


Design and Site Evaluation Overview



The “BIG” Questions

- ❑ What system- The right choice
 - ❑ How BIG- Sizing
 - ❑ Where should/ can it go
 - ❑ Only Designer can change the design
- 

Permit Requirements

Site Evaluation and Design

Two sites

Maintenance plan [access]

- **Recommended** limit = 100 feet of horizontal distance (hose) and 25 feet of vertical distance (lift of vacuum)

As built

Certified statement(s)



What System?

Function of site

- Home
- Commercial kitchen

Limiting condition

- Saturated soil
- Bedrock

System choice

- Cost
- Size [fit]
- Feelings
- Newer technology



Limiting Conditions: No Treatment

Bedrock

Saturated Soil

- Water
- Soil color

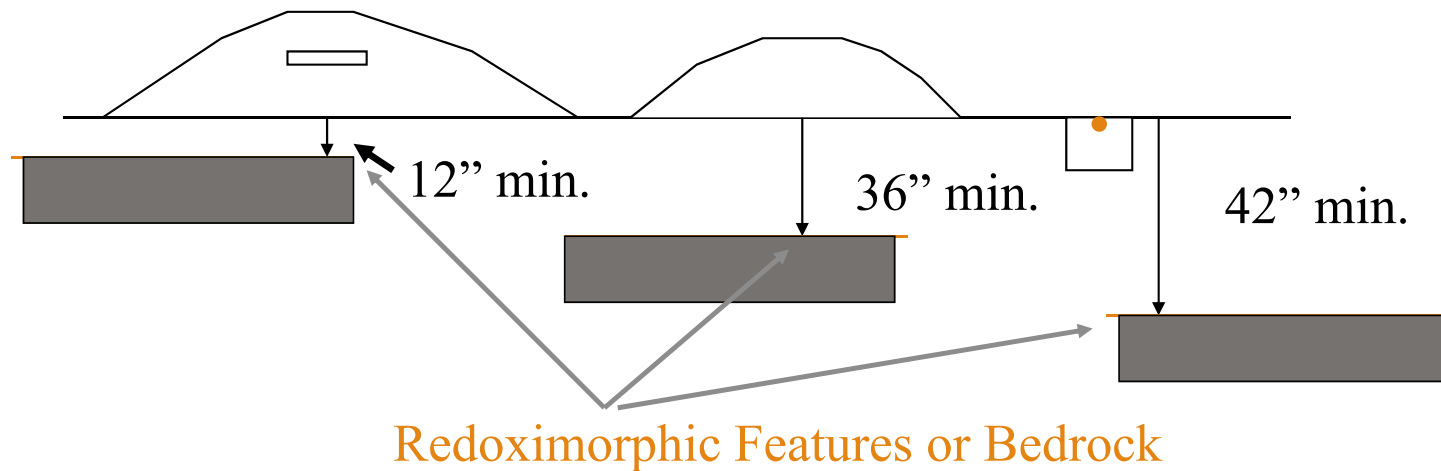
Other

- Nutrients
- Damaged soil



Vertical Separation

36" from bottom of distribution medium



Type I systems

System Choice

- Separation ~ “Good Soil”
- System Selection process
- Good Soil – 36” = Available treatment
- Available treatment is > 6 ”: Inground System
- Available treatment is 0 to 6”: Atgrade System
- Available treatment is < 0 ”: Mound System System

Negative answer is Sand depth

What if I do not have 3 Feet?

No Treatment



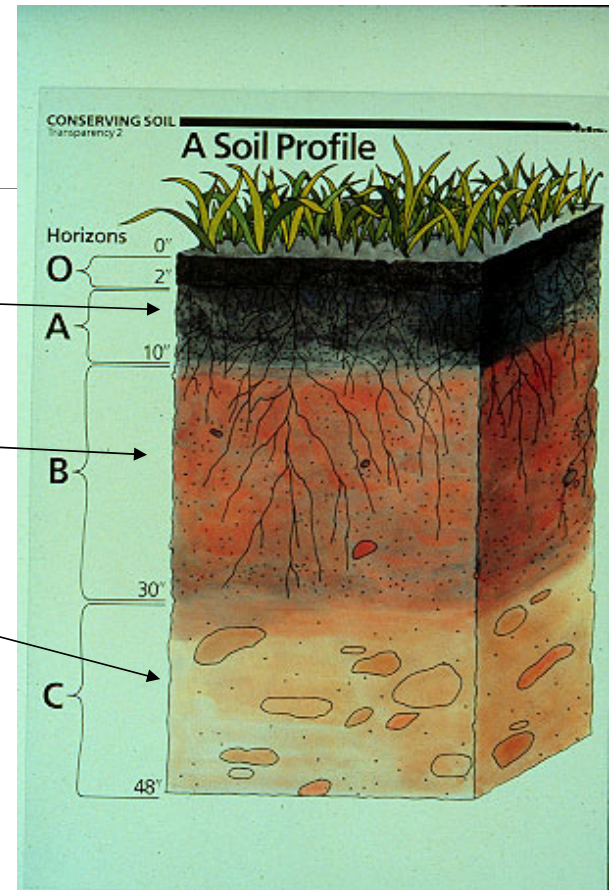
Layers- Horizons

Topsoil

Subsoil

Parent material

**All horizons
together is called a
profile**



Soil description

Layers [Horizons]

Color

Texture

Structure

Limiting Conditions

- Saturated Soil
- Bedrock
- Other



Form

OSTP Soil Observation Log

Project ID:

v 05.13.14



Client/ Address:		Sue Butter			Legal Description/ GPS:		Till 20146			
Soil parent material(s): (Check all that apply) <input type="checkbox"/> Outwash <input type="checkbox"/> Lacustrine <input type="checkbox"/> Loess <input checked="" type="checkbox"/> Till <input type="checkbox"/> Alluvium <input type="checkbox"/> Bedrock <input type="checkbox"/> Organic Matter										
Landscape Position: (check one) <input type="checkbox"/> Summit <input checked="" type="checkbox"/> Shoulder <input type="checkbox"/> Back/Side Slope <input type="checkbox"/> Foot Slope <input type="checkbox"/> Toe Slope Slope shape										
Vegetation		Grass		Soil survey map units		335		Slope%		
						4.0		Elevation:		
								92'		
Weather Conditions/Time of Day:			Sunny/ 10:20 am				Date		08/14/14	
Observation #/Location:			Pit #3/ N Corner of Site				Observation Type:		Soil Pit	
Depth (in)	Texture	Rock Frag. %	Matrix Color(s)	Mottle Color(s)	Redox Kind(s)	Indicator(s)	I----- Structure-----I			
							Shape	Grade	Consistence	
0-8	Loam	2%	10YR 2/1	NA	NA	NA	Granular	Moderate	Loose	
8-18	Silt Loam	4%	10YR 3/2	NA	NA	NA	Blocky	Moderate	Loose	
18-56	Silt Loam	7%	10YR 4/4	None	NA	NA	Blocky	Moderate	Loose	
56-66	Clay Loam	15%	10YR 4/3	7.5YR 4/6	Concentrations	S1	Blocky	Weak	Loose	
66-72	Sandy Clay	22%	10YR 5/2	10YR 4/8	Gray Matrix	S1, S2	Massive	Structureless	Loose	
Comments										
I hereby certify that I have completed this work in accordance with all applicable ordinances, rules and laws.										
Tinker Onsite				L 8			8/14/2014			
(Designer/Inspector)				(Signature)			(License #)			

Soil Color: Identifying Saturation

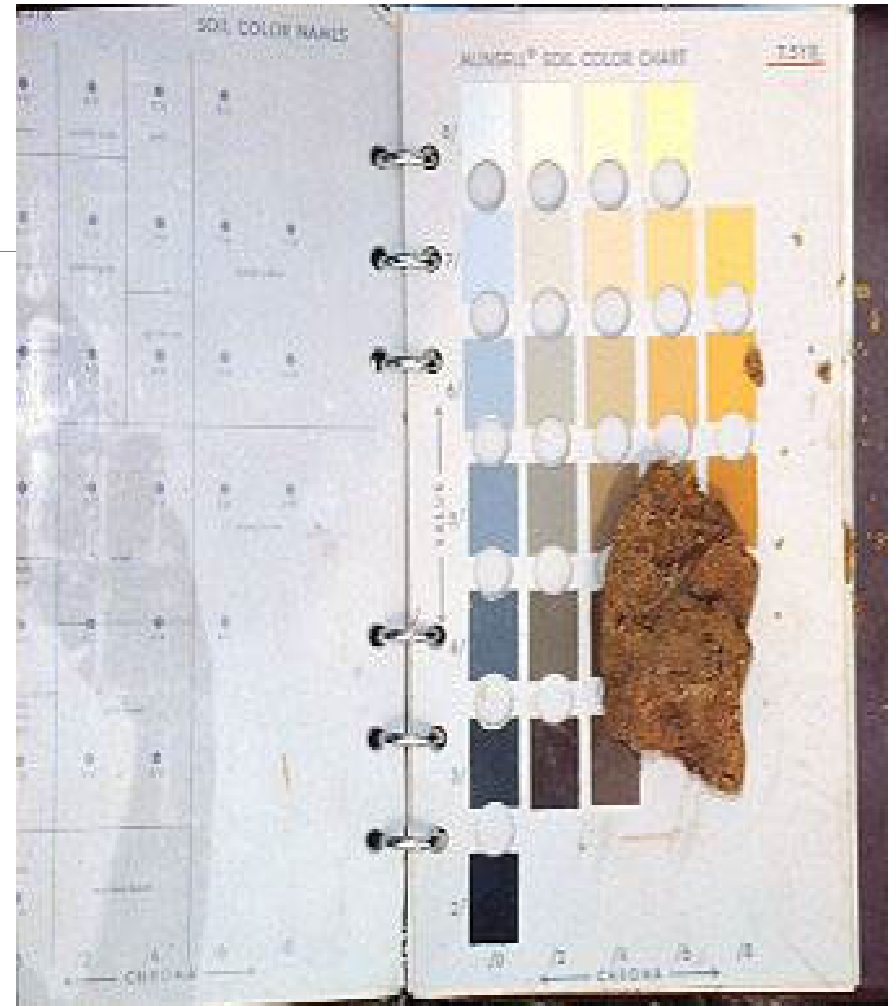




Color identifies Saturation
Separation = Treatment



Munsell color book
Standardizes colors
OK if color blind
Need good sunlight
NO Sunglasses



When is soil saturated?

Redoximorphic Features

Gray is Wet

- All iron has left (very wet)

Gray with red Mottles are Wet

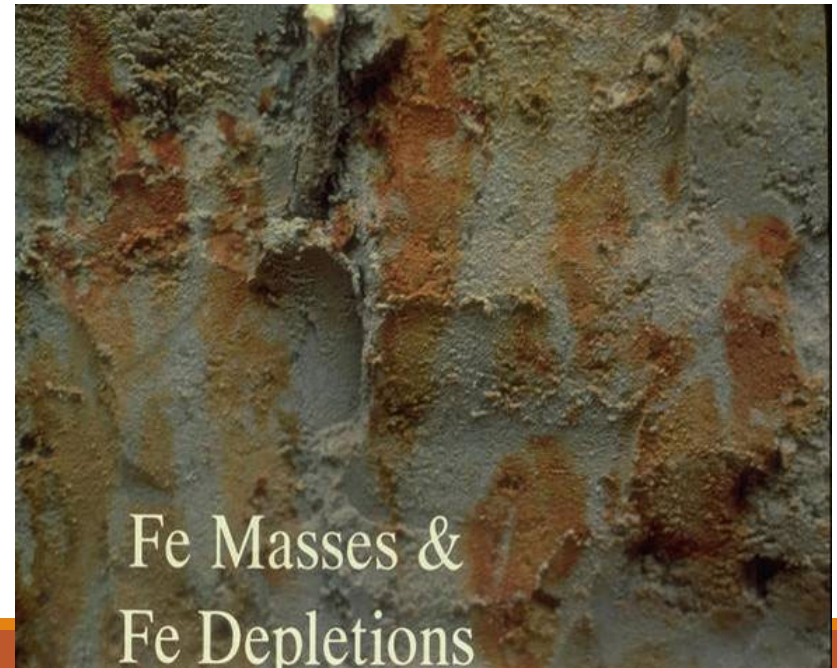
- Iron has started to move around due to seasonal saturation

Black tells you nothing because of organic staining



Redox Features

Iron is free to move wherever the soil water is moving causing it to **accumulate** in certain parts of the soil and **leave** other parts changing the way the soil looks



MOUNDS

Type I Mound must have 12" of natural soil

- This is to make sure the sewage soaks into the ground
- Be careful of Wetlands [$< 12''$ of Separation]
- Not need for treatment

Organic loading

How big?

Flow

Soil

- Texture
- Structure

Biomat

Soil- Air



What is Soil?

Particles- Texture

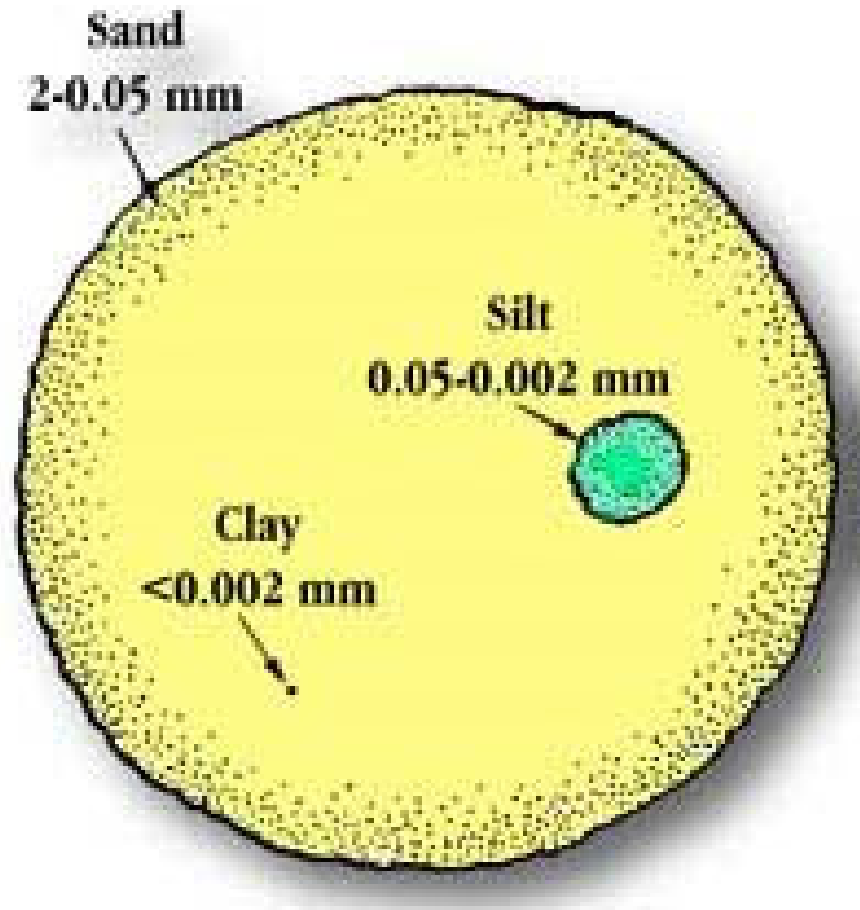
- % Sand - % Silt - % Clay

Pores: Air & Water

Structure

Surface Area [Treatment]

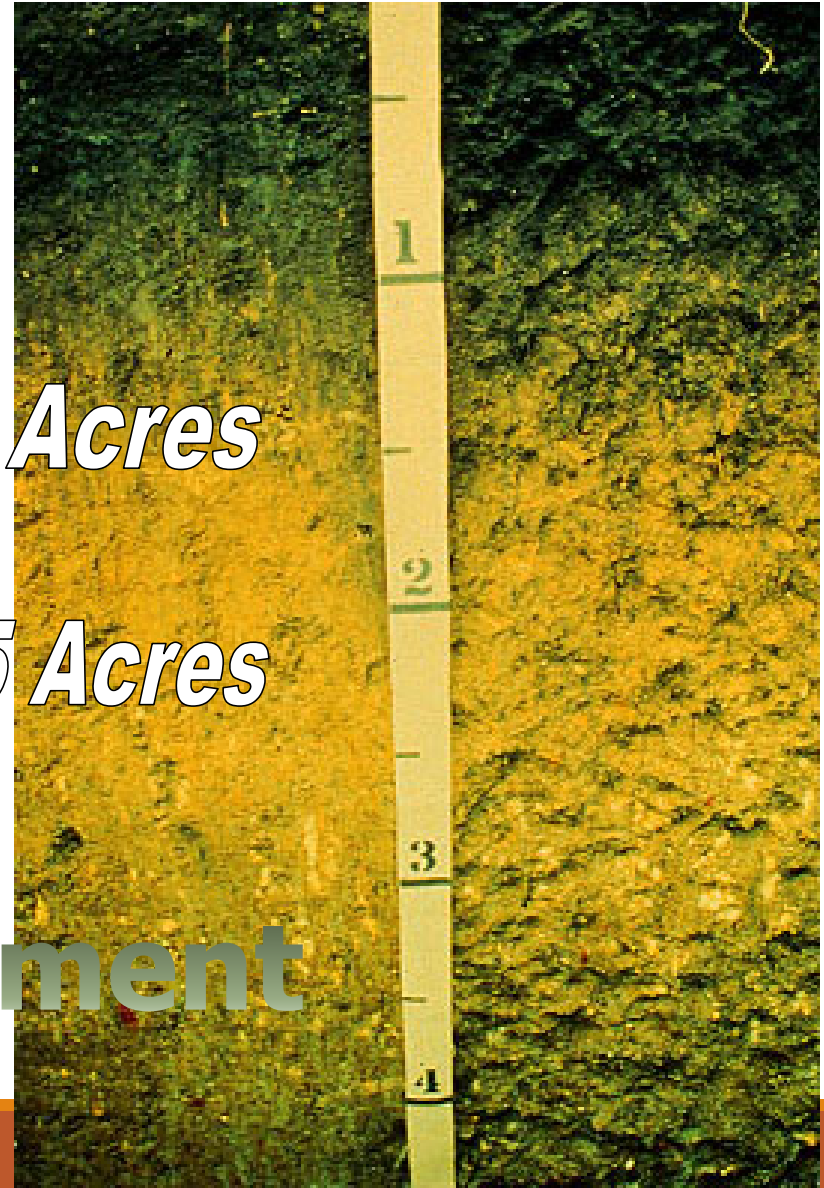
- Sand-[Less], water moves faster
- Clay-[More], water moves slower

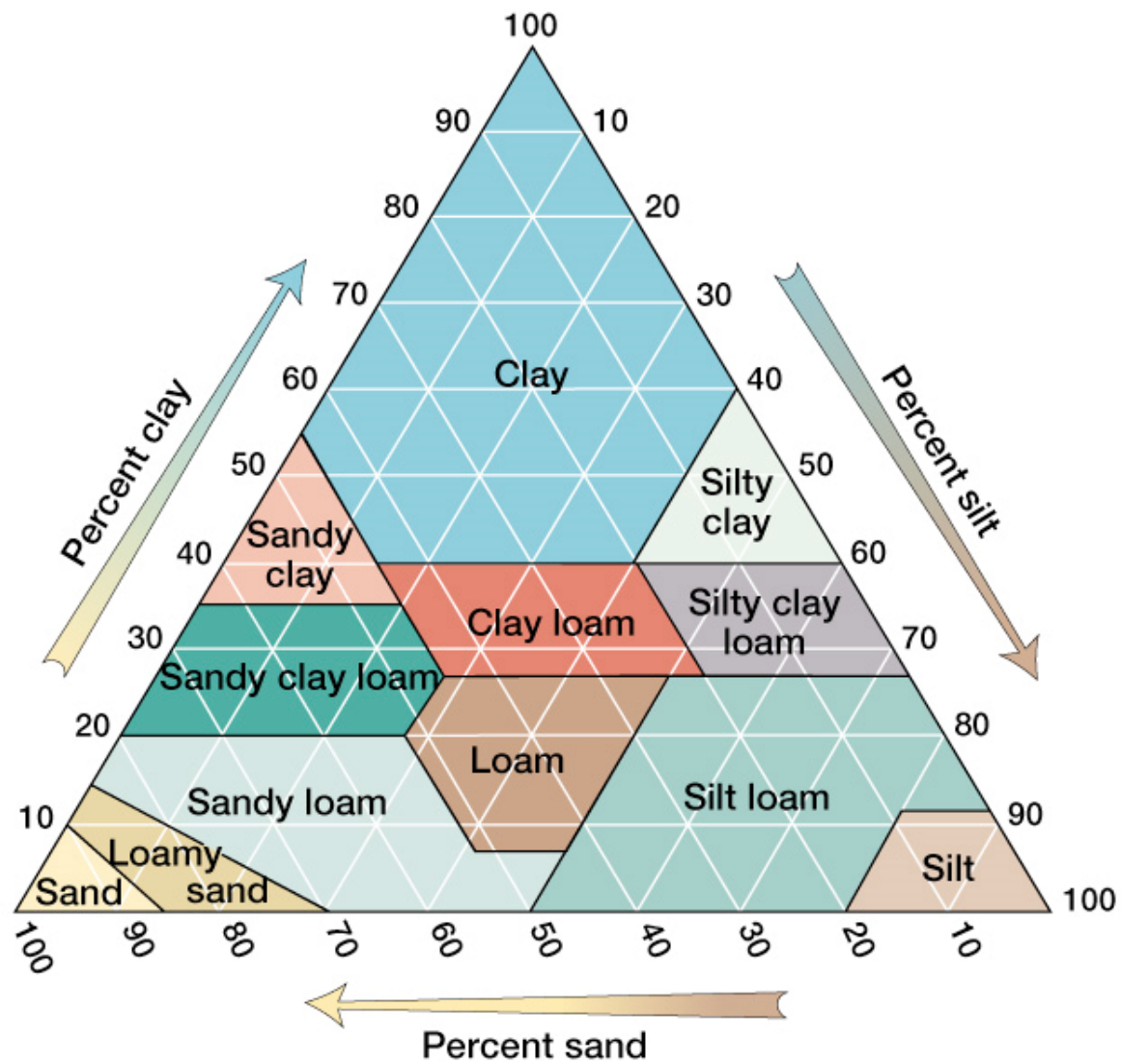


1 Pound Sandy Soil= 3 Acres

1 Pound Loamy Soil= 15 Acres

Sand ~ Less treatment





Texture

Methods

- Hands
- Lab
- Perc Test



Soil Structure

How the soil is glued together

Increases

- porosity
- pore size
- Interconnectivity
- percolation rate



Structure the KEY to Movement



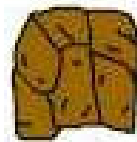
Structure Shape

Granular

Platy

Blocky

Prismatic

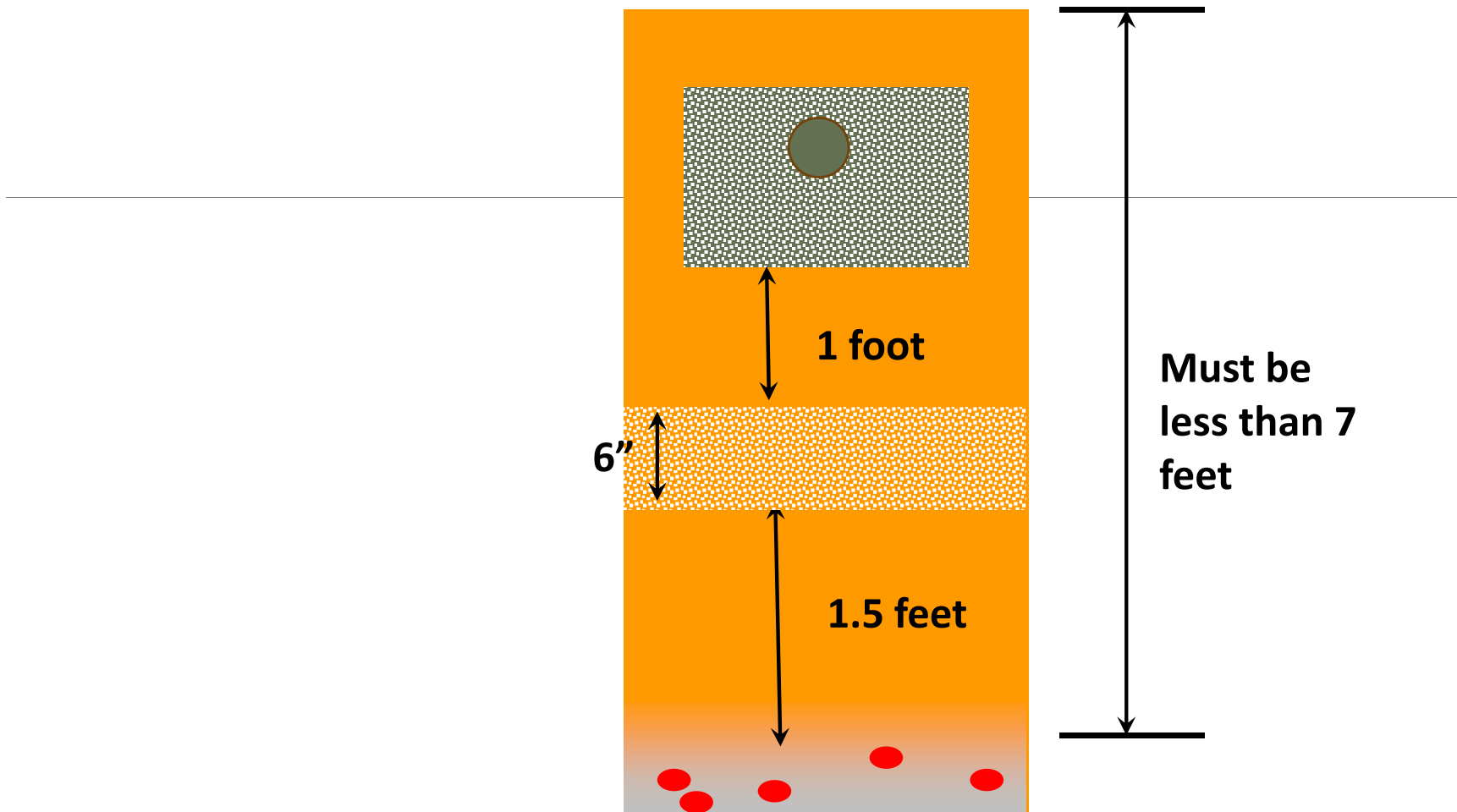


Massive
Slows water
Movement

A horizontal, elongated, brown soil plate.

Platy

Single grain: Sand





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PERCOLATION TEST

Not required in 7080, some LGUs do

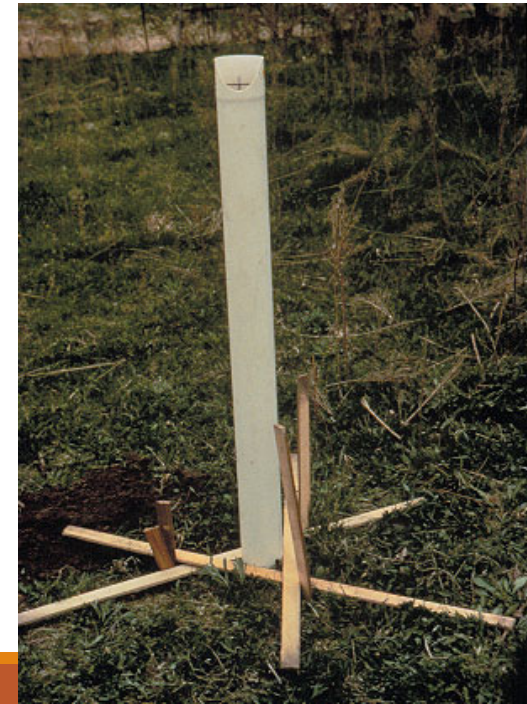
Location

Method

Number

Reporting

Problems



8 inch hole



Soak hole

Unless Sandy

12" depth

Manual: Auto

Soak

- 4 hours

Saturate

- 16-30 hours



Run Test

Fill to 8" above soil

Time- Minutes

Drop- Inches

- 1/16" accuracy

Perc rate = $\text{Time} \div \text{Drop}$

- Minutes per inch ~ MPI

Report findings



Where it goes?

Placement

- Soil Color
 - Depth
- Soil texture
 - Size
- Contours

Location

- *On property*
- *Meeting all setbacks*



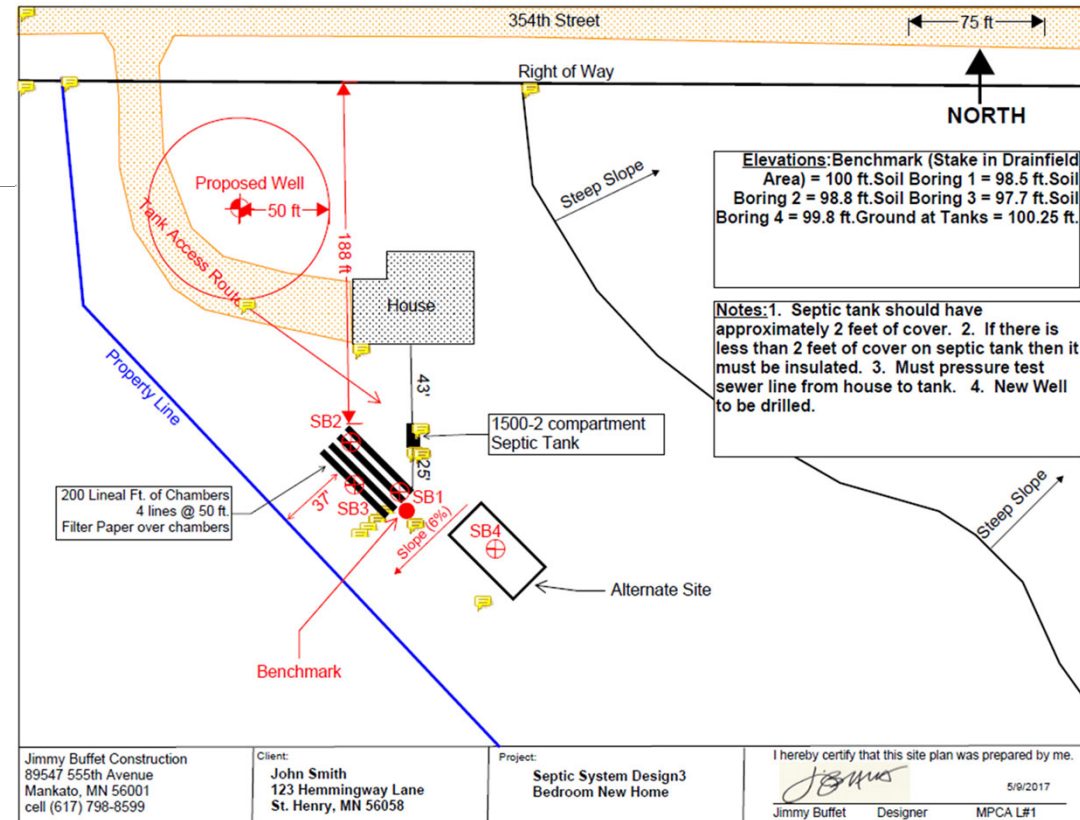
Location

Setbacks

- Well
- Building
- Property line

Site Requirements

- Follows the contours
- Fits on the property



Jimmy Buffet Construction
89547 555th Avenue
Mankato, MN 56001
cell (617) 798-8599

Client:
John Smith
123 Hemmingway Lane
St. Henry, MN 56058

Project:
Septic System Design3
Bedroom New Home

I hereby certify that this site plan was prepared by me.

Jimmy Buffet
Jimmy Buffet Designer MPCA L#1
5/9/2017

Design Process

1. Preliminary evaluation

What happens before visiting the SITE

Homeowner and basic site information

Check if a permit file exists

Soil Survey

A solid orange horizontal bar spanning the width of the slide, located at the bottom.

Home owner Information

Address

Home Size

Water Use

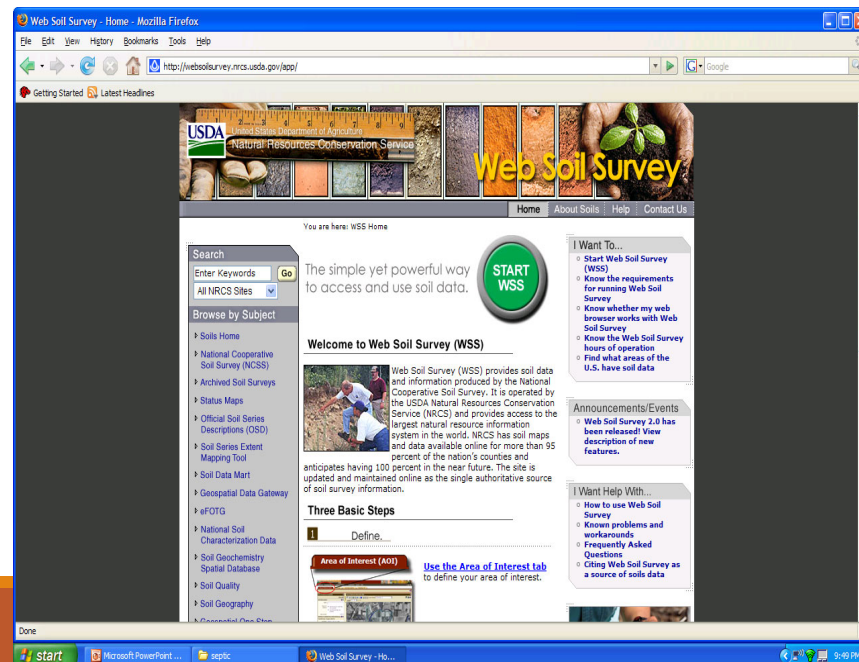
Garbage Disposal

Well Information



SOIL SURVEY {on the WEB}

Good estimation of broad soil properties
(some better than others)



Design Process

2. Field Work

- Landscape and vegetation evaluation
- Soil investigation
- Determining appropriate system
- General layout
- Report



LANDSCAPE “Observation”

- ☐ Location on Slope
- ☐ Contours
- ☐ Water Movement



VEGETATION “Observation”

☐ Wetlands

☐ Trees



Soils Observation



System Layout

- Flow Diagram
- Contours
- Setbacks
 - Property lines

Report Keys

- ☐ Soil Description with Hydraulic loading rate
 - ☐ Elevation of System
 - ☐ Layout of system on contours
- 