ICHD–ENVIRONMENTAL HEALTH DIVISION

Statesville Office (704) 878-5305 (Mooresville Office (704) 660-3625) PERMIT # AP300699

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

PIN # 4628502907

APPLICANT/OWNER: Evan Morgan APPLICANT ADDRESS: 324 Blackwell St, Suite 1200 Durham NC 27701

SITE ADDRESS: 168 High Hills Dr Mooresville NC 28117 PHONE: 919-4170509 ALT. PHONE 919-732-1300

SITE DIRECTIONS: NC 150 W to Left on High Hills Dr., septic lot will be immediately on right, House Lot at end SAP CONTROLLED: ☐ YES ☒ NO

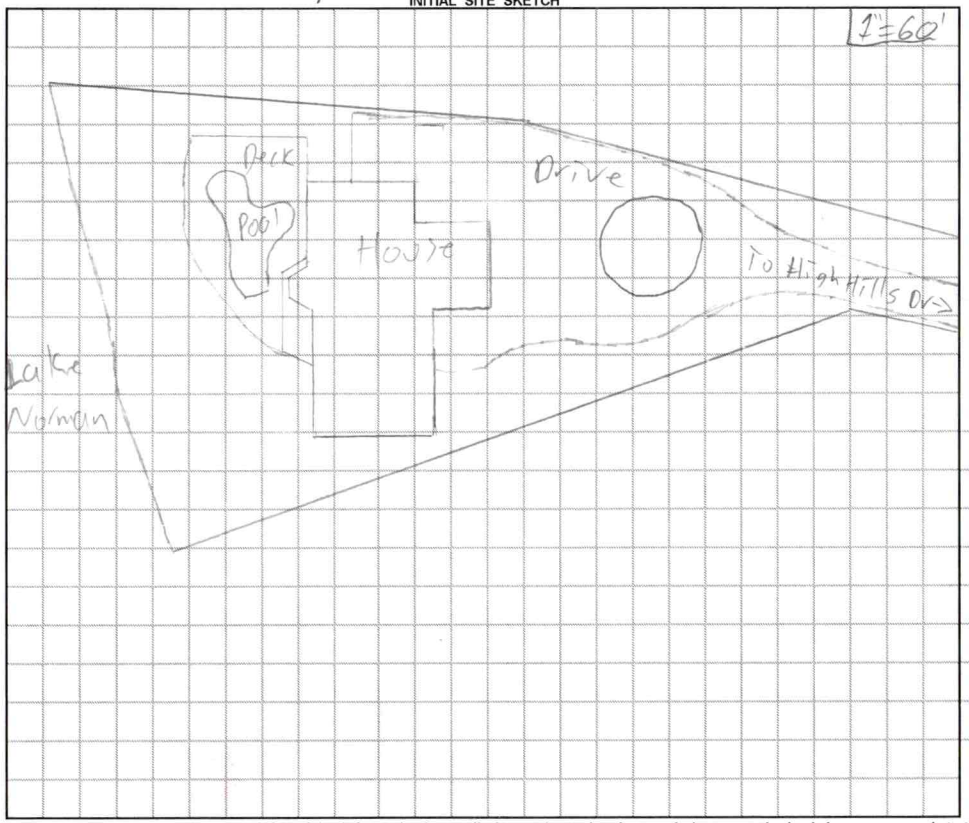
SUBDIVISION: Pinnacle shores SECTION: PH1 LOT # 28128A LOT AREA: Lot 28 0.59 / 28A pt 0.588 DESIGN FLOW: 600GPD L.T.A.R.: .3

Septic Tank	1500	(gal)	STB		Date		☐ New System	☐ Repair	☐ Expansion	System Type: I II III IV V VI	
Pump Tank	1500	(gal)	PT		Date		System Description:	LPPPBPS			
Pump Make			Model		Serial #		Repair System Description:	TS2 pretreated Drip			
# Nitrification Fields	1	# Lines	4		Linear Ft	334	Maintenance Agreement Required:	☒ YES	☐ NO		
Trench Width	36"	Trench Bottom Depth(Low side)			Gravel Depth	—		☐ GRAVITY	☒ PRESSURE		

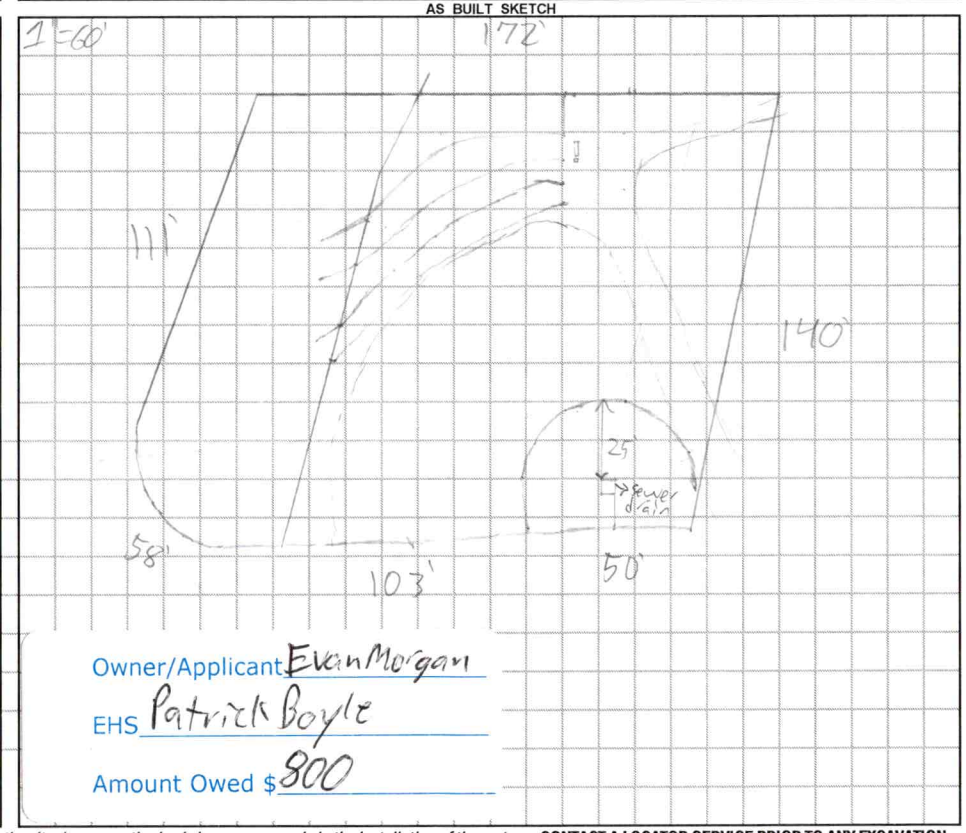
☒ Residence	No. Bedrooms	5	Water Supply
☐ Business	No. Persons	10	☐ Private
☐ Other	No. Employees		☒ Public
☐ Slab	☐ Crawl Space		☐ Community
☒ Basement w/plumbing		☐ Basement w/o plumbing	

Comments / Conditions: Install Lines on contour. Ends of septic Lines must be properly abandoned. All Easments and R/W's must be clearly marked during time of inspection.

INITIAL SITE SKETCH



AS BUILT SKETCH



Owner/Applicant Evan Morgan

EHS Patrick Boyle

Amount Owed $ 800

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.* ☐ **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: _____ Date: _____ Installed by: _____

IMPROVEMENT PERMIT by: _____ Date: _____ OPERATION PERMIT by: _____ Date: _____

AUTHORIZATION TO CONSTRUCT by: _____ Date: _____ Existing System Inspected by: _____ Date: _____

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

Withdrawn

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

Sheet 1 of 1
PROPERTY ID #: 4625502
COUNTY: Durham

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

OWNER: Evan Morgan
ADDRESS: 324 Blackwell St, Suite 1200, Durham NC 27701
PROPOSED FACILITY: Newsom's Organ
LOCATION OF SITE: 168 High Hills Dr Mooresville NC 28117
APPLICATION DATE: 9-6-19
DATE EVALUATED: 10-9-19
PROPOSED DESIGN FLOW (.1949): 600GPD
PROPERTY SIZE: 0.558
PROPERTY RECORDED: yes

WATER SUPPLY: ☐ Private ☐ Public ☐ Well ☐ Spring ☒ Other City
EVALUATION METHOD: ☐ Auger Boring ☒ Pit ☐ Cut
TYPE OF WASTEWATER: ☒ Sewage ☐ Industrial Process ☐ Mixed

PROFILE #	.1940 LANDSCAPE POSITION/ SLOPE %	HORIZON DEPTH (IN.)	SOIL MORPHOLOGY (.1941) .1941 STRUCTURE/ TEXTURE	SOIL MORPHOLOGY (.1941) .1941 CONSISTENCE/ MINERALOGY	OTHER PROFILE FACTORS .1942 SOIL WETNESS/ COLOR	.1943 SOIL DEPTH	.1956 SAPRO CLASS	.1944 RESTR HORIZ	PROFILE CLASS & LTAR
1	SS 9%	0-11	F, I	—	Mottles starting at 24" Gley at 24"	60"	Litho inclusions	Chroma 1 sand gley at 24"	PS .1d,i,f Repair
		11-31	C SBK/ABK	Fr SS SP					
		31-60	Chroma 2	Fr SS SP					
2	SS 13%	0-13	F, I	—	Chroma 2's at 29" Mottles starting	60"	Litho inclusions	Chroma 2's at 29"	PS .1d,f,? Repair
		13-30	C SBK/ABK	Fr SS SP SO					
		30-60	CC SBK/ABK	Fr SS SP SO					
3	SS 13%	0-10	F, I	—	Mottles increasing	45"	Litho inclusions increasing at 45"	Rock/saprolite between 12" to 28"	PS,2 due to depth and color Repair
		10-32	C SBK/ABK	Fr SS SP SO					
		32-45	C SBK/ABK	Fr SS SP SO					
		45-60	Chroma 2 sap mass	Fr					
4	SS 11%	0-23	F, I	—	—	72"	Litho inclusions Starting at 72"	Fill needs to be removed	PS,3 after fill removed Initial.
		23-32	C SBK	Fr SS SP SO					
		32-72	C LS BK	Fr SS SP SO					

DESCRIPTION	INITIAL SYSTEM	REPAIR SYSTEM
Available Space (.1945)	334'	4800 sf
System Type(s)	50% Red	Drip
Site LTAR	.3	.1

OTHER FACTORS (.1946):
SITE CLASSIFICATION (.1948):
EVALUATED BY: Patrick B
OTHER(S) PRESENT: Heather Whitesides

COMMENTS: rn

Soil Evaluation Form

Three Oaks Engineering
324 Blackwell Street, Suite 1200
Durham, NC 27701
919.732.1300

Sheet 1 of 1
Job: 18-7011 R-2307B Parcel 17
County: Iredell
Date: 5-25-14

Soil Borings

	B1	B2								
Landscape Position	L	L								
Slope (%)	5	5								
Horizon 1 Depth	24	12								
Texture	SCL	SCL								
Consistence	FI	FR								
Structure	SBK	SBK								
Clay Mineralogy	SE	SE								
Horizon 2 Depth	45	48								
Texture	C	C								
Consistence	FI	FI								
Structure	SBK	SBK								
Clay Mineralogy	SE	SE								
Horizon 3 Depth										
Texture										
Consistence										
Structure										
Clay Mineralogy										
Horizon 4 Depth										
Texture										
Consistence										
Structure										
Clay Mineralogy										
Horizon 5 Depth										
Texture										
Consistence										
Structure										
Clay Mineralogy										
Soil Wetness										
Restrictive Horizon										
Saprolite										
Other										
CLASSIFICATION	PS	PS								
LTAR (gpd/ft^2)	0.3	0.3								

Comments:

Evaluated by : ETM

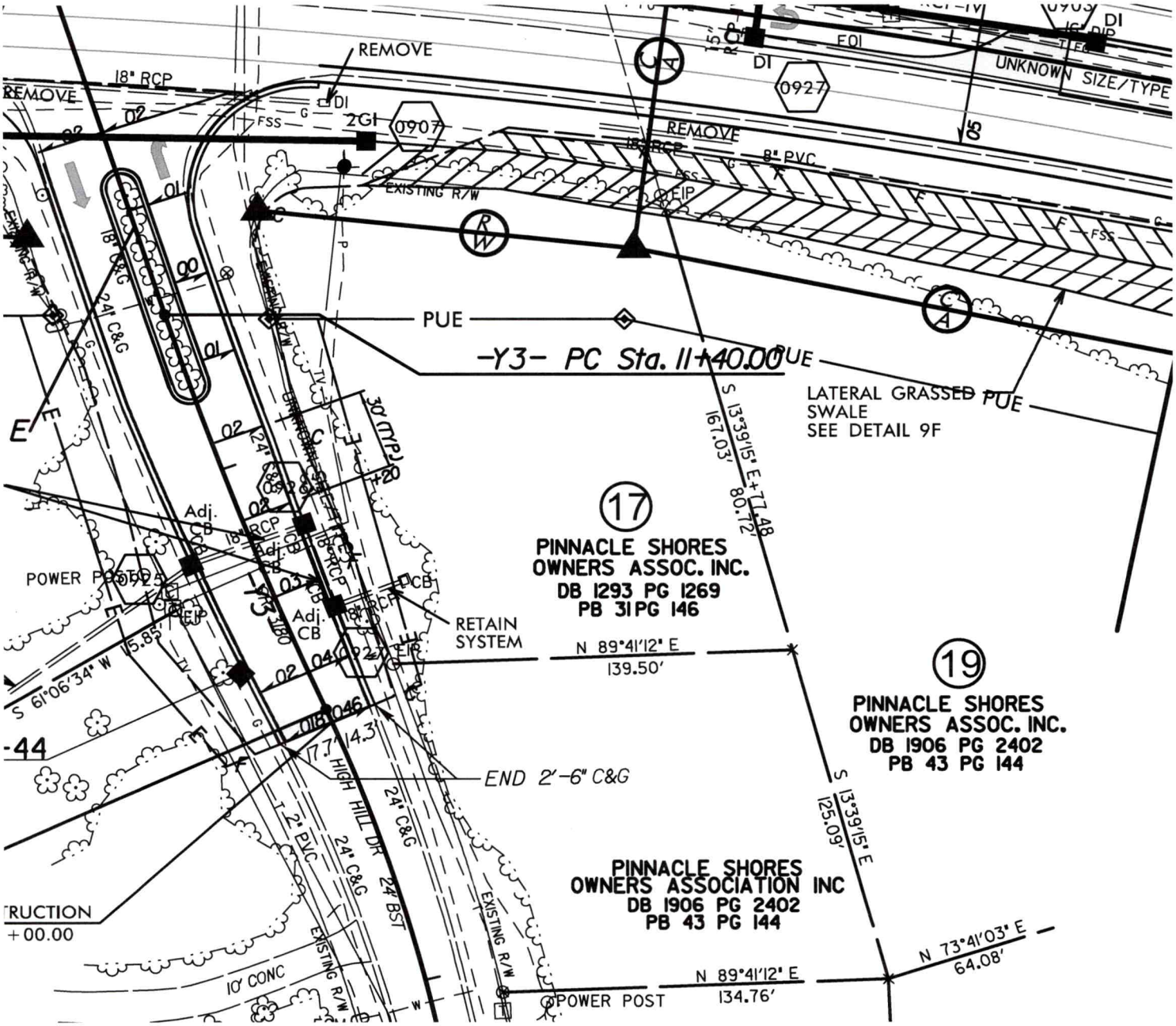
SOIL EVALUATION FORM

Three Oaks Engineering
324 Blackwell Street, Suite 1200
Durham, NC 27701
919.732.1300

Job: High Hills Drive
County: Iredell
Date: 1-23-2020
Sheet: 1 of 1

	Profile #	Horizon	Horizon Depth (in)	Structure / Texture	Consistence / Mineralogy	Matrix Color	Mottle Colors (Quantity, Size, Contrast, Color)
K1	P1	10	A	1mSBK/SCL	FI/SS,SP	7.5YR5/4	
		32	Bt	2mSBK/C	FI/SS,SP	7.5YR5/8	f,1,D 10YR 6/6
K2 Below	P2	8	A	1mSBK/SCL	FI/SS,SP	7.5YR4/4	
		32	Bt	2mSBK/C	FI/SS,SP	7.5YR6/6	f,1,F 10YR 6/6; f,1,D 10YR 5/8
K3 Above	P2	6	A	1mSBK/SCL	FI/SS,SP	7.5YR5/4	
		32	Bt	2mSBK/C	FI/SS,SP	7.5YR6/8	f,1,F 10YR 6/6

Evaluated by: ETM


REMOVE
18" RCP
REMOVE
DI
FSS
2GI
0907
0927
DI
FOI
UNKNOWN SIZE/TYPE
REMOVE
18" RCP
8" PVC
EXISTING R/W
PUE
-Y3- PC Sta. 11+40.00
PUE
LATERAL GRASSED SWALE
SEE DETAIL 9F
PUE
18" C&G
24" C&G
30' (TYP.)
Adj. CB
18" RCP
Adj. CB
POWER POST
-Y3-
Adj. CB
RETAIN SYSTEM
S 13°39'15" E 167.03'
+77.48
80.72'
17
PINNACLE SHORES
OWNERS ASSOC. INC.
DB 1293 PG 1269
PB 31 PG 146
N 89°41'12" E
139.50'
19
PINNACLE SHORES
OWNERS ASSOC. INC.
DB 1906 PG 2402
PB 43 PG 144
S 61°06'34" W
15.85'
-44
END 2'-6" C&G
HIGH HILL DR
24' BST
12" PVC
24" C&G
24" C&G
EXISTING R/W
S 13°39'15" E
125.09'
PINNACLE SHORES
OWNERS ASSOCIATION INC
DB 1906 PG 2402
PB 43 PG 144
TRUCTION
+00.00
10' CONC
EXISTING R/W
POWER POST
N 89°41'12" E
134.76'
N 73°41'03" E
64.08'

PHASE 1 SOIL & SEPTIC EVALUATION

TIP R-2307B

Parcel 17
PIN: 4628502907.000
High Hills Drive
Mooresville, NC 28117
Three Oaks Job # 18-7011

Prepared For:

Professional Property Services, Inc.
362 Union Street South
Concord, NC 28025

Prepared By:

324 Blackwell Street, Suite 1200
Durham, NC 27701
(919) 732-1300

July 26, 2019



Evan T. Morgan

INTRODUCTION

Three Oaks Engineering (Three Oaks) was retained by Professional Property Services, Inc. (PPS) to complete a Phase 1 Soil & Septic Evaluation within Parcel 17 located at the intersection of High Hills Drive and NC-150, Mooresville, NC (PIN: 4628401924.000). PPS has stated that the existing septic system may be impacted by the NCDOT R-2307B NC 150 HWY improvement project. The purpose of the evaluation was to determine if the septic system is being impacted and if adequate available space exists to relocate the existing septic system and provide 100% repair area. The property was evaluated in accordance with North Carolina statutes for waste disposal ("Laws and Rules for Sewage Treatment and Disposal Systems", amended December 6, 2018).

Parcel 17 is approximately 0.59-acre and is the offsite septic easement for a four-bedroom house located at 168 High Hills Drive. The parcel is assumed to be permitted for 480 gallons per day (GPD) based on online real estate records. An Improvement Permit was not on file with Iredell County Environmental Health (ICEH). The property is serviced by a pre-fabricated permeable block panel subsurface septic system (PPBPS) and public water.

INVESTIGATION METHODOLOGY

The field survey was conducted on May 28 and June 27, 2019, by Evan T. Morgan, LSS. Soil borings were advanced with a hand-auger and soil color was determined with a Munsell Soil Color Chart. Observations of the landscape (slope, drainage patterns, etc.) as well as soil properties (depth, texture, structure, soil wetness, restrictive horizons, etc.) were recorded. The limits of the easement and ROW were staked. All property lines and corners were not visibly marked on the day of the investigation. Soil augers, tile probes and ground penetrating radar (GPR) were used to attempt to locate septic system components.

RESULTS

The septic tank and pump tank are located on the main property containing the house and were not identified. The septic drainfield and pressure manifold were located along the eastern edge of the offsite easement and the drainfield is comprised of four approximately 95-ft PPBPS drainlines. Approximately 40-ft of total drainline extends into the proposed highway improvements.

Soil borings were advanced below the existing system. Borings were rated as Provisionally Suitable for PPBPS Systems. The soil borings typically exhibited a friable or firm, sandy loam texture that ranged in depth from 12 to 24 inches, overlying a firm, clay textured subsurface that ranged in depth from 45 to 48 inches. A long-term acceptance rate of 0.3 GPD/sq-ft is recommended for these borings. An unsuitable concave landscape was observed directly below the installed system.

CONCLUSIONS

Approximately 40-ft of the existing PPBPS septic drainlines are impacted by the proposed highway improvements. It is Three Oaks' opinion based on our Phase 1 Soil and Septic Evaluation that the following options exist for Parcel 017:

OPTION 1. Remove or relocate the highway improvments altogether to eliminate the impact to the existing system.

OPTION 2. Connect to public sewer if available.

OPTION 3. Install additional PPBPS septic drainlines equivalent to the impacted portion of the initial system and demonstrate 100% repair area. An area of usable soil was identified below the existing system that appears close in size, outside of the unsuitable concave landscape, to the amount of area needed to support relocation for the impacted initial system and also provide 100% repair area. However, a Phase 2 Soil & Septic Evaluation would be needed to determine if Option 3 is viable. Locating the existing septic permit at ICEH offices would be advantageous to the viability of Option 3; as Option 3 is dependent upon the house being 4-bedrooms and the daily flow being 480 GPD. If enough drainline cannot be demonstrated on Parcel 17, it is possible enough usable area exists on Parcel 19 to support the entire system and repair area for Parcel 19 and a portion of the Parcel 17 drainfield. This would require redrawing property lines or adding an easement to Parcel 19. In addition, a Phase 2 Soil & Septic Evaluation would be required for Parcel 19 and an Agreement between the owners of Parcel 17, Parcel 19, and the Pinnacle Shores Owners Association.

Soils naturally change across a landscape and contain many inclusions. As such, attempts to quantify them are not always precise and exact. Due to this inherent variability of soils and the subjectivity when determining limiting factors, there is no guarantee that a regulating authority will agree with the findings of this report. An Improvement Permit for a subsurface septic system would be issued by ICEH. Any concurrence with the findings of this report would be made by ICEH at the time an Improvement Permit is issued.

SPECIAL SITE EVALUATION

PIN: 4628502907.000
High Hills Drive
Mooresville, NC 28117
Three Oaks Job # 18-7011

Prepared For:

Professional Property Services, Inc.
362 Union Street South
Concord, NC 28025

Prepared By:

324 Blackwell Street, Suite 1200
Durham, NC 27701
(919) 732-1300

February 3, 2020



Evan Morgan

INTRODUCTION & SITE DESCRIPTION

This Special Site Evaluation is being submitted pursuant to Innovative Wastewater System Approval (IWWS)-93-1-R6B for American Perc-Rite Subsurface Drip System, Aerobic. The property was evaluated in accordance with North Carolina statutes for waste disposal ("Laws and Rules for Sewage Treatment and Disposal Systems", amended December 6, 2018).

There is an existing prefabricated permeable block-panel system for a five-bedroom house system with a design daily flow of 600 gallons per day (GPD) that is in the process of being relocated due to NCDOT NC-150 Widening Impacts. The pending permit identified sufficient area to relocate the initial system and 4,800 sq-ft of repair area for a non-treated subsurface drip system. This repair area was assigned a long-term acceptance rate (LTAR) of 0.1 GPD/sq-ft and is large enough only for a 480 GPD system. A special site evaluation is required to justify raising the LTAR above 0.1 GPD/sq-ft pursuant to IWWS-93-1-R6B Section IV(A).

INVESTIGATION METHODOLOGY

The field survey was conducted on January 23, 2020, by Evan T. Morgan, LSS.

The infiltration rate of a soil can be determined by measuring the saturated hydraulic conductivity (K_{SAT}). K_{SAT} measurements were performed with a compact constant-head permeameter (Amoozemeter). Tests were conducted in accordance with the "Recommended Guidance for In-situ Measurements of Saturated Hydraulic Conductivity by the Constant Head Well Permeameter Method and for Reporting Results, August 19, 2014." K_{SAT} test values were generated using the published calculations and formulas found in the corresponding User's Manual. The Glover solution was chosen as the most appropriate method for calculating K_{SAT}. The Glover solution is recommended when the distance between the bottom of the auger hole and any impermeable layer(s) is greater than 2 times the head (H), or constant water level in the hole.

The Glover solution is given by: $K_{SAT} = AQ$

Where: $A= \{\sinh^{-1}(H/r)-[(r/H)^2+1]^{1/2}+r/H\} / (2\pi H^2)$

And: Q is the steady-state rate of water flow from the Amoozemeter into the auger hole.

To solve for A: H is the head in the hole (i.e. total water depth) and r is the radius of the hole. Values for H and r can be found on the attached K_{SAT} data sheets.

FINDINGS

Hydraulic Conductivity Measurements

The IWWS approval requires that K_{SAT} tests be performed to substantiate the LTAR. A total of three K_{SAT} measurements were performed within the usable soil area (Figure 1). Tests were conducted in the most hydraulically limiting, naturally occurring soil horizon within 18 inches of the naturally occurring soil surface or to a depth of 12 inches below the trench

bottom or point of application, whichever is deeper; pursuant to Section III(A) of the IWWS. Soil profiles for each K_{SAT} boring are attached.

Table 1: Hydraulic conductivity tests results and depth of tests

Test #	Soil Boring #	Depth of test (in)	Measured K_{SAT} (GPD/sq-ft)
K1	Pit 1	18	2.81
K2	Below Pit 2	18	3.51
K3	Above Pit 2	18	2.24
		Geometric Mean	**2.81**

Design LTAR Justification

The value of the K_{SAT} must be modified by an appropriate design factor to determine the LTAR. This factor reflects the influence of several parameters including variation of permeability within a soil, slope, soil depth, and treatment levels. Considering the above factors, a design LTAR of 0.125 GPD/sq-ft, representing approximately 4.44% of the geometric mean for measured K_{SAT} tests is proposed for the repair system. As such, a 600 GPD system would require 2,400-ft of subsurface drip tubing, or 4,800 sq-ft of usable soil area.

CONCLUSIONS

The findings presented herein represent Three Oaks' professional opinion based on our Soil and Site Evaluation and knowledge of the current laws and rules governing on-site wastewater systems in North Carolina. A Special Site Evaluation was conducted pursuant to IWWS-93-1-R6B to substantiate and justify the raising the LTAR of a 600 GPD non-treated subsurface drip system. Hydraulic conductivity tests were conducted in the most restrictive soil horizon within 18 inches of the surface resulting in a measured geometric mean of 2.81 GPD/sq-ft. A LTAR of 0.125 GPD/sq-ft, representing approximately 4.44% of the geometric mean, is proposed for the 600 GPD repair area identified at the High Hills Drive site by Iredell County Environmental Health (ICEH).

Soils naturally change across a landscape and contain many inclusions. As such, attempts to quantify them are not always precise and exact. Due to this inherent variability of soils and the subjectivity when determining limiting factors, there is no guarantee that a regulating authority will agree with the findings of this report. An Improvement Permit for a subsurface septic system would be issued by ICEH. Any concurrence with the findings of this report would be made by ICEH at the time an Improvement Permit is issued.

Line totals with no changes
L1=96 L3=108' total 406
L2=96' L4=106'

New Line lengths
L1=99 LP
L2=83'
L3=118
L4=106
total = 406

Option 1 add to 1st and 3rd line
↓ 19' ↓ 19' 18=34

Total once Footage removed from RW
L1=80
L2=83
L3=99
L4=

need another pit and Easements marked
move any part of system in easement to the other side and have drip Repair

600÷37
→ 2000÷37
→ 66.7 x 5
→ 334

any debris or excess soil on top of system must be removed

5 bedrooms at a.3 needs 334 with 50%

4 bedroom will work if the owners to save $ they would have to put it to use

Possibly supply Line

High Hills

Riverbank

173' total Length curves 47' 54'

New Easement

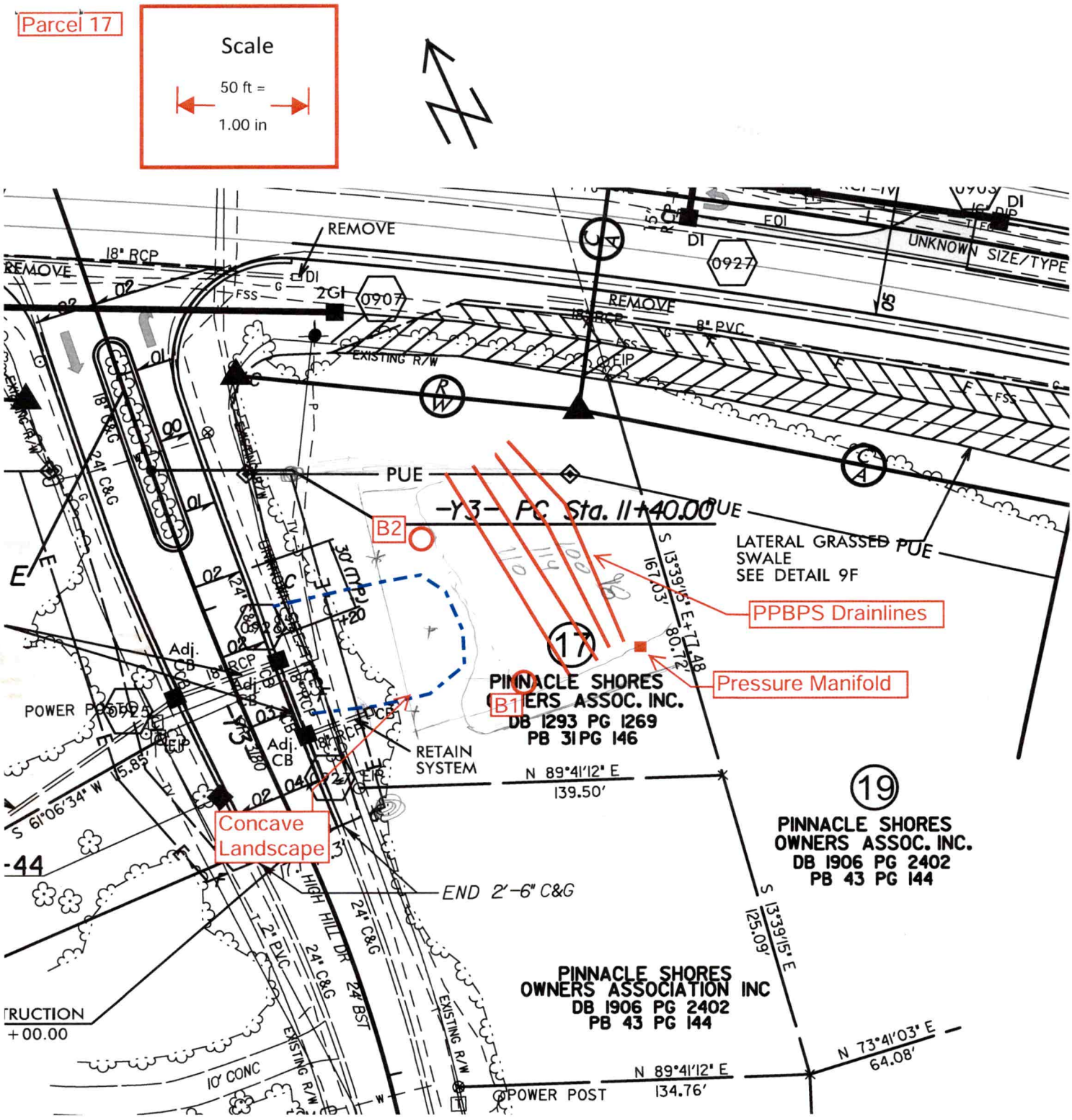
Line metal and mark side

1 2 3

Drip Repair 110' 48'

25' 13' 25'

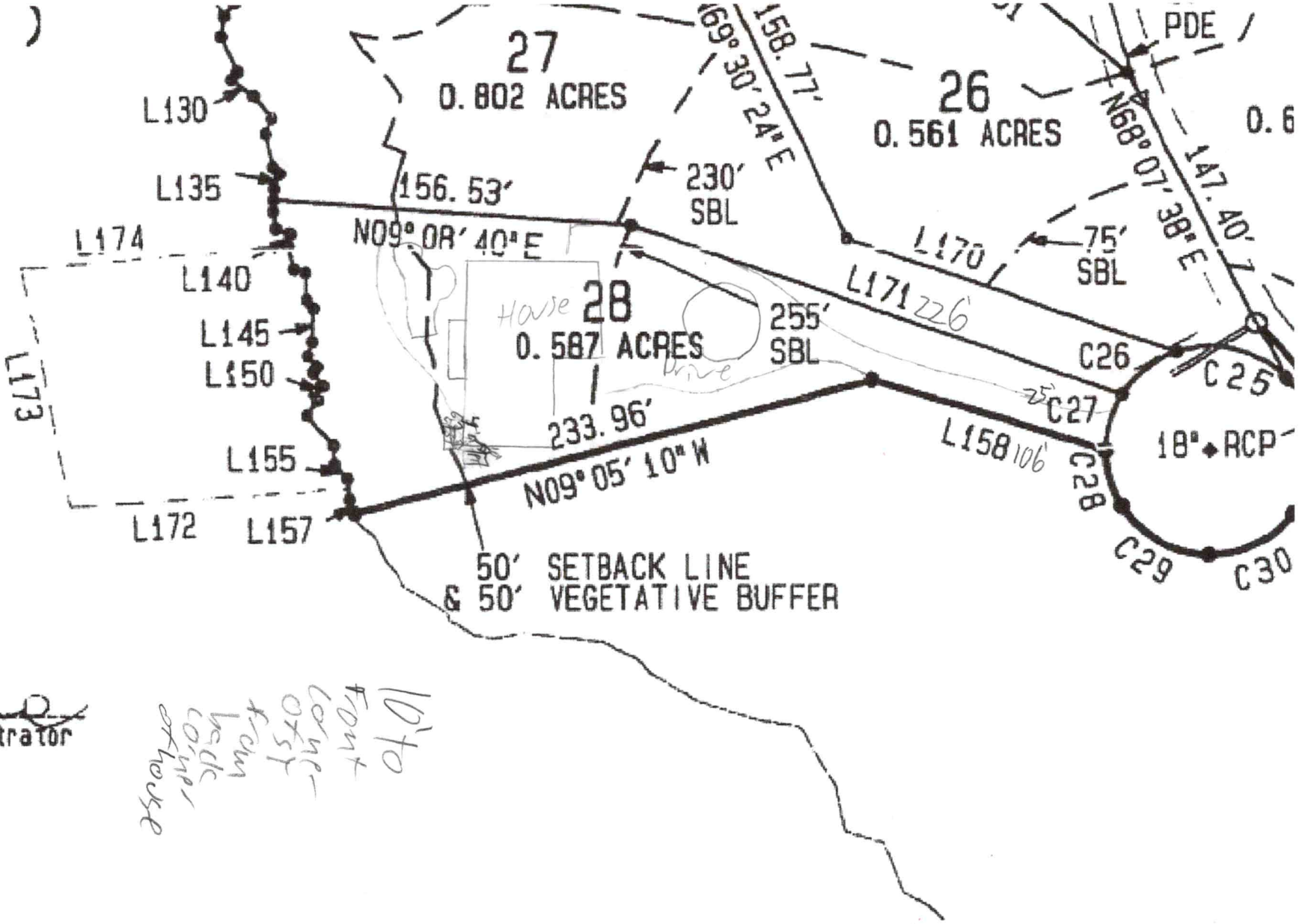
8' Center on Center


Parcel 17
Scale
50 ft =
1.00 in
N
REMOVE
18" RCP
FSS
2GI
0907
EXISTING R/W
8" PVC
FOI
DI
0927
UNKNOWN SIZE/TYPE
PUE
-Y3- PC Sta. 11+40.00
B2
LATERAL GRASSED SWALE
SEE DETAIL 9F
S 13°39'15" E 167.03'
PPBPS Drainlines
80.72'
Pressure Manifold
17
PINNACLE SHORES OWNERS ASSOC. INC.
DB 1293 PG 1269
PB 31 PG 146
B1
RETAIN SYSTEM
N 89°41'12" E
139.50'
19
PINNACLE SHORES OWNERS ASSOC. INC.
DB 1906 PG 2402
PB 43 PG 144
S 13°39'15" E
125.09'
Concave Landscape
END 2'-6" C&G
24" C&G
24" BST
HIGH HILL DR
12" PVC
EXISTING R/W
PINNACLE SHORES OWNERS ASSOCIATION INC
DB 1906 PG 2402
PB 43 PG 144
N 89°41'12" E
134.76'
POWER POST
N 73°41'03" E
64.08'
10' CONC
S 61°06'34" W
15.85'
Adj. CB
POWER POST
+00.00

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plat has
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on Administrator



Lot 10
Front corner 0.57± from back corner of house

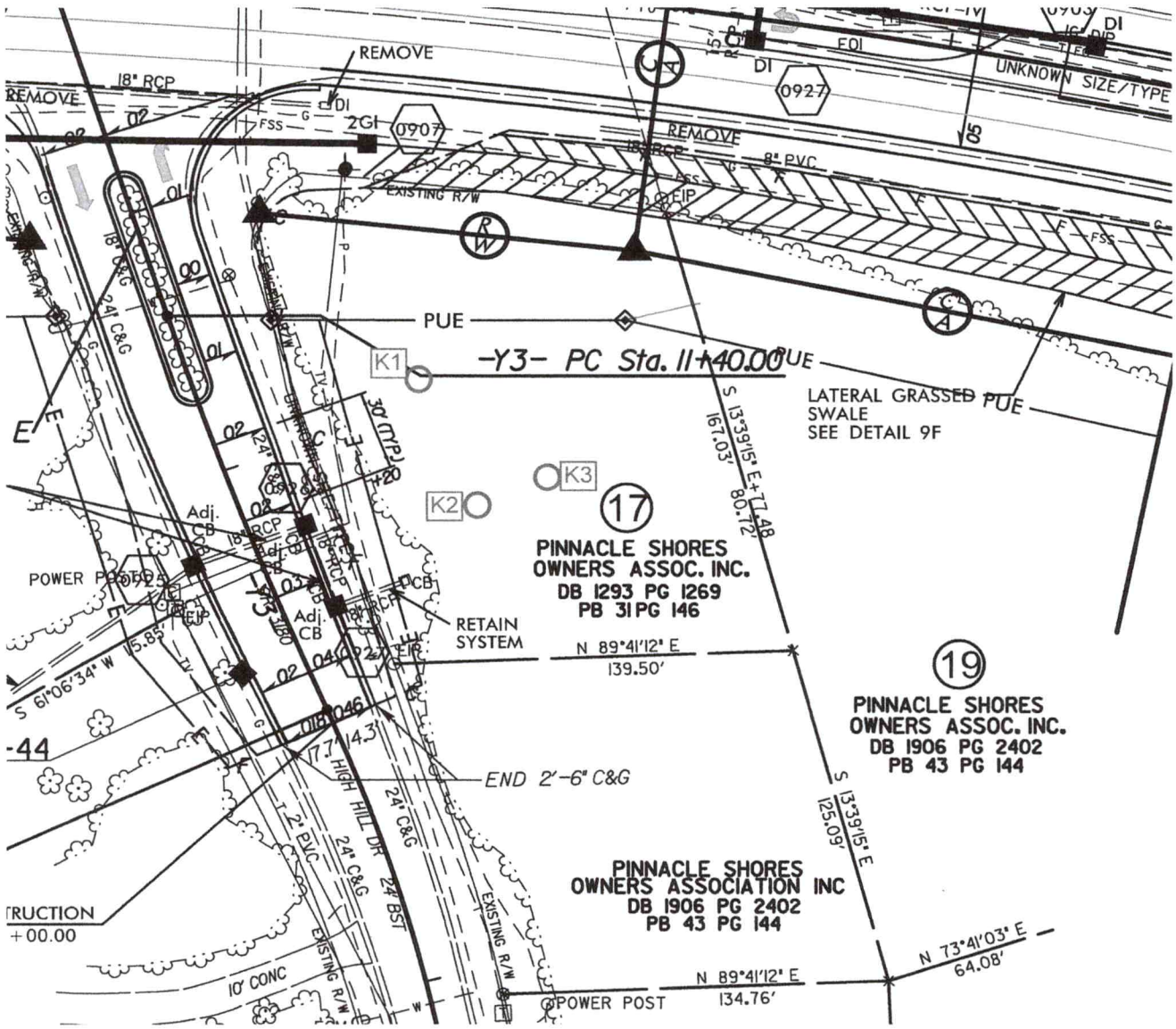
20' PSUE
SETBACK LINE
CCW C5
C37
IC RIGHT OF WAY)
L293
L162
L161
L294
18" RCP
C40
C4
154.78'
C3
10 X 70
ST
C41
C38
C42
N89° 41' 13"E
139.74'
N13° 39' 15"W
172.33'
2BA
0.588 ACRES
SEWER EASEMENT
SEWER EASEMENT
SUBDIVIDED OUT OF LOT 16
COMMON OPEN SPACE
N89° 46' 17"E COMBINED FACTOR = 0.9
756.39' HORIZONTAL GROUND DIS
JBLIC RIGHT OF WAY)
PINE LANE
(60' R/W)
25' FUTURE
RIGHT OF WAY
IURCES, INC.
ELOPMENT

Scale

50 ft =

1.00 in

High Hills Drive Figure 1



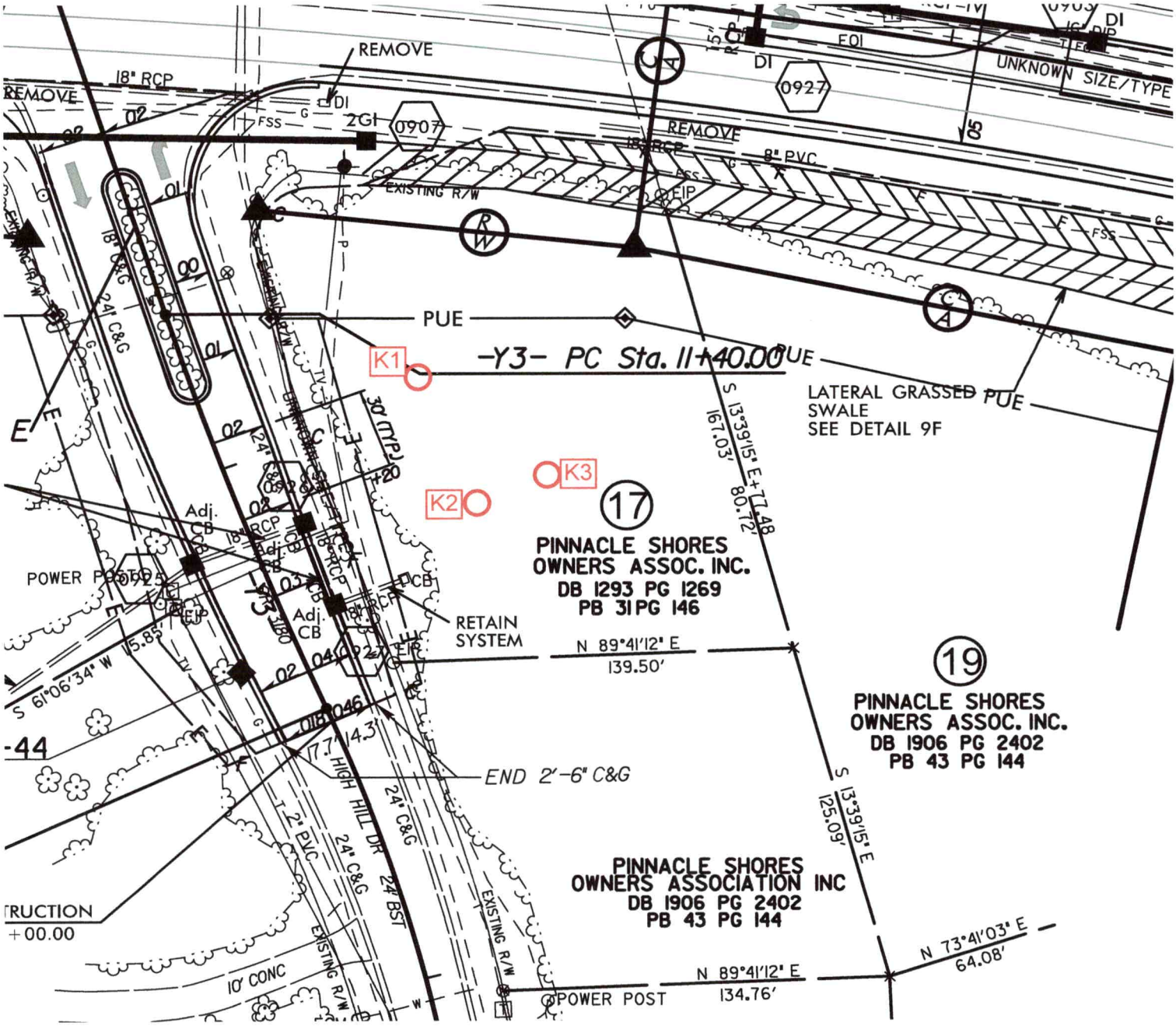
○ Ksat Location

Scale

50 ft =

1.00 in

High Hills Drive Figure 1



○ Ksat Location

SATURATED HYDRAULIC CONDUCTIVITY STUDY
High Hills Drive

Date: 1/23/2020
Location: Pit 1
Number: 1
Horizon: Bt
Depth(inches): 18.0

Weather Condition: Sunny
Temperature (F): 50

SET UP

		cm	in
Hole Depth:		45.7	18.0
Reference:	+	10.2	4.0
Head:	-	15.2	6.0
CHT Tube(s) setting:	=	40.6	16.0

Valve Setting: x (1-ON, 2-ON)

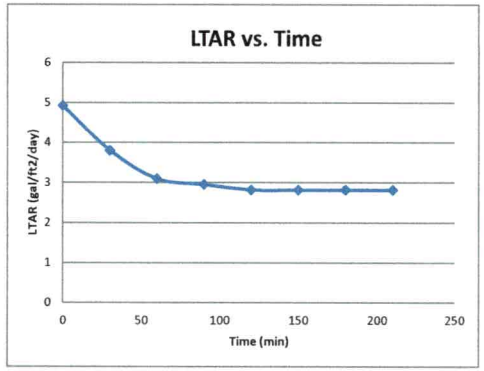
Coversion Factor (C.F.): 105.0

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

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

NOTE: Readings based on Ending Water Level

Water Reading	Change in Water Level	Chamber C.F.	Clock Time (min)	Elapsed Time (min)	Flow Volume (cm3)	Q (cm3/hr)	K (cm/hr)	K (in/hr)	K gal/ft2/day
48	0.0	105.0	0.0						
44.5	3.5	105.0	30.0	30.00	367.500	735.0	0.8351	0.3288	4.919
41.8	2.7	105.0	60.0	30.00	283.500	567.0	0.6442	0.2536	3.795
39.6	2.2	105.0	90.0	30.00	231.000	462.0	0.5249	0.2067	3.092
37.5	2.1	105.0	120.0	30.00	220.500	441.0	0.5011	0.1973	2.952
35.5	2.0	105.0	150.0	30.00	210.000	420.0	0.4772	0.1879	2.811
33.5	2.0	105.0	180.0	30.00	210.000	420.0	0.4772	0.1879	2.811
31.5	2.0	105.0	210.0	30.00	210.000	420.0	0.4772	0.1879	2.811
29.5	2.0	105.0	240.0	30.00	210.000	420.0	0.4772	0.1879	2.811
						Final Ksat	**0.477**	**0.188**	**2.811**



SATURATED HYDRAULIC CONDUCTIVITY STUDY
High Hills Drive

Date: 1/23/2020
Location: Below Pit 2
Number: 2
Horizon: Bt
Depth(inches): 18.0

Weather Condition: Sunny
Temperature (F): 50

SET UP

		cm	in
Hole Depth:		45.7	18.0
Reference:	+	10.2	4.0
Head:	-	15.2	6.0
CHT Tube(s) setting:	=	40.6	16.0

Valve Setting: x (1-ON, 2-ON)

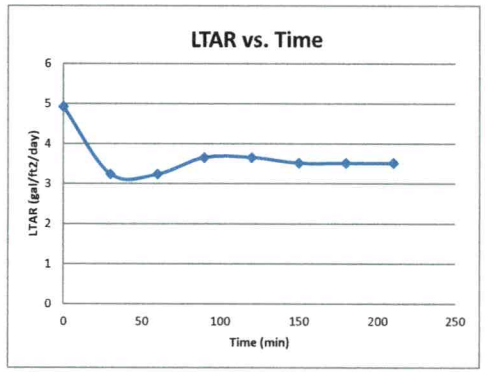
Coversion Factor (C.F.): 105.0

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

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

NOTE: Readings based on Ending Water Level

Water Reading	Change in Water Level	Chamber C.F.	Clock Time (min)	Elapsed Time (min)	Flow Volume (cm3)	Q (cm3/hr)	K (cm/hr)	K (in/hr)	K gal/ft2/day
46.9	0.0	105.0	0.0						
43.4	3.5	105.0	30.0	30.00	367.500	735.0	0.8351	0.3288	4.919
41.1	2.3	105.0	60.0	30.00	241.500	483.0	0.5488	0.2161	3.233
38.8	2.3	105.0	90.0	30.00	241.500	483.0	0.5488	0.2161	3.233
36.2	2.6	105.0	120.0	30.00	273.000	546.0	0.6204	0.2442	3.654
33.6	2.6	105.0	150.0	30.00	273.000	546.0	0.6204	0.2442	3.654
31.1	2.5	105.0	180.0	30.00	262.500	525.0	0.5965	0.2349	3.514
28.6	2.5	105.0	210.0	30.00	262.500	525.0	0.5965	0.2349	3.514
26.1	2.5	105.0	240.0	30.00	262.500	525.0	0.5965	0.2349	3.514
						Final Ksat	**0.597**	**0.235**	**3.514**



SATURATED HYDRAULIC CONDUCTIVITY STUDY
High Hills Drive

Date: 1/23/2020
Location: Above Pit 2
Number: 3
Horizon: Bt
Depth(inches): 18.0

Weather Condition: Sunny
Temperature (F): 50

SET UP

		cm	in
Hole Depth:		45.7	18.0
Reference:	+	10.2	4.0
Head:	-	15.2	6.0
CHT Tube(s) setting:	=	40.6	16.0

Valve Setting: 0 (1-ON) x (2-ON)

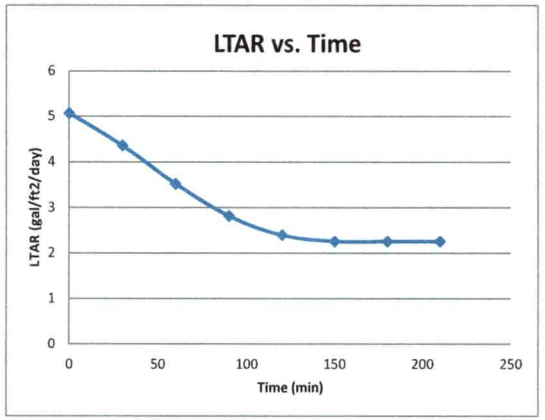
Coversion Factor (C.F.): 105.0

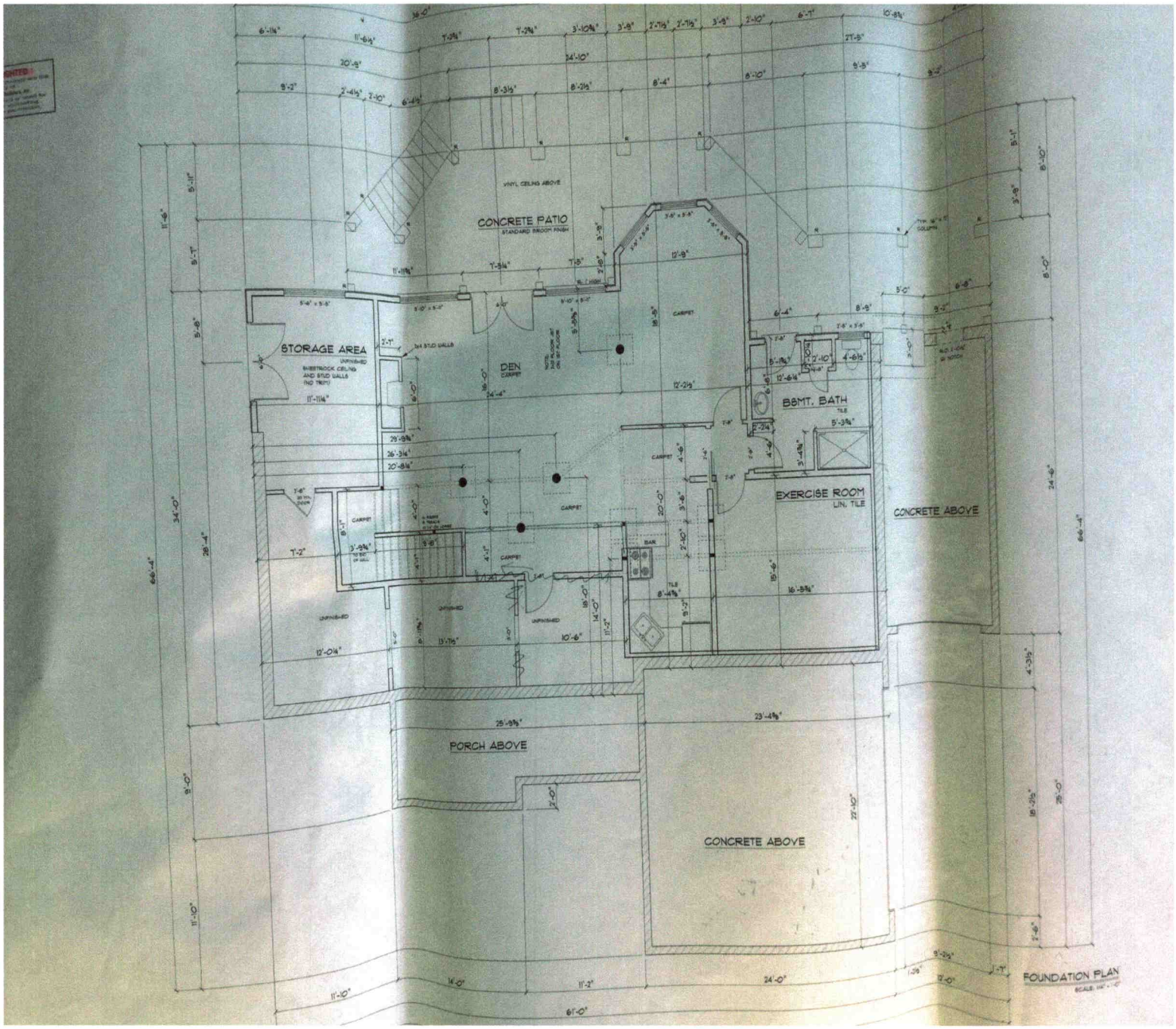
	cm	in
Target Water Level:	15.2	6.0
Beginning Water Level:	15.2	6.0
Ending Water Level:	15.2	6.0

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

NOTE: Readings based on Ending Water Level

Water Reading	Change in Water Level	Chamber C.F.	Clock Time (min)	Elapsed Time (min)	Flow Volume (cm3)	Q (cm3/hr)	K (cm/hr)	K (in/hr)	K gal/ft2/day
45.2	0.0	105.0	0.0						
41.6	3.6	105.0	30.0	30.00	378.000	756.0	0.8590	0.3382	5.060
38.5	3.1	105.0	60.0	30.00	325.500	651.0	0.7397	0.2912	4.357
36	2.5	105.0	90.0	30.00	262.500	525.0	0.5965	0.2349	3.514
34	2.0	105.0	120.0	30.00	210.000	420.0	0.4772	0.1879	2.811
32.3	1.7	105.0	150.0	30.00	178.500	357.0	0.4056	0.1597	2.389
30.7	1.6	105.0	180.0	30.00	168.000	336.0	0.3818	0.1503	2.249
29.1	1.6	105.0	210.0	30.00	168.000	336.0	0.3818	0.1503	2.249
27.5	1.6	105.0	240.0	30.00	168.000	336.0	0.3818	0.1503	2.249
						Final Ksat	**0.382**	**0.150**	**2.249**

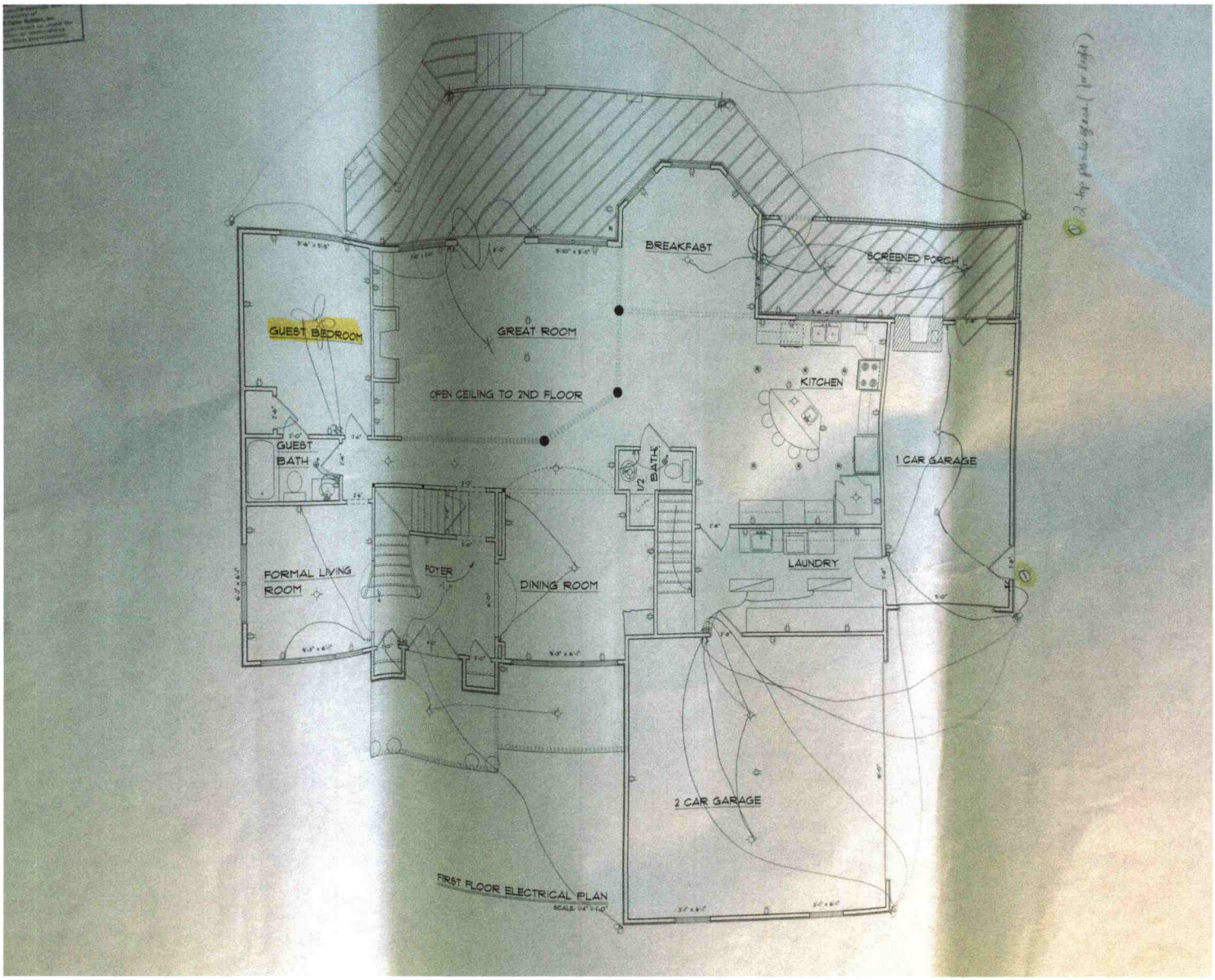




Acknowledgement Of
Plans Submittal ONLY!

_____ Date _____

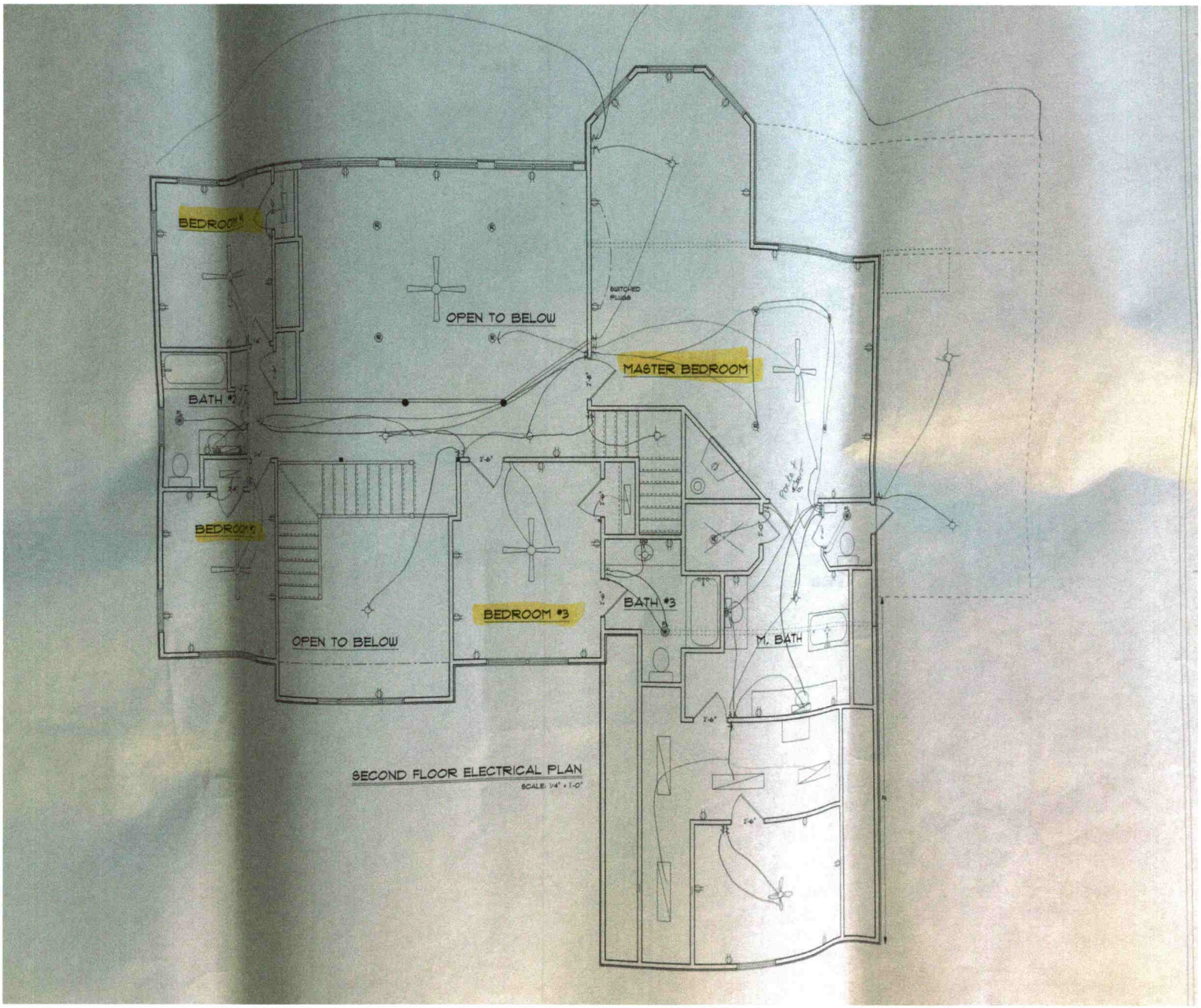
_____ Date _____



Acknowledgement Of
Plans Submittal ONLY!

_____ Date_____

_____ Date_____



Acknowledgement Of
Plans Submittal ONLY!

_____ Date _____

_____ Date _____

APPLICATION MUST BE FILLED OUT COMPLETELY & BE LEGIBLE
OR IT WILL NOT BE PROCESSED

$500
AP300699

Iredell County Health Department – Environmental Health Division

PAGE 1: *APPLICATION FORM*

Application For: Relocation ( ) New Well Permit ( ) Well Repair Permit ( ) Well Abandonment
(✓) Septic Improvement Permit (✓) 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: EVAN MORGAN **Address:** 324 Blackwell Street, Suite 1200 Durham **Zip:** 27701
Applicant Email: evan.morgan@threeoaksengineering.com **Phone:** 919-417-0509 **Alt. Phone:** 919-732-1300
Owner Name: Turner Creech **Address:** _____ **Zip:** _____
Owner Email: _____ **Phone:** _____ **Alt. Phone:** _____

Property Information:

Street Address: 168 High Hills Drive, Mooresville Offsite system PIN: 4628502907 Intersection of High Hills & NC-150
Subdivision Name: Pinnacle Shores **Section/Phase:** _____ **Lot Number:** 28
Driving Directions: 4.25 miles west on NC-150 from I-77. Property is immediately on left after turning on High Hills Drive

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

Existing SFR → no permit on file ?

CHECK FOUNDATION TYPE

( ) New Single Family Residence — Maximum Number of Bedrooms: _____ — ( ) Crawl Space Foundation
( ) New Multi-Family Residence — Maximum Number of Occupants: _____ — ( ) Concrete Slab Foundation
( ) Accessory Building — ( ) Swimming Pool — ( ) Basement with Plumbing
( ) Bedroom(s) Addition — ( ) Other Addition/Structure: _____ — ( ) Basement without Plumbing
( ) Repair to failing septic system ___ Tank ___ Drain lines Describe Problem: _____
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: _____
( ) No Preference ( ) Alternative ( ) Conventional ( ) Innovative ( ) Modified Conventional (✓) Other: PPBPS

Please answer the following to the best of your ability:
( ) Yes (✓) No Does the site contain any jurisdictional wetlands?
( ) Yes (✓) No Is any non-domestic sewage (i.e. industrial) to be generated?
( ) Yes (✓) No Is the site subject to approval by any other public agency?

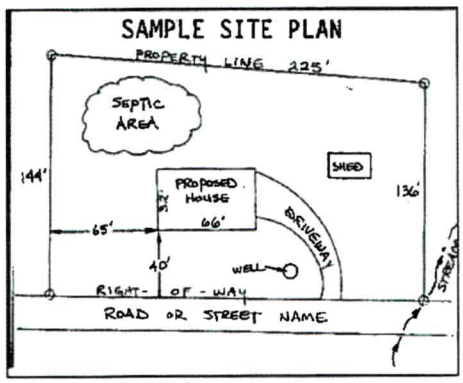
I have read this application and certify that the information provided herein is true, complete, and correct. Authorized county and state officials are granted right of entry to conduct necessary inspections to determine compliance with applicable laws and rules. I understand that I am solely responsible 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: Evan Morgan — 9-6-2019
Property owner or owner's legal representative signature (SIGNATURE REQUIRED) — DATE

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
- NA ( ) All proposed structures are indicated
- (X) Front and side setbacks from property line
- NA ( ) Preferred driveway location
- NA ( ) 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

See Attached Site Plan
for existing system location

Signature: _____ 9-6-2019

Property owner or owner's legal representative signature (SIGNATURE REQUIRED) **DATE**

IREDELL COUNTY DEPARTMENT OF ENVIRONMENTAL HEALTH

DOCUMENTATION TO AUTHORIZE AN OWNER'S LEGAL REPRESENTATIVE

(Check and sign only ONE of the options below)

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

Applications for permits require the "signature of the owner or owner's legal representative" (15A NCAC 18A .1937). If the owner does not sign the application himself or herself, they can submit any one of the following documents to designate their legal representative: *Power of Attorney; Real Estate Contract; Estate executor; Bankruptcy trustee; Court ordered guardianship*
In the absence of the above documentation, the property owner may provide the local health department with documentation that designates a legal representative. A property owner may:
Complete this form to document his or her legal representative, or provide his or her own form that contains the information in this form. If there are multiple property owners, then all property owners must sign the form that designates a legal representative.
By signing a form that designates a legal representative for purposes of 15A NCAC 18A .1937, the property owner authorizes that representative to act on their behalf in matters pertaining to the application and permitting process, including signing or receiving any application, document or permit. The owner retains full responsibility to meet all permit conditions specified by the local health department.

2. I, Turner Creech HOA President, am the legal owner(s) of the property located at High Hills Drive, Mooresville, NC 28117, identified as

PIN (Parcel Identification Number) 4628502907, located in Iredell County, North Carolina.

I do hereby authorize (**print legal representative/company name**) Evan Morgan, Three Oaks Engineering, 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.

_____ 8-25-19

Signature of Owner(s) Date

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

ENVIRONMENTAL HEALTH REQUIREMENTS for SEPTIC and WELL PERMITS

The following items must be completed *PRIOR* to the *SUBMITTAL* of any Environmental Health Application. Incomplete applications will be returned to the applicant and cannot be processed or placed on the work list.

***** Initial all lines below to indicate you have submitted each form and completed every site requirement *****

ETM **Complete all Environmental Health forms**:
- ETM Application
- ETM Site Plan including the dimensions of proposed structure, addition, pool etc.
- ETM Documentation to Authorize Owner Agent (even if the property owner is the applicant – complete section 1 or 2)
- ETM Copy of Zoning Permit when applicable
- ETM Sign this sheet after you have completed all items

ETM **Lot must be cleared of heavy undergrowth.** In order to evaluate the lot, the footprint of the proposed structure must be visible. Adequate area for the septic drain field and repair area must be sufficiently cleared of heavy undergrowth, with **50 feet of visibility** in all directions. Inspectors must be able to evaluate the property, shoot laser level elevations, layout the drain field, do soils work, etc. **If the lot is not cleared sufficiently, then a $100 site revisit fee will be charged and the evaluation will be put on HOLD until the requirement is met.**

ETM **Clearly mark all property corners by locating existing iron or concrete markers.** Flag all property lines every 25 feet if adjacent corners are not visible when standing on any given corner. Property lines must be flagged by a licensed NC surveyor & easily identified **prior to application submittal** (exception may apply for septic repair evaluations only).
'Mow lines' and/or fence lines do NOT constitute marked lines. **If the property lines are not properly marked when the lot is ready to be evaluated, then the application will be put on HOLD and a $100 site re-visit fee charged.**

ETM **Stake or flag the footprint of the proposed structure, addition, pool etc. to match the site plan submitted.** The proposed structure, etc. **must be staked** out on the property as per the site plan.

ETM If an **Authorization to Construct (AC) is desired**, submit a recorded copy of the plat for newly created or subdivided lot(s) and a LEGIBLE copy of the basic floor plan no larger than 8 ½" x 14" for each floor of the structure including decks, porches, etc. **The overall dimensions must be clearly noted & the rooms labeled.**

Any site not meeting the above requirements when staff arrives for the evaluation will result in a $100 site revisit fee being charged and the request being placed on HOLD. This will delay the processing of the application.
Once work by Environmental Health staff begins, the up-front fees paid toward securing any health department permit are non-refundable. Refunds for work not started, due to a customer changing their mind or plans, are subject to an administrative fee of $50 to defray a portion of the costs of processing the refund.

Backhoe pits are required for all applications that require a soils evaluation.
DO NOT DIG PITS UNTIL THE EH SPECIALIST HAS AUTHORIZED AND SCHEDULED YOUR EVALUATION TIME.
- **All utilities shall be marked before pits are dug. Call NC 811 for this service.**
- **The applicant/agent is responsible for securing these services**
- **Backhoe pits are to be dug at the locations and depths determined by the Environmental Health Specialist or a NC Licensed Soil Scientist. A minimum of four pits must be dug.**
- **The EH specialist will contact you when your application is ready to be processed for pit scheduling.**
- **Your backhoe operator must be on site during the EH Specialist's evaluation to prevent your operator from having to return to the property for additional work.**

By signing below I am acknowledging the above specifications have been met and the site is READY to be evaluated AND I understand the backhoe pit requirement and will secure those services (if applicable).

Signature _____ **Date** 9-6-2019

Questions? Contact the Environmental Health Offices below:

Statesville Office
349 North Center Street (2nd Floor Building Standards)
Statesville, NC 28677-4063
Phone: (704)878-5305 ext. 3456

Mooresville Office
610 East Center Avenue (2nd Floor Govt. Center South)
Mooresville, NC 28115-2548
Phone: (704)660-3625