROPOSED 3320 A
15' BSY
10' Septic Setback
N 02°46'30" E 264.37'
49.33'
49.00'
10.00'
DECK
26.00'
1,750 SQ. FT.
REPAIR AREA
Pit #2
KSat #3
Pit #3
KSat #2
Pit #4
88 LF
87 LF
86 LF
87 LF
85 LF
87 LF
85 LF
86 LF
84 LF
85 LF
83 LF
84 LF
82 LF
84 LF
82 LF
83 LF
N 02°46'30" E 263.27'
50' Stream Buffer
C4
L7
L8
L9
L10
L4

Constant-Head Borehole Permeameter Test

Solution: USBR 7300-89 Condition I (Deep WT or Impermeable layer)

File Name.....: USBR-7300-89-Cond. I

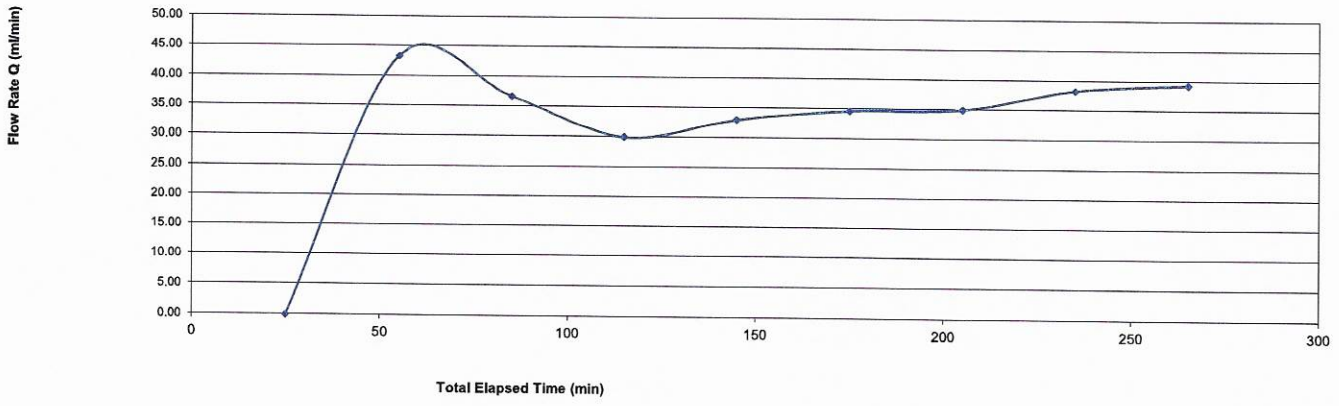
Project Name.....:	Adams Homes	**Boring No.....:**	KSAT #1	**Solution and Terminology (USBR 7300-89 Condition I)***	
Project No.....:		**Investigators.....:**	T. Hackney	$K_B = QV/(2\pi H^2)[\ln\{H/r+((H/r)^2+1)^{0.5}\}-((H/r)^2+1)^{0.5}/(H/r)+1/(H/r))]$	
Project Location...:	169 Northlake Drive (Lot 54)	**Date.....:**	June 24, 2021	where:	
Boring Depth.....:	26 in **(Specify units)**	**WCU Base Ht. h:**	17.0 **cm***	K_B: (Coefficient of Permeability) @ base Tmp. T_B °C:	25
Boring Diameter...:	7.0 **cm**	**WCU Susp. Ht. S:**	5.0 **cm**	Q: Rate of flow of water from the borehole	
Boring Radius r.....:	3.50 **cm**	**Const. Wtr. Ht. H:**	22.0 **cm**	H: Constant height of water in the borehole	
Soil/Water Tmp. T:	25 **°C**	**H/r**.....:**	6.3	r: Radius of the cylindrical borehole	
Dyn. Visc. @ T.....:	0.000891 **kg/m·s**	**Dyn. Visc. @ T_B.:**	0.000891 **kg/m·s**	V: Dynamic viscosity of water @ T °C/Dyn. Visc. of water @ T_B °C	

VOLUME (ml)	Volume Out (ml)	TIME (h:mm:ss A/P)	Interval Elapsed Time (hr:min:sec)	Interval Elapsed Time (min)	Flow Rate Q (ml/min)	K_B Equivalent Values (µm/sec)	K_B Equivalent Values (cm/sec)	K_B Equivalent Values (cm/day)	K_B Equivalent Values (in/hr)	K_B Equivalent Values (ft/day)
Start Soak		7:50:00 AM								
3,250	#VALUE!	8:15:00 AM	0:25:00	25.00	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
1,950	1,300	8:45:00 AM	0:30:00	30.00	43.33	4.0	4.00E-04	34.6	0.57	1.13
850	1,100	9:15:00 AM	0:30:00	30.00	36.67	3.4	3.38E-04	29.2	0.48	0.96
3,250		9:15:00 AM								
2,350	900	9:45:00 AM	0:30:00	30.00	30.00	2.8	2.77E-04	23.9	0.39	0.78
1,360	990	10:15:00 AM	0:30:00	30.00	33.00	3.0	3.05E-04	26.3	0.43	0.86
320	1,040	10:45:00 AM	0:30:00	30.00	34.67	3.2	3.20E-04	27.6	0.45	0.91
3,250		10:45:00 AM								
2,200	1,050	11:15:00 AM	0:30:00	30.00	35.00	3.2	3.23E-04	27.9	0.46	0.92
1,050	1,150	11:45:00 AM	0:30:00	30.00	38.33	3.5	3.54E-04	30.6	0.50	1.00
3,250		11:45:00 AM								
2,070	1,180	12:15:00 PM	0:30:00	30.00	39.33	3.6	3.63E-04	31.4	0.51	1.03

Natural Moisture.....:	Moist	**Consistency.....:**	SS; SP; FI	**Total Time (min)**	**Enter K_B Value:**	**3.40E+00**	**3.40E-04**	**29.4**	**0.48**	**0.96**
USDA Txt./USCS Class:	C; SBK	**Water Table Depth...:**	10+ ft.			Average last 4				
Struct./% Pass. #200..:		**Init. Saturation Time.:**		265.00						

*USBR 7300-89. Condition I exists when the distance from the water surface in the borehole to the water table or an impermiable layer is ≥3X the depth of the water in the borehole. **H/r ≥5 - ≤10. ***Model JP-M1: h = 15cm, Model JP-M2 (3"): h = 10cm, Model JP-JR2 (2") h = 17cm. Johnson Permeameter, LLC. Revised 12/04/2015

Flow Rate Q vs. Total Elapsed Time



Constant-Head Borehole Permeameter Test

Solution: USBR 7300-89 Condition I (Deep WT or Impermeable layer)

File Name.....: USBR-7300-89-Cond. I

Project Name.....:	Adams Homes	Boring No.....:	KSAT #2 (Sheet 1)
Project No.....:		Investigators.....:	T. Hackney
Project Location...:	169 Northlake Drive (Lot 54)	Date.....:	June 24, 2021
Boring Depth.....:	24 in (Specify units)	WCU Base Ht. h:	17.0 cm***
Boring Diameter...:	7.0 cm	WCU Susp. Ht. S:	5.0 cm
Boring Radius r.....:	3.50 cm	Const. Wtr. Ht. H:	22.0 cm
Soil/Water Tmp. T:	25 °C	H/r**.....:	6.3
Dyn. Visc. @ T.....:	0.000891 kg/m-s	Dyn. Visc. @ T_B.:	0.000891 kg/m-s

Solution and Terminology (USBR 7300-89 Condition I)*

$K_B = QV/(2\pi H^2)[\ln\{H/r+((H/r)^2+1)^{0.5}\}-((H/r)^2+1)^{0.5}/(H/r)+1/(H/r))]$

where:

K_B: (Coefficient of Permeability) @ base Tmp. T_B °C: 25

Q: Rate of flow of water from the borehole

H: Constant height of water in the borehole

r: Radius of the cylindrical borehole

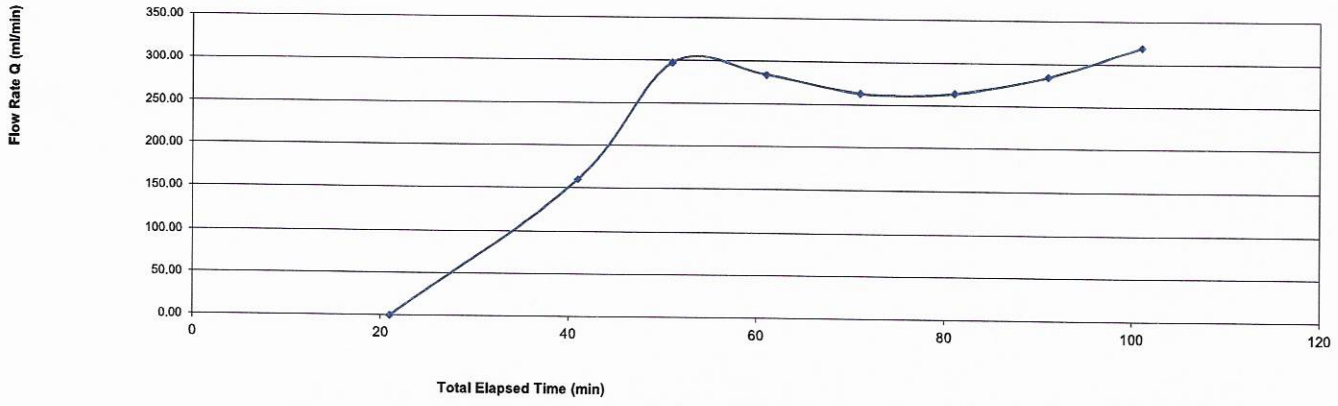
V: Dynamic viscosity of water @ T °C/Dyn. Visc. of water @ T_B °C

VOLUME (ml)	Volume Out (ml)	TIME (h:mm:ss A/P)	Interval Elapsed Time (hr:min:sec)	Interval Elapsed Time (min)	Flow Rate Q (ml/min)	K_B Equivalent Values (µm/sec)	(cm/sec)	(cm/day)	(in/hr)	(ft/day)
Start Soak		7:55:00 AM								
3,250	#VALUE!	8:16:00 AM	0:21:00	21.00	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
50	3,200	8:36:00 AM	0:20:00	20.00	160.00	14.8	1.48E-03	127.6	2.09	4.19
3,250		8:36:00 AM								
270	2,980	8:46:00 AM	0:10:00	10.00	298.00	27.5	2.75E-03	237.7	3.90	7.80
3,250		8:46:00 AM								
400	2,850	8:56:00 AM	0:10:00	10.00	285.00	26.3	2.63E-03	227.3	3.73	7.46
3,250		8:56:00 AM								
610	2,640	9:06:00 AM	0:10:00	10.00	264.00	24.4	2.44E-03	210.5	3.45	6.91
3,250		9:06:00 AM								
600	2,650	9:16:00 AM	0:10:00	10.00	265.00	24.5	2.45E-03	211.3	3.47	6.93
3,250		9:16:00 AM								
400	2,850	9:26:00 AM	0:10:00	10.00	285.00	26.3	2.63E-03	227.3	3.73	7.46
3,250		9:26:00 AM								
50	3,200	9:36:00 AM	0:10:00	10.00	320.00	29.5	2.95E-03	255.2	4.19	8.37

Natural Moisture.....:	Moist	Consistency.....:	SS; SP; FI	Total Time (min)	Enter K_B Value:
USDA Txt./USCS Class:	C; SBK	Water Table Depth...:	10+ ft.		See Sheet 3 or 4
Struct./% Pass. #200..:		Init. Saturation Time.:		101.00	

*USBR 7300-89. Condition I exists when the distance from the water surface in the borehole to the water table or an impermiable layer is ≥3X the depth of the water in the borehole. **H/r ≥5 - ≤10. ***Model JP-M1: h = 15cm, Model JP-M2 (3"): h = 10cm, Model JP-JR2 (2") h = 17cm. Johnson Permeameter, LLC. Revised 12/04/2015

Flow Rate Q vs. Total Elapsed Time



Constant-Head Borehole Permeameter Test

Solution: USBR 7300-89 Condition I (Deep WT or Impermeable layer)

File Name.....: USBR-7300-89-Cond. I

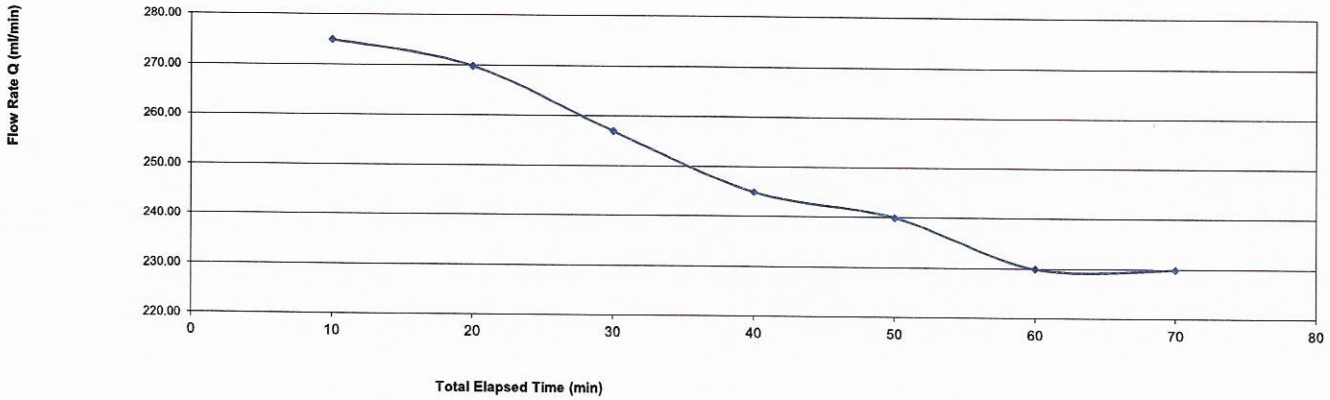
Project Name.....:	Adams Homes	Boring No.....:	KSAT #2 (Sheet 2)	Solution and Terminology (USBR 7300-89 Condition I)*	
Project No.....:		Investigators.....:	T. Hackney	$K_B = QV/(2\pi H^2)[\ln\{H/r+((H/r)^2+1)^{0.5}\}-((H/r)^2+1)^{0.5}/(H/r)+1/(H/r))]$	
Project Location...:	169 Northlake Drive (Lot 54)	Date.....:	June 24, 2021	where:	
Boring Depth.....:	24 in (Specify units)	WCU Base Ht. h:	17.0 cm***	K_B: (Coefficient of Permeability) @ base Tmp. T_B °C:	25
Boring Diameter...:	7.0 cm	WCU Susp. Ht. S:	5.0 cm	Q: Rate of flow of water from the borehole	
Boring Radius r.....:	3.50 cm	Const. Wtr. Ht. H:	22.0 cm	H: Constant height of water in the borehole	
Soil/Water Tmp. T:	25 °C	H/r**.....:	6.3	r: Radius of the cylindrical borehole	
Dyn. Visc. @ T.....:	0.000891 kg/m·s	Dyn. Visc. @ T_B.:	0.000891 kg/m·s	V: Dynamic viscosity of water @ T °C/Dyn. Visc. of water @ T_B °C	

VOLUME (ml)	Volume Out (ml)	TIME (h:mm:ss A/P)	Interval Elapsed Time (hr:min:sec)	Interval Elapsed Time (min)	Flow Rate Q (ml/min)	K_B Equivalent Values (µm/sec)	(cm/sec)	(cm/day)	(in/hr)	(ft/day)
3,250		9:36:00 AM								
500	2,750	9:46:00 AM	0:10:00	10.00	275.00	25.4	2.54E-03	219.3	3.60	7.20
3,250		9:46:00 AM								
550	2,700	9:56:00 AM	0:10:00	10.00	270.00	24.9	2.49E-03	215.3	3.53	7.06
3,250		9:56:00 AM								
680	2,570	10:06:00 AM	0:10:00	10.00	257.00	23.7	2.37E-03	205.0	3.36	6.72
3,250		10:06:00 AM								
800	2,450	10:16:00 AM	0:10:00	10.00	245.00	22.6	2.26E-03	195.4	3.21	6.41
3,250		10:16:00 AM								
850	2,400	10:26:00 AM	0:10:00	10.00	240.00	22.2	2.22E-03	191.4	3.14	6.28
3,250		10:26:00 AM								
950	2,300	10:36:00 AM	0:10:00	10.00	230.00	21.2	2.12E-03	183.4	3.01	6.02
3,250		10:36:00 AM								
950	2,300	10:46:00 AM	0:10:00	10.00	230.00	21.2	2.12E-03	183.4	3.01	6.02

Natural Moisture.....:	Moist	Consistency.....:	SS; SP; FI	Total Time (min)	Enter K_B Value:	
USDA Txt./USCS Class:	C; SBK	Water Table Depth...:	10+ ft.			See Sheet 3 or 4
Struct./% Pass. #200..:		Init. Saturation Time.:		70.00		

*USBR 7300-89. Condition I exists when the distance from the water surface in the borehole to the water table or an impermiable layer is ≥3X the depth of the water in the borehole. **H/r ≥5 - ≤10. ***Model JP-M1: h = 15cm, Model JP-M2 (3"): h = 10cm, Model JP-JR2 (2") h = 17cm. Johnson Permeameter, LLC. Revised 12/04/2015

Flow Rate Q vs. Total Elapsed Time



Constant-Head Borehole Permeameter Test

Solution: USBR 7300-89 Condition I (Deep WT or Impermeable layer)

File Name.....: USBR-7300-89-Cond. I

Project Name.....:	Adams Homes	**Boring No.....:**	KSAT #2 (Sheet 3)
Project No.....:		**Investigators.....:**	T. Hackney
Project Location...:	169 Northlake Drive (Lot 54)	**Date.....:**	June 24, 2021
Boring Depth.....:	24 in **(Specify units)**	**WCU Base Ht. h:**	17.0 **cm*** **
Boring Diameter...:	7.0 **cm**	**WCU Susp. Ht. S:**	5.0 **cm**
Boring Radius r.....:	3.50 **cm**	**Const. Wtr. Ht. H:**	22.0 **cm**
Soil/Water Tmp. T:	25 **°C**	**H/r**.....:**	6.3
Dyn. Visc. @ T.....:	0.000891 **kg/m·s**	**Dyn. Visc. @ T_B.:**	0.000891 **kg/m·s**

Solution and Terminology (USBR 7300-89 Condition I)*

$K_B = QV/(2\pi H^2)[\ln\{H/r+((H/r)^2+1)^{0.5}\}-((H/r)^2+1)^{0.5}/(H/r)+1/(H/r))]$

where:

K_B: (Coefficient of Permeability) @ base Tmp. T_B °C: 25

Q: Rate of flow of water from the borehole

H: Constant height of water in the borehole

r: Radius of the cylindrical borehole

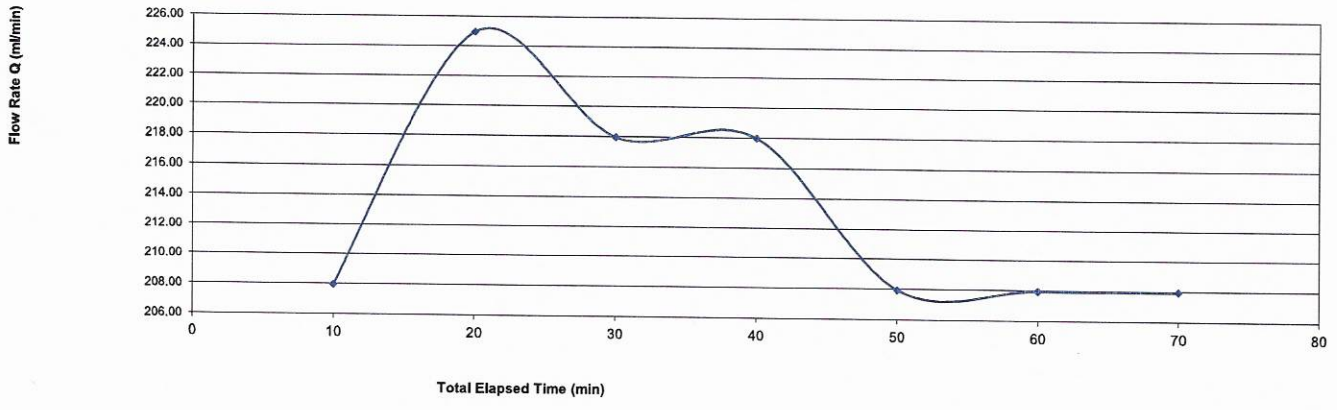
V: Dynamic viscosity of water @ T °C/Dyn. Visc. of water @ T_B °C

VOLUME (ml)	Volume Out (ml)	TIME (h:mm:ss A/P)	Interval Elapsed Time (hr:min:sec)	Interval Elapsed Time (min)	Flow Rate Q (ml/min)	K_B Equivalent Values (µm/sec)	(cm/sec)	(cm/day)	(in/hr)	(ft/day)
3,250		10:46:00 AM								
1,170	2,080	10:56:00 AM	0:10:00	10.00	208.00	19.2	1.92E-03	165.9	2.72	5.44
3,250		10:56:00 AM								
1,000	2,250	11:06:00 AM	0:10:00	10.00	225.00	20.8	2.08E-03	179.4	2.94	5.89
3,250		11:06:00 AM								
1,070	2,180	11:16:00 AM	0:10:00	10.00	218.00	20.1	2.01E-03	173.9	2.85	5.70
3,250		11:16:00 AM								
1,070	2,180	11:26:00 AM	0:10:00	10.00	218.00	20.1	2.01E-03	173.9	2.85	5.70
3,250		11:26:00 AM								
1,170	2,080	11:36:00 AM	0:10:00	10.00	208.00	19.2	1.92E-03	165.9	2.72	5.44
3,250		11:36:00 AM								
1,170	2,080	11:46:00 AM	0:10:00	10.00	208.00	19.2	1.92E-03	165.9	2.72	5.44
3,250		11:46:00 AM								
1,170	2,080	11:56:00 AM	0:10:00	10.00	208.00	19.2	1.92E-03	165.9	2.72	5.44

Natural Moisture.....:	Moist	**Consistency.....:**	SS; SP; FI	**Total Time (min)**	**Enter K_B Value:**	**1.92E+01**	**1.92E-03**	**165.9**	**2.72**	**5.44**
USDA Txt./USCS Class:	C; SBK	**Water Table Depth...:**	10+ ft.			Used Last Value. Reading at 12:06 remained the same.				
Struct./% Pass. #200..:		**Init. Saturation Time.:**		70.00						

*USBR 7300-89. Condition I exists when the distance from the water surface in the borehole to the water table or an impermiable layer is ≥3X the depth of the water in the borehole. **H/r ≥5 - ≤10. ***Model JP-M1: h = 15cm, Model JP-M2 (3"): h = 10cm, Model JP-JR2 (2") h = 17cm. Johnson Permeameter, LLC. Revised 12/04/2015

Flow Rate Q vs. Total Elapsed Time



Constant-Head Borehole Permeameter Test

Solution: USBR 7300-89 Condition I (Deep WT or Impermeable layer)

File Name.....: USBR-7300-89-Cond. I

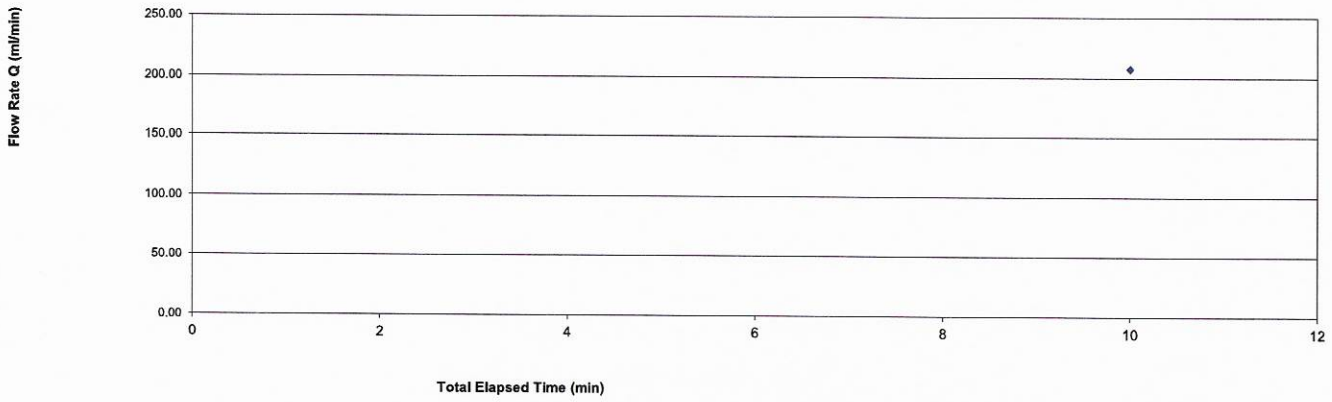
Project Name.....:	Adams Homes	**Boring No.....:**	KSAT #2 (Sheet 4)	**Solution and Terminology (USBR 7300-89 Condition I)***	
Project No.....:		**Investigators.....:**	T. Hackney	$K_B = QV/(2\pi H^2)[\ln\{H/r+((H/r)^2+1)^{0.5}\}-((H/r)^2+1)^{0.5}/(H/r)+1/(H/r))]$	
Project Location...:	169 Northlake Drive (Lot 54)	**Date.....:**	June 24, 2021	where:	
Boring Depth.....:	24 in **(Specify units)**	**WCU Base Ht. h:**	17.0 **cm*** **	K_B: (Coefficient of Permeability) @ base Tmp. T_B °C:	25
Boring Diameter...:	7.0 **cm**	**WCU Susp. Ht. S:**	5.0 **cm**	Q: Rate of flow of water from the borehole	
Boring Radius r.....:	3.50 **cm**	**Const. Wtr. Ht. H:**	22.0 **cm**	H: Constant height of water in the borehole	
Soil/Water Tmp. T:	25 **°C**	**H/r**.....:**	6.3	r: Radius of the cylindrical borehole	
Dyn. Visc. @ T.....:	0.000891 **kg/m-s**	**Dyn. Visc. @ T_B.:**	0.000891 **kg/m-s**	V: Dynamic viscosity of water @ T °C/Dyn. Visc. of water @ T_B °C	

VOLUME (ml)	Volume Out (ml)	TIME (h:mm:ss A/P)	Interval Elapsed Time (hr:min:sec)	Interval Elapsed Time (min)	Flow Rate Q (ml/min)	K_B Equivalent Values (µm/sec)	(cm/sec)	(cm/day)	(in/hr)	(ft/day)
3,250		11:56:00 AM								
1,170	2,080	12:06:00 PM	0:10:00	10.00	208.00	19.2	1.92E-03	165.9	2.72	5.44

Natural Moisture.....:	Moist	**Consistency.....:**	SS; SP; FI	**Total Time (min)**	**Enter K_B Value:**	**1.92E+01**	**1.92E-03**	**165.9**	**2.72**	**5.44**
USDA Txt./USCS Class:	C; SBK	**Water Table Depth...:**	10+ ft.			Used Last Value. See Sheet 3 for steady state				
Struct./% Pass. #200..:		**Init. Saturation Time.:**		10.00						

*USBR 7300-89. Condition I exists when the distance from the water surface in the borehole to the water table or an impermiable layer is ≥3X the depth of the water in the borehole. **H/r ≥5 - ≤10. ***Model JP-M1: h = 15cm, Model JP-M2 (3"): h = 10cm, Model JP-JR2 (2") h = 17cm. Johnson Permeameter, LLC. Revised 12/04/2015

Flow Rate Q vs. Total Elapsed Time



Constant-Head Borehole Permeameter Test

Solution: USBR 7300-89 Condition I (Deep WT or Impermeable layer)

File Name.....: USBR-7300-89-Cond. I

Project Name.....:	Adams Homes	**Boring No.....:**	KSAT #3
Project No.....:		**Investigators.....:**	T. Hackney
Project Location...:	169 Northlake Drive (Lot 54)	**Date.....:**	June 24, 2021
Boring Depth.....:	21 in **(Specify units)**	**WCU Base Ht. h:**	17.0 **cm*** **
Boring Diameter...:	7.0 **cm**	**WCU Susp. Ht. S:**	5.0 **cm**
Boring Radius r.....:	3.50 **cm**	**Const. Wtr. Ht. H:**	22.0 **cm**
Soil/Water Tmp. T:	25 **°C**	**H/r**.....:**	6.3
Dyn. Visc. @ T.....:	0.000891 **kg/m·s**	**Dyn. Visc. @ T_B.:**	0.000891 **kg/m·s**

Solution and Terminology (USBR 7300-89 Condition I)*

$K_B = QV/(2\pi H^2)[\ln\{H/r+((H/r)^2+1)^{0.5}\}-((H/r)^2+1)^{0.5}/(H/r)+1/(H/r))]$

where:

K_B: (Coefficient of Permeability) @ base Tmp. T_B °C: 25

Q: Rate of flow of water from the borehole

H: Constant height of water in the borehole

r: Radius of the cylindrical borehole

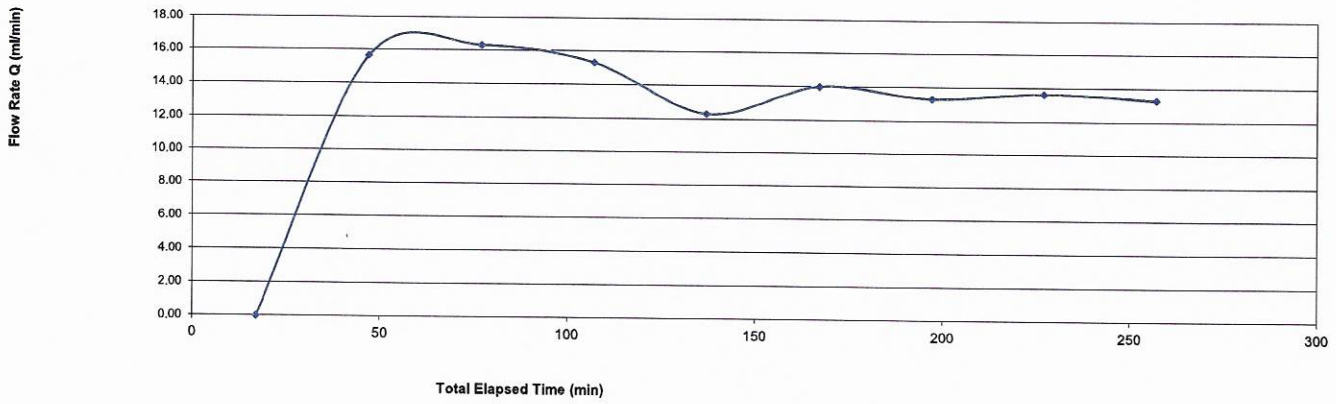
V: Dynamic viscosity of water @ T °C/Dyn. Visc. of water @ T_B °C

VOLUME (ml)	Volume Out (ml)	TIME (h:mm:ss A/P)	Interval Elapsed Time (hr:min:sec)	Interval Elapsed Time (min)	Flow Rate Q (ml/min)	K_B Equivalent Values (µm/sec)	K_B Equivalent Values (cm/sec)	K_B Equivalent Values (cm/day)	K_B Equivalent Values (in/hr)	K_B Equivalent Values (ft/day)
Start Soak		8:00:00 AM								
3,250	#VALUE!	8:17:00 AM	0:17:00	17.00	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!
2,780	470	8:47:00 AM	0:30:00	30.00	15.67	1.4	1.45E-04	12.5	0.20	0.41
2,290	490	9:17:00 AM	0:30:00	30.00	16.33	1.5	1.51E-04	13.0	0.21	0.43
1,830	460	9:47:00 AM	0:30:00	30.00	15.33	1.4	1.42E-04	12.2	0.20	0.40
1,460	370	10:17:00 AM	0:30:00	30.00	12.33	1.1	1.14E-04	9.8	0.16	0.32
1,040	420	10:47:00 AM	0:30:00	30.00	14.00	1.3	1.29E-04	11.2	0.18	0.37
640	400	11:17:00 AM	0:30:00	30.00	13.33	1.2	1.23E-04	10.6	0.17	0.35
230	410	11:47:00 AM	0:30:00	30.00	13.67	1.3	1.26E-04	10.9	0.18	0.36
3,250		11:47:00 AM								
2,850	400	12:17:00 PM	0:30:00	30.00	13.33	1.2	1.23E-04	10.6	0.17	0.35

Natural Moisture.....:	Moist	**Consistency.....:**	SS; SP; FI	**Total Time (min)**	**Enter K_B Value:**	**1.24E+00**	**1.24E-04**	**10.7**	**0.18**	**0.35**
USDA Txt./USCS Class:	C; SBK	**Water Table Depth...:**	10+ ft.			Average last 3				
Struct./% Pass. #200..:		**Init. Saturation Time.:**		257.00						

*USBR 7300-89. Condition I exists when the distance from the water surface in the borehole to the water table or an impermiable layer is ≥3X the depth of the water in the borehole. **H/r ≥5 - ≤10. ***Model JP-M1: h = 15cm, Model JP-M2 (3"): h = 10cm, Model JP-JR2 (2") h = 17cm. Johnson Permeameter, LLC. Revised 12/04/2015

Flow Rate Q vs. Total Elapsed Time



DEPARTMENT OF HEALTH AND HUMAN SERVICES
DIVISION OF PUBLIC HEALTH, ENVIRONMENTAL HEALTH SECTION
ON-SITE WATER PROTECTION BRANCH

Sheet __1__ *of* _1___
PROPERTY ID #: _____
COUNTY: ___Iredell__

SOIL/SITE EVALUATION
***for* ON-SITE WASTEWATER SYSTEM**
(Complete all fields in full)

OWNER: _____Adams Homes_____KSAT Description Sheet_____ APPLICATION DATE_____
ADDRESS:_____169 Northlake Drive, Statesville, NC_____ DATE EVALUATED: _6/24/21____
PROPOSED FACILITY: Single Family Residence_PROPOSED DESIGN FLOW (.1949): 360 GPD__ PROPERTY SIZE:_0.62 ac
LOCATION OF SITE: _____169 Northlake Drive, Statesville, NC _____ PROPERTY RECORDED: _____
WATER SUPPLY: ☐ Private ☑ Public ☐ Well ☐ Spring ☐ Other _____
EVALUATION METHOD: ☐ Auger Boring ☑ Pit ☐ Cut TYPE OF WASTEWATER: ☑ Sewage ☐ Industrial Process ☐ Mixed

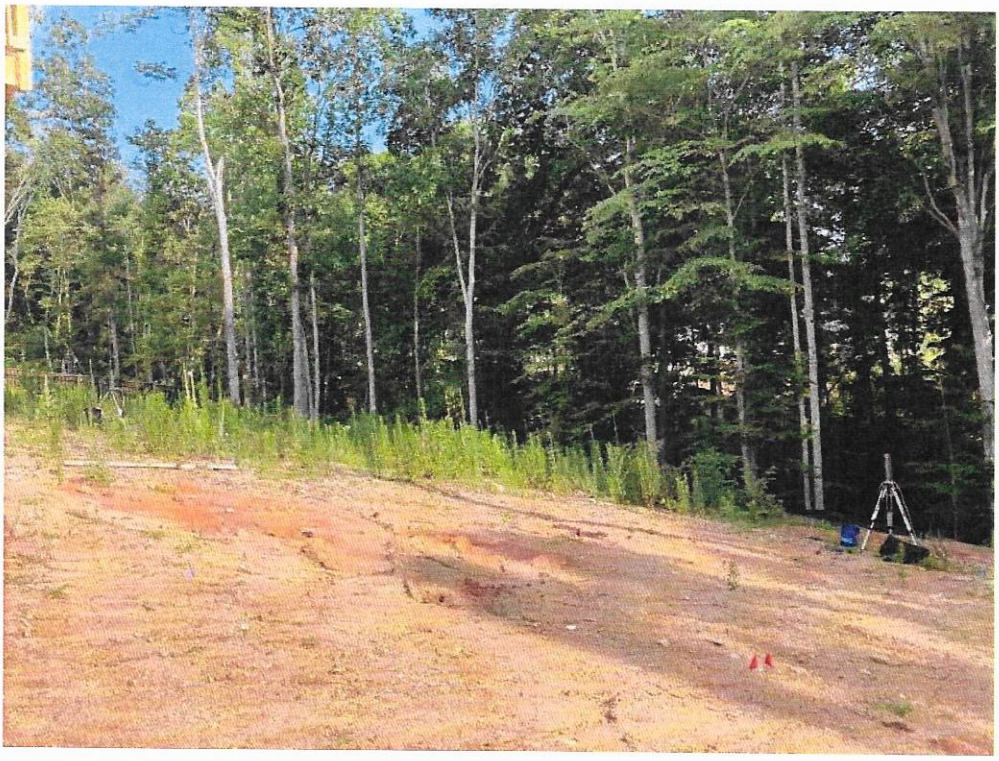
PROFILE #	.1940 LANDSCAPE POSITION/ SLOPE %	HORIZON DEPTH (IN.)	SOIL MORPHOLOGY (.1941)		OTHER PROFILE FACTORS				PROFILE CLASS & LTAR
			.1941 STRUCTURE/ TEXTURE	.1941 CONSISTENCE/ MINERALOGY	.1942 SOIL WETNESS/ COLOR	.1943 SOIL DEPTH	.1956 SAPRO CLASS	.1944 RESTR HORIZ	
1	KSAT 1 26"	0-9"	Fill Soil	-	-	44+"		-	.15 GPD/ft²
		9-14"	SCL, WSBK	Fr; SS; SP					
		14-33"	C; SBK	FI; SS; SP					
		33-44"	CL; WSBK	Fr; SS; SP					
2	KSAT 2 24"	0-7"	Fill Soil	-	-	40+"		-	.15 GPD/ft²
		7-16"	SCL, WSBK	Fr; SS; SP					
		16-35"	C, SBK	FI; SS; SP					
		35-40"	CL; WSBK	Fr; SS; SP;					
3	KSAT 3 21"	0-12"	Fill Soil	-		33+"			.15 GPD/ft²
		12-33+"	C; SBK	FI; SS; SP					
4									

DESCRIPTION	INITIAL SYSTEM	REPAIR SYSTEM
Available Space (.1945)	P.S	P.S.
System Type(s)	Subsurface Drip W/ Pretreatment	Subsurface Drip W/ Pretreatment
Site LTAR	0.15	0.15

OTHER FACTORS (.1946): _____
SITE CLASSIFICATION (.1948): _____

EVALUATED BY: _____Jeff Vaughan_&_Trevor Hackney_____
OTHER(S) PRESENT: _____

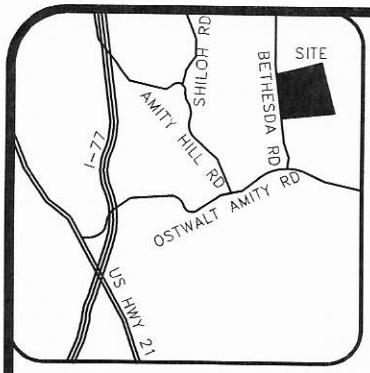
COMMENTS:_____



KSAT Tests Overview



KSAT Test (Front Yard)



VICINITY MAP (NTS)

LEGEND

AC=AIR CONDITIONING UNIT
BOC=BACK OF CURB
DW=CONC DRIVEWAY
EB=ELECTRIC BOX
EOP=EDGE OF PAVEMENT
P=PATIO
PO=PORCH
SCO=CLEANOUT
SW=SIDEWALK
TP=TELEPHONE PEDESTAL
WM=WATER METER

- IRON PIPE FOUND
- IRON PIPE SET
- NAIL SET

THIS SURVEY IS OF AN EXISTING PARCEL OR PARCELS OF LAND AND DOES NOT CREATE A NEW STREET OR CHANGE AN EXISTING STREET.

SHAWN T. RUMBERGER, PLS L-4909 DATE

THIS MAP IS ONLY INTENDED FOR THE PARTIES AND PURPOSES SHOWN. THIS MAP IS NOT FOR RECORDATION. NO TITLE REPORT PROVIDED.

NOTE: LOTS SHOWN HEREON ARE SUBJECT TO ANY AND ALL EASEMENTS, RIGHT OF WAYS, AND RESTRICTIONS OF RECORD.

IMPERVIOUS AREA

HOUSE	2,553 SQ.FT.
DRIVE TO R/W	1,437 SQ.FT.
WALK	107 SQ.FT.
DECK	140 SQ.FT.
TOTAL	4,237 SQ.FT.

SETBACKS

FRONT	35'
SIDE	15'
REAR	35'
SIDE STREET	25'

NOTE: ALL LOTS SUBJECT TO A 10' UTILITY & DRAINAGE EASEMENT. 10' ON EACH SIDE OF ALL PROPERTY LINES.

Additional Comments:

We can go to a 0.125 LTAR for an anerobic drip septic system (Initial and Repair).

Trench depth needs to be 14" down due to the ammount of "fill soil" on the property

We can either run KSAT's or entertain a flow reduction to make this work with the line length we have.

50' BUFFER; 25' EACH SIDE REAR PROPERTY LINE PER PLAT BK. 54, PG. 71

50' BUFFER; 50' EACH SIDE REAR PROPERTY LINE PER COUNTY HEALTH DEPARTMENT

50.0

L7 L8 L9 L10

PLAT BOOK PB 53, PG 99

Pit 4

127.3

54

0.62 AC.

264.37'

263.27'

Pit 3

Pit 2

ST & PT or Treatment Pod

53

55

PROPOSED 3320 A

DECK

PROP CONC DRIVE

25.5

25.5

N 02°46'30" W

S 02°46'30" W

5' x 5' Area to blank Through

87.0

Pit 1

Property Line Stakes Shot

Water Meter

100.01'

Iron Pin Shot

Electrical Box

N 86°16'36" W

NORTHLAKE DRIVE

50' PUBLIC R/W

LINE TABLE

LINE	LENGTH	BEARING
L7	20.33	S81°46'20"E
L8	30.00	S63°56'26"W
L9	37.10	S88°48'02"E
L10	23.13	S42°21'45"E

GRAPHIC SCALE

50 0 25

1 inch = 50 ft.

PRELIMINARY PLOT PLAN

PROJECT:	18-005 NORTHLAKES
DRAWN BY:	APS
SCALE:	1"=50'
DATE:	3-10-20

FOR
ADAMS HOMES CHARLOTTE
169 NORTHLAKE DRIVE, STATESVILLE
LOT 54 NORTHLAKE SUBDIVISION
CHAMBERSBURG TWP., IREDELL CO., NC
P.B. 53, PG. 94

ECLS GLOBAL, INC.
U.S. VETERAN-OWNED
19 N MCKINLEY ST
COATS, NC 27521
910.897.3257 ECLSGLOBALINC.COM
910.897.2329 (FAX) CO#C-4175

SOIL/SITE EVALUATION

(Continuation Sheet-Complete all field in full)

DEPARTMENT OF HEALTH AND HUMAN SERVICES
DIVISION OF PUBLIC HEALTH
ENVIRONMENTAL HEALTH SECTION
ON-SITE WATER PROTECTION BRANCH

NOT A PERMIT

LOT 54

PROPERTY ID #: 4761-59-4404
DATE OF EVALUATION: 5-28-2021
COUNTY: IREDELL

PROFILE #	.1940 LANDSCAPE POSITION/ SLOPE %	HORIZON DEPTH (IN.)	SOIL MORPHOLOGY (.1941) STRUCTURE/ TEXTURE	SOIL MORPHOLOGY (.1941) CONSISTENCE/ MINERALOGY	OTHER PROFILE FACTORS .1942 SOIL WETNESS/ COLOR	.1943 SOIL DEPTH	.1956 SAPRO CLASS	.1944 RESTR HORIZ	PROFILE CLASS & LTAR
1	LINEAR SIDE 15%	0-9	fill	MIXED	SAP INC THRU OUT	44"	U TT SL VFI	~~VFI~~ ~~SA~~ BHR 52"	PS -3 ABOVE 44
		9-14	SCL, SBK	FR, SS, SP, SEXP					
		14-36	C, SBK	FR, S, P, SEXP					
		36-44	CL, WABK	FI, SS, SP, SEXP					
		44-52	SAP, RC	VFI, NS, NP, SEXP					
2	LINEAR SIDE 12%	0-10	FILL.	MIXED	FEW SAP INC FEW Y/B MOTS 30"+	48"+	NA	NA	PS .25
		10-42	C, SBK	FR, S, P, SEXP					
		42-48	CL, WABK	FI, SS, SP, SEXP					
4	LINEAR SIDE 15%	0-8	SCL, SBK	FR, SS, SP, SEXP	FEW SAP INC	48"+	NA	NA	PS .3
		8-36	CL, SBK	FR, S, P, SEXP					
		36-48	CL, WABK	FI, SS, SP, SEXP					
5	LINEAR SIDE 15%	0-13	FILL	MIXED	FEW SAP INC THRU	50"+	NA	NA	PS .3
		13-20	SCL, SBK	FR, SS, SP, SEXP					
		20-35	C, SBK	FR, S, P, SEXP					
		35-50	CL, W	FI, SS, SP, SEXP					

COMMENTS:

RECEIVED JAN 2 0 2021

Paid $500.00

IREDELL COUNTY DEPARTMENT of ENVIRONMENTAL HEALTH

APPLICATION FORM

Comprehensive Relayout

#241752

Application For: ( ) New Well Permit ( ) Well Repair Permit ( ) Well Abandonment
( ) Septic Improvement Permit (X) Authorization to Construct ( ) Existing System Inspection ( ) Septic System Repair

THE ABOVE PERMIT DOCUMENTS WILL BECOME INVALID IF INFORMATION PROVIDED ON THIS APPLICATION IS FALSIFIED OR CHANGED, OR IF THE SITE IS ALTERED. THE IMPROVEMENT PERMIT IS VALID FOR EITHER 60 MONTHS OR WITHOUT EXPIRATION DEPENDING UPON DOCUMENTATION SUBMITTED. APPLICATION WITH SITE PLAN 60 MONTHS, APPLICATION WITH COMPLETE, SCALED PLAT WITHOUT EXPIRATION. SEE 15A NCAC 18A .1937(f) FOR DETAILS.

Page 2: *Site Plan Worksheet* form MUST accompany this application

The following optional attachments may also be submitted: ( ) Survey Plat, scaled no more than 1 inch = 60 feet
Place an (X) beside whichever is submitted if applicable ( ) Custom Site Plan, scaled no more than 1 inch = 60 feet

Applicant Information: (PRINT CLEARLY)

Applicant Name: Cynthia Bladning **Address:** 3401 Saint Vardell Lane, Suite B, Charlotte, NC **Zip:** 28217

Applicant Email: submit@maipermits.com **Phone:** (704) 621-4664 **Alt. Phone:** (704) 884-1548

Owner Name: Adams Homes AEC, LLC **Address:** 3401 Saint Vardell Lane, Suite B, Charlotte, NC **Zip:** 28217

Owner Email: charlottewarranty@adamshomes.com **Phone:** (704) 558-4527 **Alt. Phone:**

Property Information:

Street Address: 169 Northlake Drive, Statesville, NC 28677

Subdivision Name: Northlakes **Section/Phase:** **Lot Number:** 54

Driving Directions: I-77 North, exit 42, right onto NC-115 / US-21 toward Troutman , Turn left onto US-21 N / NC-115 N, Turn right onto Ostwalt Amity Rd, Turn left onto Bethesda Rd, Turn right onto Northlake Dr

Site Development Information: *(check or complete ALL that apply*

(X) New Single Family Residence
( ) New Multi-Family Residence
( ) Accessory Building
( ) Bedroom(s) Addition
( ) Repair to failing septic system ___ Tank ___ Drain lines Describe Problem:

Maximum Number of Bedrooms: 3
Maximum Number of Occupants:
( ) Swimming Pool
( ) Other Addition/Structure:

CHECK FOUNDATION TYPE

(X) Crawl Space Foundation
( ) Concrete Slab Foundation
( ) Basement with Plumbing
( ) Basement without Plumbing

Non-Residential Site Development: **Type of Business:**
Square Footage of Building: **Max. Number of Employees:** **Max. Number of Seats/Beds/Other:**

Water Supply: ( ) Replacement Well – Reason:
( ) Multi-connection Well **Number of Houses:** **Number of Persons:**

( ) New Well ( ) Existing Well ( ) Community Well ( ) City Water ( ) Other Public Water

Desired Septic System Type: *(you may rank in order of preference)* **Year existing system installed:**
(X) No Preference ( ) Alternative ( ) Conventional ( ) Innovative ( ) Modified Conventional ( ) Other:

Please answer the following to the best of your ability:

( ) Yes (X) No **Does the site contain any jurisdictional wetlands?**
( ) Yes (X) No **Is any non-domestic sewage (i.e. industrial) to be generated?**
( ) Yes (X) No **Is the site subject to approval by any other public agency?**

I have read this application and certify that the information provided herein is true, complete, and correct. Authorized county and state officials are granted right of entry to conduct necessary inspections to determine compliance with applicable laws and rules. I understand that I am solely responsible for the proper identification and labeling of all property lines and corners and making the site accessible so that a complete site evaluation can be performed.

Signature: Cynthia Bladning
Property owner or owner's legal representative signature (SIGNATURE REQUIRED)

January 20, 2021
DATE

Jenkins – 910-777-8531 Northlake Drive lots

Ryan Kinard – 704-813-7535 Wylie Trial lots

Northlake Lot: **54**

IREDELL COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH

DOCUMENTATION TO AUTHORIZE AN OWNER'S LEGAL REPRESENTATIVE

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.

I, Adams Homes NC, LLC, am the legal owner(s) of the property located at 169 Northlake Drive, Statesville, NC 28677, identified as PIN (Parcel Identification Number) 4761-594-404, located in Iredell County, North Carolina.

I do hereby authorize **(print legal representative/company name)** Cynthia Blanding, MAJ Permits 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.

(X) MANAGER 7/19/2016
Signature of Owner(s) Date

(X) 7.19.16
Signature of Witness Date

Please return this signed form to the appropriate office:

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

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

169 Northlake Drive, Statesville, NC 28677 Lot 54

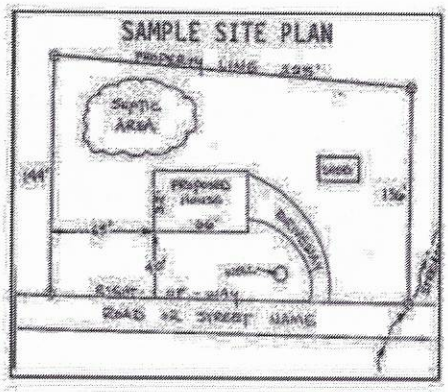
IREDELL COUNTY DEPARTMENT of ENVIRONMENTAL HEALTH

SITE PLAN WORKSHEET

SEE THE "SAMPLE SITE PLAN" BELOW. *INCOMPLETE SITE PLANS WILL BE RETURNED TO YOU FOR COMPLETION AND MAY RESULT IN A DELAY IN THE ISSUANCE OF YOUR SEPTIC SYSTEM OR WELL PERMIT!!!*

Place an (X) beside each item as you complete the site plan:

(X) Property Line measurements are clearly identified
(X) All proposed structures are indicated
(X) Front and side setbacks from property line
(X) Preferred driveway location
(X) Preferred well location
(X) Preferred septic system location
(X) North arrow, or other sufficient indicator of direction



Circle N/A on the following if appropriate:

Location of septic systems and wells within 100' of your property	N/A
Location of easements and rights of ways on your property	N/A
Location of any designated wetlands on the property	N/A

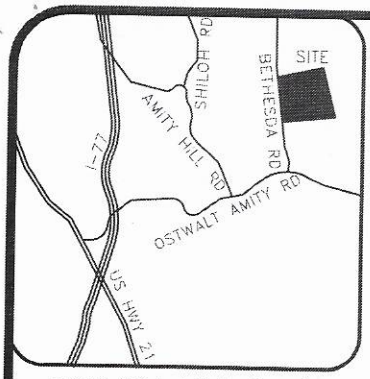
USE THIS SPACE TO DRAW YOUR SITE PLAN

Show: proposed house or business footprint, wells, water lines, patios, pools and decks, and any other item that will occupy space on the site

Please see attached

Signature: Cynthia Blanding
Property owner or owner's legal representative signature (SIGNATURE REQUIRED)

January 20, 2021
DATE



VICINITY MAP (NTS)

LEGEND

AC=AIR CONDITIONING UNIT
BOC=BACK OF CURB
DW=CONC DRIVEWAY
EB=ELECTRIC BOX
EOP=EDGE OF PAVEMENT
P=PATIO
PO=PORCH
SCO=CLEANOUT
SW=SIDEWALK
TP=TELEPHONE PEDESTAL
WM=WATER METER
IRON PIPE FOUND
IRON PIPE SET
NAIL SET

THIS SURVEY IS OF AN EXISTING PARCEL OR PARCELS OF LAND AND DOES NOT CREATE A NEW STREET OR CHANGE AN EXISTING STREET.

SHAWN T. RUMBERGER, PLS L-4909 DATE

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NOTE: LOTS SHOWN HEREON ARE SUBJECT TO ANY AND ALL EASEMENTS, RIGHT OF WAYS, AND RESTRICTIONS OF RECORD.

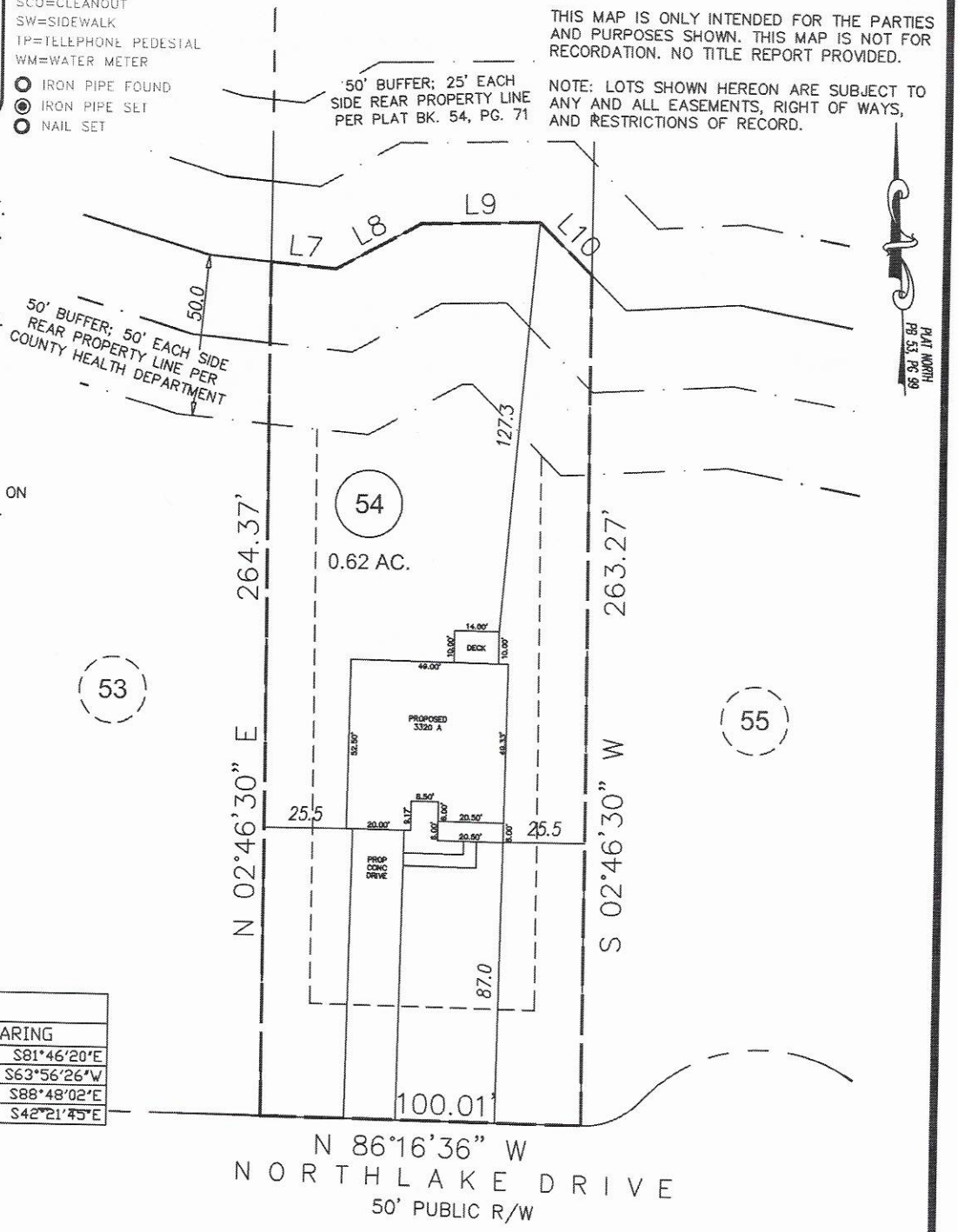
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DRIVE TO R/W	1,437 SQ.FT.
WALK	107 SQ.FT.
DECK	140 SQ.FT.
TOTAL	4,237 SQ.FT.

SETBACKS

FRONT	35'
SIDE	15'
REAR	35'
SIDE STREET	25'

NOTE: ALL LOTS SUBJECT TO A 10' UTILITY & DRAINAGE EASEMENT. 10' ON EACH SIDE OF ALL PROPERTY LINES.



LINE TABLE		
LINE	LENGTH	BEARING
L7	20.33	S81°46'20"E
L8	30.00	S63°56'26"W
L9	37.10	S88°48'02"E
L10	23.13	S42°21'45"E

GRAPHIC SCALE

50 0 25

1 inch = 50 ft.

PRELIMINARY PLOT PLAN

PROJECT:	18-005 NORTHLAKES
DRAWN BY:	APS
SCALE:	1"=50'
DATE:	3-10-20

FOR
ADAMS HOMES CHARLOTTE
169 NORTHLAKE DRIVE, STATESVILLE
LOT 54 NORTHLAKE SUBDIVISION
CHAMBERSBURG TWP., IREDELL CO., NC
P.B. 53, PG. 94

ECLS GLOBAL, INC.
U.S. VETERAN-OWNED
19 N MCKINLEY ST
COATS, NC 27521
910.897.3257 ECLSGLOBALINC.COM
910.897.2329 (FAX) CO#C-4175

ICHD - ENVIRONMENTAL HEALTH DIVISION

Statesville Office (704) 878-5305 Mooresville Office (704) 660-3825 (DP)

PERMIT # 241752

SEPTIC: IMPROVEMENT PERMIT / AUTHORIZATION TO CONSTRUCT / OPERATION PERMIT / EXISTING SYSTEM

PIN # 4761594404

APPLICANT/OWNER: ADAM HOMES AEC LLC

APPLICANT ADDRESS: 3401 SAINT VARDELL LANE, SUITE B, CHARLOTTE, N.C. 28217

SITE ADDRESS: 169 NORTHLAKE DRIVE, STATESVILLE, N.C. 28677

PHONE: 704-361-5437 ALT. PHONE 910-777-8531

SITE DIRECTIONS: (F) ON 70, (R) ON BETHESDA, (L) ON NORTHLAKE DRIVE, LOT ON (L)

SUBDIVISION: NORTHLAKE

SECTION: 1 LOT# 54 LOT AREA: 0.62 AC

SAP CONTROLLED: [X] YES [ ] NO

DESIGN FLOW: 360 GPD L.T.A.R.: 0.275 (0.125 REPAIR)

Septic Tank	1000 (gal)	STB		Date			
Pump Tank	— (gal)	PT	—	Date	—		
Pump Make	—	Model	—	Serial #	—		
# Nitrification Fields	1	# Lines	5	Linear Ft	225 FT		
Trench Width	36 IN	Trench Bottom Depth(Low side)	21 IN	Gravel Depth	—		

[X] New System [ ] Repair [ ] Expansion System Type: I II (III) IV V VI

System Description: 50% REDUCTION -- PPBPS GRAVITY

Repair System Description: DRIP

Maintenance Agreement Required: [ ] YES [X] NO

[X] GRAVITY [ ] PRESSURE

[X] Residence No. Bedrooms 3

[ ] Business No. Persons 6

[ ] Other No. Employees —

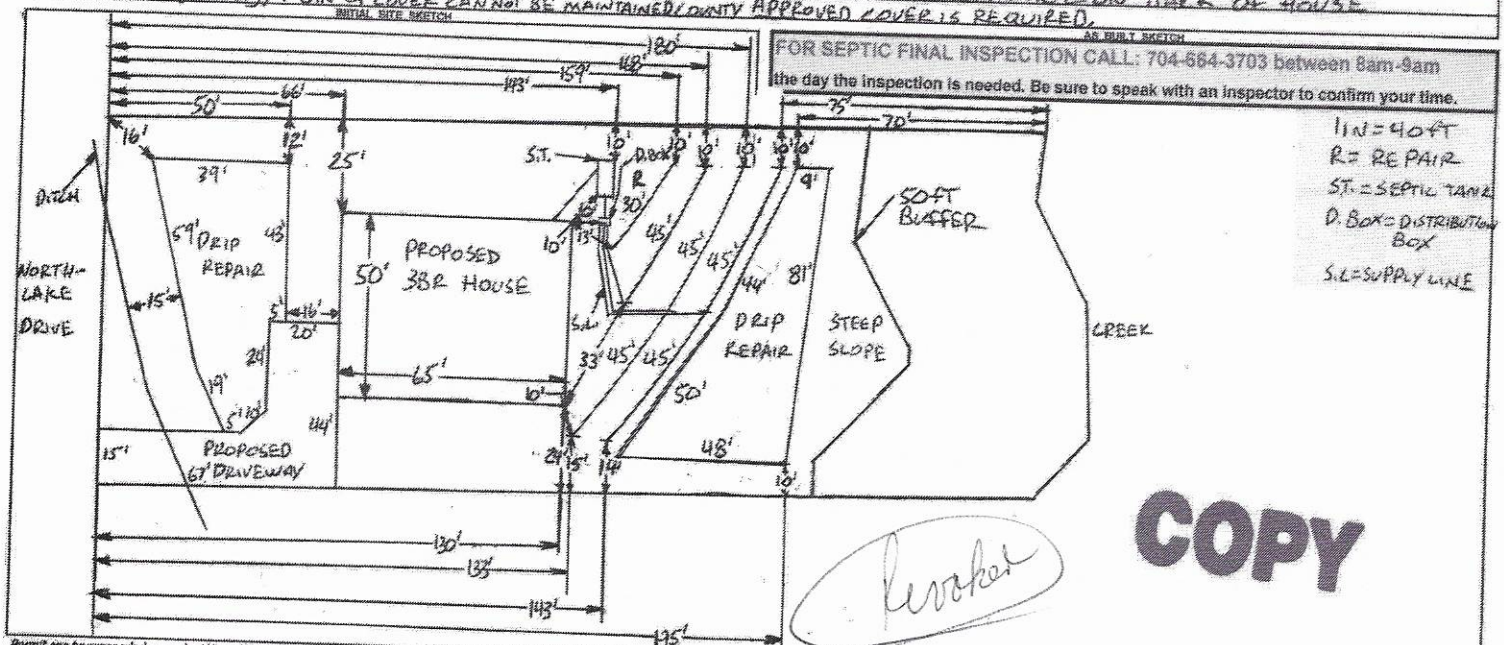
[ ] Slab [X] Crawl Space

[ ] Basement w/plumbing [ ] Basement w/o plumbing

Water Supply: [ ] Private [X] Public [ ] Community

Comments / Conditions: INSTALL ON 6FT CENTERS, INSTALL ON CONTOUR, UTILIZE HORIZONTAL PANEL BLOCKS, UTILIZE PARALLEL DISTRIBUTION (D-BOX), IF BIN OF LOVER CAN NOT BE MAINTAINED/OUNTY APPROVED COVER IS REQUIRED. DO NOT EXCEED A 29 IN MAX TRENCH BOTTOM. NO FOUNDATION DRAINAGE ON BACK OF HOUSE

INITIAL SITE SKETCH



1 IN = 40 FT
R = REPAIR
ST. = SEPTIC TANK
D. BOX = DISTRIBUTION BOX
S.L. = SUPPLY LINE

AS BUILT SKETCH

FOR SEPTIC FINAL INSPECTION CALL: 704-664-3703 between 8am-9am the day the inspection is needed. Be sure to speak with an inspector to confirm your time.

COPY

Revoked

Permit can be suspended or revoked if any false information is supplied toward securing the permit / any unauthorized changes are made to the site / any unauthorized changes are made in the installation of the system. CONTACT A LOCATOR SERVICE PRIOR TO ANY EXCAVATION

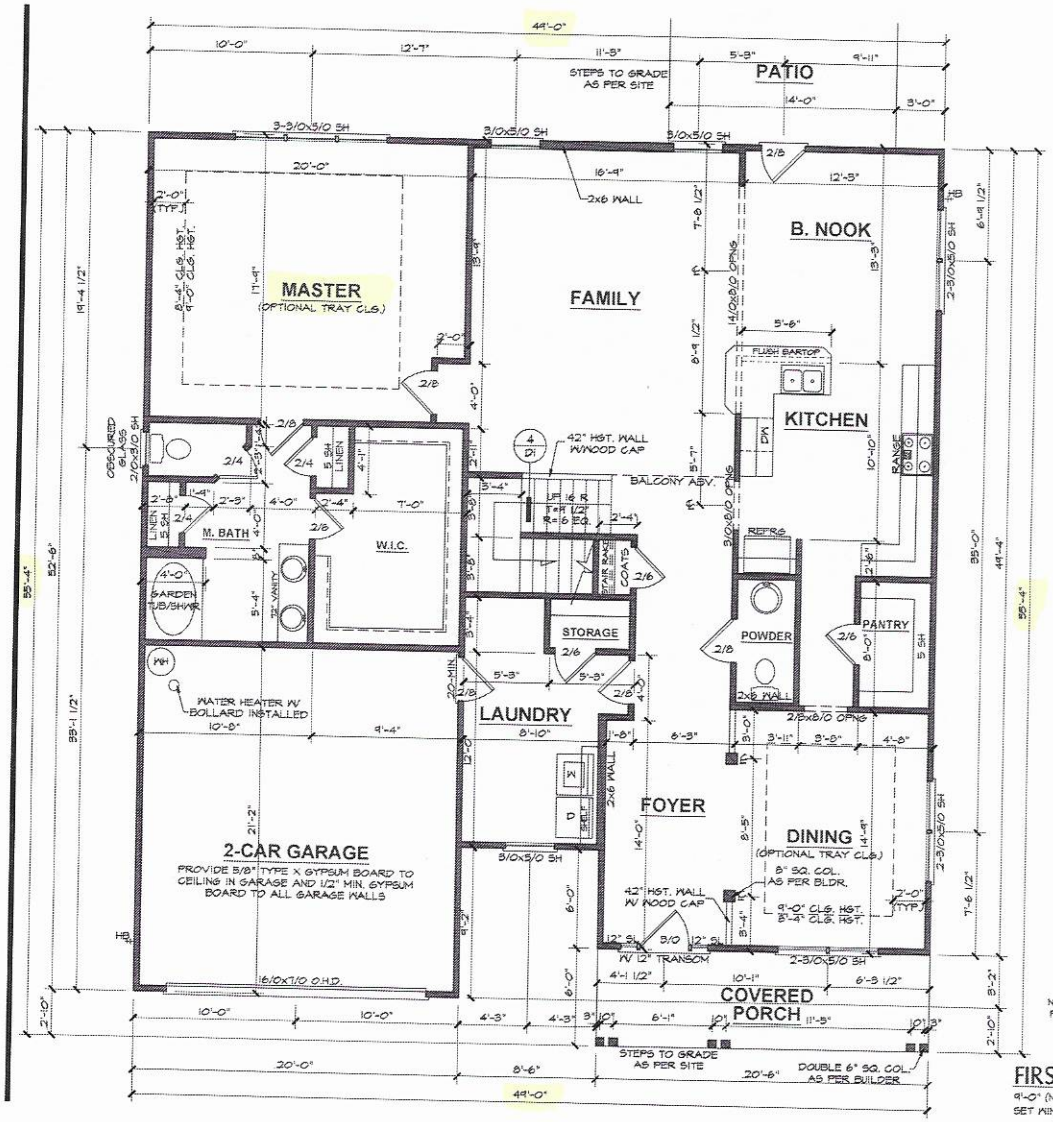
[ ] IMPROVEMENT PERMIT *with plat valid without expiration.* [X] IMPROVEMENT PERMIT *with site plan valid for 60 mos.* [X] AUTHORIZATION TO CONSTRUCT *valid for period equal to IMPROVEMENT PERMIT--not to exceed 60 mo.*

Owner / Applicant Signature: Permit Acceptance Form Rec'd Date: 7-13-20 Installed by:

IMPROVEMENT PERMIT by: Benjamin C. White Date: 7-7-2020 OPERATION PERMIT by: Date:

AUTHORIZATION TO CONSTRUCT by: Benjamin C. White Date: 7-7-2020 Existing System Inspected by: Date:

FOR SEPTIC FINAL INSPECTION: CALL 704-664-3703 between 8am-9am the day the inspection is needed.



NOTE - PROVIDE RAILS AT PORCH ONLY IF REQUIRED BY CODE

FIRST FLOOR PLAN

9'-0" (NOM.) CLG. HGT. U.N.O.
SET WINDOWS @ 7'-0" U.N.O.

SCALE: 1/4"=1'-0"

ADAMS HOMES AEC, LLC

3320 "A" FE (L) NR054

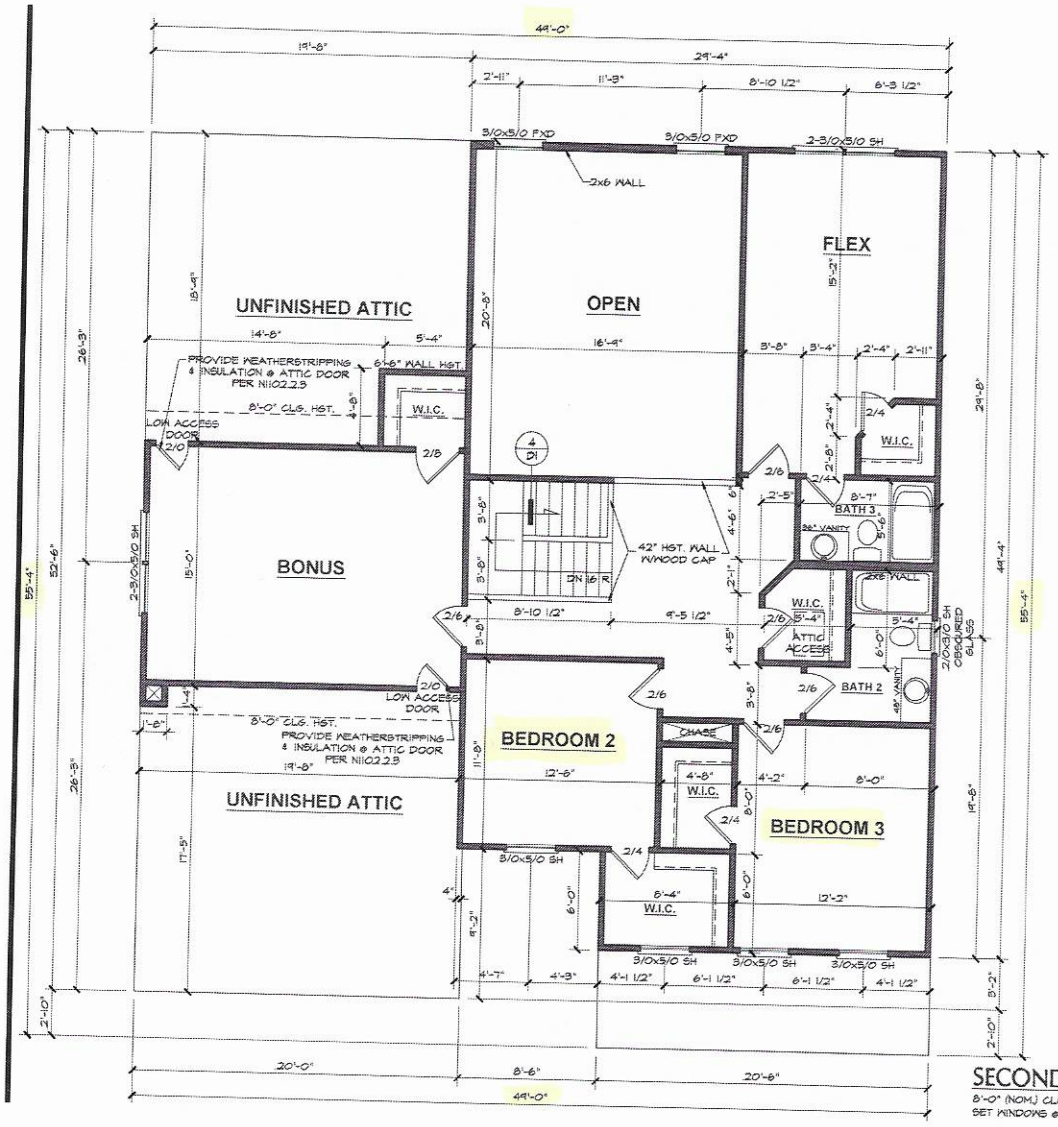
DATE DRAWN
5/5/2020
REVISIONS
4.29.4

SHEET
3

Acknowledgement of Plans Submittal ONLY!

Date 8/29/21

Date 8-25-2021



SECOND FLOOR PLAN

8'-0" (NOM.) CLG. HST. U.N.O.
SET WINDOWS @ 7'-2" U.N.O.

SCALE: 1/4"=1'-0"

ADAMS HOMES AEC, LLC

3320 "A" FE (L) NR054

DATE DRAWN
3/5/2020
REVISIONS
4244

SHEET
4

Acknowledgement of Plans Submittal ONLY!

_____ Date _____

Bryant C. White Date 8-25-2021

IREDELL COUNTY

PO Box 788
349 North Center St.
Statesville, NC 28677

APPLICATION NUMBER
241752
Issue Date: 01/28/2019

ZONING PERMIT

Open Space

Parcel Number	Street Address	Jurisdiction
4761594404.000	169 NORTHLAKE DRIVE, STATESVILLE, NC	IREDELL COUNTY

Owner Information	Applicant Information
Owner: LAKESIDE VISTA PARTNERS LLC	Applicant: CAROLINA SOIL SEPTIC C
Address: 12621 MCGINNIS LANE	Address: 162 WEST B ST
STATESVILLE, NC 28078	KANNAPOLIS, NC 28081
Phone:	Phone: 704-202-5791

Use Requested	Zone Code
SFD REPLACING PERMIT 155706	RA

Lot Acreage	F Setback	B Setback	L Setback	R Setback	Watershed	Flood Zone
.620	35.00	35.00	15.00	15.00	NOT	X

Remarks:

The applicant certifies that there are no deed restrictions, contractual agreements or governmental regulations of any kind that interfere with or prohibit the use of the property or the use for which this permit is requested. The applicant further acknowledges that enforcement of deed restrictions, plat conditions and other contractual agreements will not be undertaken by Iredell County and is the sole responsibility of the affected parties.

Applicant: _____ Date: _____

Permit Number	165697	TOTAL FEES:	$ 77.25