

Central Carolina Soil Consulting, PLLC

1900 South Main Street, Suite 110

Wake Forest, 27588

919-569-6704

December 11, 2021

Project # 4058

Windjam Properties
Rex Vick, Jr.
5711 Six Forks Road
Suite 200
Raleigh, NC 27609

RE: Detailed soil/site evaluation on ~42-acres north of Hamlets Chapel Road in Chatham County.

Dear Mr. Vick:

Central Carolina Soil Consulting, PLLC conducted a detailed soil evaluation on the referenced parcel to determine the areas of soils which are provisionally suitable for subsurface wastewater disposal systems (conventional & LPP only). The soil/site evaluation was performed using hand auger borings during moist to saturated soil conditions based on the criteria found in the State Subsurface Rules, 15ANCAC 18A .1900 "Laws and Rules for Sewage Treatment and Disposal Systems". From this evaluation, CCSC flagged the boundary between the provisionally suitable soils and unsuitable soils and gps field located them to increase mapping accuracy.

The soils that have formed on this parcel have characteristics similar to the Appling, Wedowee, Helena and Worsham Soil Series. The attached soils map indicates the areas of provisionally suitable vs. unsuitable soils. The Appling and Wedowee series are generally provisionally suitable for subsurface wastewater systems. That is, the morphology of the soils contain provisionally suitable characteristics that would support subsurface septic systems such as clay to sandy clay loamed textured subsoils which are not considered expansive and have blocky structure with no indicators of restrictive characteristics within 24 inches of the soil surface. The Helena soil series contains expansive clays and/or field indicators of a perched water table within 24 inches of the soil surface and area unsuitable for conventional/LPP septic systems. The Worsham soil series is a poorly drained soil which has formed from fluvial sediments on streams terraces on the property. These soil types are unsuitable for subsurface septic

systems. Additional unsuitable soil areas are due to complex topographic features such as old road cuts, gullies, existing house and fill material.

The attached soils map indicates the areas of soils which are suitable for subsurface wastewater systems. The "hatched soil units" on the attached map indicates the areas of soils that have 30 inches or more of suitable soil material. These areas have potential for conventional and modified conventional septic systems. There may be inclusions of soils 24-29 inches that would support LPP or ultra-shallow conventional septic systems in the areas mapped as conventional. The "cross hatched" soil units indicates areas of soils with 24-29 inches of provisionally suitable soils suitable for Low Pressure Pipe septic systems. Unit "UN" on the attached map indicates areas of soils with restrictive horizons within 24 inches of the soil surface or areas of unsuitable topography. The "block units" indicates areas of soils with 20" of provisionally suitable soils usable for low profile chamber systems (no reduction allowed). A final soil unit "SSD" has areas of soils with greater than 18 inches of provisionally suitable material for subsurface drip septic systems (price greater than \$40,000 per system). Please note that the area of suitable soils was delineated by soil borings using hand auger in various locations and flagging out the unsuitable borings along with the unsuitable topography on the property. Central Carolina Soil Consulting cannot guarantee that every square foot of area shown as potentially suitable for septic systems will be permitted by the local health department due to the variability of naturally occurring soils.

Future Subdivision Considerations

Several factors should be considered before a final subdivision plan is created for this property. One consideration is that each proposed lot shall contain an adequate amount of suitable soils, which can support a primary septic system along with a repair septic system. The suitable soil areas cannot be affected by future homes, driveways, patios, excavation or filling activities and if an on-site well is used then a 100' setback is required around the well head. An exact square footage of suitable soils required per lot to obtain a permit cannot be given due to soil variability and topographic characteristics on each lot. The amount of suitable soils required to support a 4-bedroom residence will range between 12,000ft²-14,000 ft² (could be more or less) per lot. A septic system field layout may be required on lots to demonstrate available space for the required primary and repair septic areas. These soil area estimates are based upon soil application rates for a sandy clay loam to clay textured subsoil with a site LTAR of 0.25-0.30 gallons per day/square foot for conventional type systems. The ultimate application rate will be assigned by the Chatham County Health Department based on a detailed evaluation of each new lot.

During the road construction process of a subdivision it is important not to impact any suitable soil areas with such activities as excavating or filling. Only the actual roadways and required drainage ditches and/or sediment basins should be constructed during this process. If the contractor requires a staging area to place fill from the construction process, then areas of unsuitable soils on the property should be utilized as long as they are not state/county buffers, jurisdictional wetlands or other areas protected by local zoning regulations. If this is not possible, then the disturbed areas should be minimized as much as possible. The same precautions should be taken when the individual lots are cleared for home sites. Only the vegetation should be removed in the areas of the proposed drain fields on lots to prevent any disturbance of the naturally occurring soil. A lot with adequate areas of suitable soils can be deemed unsuitable due to poor planning or site disturbance. Central Carolina Soil Consulting recommends that all lot clearing activities are delayed until a permit is issued by the local health department, with the exception of clearing thick vegetation to access the lot.

This report discusses the location of suitable soils for subsurface wastewater disposal systems and does not guarantee any permits or approval required by the local health department. Central Carolina Soil Consulting, PLLC is a professional consulting firm specializing in soil delineations and design for on-site wastewater disposal systems. The rules governing on-site wastewater disposal systems are complex and the interpretation of the rules are based upon the opinions of regulators (state and county level). Due to the subjective nature of the permitting process and the variability of naturally occurring soils, CCSC cannot guarantee that areas delineated as suitable for on-site wastewater disposal systems will be permitted by the governing agencies. These permitting considerations should be taken into account before a financial commitment is made on a tract of land.

If you have any questions regarding the findings on the attached map or in this report, please feel free contact me at anytime. Thank you allowing Central Carolina Soil Consulting to perform this site evaluation for you.

Sincerely,

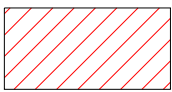
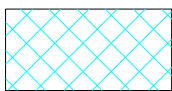
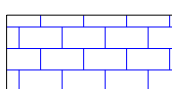


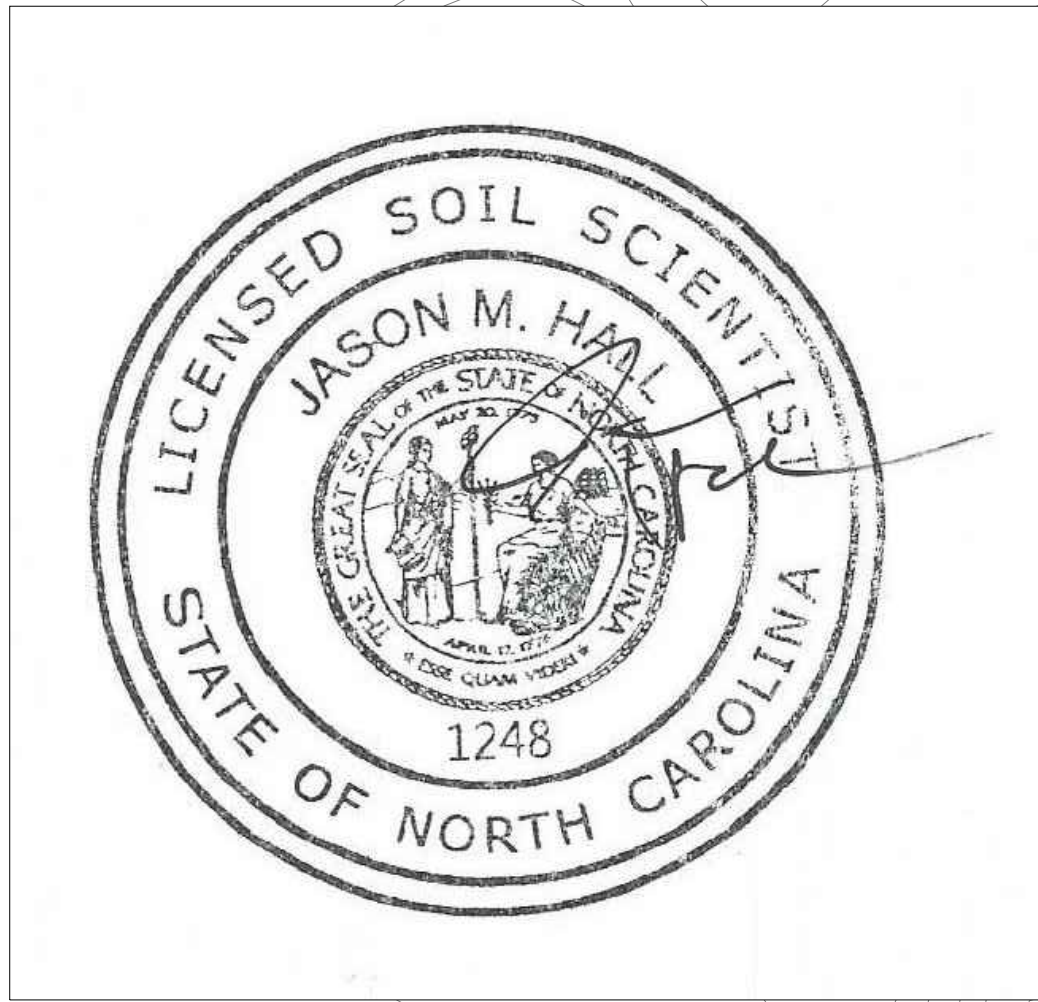
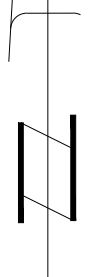
Jason Hall
NC Licensed Soil Scientist #1248



Encl: Soil Map

Legend

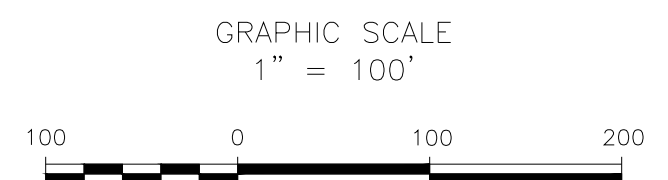
-  Areas contain 30 inches or more of provisionally useable material and have potential for conventional or modified conventional septic systems. There may be inclusions of soils in these areas that may only be suitable for LPP septic systems due to soils variability.
-  Areas contain soils with 24 to 29 inches or more of provisionally useable material and have potential LPP or ultra-shallow conventional septic systems. There may be inclusions of soils 18-23" which are provisionally suitable for Low Profile Chambers with cover or subsurface drip.
-  Areas contain soils with 20 to 23 inches or more of provisionally useable material and have potential low profile chamber systems. These systems require cover and do not allow for any reduction in area.
- SSD** Areas contain soils with 18 inches or more of provisionally useable material and have potential subsurface drip septic systems. These systems are expensive and can cost greater than \$35,000 for installation.
- UN** Unsuitable areas surface septic systems.



*Detailed Soils Evaluation
 *Soil boundary was flagged in the field and located via GPS.

- *Septic system setbacks listed below for new lots.
- 1) 10' from property lines.
 - 2) 50' from wells for primary systems, 100' for saprolite.
 - 3) 50' from wells for repair systems, 100' for saprolite.
 - 4) 50' from surface waters (streams, ponds, lakes).
 - 5) 50' from Wet Ponds or Wet Detention BMP's.
 - 6) 25' from dry detention or infiltration BMP's.

*Any mechanical disturbances such as grading, cutting and filling of the suitable soil areas can render areas unsuitable for future septic systems.
 *See accompanying report for additional information.
 *Base map acquired from Chatham County GIS, not a survey.
 *Due to Soil Variability, CCSC cannot guarantee that the areas shown as suitable will be permitted by the local Health Department.
 *The preliminary (approximate) soil lines cannot be used as legal descriptions for purposes of a land transfer or legal documentation.
 *Additional field work may be required for a septic permit (septic system field layout/design).
 *Site contains thick vegetation. Lanes were mowed in for access. There may be areas of unsuitable soils or topography in that could not be evaluated by CCSC due to the thick vegetation.





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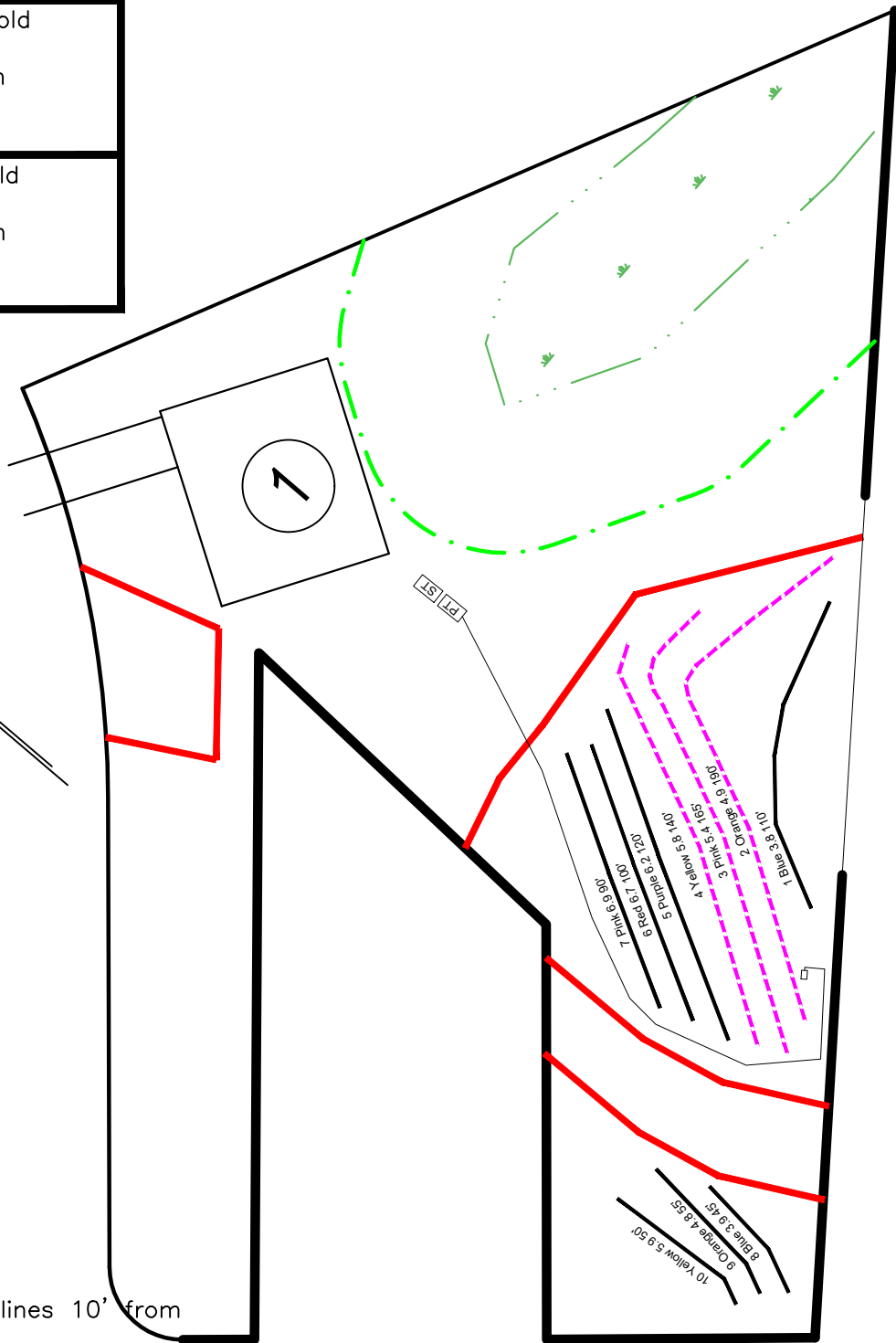
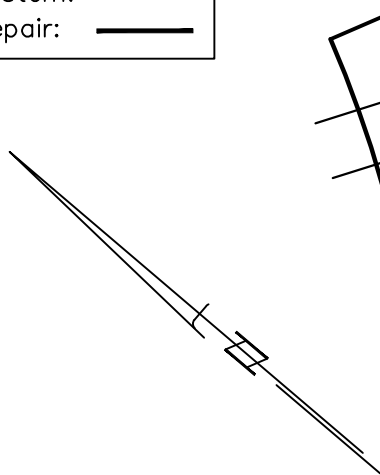
Detailed Soils Evaluation
 Hamlets Chapel Road, 90-acre per GIS map
 Chatham County, North Carolina

Job# : 4058
 Drawn By : JH
 Date : 12/9/2021
 Revision : 00/00/0000

System: Pressure Manifold
 Lines: 2-4, (495')
 Accepted Status System
 0.25 Soil LTAR

Repair: Pressure Manifold
 Lines: 1,5-10, (570')
 Accepted Status System
 0.25 Soil LTAR

System: 
 Repair: 



- *Keep tanks and drain lines 10' from property lines.
- *Not a survey.
- *Not a guarantee of a septic permit.
- *Keep supply lines >5' from property lines.
- *Some lines are flagged longer in the field than lengths indicate.
- *No grading septic area.

GRAPHIC SCALE
 1" = 60'





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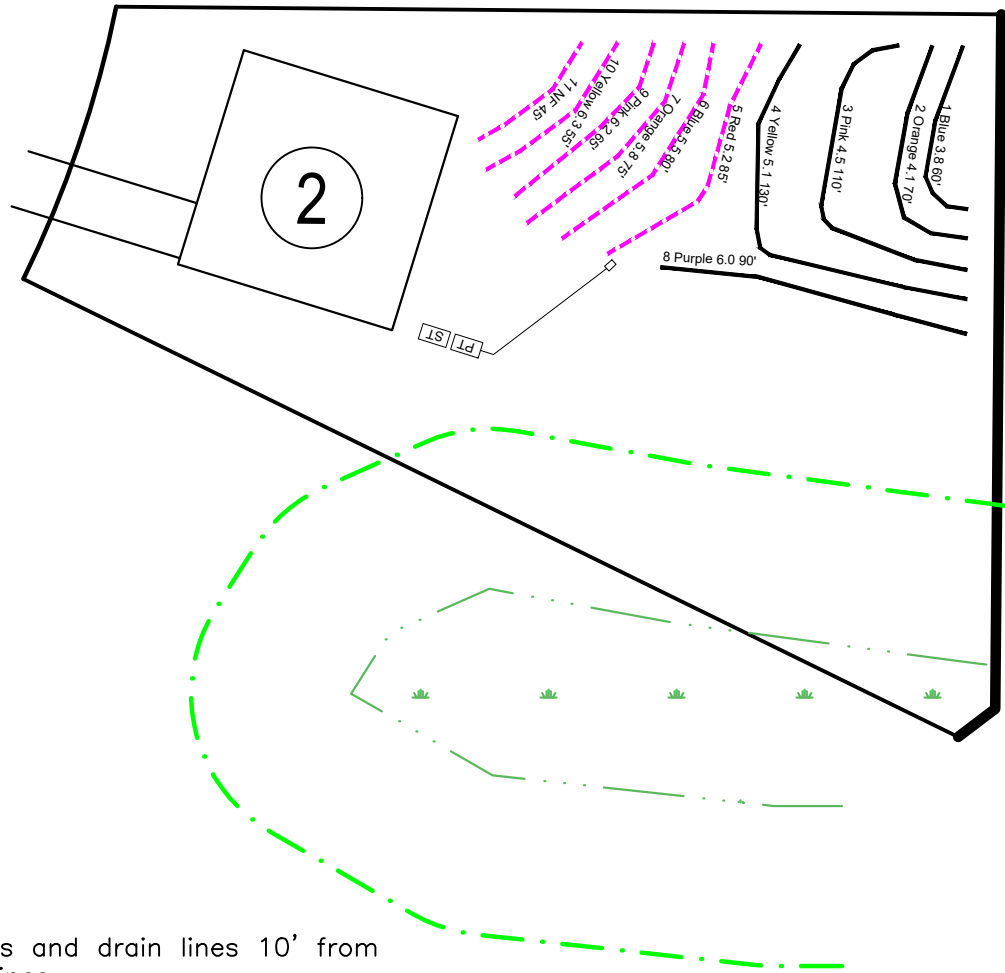
4-Bedroom Septic Layout
 Lot 1, Flat Iron Forest Subdivision
 Chatham County, North Carolina

Job# : 4058
Drawn By : AH
Date : 11/2/2022
Revision:

System: Pressure Manifold
 Lines: 5–11, (495')
 Accepted Status System
 0.25 Soil LTAR

Repair: Pressure Manifold
 Lines: 1–4,8, (370')
 T&J Panel 50% Reduction
 0.25 Soil LTAR

System: 
 Repair: 



- *Keep tanks and drain lines 10' from property lines.
- *Not a survey.
- *Not a guarantee of a septic permit.
- *Keep supply lines >5' from property lines.
- *Some lines are flagged longer in the field than lengths indicate.
- *No grading septic area.

GRAPHIC SCALE
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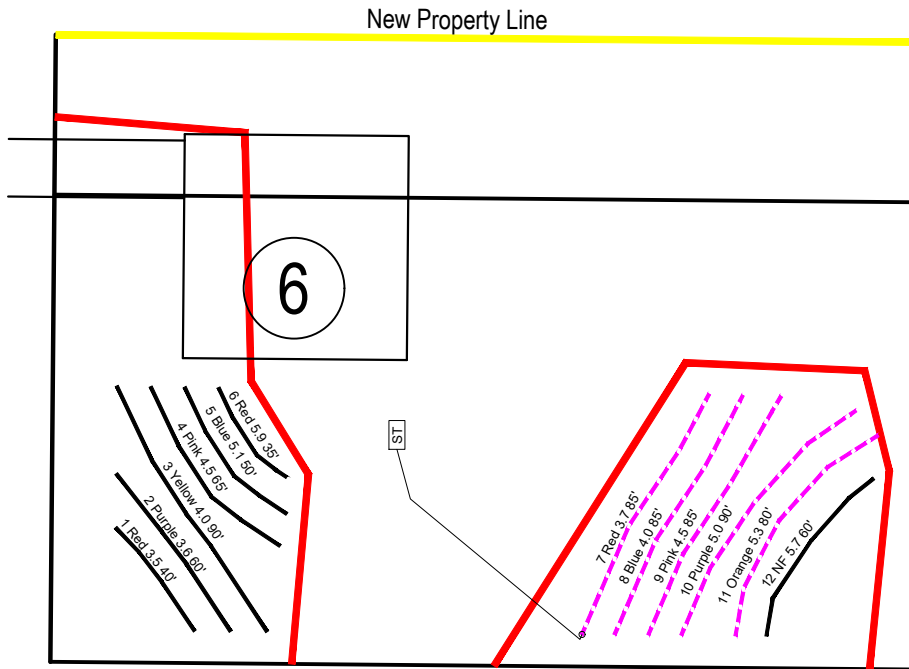
4-Bedroom Septic Layout
 Lot 2, Flat Iron Forest Subdivision
 Chatham County, North Carolina

Job# : 4058
Drawn By : AH
Date : 11/2/2022
Revision:

System: Low Profile Chamber
 Lines: 5–11, (425')
 0.325 Soil LTAR
 8" Trench Bottom

Repair: Pressure Manifold
 Lines: 1–6, (400')
 Accepted Status System
 0.3 Soil LTAR

System: 
 Repair: 



- *Keep tanks and drain lines 10' from property lines.
- *Not a survey.
- *Not a guarantee of a septic permit.
- *Keep supply lines >5' from property lines.
- *Some lines are flagged longer in the field than lengths indicate.
- *No grading septic area.

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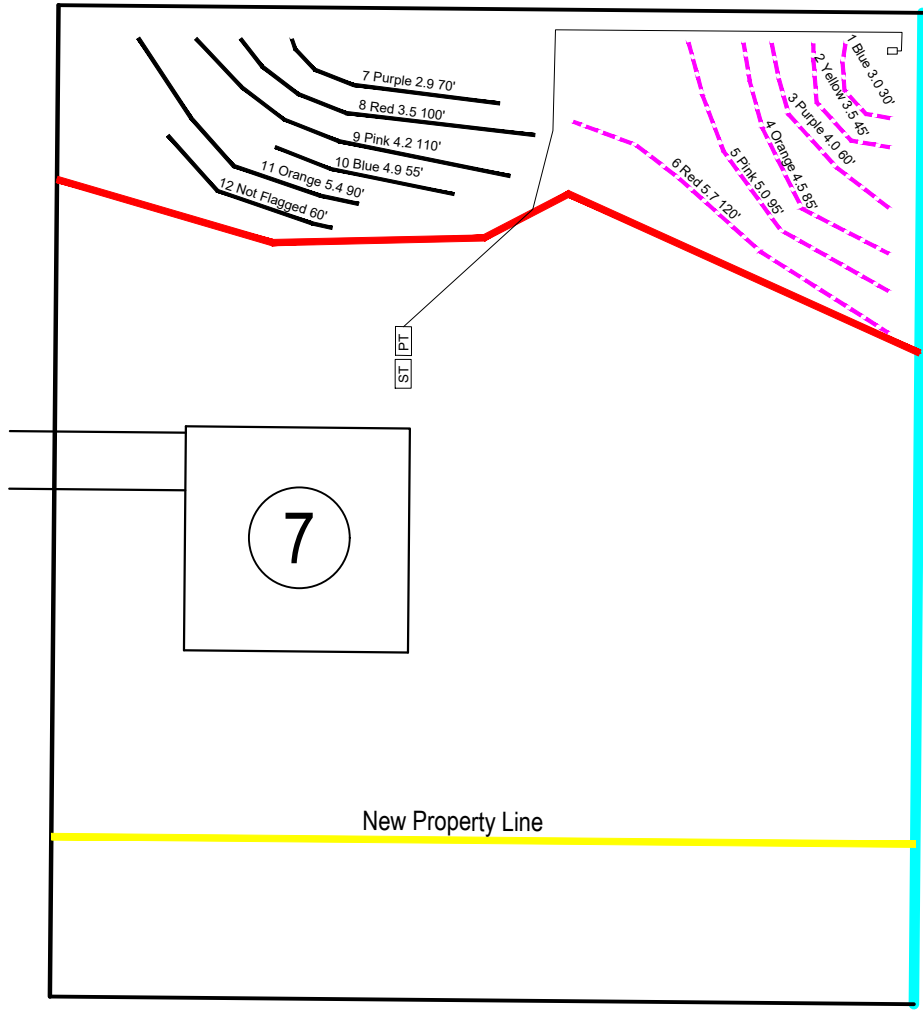
4-Bedroom Septic Layout
 Lot 6, Flat Iron Forest Subdivision
 Chatham County, North Carolina

Job# : 4058
 Drawn By : AH
 Date : 11/2/2022
 Revision:

System: Pressure Manifold
 Lines: 1–6, (435')
 Accepted Status System
 0.325 Soil LTAR
 18" Trench Bottom

Repair: Pressure Manifold
 Lines: 7–12, (485')
 Accepted Status System
 0.275 Soil LTAR
 12" Trench Bottom

System: 
 Repair: 



- *Keep tanks and drain lines 10' from property lines.
- *Not a survey.
- *Not a guarantee of a septic permit.
- *Keep supply lines >5' from property lines.
- *Some lines are flagged longer in the field than lengths indicate.
- *No grading septic area.

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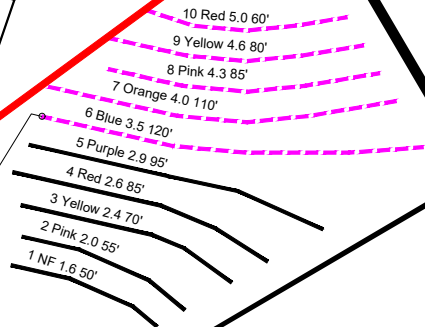
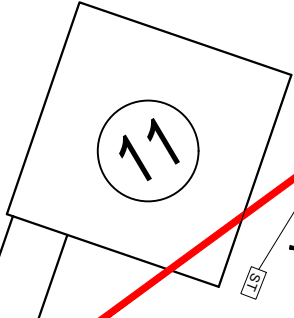
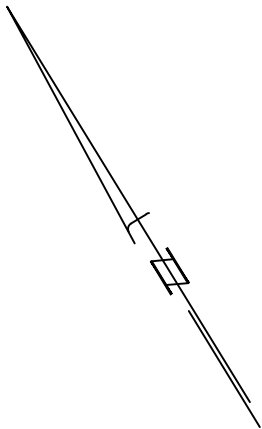
4-Bedroom Septic Layout
 Lot 6, Flat Iron Forest Subdivision
 Chatham County, North Carolina

Job# : 4058
Drawn By : AH
Date : 11/2/2022
Revision:

System: Gravity to Serial Dist.
 Lines: 6-11, (455')
 Accepted Status System
 0.3 Soil LTAR
 12" Trench Bottom

Repair: Pressure Manifold
 Lines: 7-12, (485')
 Accepted Status System
 0.3 Soil LTAR
 12" Trench Bottom

- *Keep tanks and drain lines 10' from property lines.
- *Not a survey.
- *Not a guarantee of a septic permit.
- *Keep supply lines >5' from property lines.
- *Some lines are flagged longer in the field than lengths indicate.
- *No grading septic area.



System:
 Repair:

GRAPHIC SCALE
 1" = 60'



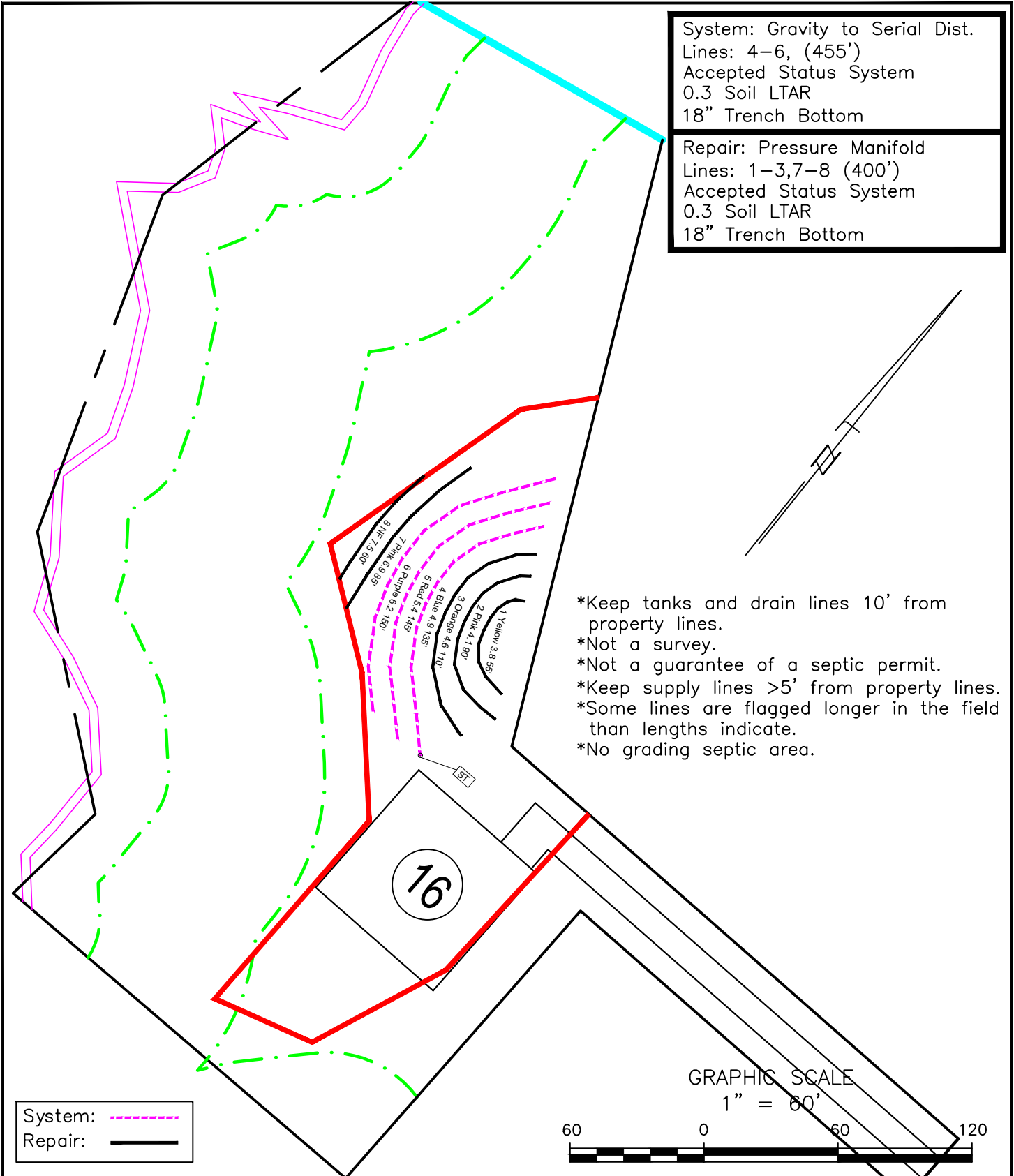
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4-Bedroom Septic Layout
 Lot 11, Flat Iron Forest Subdivision
 Chatham County, North Carolina

Job# : 4058
Drawn By : AH
Date : 11/2/2022
Revision:

System: Gravity to Serial Dist.
 Lines: 4-6, (455')
 Accepted Status System
 0.3 Soil LTAR
 18" Trench Bottom

Repair: Pressure Manifold
 Lines: 1-3,7-8 (400')
 Accepted Status System
 0.3 Soil LTAR
 18" Trench Bottom



- *Keep tanks and drain lines 10' from property lines.
- *Not a survey.
- *Not a guarantee of a septic permit.
- *Keep supply lines >5' from property lines.
- *Some lines are flagged longer in the field than lengths indicate.
- *No grading septic area.

System:
 Repair:

GRAPHIC SCALE
 1" = 60'
 60 0 60 120





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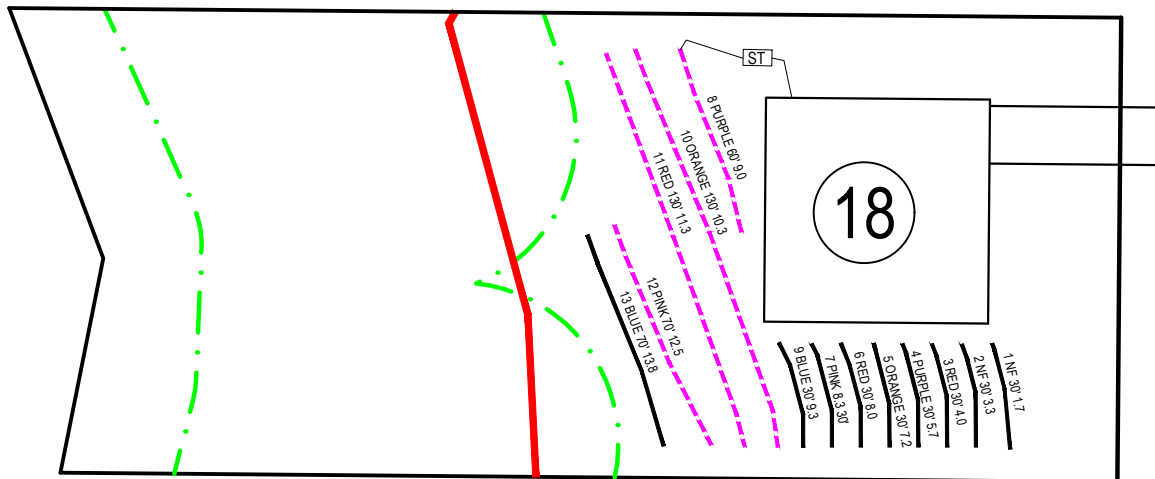
4-Bedroom Septic Layout
 Lot 16, Flat Iron Forest Subdivision
 Chatham County, North Carolina

Job# : 4058
Drawn By : AH
Date : 11/8/2022
Revision:

System: Gravity to Serial Dist.
 Lines: 8-12, (390')
 Accepted Status System
 0.325 Soil LTAR
 18" Trench Bottom

Repair: Pressure Manifold
 Lines: 1-7,9,13, (310')
 T&J Panel 50% Reduction
 0.325 Soil LTAR
 18" Trench Bottom

System: 
 Repair: 



- *Keep tanks and drain lines 10' from property lines.
- *Not a survey.
- *Not a guarantee of a septic permit.
- *Keep supply lines >5' from property lines.
- *Some lines are flagged longer in the field than lengths indicate.
- *No grading septic area.

GRAPHIC SCALE
 1" = 60'





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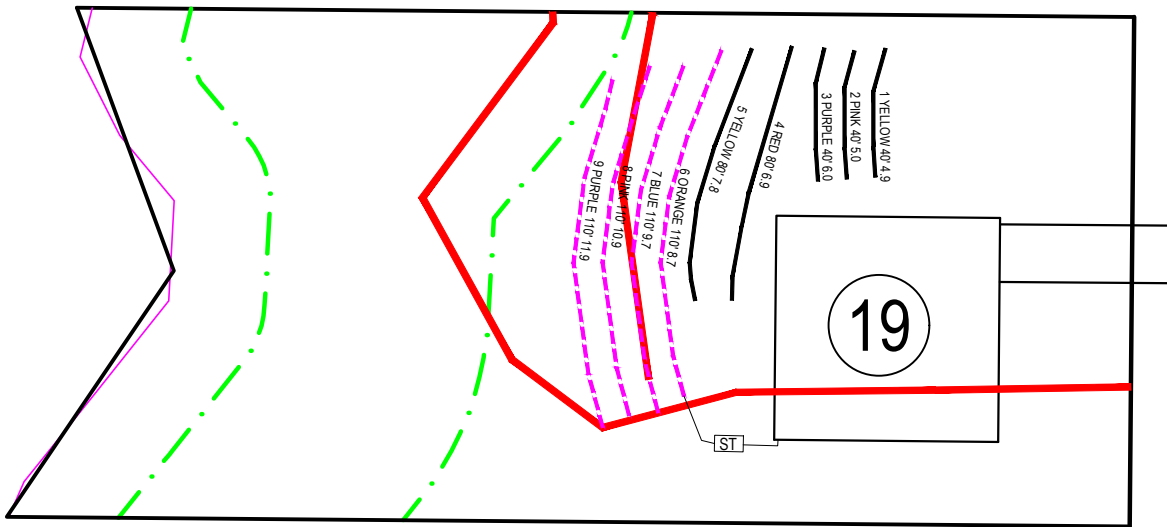
4-Bedroom Septic Layout
 Lot 18, Flat Iron Forest Subdivision
 Chatham County, North Carolina

Job# : 4058
Drawn By : AH
Date : 11/2/2022
Revision:

System: Gravity to Serial Dist.
 Lines: 6–9, (440')
 Accepted Status System
 0.3 Soil LTAR
 18" Trench Bottom

Repair: Pressure Manifold
 Lines: 1–5, (320')
 T&J Panel 50% Reduction
 0.3 Soil LTAR
 18" Trench Bottom

System: 
 Repair: 



- *Keep tanks and drain lines 10' from property lines.
- *Not a survey.
- *Not a guarantee of a septic permit.
- *Keep supply lines >5' from property lines.
- *Some lines are flagged longer in the field than lengths indicate.
- *No grading septic area.

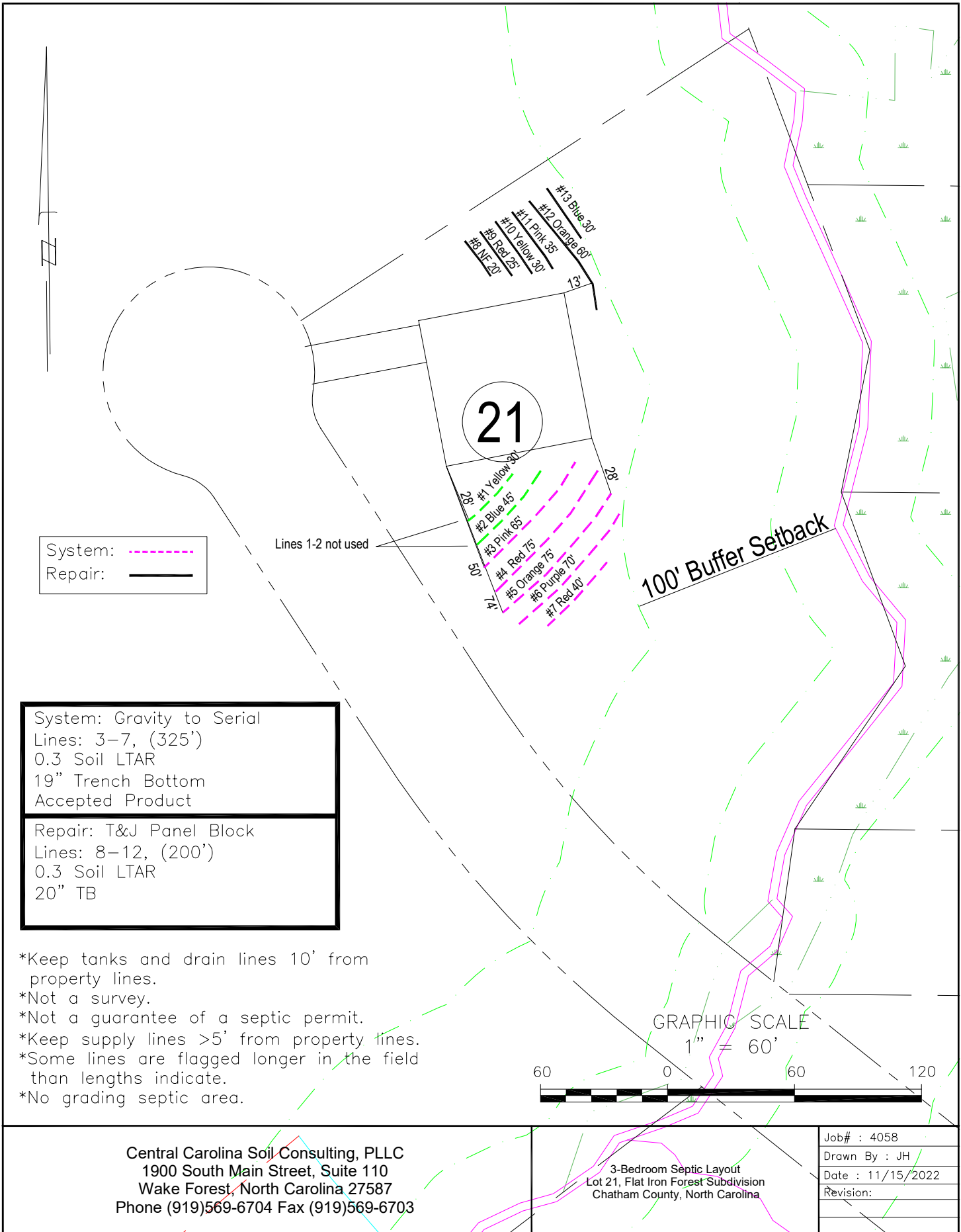
GRAPHIC SCALE
 1" = 60'



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4-Bedroom Septic Layout
 Lot 18, Flat Iron Forest Subdivision
 Chatham County, North Carolina

Job# : 4058
Drawn By : AH
Date : 11/2/2022
Revision:



System: - - - - -
 Repair: _____

Lines 1-2 not used

System: Gravity to Serial
 Lines: 3-7, (325')
 0.3 Soil LTAR
 19" Trench Bottom
 Accepted Product

Repair: T&J Panel Block
 Lines: 8-12, (200')
 0.3 Soil LTAR
 20" TB

- *Keep tanks and drain lines 10' from property lines.
- *Not a survey.
- *Not a guarantee of a septic permit.
- *Keep supply lines >5' from property lines.
- *Some lines are flagged longer in the field than lengths indicate.
- *No grading septic area.

GRAPHIC SCALE
 1" = 60'





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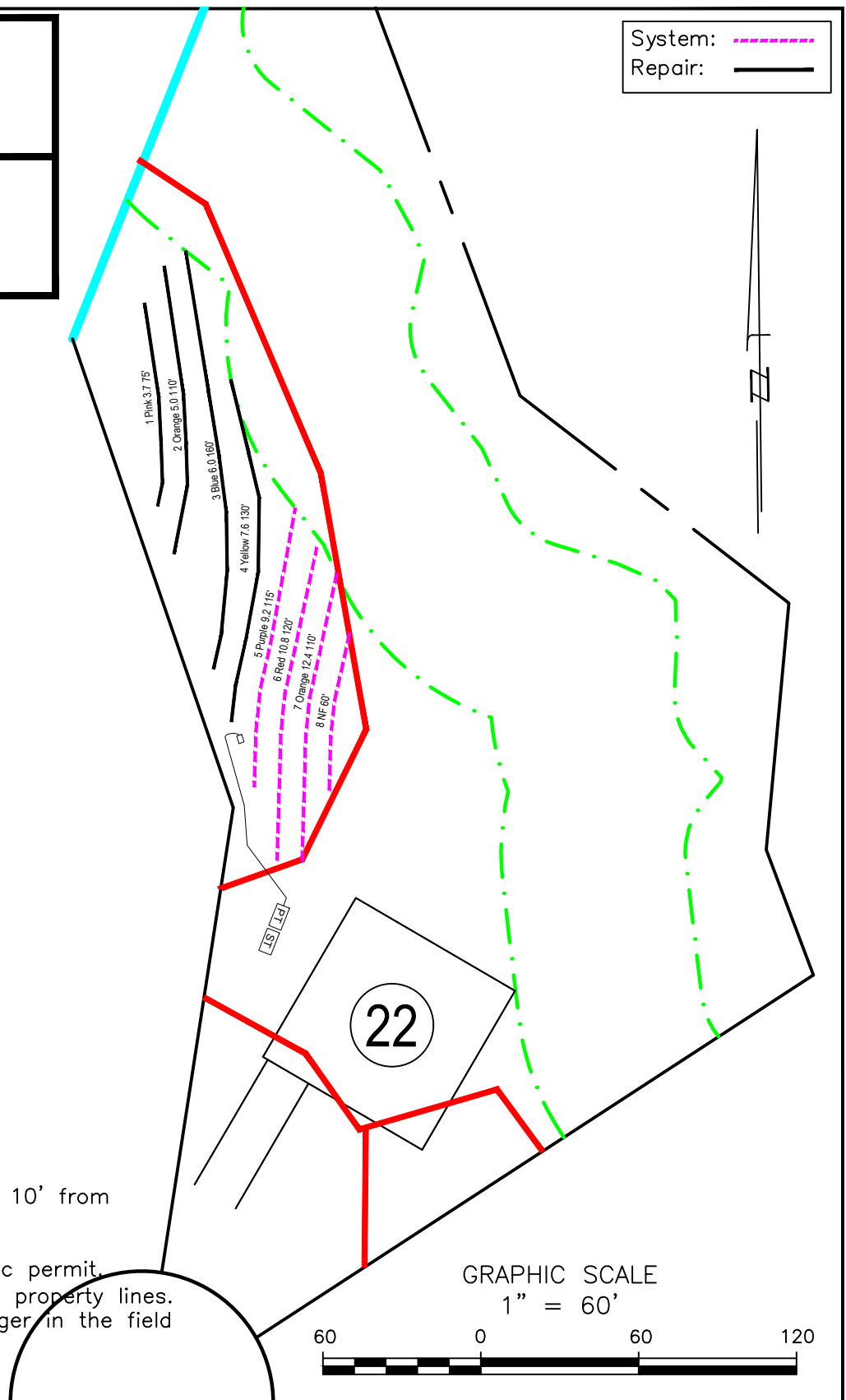
3-Bedroom Septic Layout
 Lot 21, Flat Iron Forest Subdivision
 Chatham County, North Carolina

Job# : 4058
Drawn By : JH
Date : 11/15/2022
Revision:

System: Pressure Manifold
 Lines: 5–9, (425')
 0.3 Soil LTAR
 Accepted Status System
 16" Trench Bottom

Repair: Pressure Manifold
 Lines: 1–4, (475')
 Accepted Status System
 0.3 Soil LTAR
 18" Trench Bottom

System: 
 Repair: 



- *Keep tanks and drain lines 10' from property lines.
- *Not a survey.
- *Not a guarantee of a septic permit.
- *Keep supply lines >5' from property lines.
- *Some lines are flagged longer in the field than lengths indicate.
- *No grading septic area.

GRAPHIC SCALE
 1" = 60'



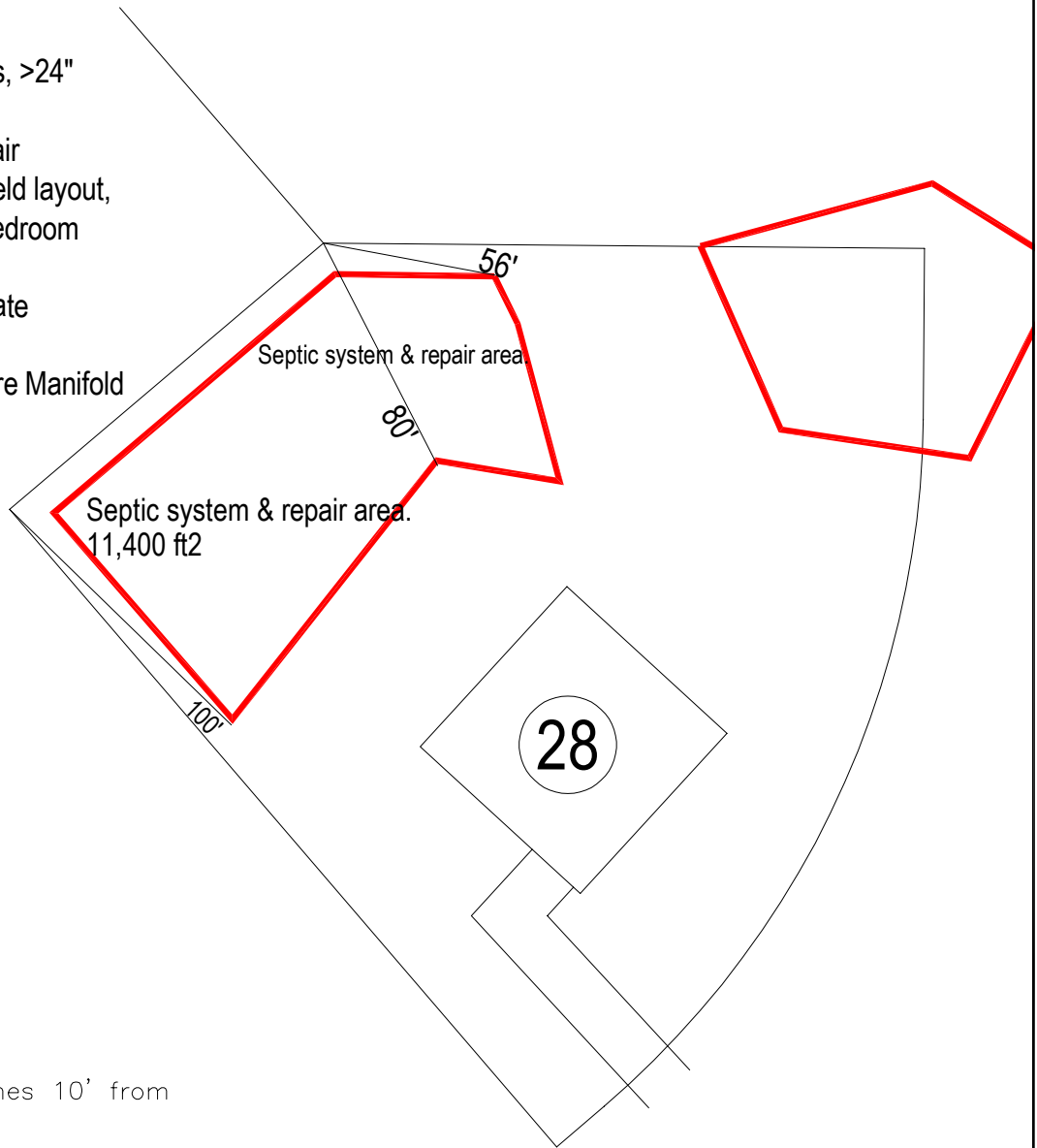
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4-Bedroom Septic Layout
 Lot 22, Flat Iron Forest Subdivision
 Chatham County, North Carolina

Job# : 4058
Drawn By : AH
Date : 11/2/2022
Revision:



Provisionally suitable soils, >24"
 ~11,400 ft², 0.275 LTAR
 3-Bedroom system & repair
 Vegetation too thick for field layout,
 field layout may yield 4-bedroom
 septic.
 Pits can be used to evaluate
 saprolite.
 Pump is required, Pressure Manifold



- *Keep tanks and drain lines 10' from property lines.
- *Not a survey.
- *Not a guarantee of a septic permit.
- *Keep supply lines >5' from property lines.
- *Some lines are flagged longer in the field than lengths indicate.
- *No grading septic area.

GRAPHIC SCALE
 1" = 60'



D:\CCSC logo 2.PNG



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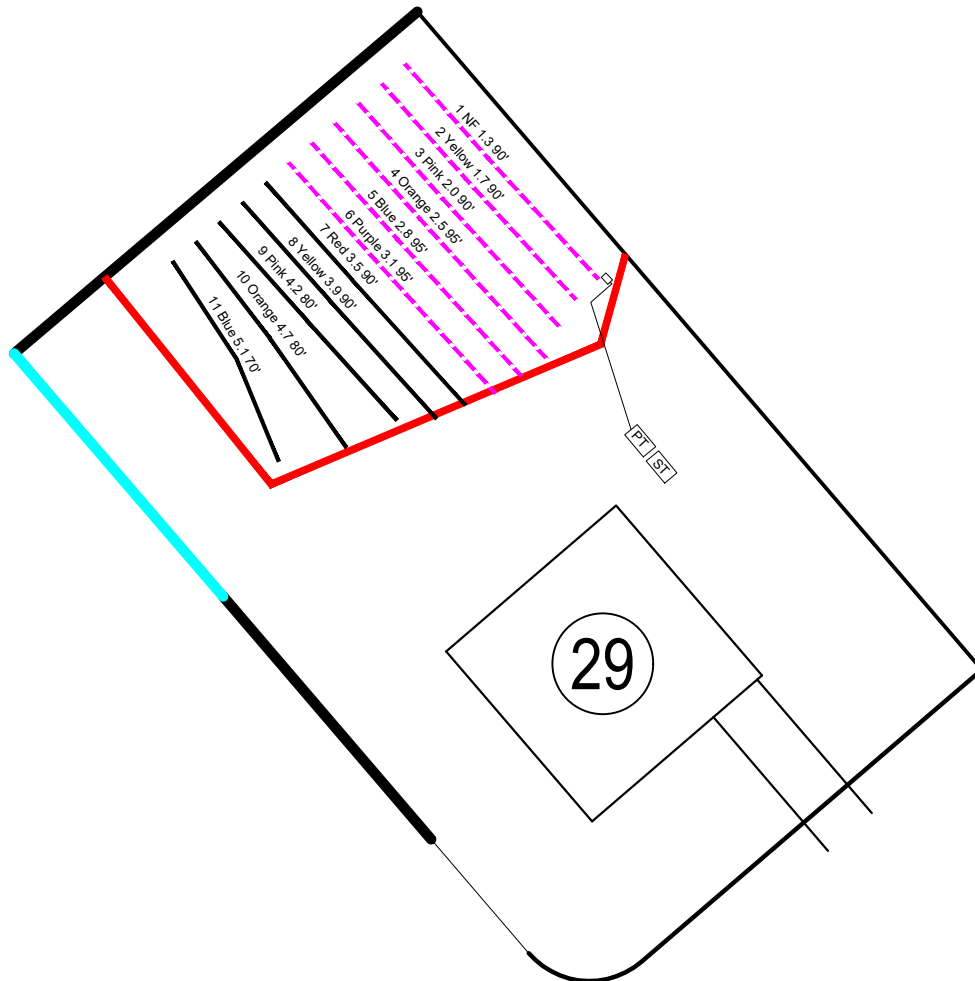
3-Bedroom Soils Map
 Lot 28, Flat Iron Forest Subdivision
 Chatham County, North Carolina

Job# : 4058
Drawn By : AH
Date : 11/2/2022
Revision:

System: Pressure Manifold
 Lines: 1–6, (555')
 Accepted Status System
 0.25 Soil LTAR
 18" Trench Bottom

Repair: Pressure Manifold
 Lines: 7–11, (410')
 T&J Panel 50% Reduction
 0.25 Soil LTAR
 18" Trench Bottom

System: 
 Repair: 



- *Keep tanks and drain lines 10' from property lines.
- *Not a survey.
- *Not a guarantee of a septic permit.
- *Keep supply lines >5' from property lines.
- *Some lines are flagged longer in the field than lengths indicate.
- *No grading septic area.

GRAPHIC SCALE
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4-Bedroom Septic Layout
 Lot 29, Flat Iron Forest Subdivision
 Chatham County, North Carolina

Job# : 4058
Drawn By : AH
Date : 11/2/2022
Revision: