SOILS AND PLAN REVIEW

WCCA Fall Conference – October 2023

OBJECTIVES

- How do we review a soil report?
- How does this match up with the proposed plan?
- Discuss report examples
- Open Discussion

What is the soil and site telling you?

The role of the soil tester is to

FIND THE STORY

AND REPORT IT TO OTHERS

We are not just describing the soil but also applying it and relating it to the task at hand

SOIL EVALUATION REPORT

SPS 385
Soil and Site Evaluations

Wisconsin Department of Safety and Professional Services
Division of Industry Services

Page _____ of _____

SOIL EVALUATION REPORT

In accordance with SPS 385, Wis. Adm. Code

Attach complete site plan on paper not less than 8 1/2 x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direction and percent slope, scale or dimensions, north arrow, and location and distance to nearest road.

Please print all information.

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County

Parcel I.D.

Reviewed by | Date

Property Owner

Property Location
Govt. Lot ¼ ¼ S T N R ☐ E (or) ☐ W

Property Owner's Mailing Address

Lot # | Block # | Subd. Name or CSM#

City | State | Zip Code | Phone Number ( )

☐ City ☐ Village ☐ Town | Nearest Road

☐ New Construction ☐ Replacement

Use: ☐ Residential / Number of bedrooms _____ Code derived design flow rate _____ GPD

☐ Public or commercial – Describe: _____

Parent material _____ Flood Plan elevation if applicable _____ ft.

General comments and recommendations:

☐ Boring # ☐ Boring ☐ Pit Ground surface elev. _____ ft. Depth to limiting factor _____ in.

Horizon	Depth In.	Dominant Color Munsell	Redox Description Qu. Az. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/Ft² *Eff#1	*Eff#2

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OTHER RESOURCES

Web Soil Survey
- Soil Descriptions

Surface Water Viewer
- Wetlands
- Floodplains

County GIS Site
- Recent aerials
- Contours (have they changed)
- Parcel lines

Historical Aerials

WEB SOIL SURVEY

ANTIGO SERIES

The Antigo series consists of very deep, well drained soils formed in 50 to 100 centimeters of loess or silty alluvium and in loamy alluvium and in the underlying stratified sandy outwash. These soils are on outwash plains, stream terraces, eskers, kames, glacial lake plains, and moraines. Slope ranges from 0 to 30 percent. Mean annual precipitation is about 810 millimeters. Mean annual air temperature is about 5 degrees C.

TAXONOMIC CLASS: Coarse-loamy over sandy or sandy-skeletal, mixed, superactive, frigid Haplic Glossudalfs

TYPICAL PEDON: Antigo silt loam, on a plane slope of less than 1 percent, in a cultivated field, at an elevation of about 463 meters above sea level. (Colors are for moist soil unless otherwise stated.)

Ap--0 to 23 centimeters; dark grayish brown (10YR 4/2) silt loam, light brownish gray (10YR 6/2) dry; weak fine subangular blocky structure; very friable; many fine roots; about 6 percent gravel and 2 percent cobbles; pH 6.8; abrupt smooth boundary.

E--23 to 30 centimeters; brown (10YR 5/3) silt loam, very pale brown (10YR 7/3) dry; weak thin platy structure; very friable; common fine roots; about 1 percent gravel and 1 percent cobbles; pH 6.1; clear wavy boundary.

B/E--30 to 48 centimeters; about 70 percent dark yellowish brown (10YR 4/4) silt loam (Bt); moderate very fine angular blocky structure; friable; few distinct brown (7.5YR 4/4) clay films on faces of peds; penetrated by brown (10YR 5/3) silt loam (E), very pale brown (10YR 7/3) dry; weak thin platy structure; very friable; common fine roots; pH 4.9; clear irregular boundary.

Bt1--48 to 71 centimeters; dark yellowish brown (10YR 4/4) silt loam; moderate fine angular blocky structure; friable; common fine roots; common distinct brown (7.5YR 4/4) clay films on faces of peds; common coats of pale brown (10YR 6/3) clean silt and very fine sand grains on vertical faces of peds; about 1 percent gravel and cobbles; pH 4.5; abrupt wavy boundary.

2Bt2--71 to 79 centimeters; brown (7.5YR 4/4) loam; moderate medium subangular blocky structure; friable; common fine roots; common prominent dark reddish brown (5YR 3/4) clay films on faces of peds and in pores; common coatings of pale brown (10YR 6/3) clean silt and sand grains primarily on vertical faces of peds; about 11 percent gravel and 2 percent cobbles; pH 4.4; abrupt wavy boundary.

2Bt3--79 to 84 centimeters; brown (7.5YR 4/4) very gravelly sandy loam; weak coarse subangular blocky structure; friable; few fine roots; few distinct dark reddish brown (5YR 3/4) clay bridges between mineral grains; about 34 percent gravel and 2 percent cobbles; pH 4.5; abrupt wavy boundary.

3C--84 to 152 centimeters; brown (7.5YR 5/4) stratified sand and gravelly sand; single grain; loose; about 16 percent gravel and 2 percent cobbles; few fine roots; pH 5.1.

STANDARDS

Checklist?

CHECKLIST FOR CERTIFIED SOIL TESTS

Submit the Following Originals (Use Permanent Ink):

- ☐ Soil Evaluation Report (SBD-8330 R. 04/15)
- ☐ Plot Plan
- ☐ Review Form (Crew file sheet, system elevation sheet) optional
- ☐ Copies of Additional Information (Tax Statement, CSM, Deed) optional
- ☐ Fee

Soil Evaluation Report: (Include the Following Information)

- ☐ Parcel Identification Number
- ☐ Property Owner's Information
- ☐ Property Location (Sec./Twp./Range, Lot #, Block #, CSM #)
- ☐ Fire Number and Nearest Road
- ☐ Floodplain Elevation, Flow Rate, Parent Material
- ☐ Proposed System elevation and system type
- ☐ Complete Soil Boring Information including loading rates
- ☐ Soils must be described accurately, including rock fragments, mottling, groundwater, bedrock or disturbed soil
- ☐ Soils must be described to at least three feet below the system elevation or more for sand with rock fragments of >35% (Table 383.44-3)
- ☐ Date Soil Evaluation was conducted
- ☐ CST Name, Signature, Number, Address and Phone Number

Plot Plan: (Include the Following Information Drawn to Dimension or to Scale)

- ☐ North arrow, scale size, legend
- ☐ CST, owner and property information
- ☐ Bench Mark (Description and Location)
- ☐ Contour Lines (Example = 98.0'/96.0'/94.0')
- ☐ Borings (Locations and Elevations)
- ☐ Percent and Direction of Land Slope
- ☐ Well Location (Including Neighboring Wells, If Applicable)
- ☐ Location of Wetland Areas, Floodplain and Navigable Waters
- ☐ Buildings, Driveways and Structures (Locations and Descriptions)
- ☐ Location of Property Lines
- ☐ Existing System Location
- ☐ Fire Number and Road Name
- ☐ Current Surface Elevation of Adjacent Navigable Waters

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☐ Replacement ☐ Public or commercial – Describe: ____
Parent material ____ Flood Plan elevation if applicable ____ ft.
General comments and recommendations:

☐ New Construction
☒ Replacement

Use: ☒ Residential / Number of bedrooms 4 Addition to existing building ____
☐ Public or commercial - Describe: ____

Code derived daily flow 600 gpd

Recommended design loading rate .7 bed, gpd/ft² .8 trench, gpd/ft²

Absorption area required 858 bed, ft² 750 trench, ft²

Maximum design loading rate .7 bed, gpd/ft² .8 trench, gpd/ft²

Recommended infiltration surface elevation(s) 939.2' ft (as referred to site plan benchmark)

Additional design/site considerations (2) trenches - High capacity Infiltrator Units

Parent material Glacial Outwash Flood plain elevation, if applicable N/A ft

S = Suitable for system U = Unsuitable for system	Conventional	Mound	In-Ground Pressure	AT-Grade	System in Fill	Holding Tank
	☒ S ☐ U	☒ S ☐ U	☒ S ☐ U	☒ S ☐ U	☒ S ☐ U	☐ S ☒ U

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COLOR

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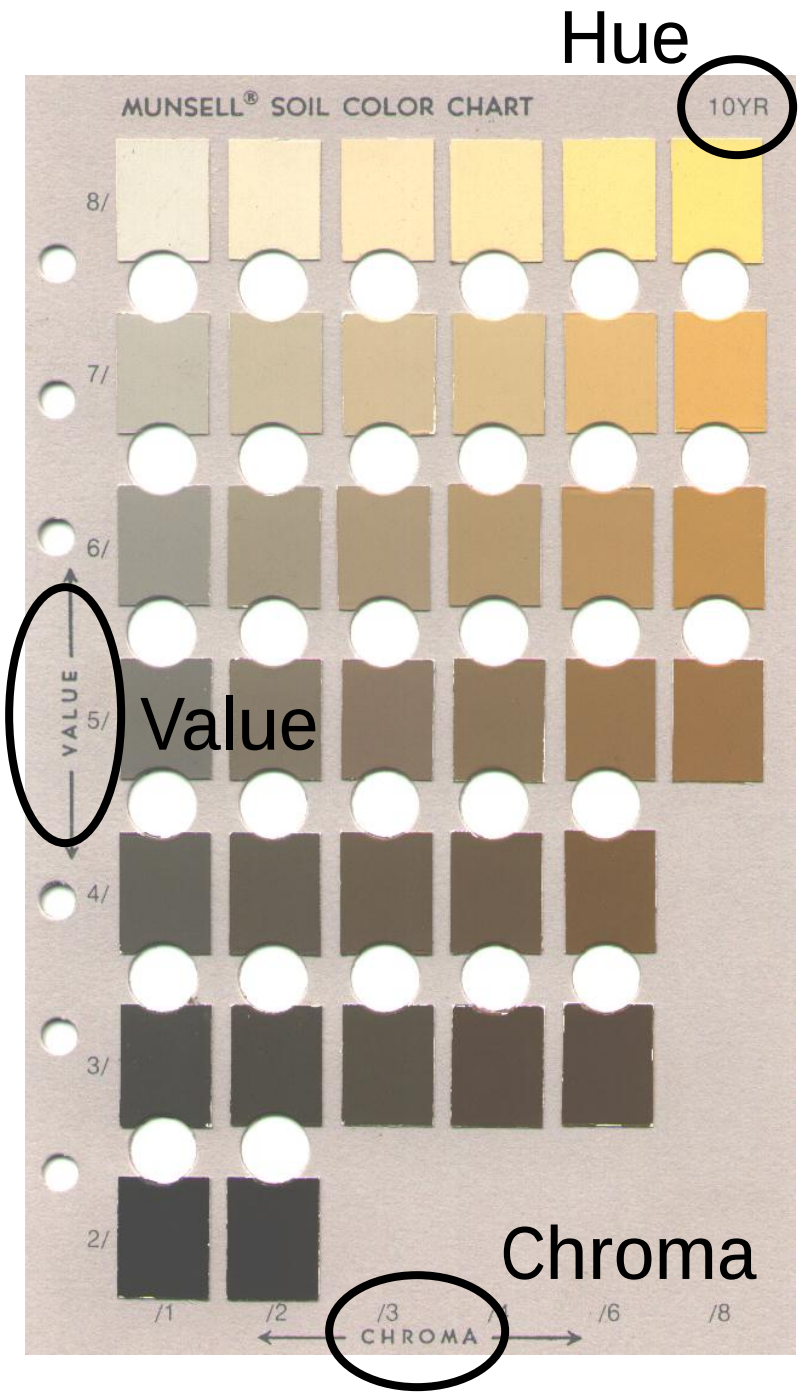
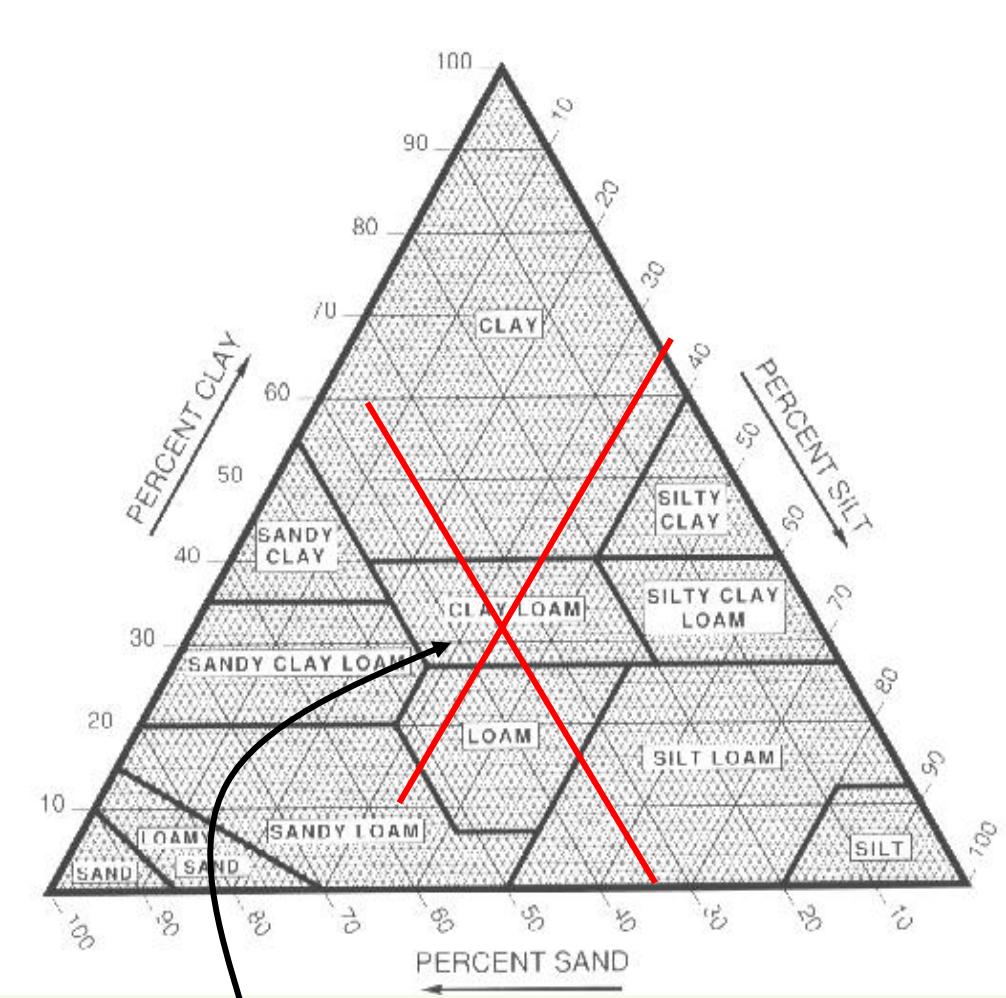
COLOR

- Munsell Soil Color Charts - use <u>moist samples</u>
- Report Hue, Value and Chroma in order (e.g. 10YR 4/4)
- Surface coatings impart color
  - Black - organic matter
  - Red, brown, yellow - different iron oxides
  - Gray - lack of OM and Fe
- An A horizon is defined as a soil horizon distinguished by it's dark color because of the accumulation of organic material.



TEXTURE

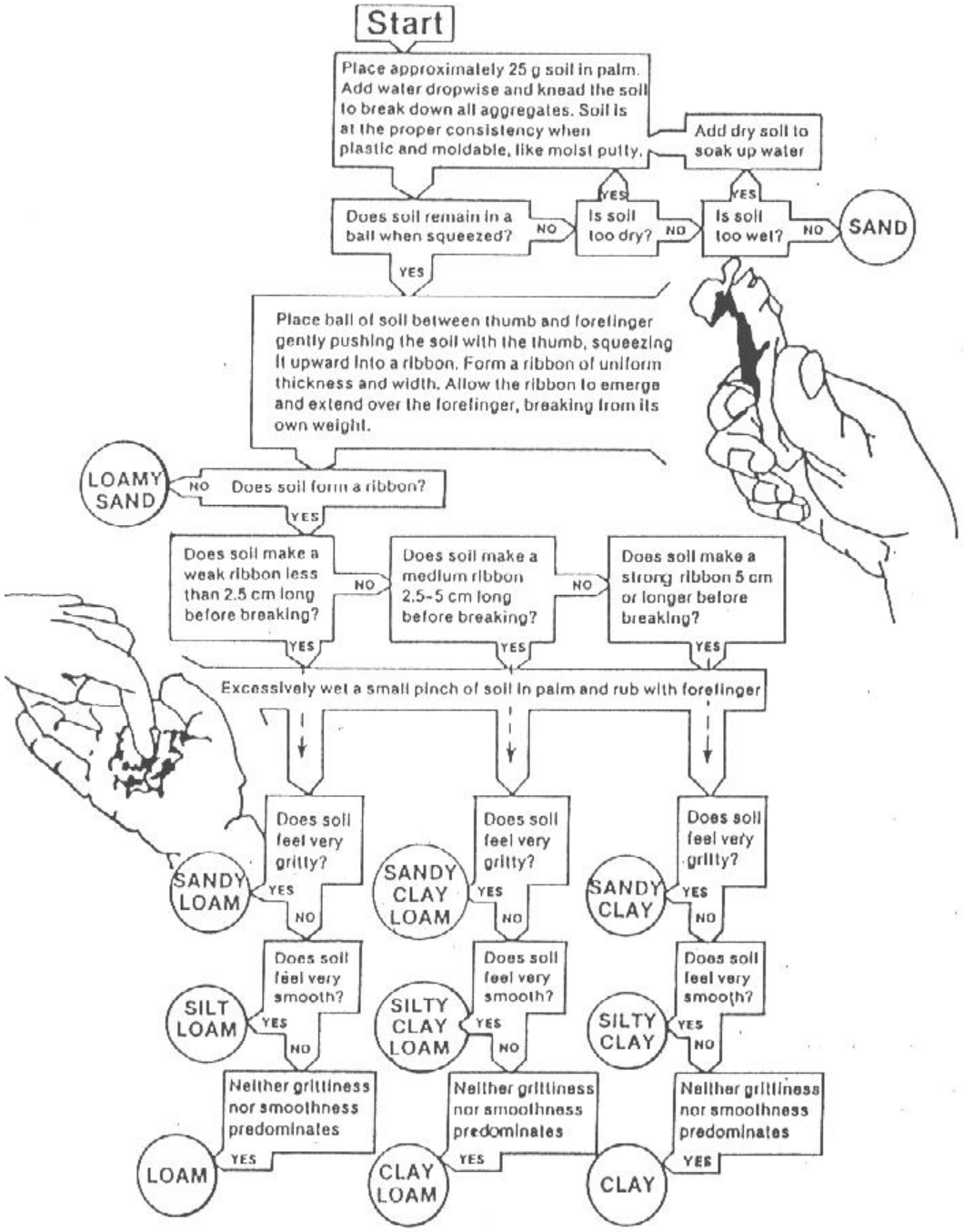


clay loam = 35% sand, 35% silt, and 30 % clay

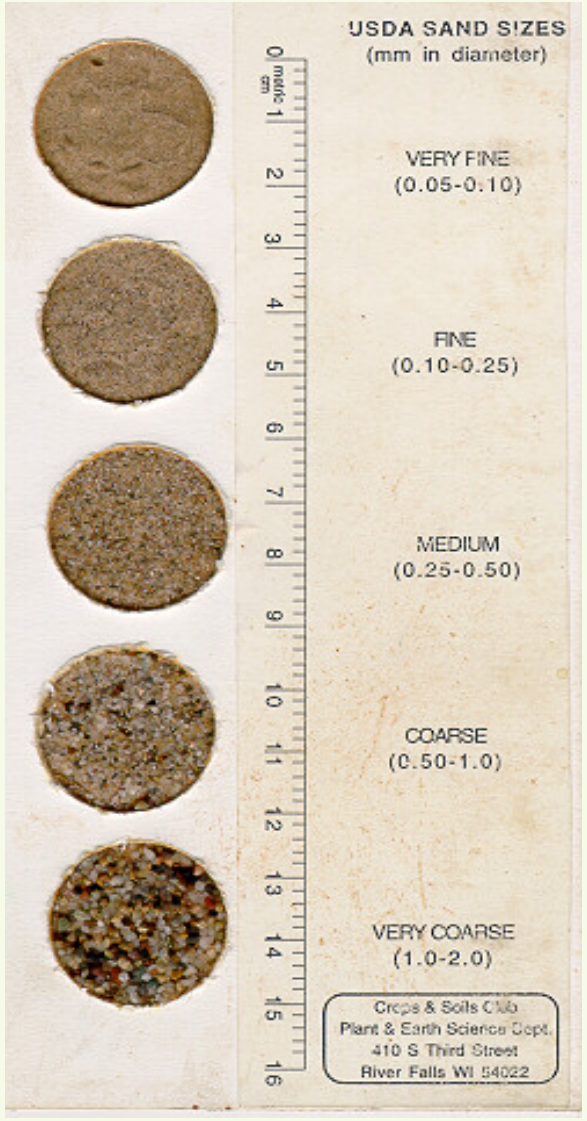
- **Defined:** Texture is the relative proportion (%) of the different soil separates in a given sample.
- Soil separates include sand, silt and clay size particles.
- 12 basic textural classes on the textural triangle.
  - Don't make up classes
  - Use texture modifiers
    - Very gravelly sand
    - Extremely cobbly sand
  - Use textural subclasses
    - Coarse sand
    - Coarse sandy loam

TEXTURE

Field determination of soil texture is by feel



TEXTURE



Rock Fragments

- Non-soil fragments over 2mm in diameter
- Coarse fragments decrease water holding capacity (treatment)

Rock Fragment Size & Content

Fragment	(mm) dia.	(in)	Modifer Term
Gravel	**2-75**	**0.08-3**	**GR (gravelly)**
Cobble	**75-250**	**3-10**	**COB (cobbly)**
Stone	**250-600**	**10-24**	**ST (stony)**
Boulder	**>600**	**>24**	**BY (bouldery)**

• <15%	texture only	S	S
• 15-35%	modifier term	GRS	COBS
• 35-60%	modifier + very	GRVS	COBVS
• 60-90%	modifier + extremely	GRXS	COBXS
• >90%	modifier term only	GR	COB

Soils Abbreviations Used By Certified Soil Testers

USDA Texture, Modifiers, and Terms Used in Lieu of Texture[1]

Texture modifiers		Texture terms		Terms used in lieu of texture	
BY	Bouldery	COS	Coarse sand	CE	Coprogenous earth
BYV	Very bouldery	S	Sand	CEM	Cemented
BYX	Extremely bouldery	FS	Fine sand	CIND	Cinders
CB	Cobbly	VFS	Very fine sand	DE	Diatomaceous earth
CBA	Angular cobbly	LCOS	Loamy coarse sand	FB	Fibric material
CBV	Very cobbly	LS	Loamy sand	FRAG	Fragmental material
CBX	Extremely cobbly	LFS	Loamy fine sand	G	Gravel
CN	Channery	LVFS	Loamy very fine sand	GYP	Gypsiferous material
CNV	Very channery	COSL	Coarse sandy loam	HM	Hemic material
CNX	Extremely channery	SL	Sandy loam	ICE	Ice or frozen soil
FL	Flaggy	FSL	Fine sandy loam	IND	Indurated
FLV	Very flaggy	VFSL	Very fine sandy loam	MARL	Marl
FLX	Extremely flaggy	L	Loam	MPT	Mucky-peat
GR	Gravelly	SIL	Silt loam	MUCK	Muck
GRC	Coarse gravelly	SI	Silt	PEAT	Peat
GRF	Fine gravelly	SCL	Sandy clay loam	SG	Sand and gravel
GRV	Very gravelly	CL	Clay loam	SP	Sapric material
GRX	Extremely gravelly	SICL	Silty clay loam	UWB	Unweathered bedrock
MK	Mucky	SC	Sandy clay	VAR	Variable
PT	Peaty	SIC	Silty clay	WB	Weathered bedrock
RB	Rubbly	C	Clay		
SR	Stratified				
ST	Stony				
STV	Very stony				
STX	Extremely stony				

[1] National Soil Survey Interpretations Handbook, Draft, 1992, p. 80.

STRUCTURE

- Soil structure is the arrangement of individual particles of sand, silt, and clay into aggregates or clusters called peds.
- Peds are classified based on degree of distinctness, size, and shape.
- Abbreviation: 2msbk = moderate, medium, subangular blocky
- Structure is the result of many processes
  - Freeze/thaw cycles
  - Chemical processes of organic material and clays that act as binding agents
  - Earthworms
  - Plant roots
- Compaction destroys the structure

STRUCTURE

- Distinctness (Grade)
  - Weak, moderate, strong
- Size - Very fine, fine, medium, coarse, very coarse (use chart)
- Shape (Type)
  - Granular
  - Blocky
  - Prismatic
  - Platy
- Structureless
  - Non aggregated soil is termed structureless.
  - Single grained
    - Loose sand - No peds
  - Massive

Ped Shapes:

granular
(only in a surface horizon)

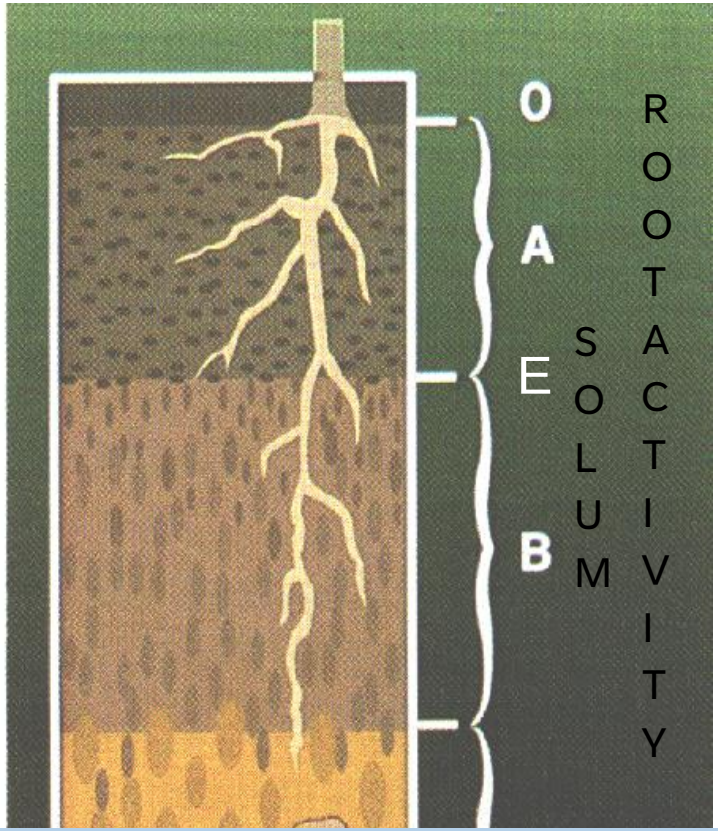
platy
(typically just beneath a surface horizon; not in a “C” horizon)

blocky
(typically in an upper “B” horizon)

prismatic
(typically in a lower “B” horizon)

NOTE: Peds are pedogenic features and will thus be absent beneath the solum.

Master Horizons



O = Organic horizon

A = Organically enriched mineral horizon

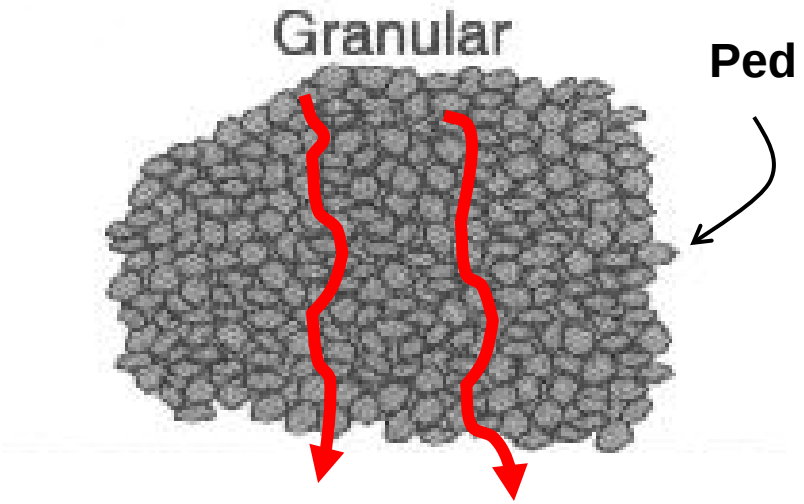
E = Mineral horizon of eluviation

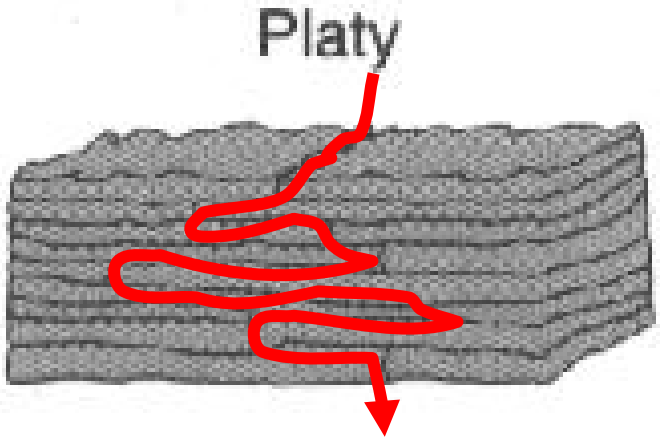
B = Mineral illuvial horizon formed below an A, E, or O horizon (subsoil)

SOIL SOLUM

- The upper layers of the soil profile that are affected by climate
- The solum generally has structure
- Below the solum is the parent material and not affected by soil genesis – which means there is no structure (massive or single grain)

STRUCTURE



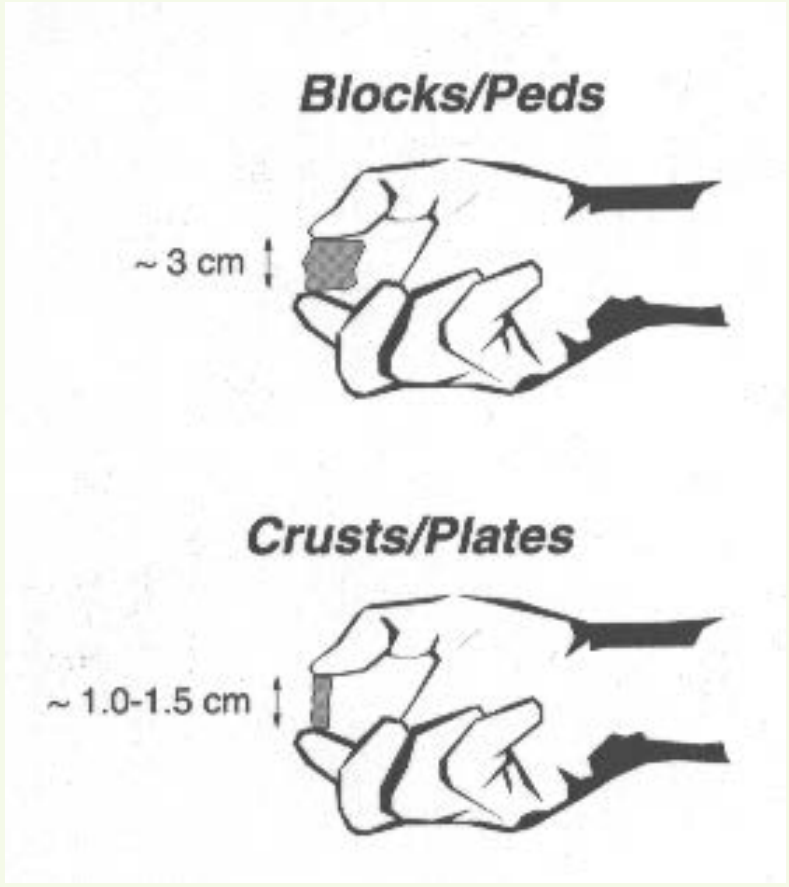


- Water movement
  - Granular and single grain
    - Fast
  - Blocky and prismatic
    - Moderate
  - Platy and massive
    - Slow


Field Margins
(not plowed in 30+ years)
Tilled Field
(history of field corn
and currently vegetables)

CONSISTENCE

Soil density affects water movement – smaller pores = slower water movement



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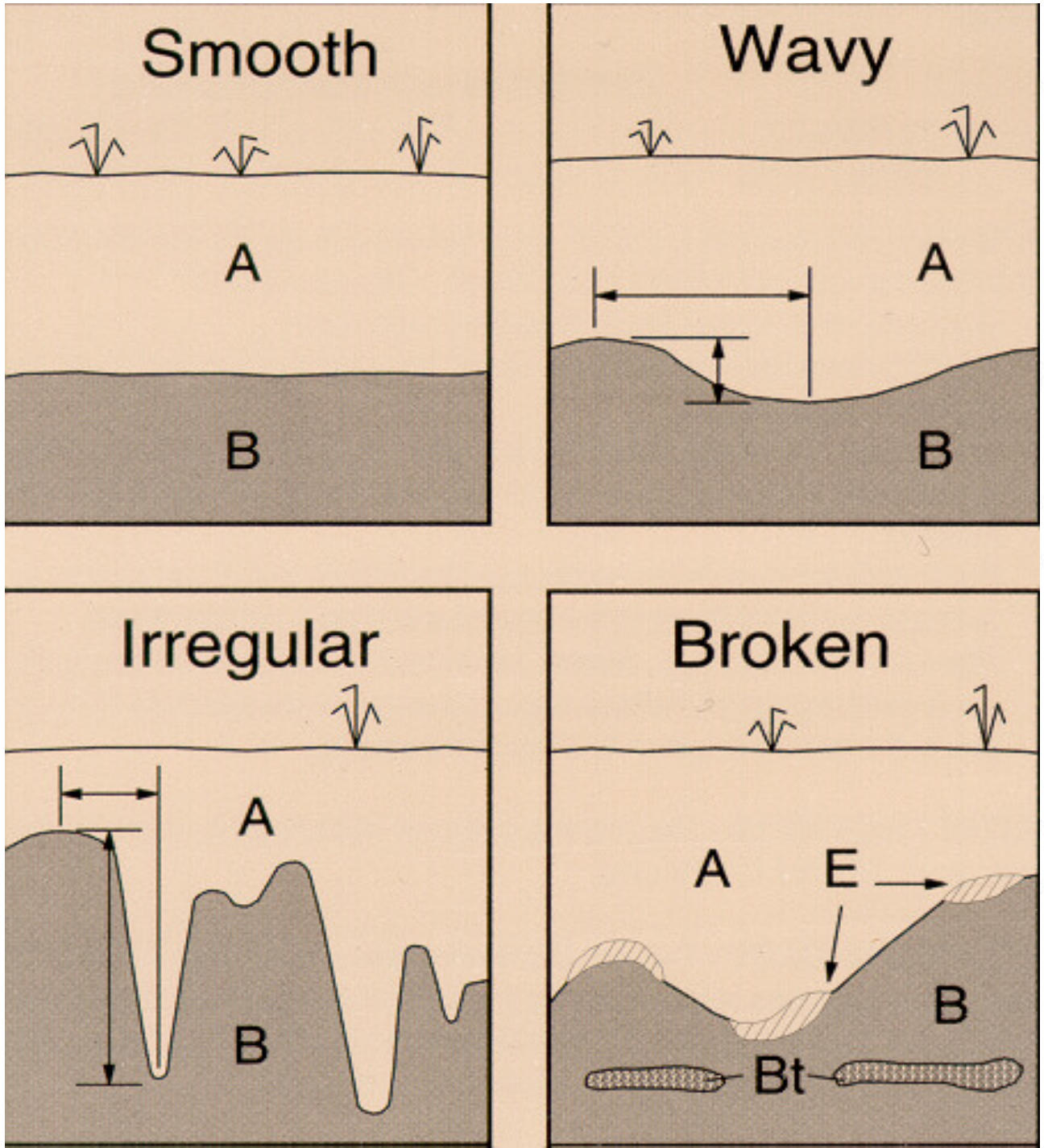
BOUNDARY



Good Soil

Compact Soil

ces

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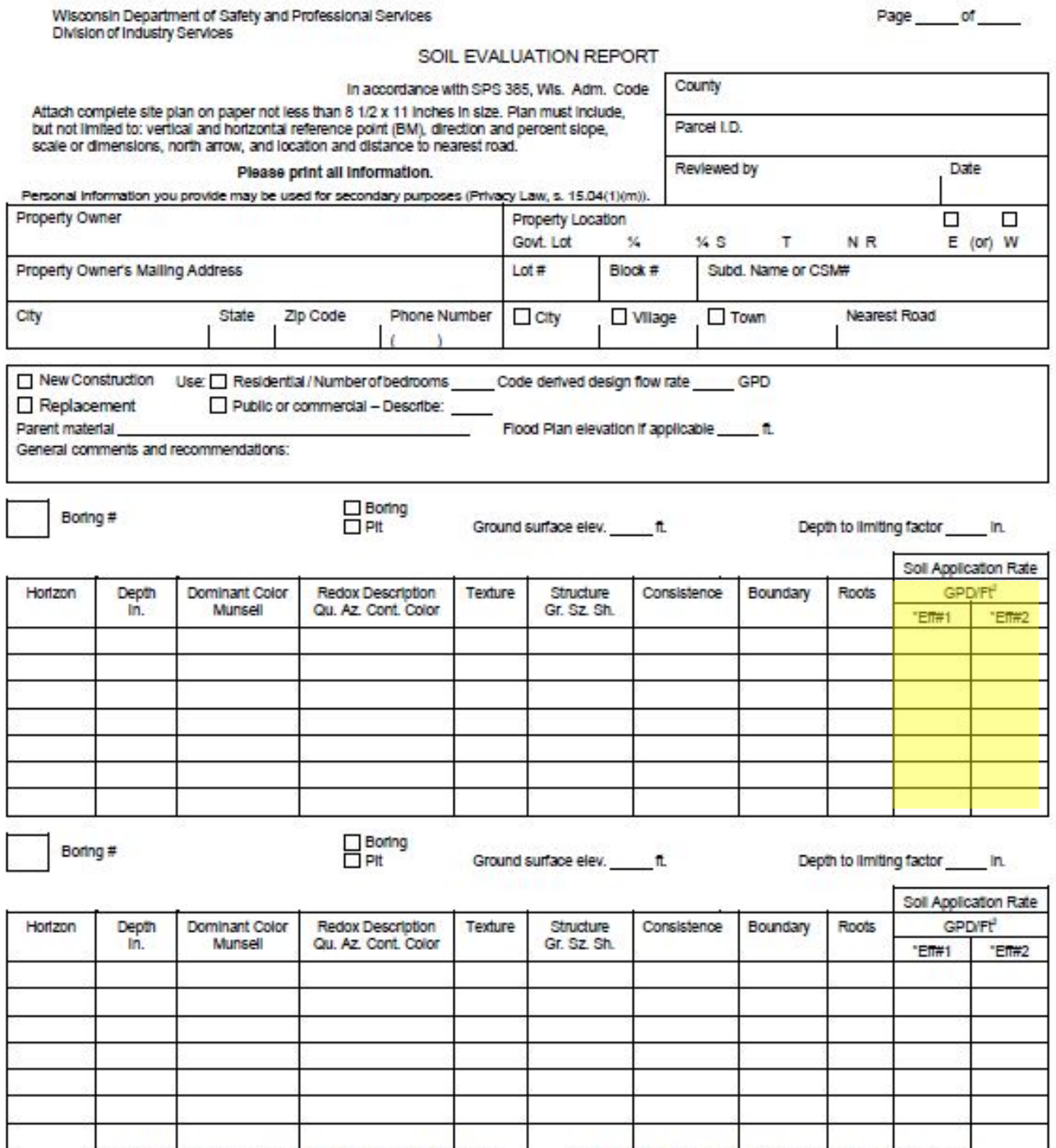
SOIL APPLICATION RATES

FROM Table 383.44-2

Maximum soil application rates in gallons/sq ft/day for POWTS designs



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Soil Application Rates

STE and HTE

Table 383.44–2
Maximum Soil Application Rates Based Upon Morphological Soil Evaluation (in gals./sq. ft./day)

Soil Characteristics			Maximum Monthly Average			
Texture[d]	Structure[e]		BOD_5 >30 ≤220mg/L TSS >30 ≤150mg/L		BOD_5 ≤30 mg/L[c] TSS ≤30 mg/L[c]	
	Shape	Grade				
COS, S, LCOS, LS	—	0	0.7[a]	0.5[b,c]	1.6[a]	0.5[b]
FS, LFS	—	0	0.5		1.0	
VFS, LVFS	—	0	0.4		0.6	
COSL, SL	—	0M	0.2		0.6	
	PL	1	0.4		0.6	
		2, 3	0.0		0.2	
	PR, BK, GR	1	0.4		0.7	
		2, 3	0.6		1.0	
FSL, VFSL	—	0M	0.2		0.5	
	PL	2, 3	0.0		0.2	
	PL, PR, BK, GR	1	0.2		0.6	
	PR, BK, GR	2, 3	0.4		0.8	
L	—	0M	0.2		0.5	
	PL	2, 3	0.0		0.2	
	PL, PR, BK, GR	1	0.4		0.6	
	PR, BK, GR	2, 3	0.6		0.8	
SIL	—	0M	0.0		0.2	
	PL	2, 3	0.0		0.2	
	PL, PR, BK, GR	1	0.4[c]		0.6	
	PR, BK, GR	2, 3	0.6		0.8	
SI	—	—	0.0		0.0	

Soil Application Rates

STE and HTE

Soil Characteristics			Maximum Monthly Average	
Texture[d]	Structure[e]		BOD_5 >30 ≤220mg/L TSS >30 ≤150mg/L	BOD_5 ≤30 mg/L[c] TSS ≤30 mg/L[c]
	Shape	Grade		
SCL, CL, SICL	——	0M	0.0	0.0
	PL	1, 2, 3	0.0	0.2
	PR, BK, GR	1	0.2	0.3
		2, 3	0.4	0.6
SC, C, SIC	——	0M	0.0	0.0
	PL	1, 2, 3	0.0	0.0
	PR, BK, GR	1	0.0	0.0
		2, 3	0.2	0.3

Note a: With ≤60% rock fragments

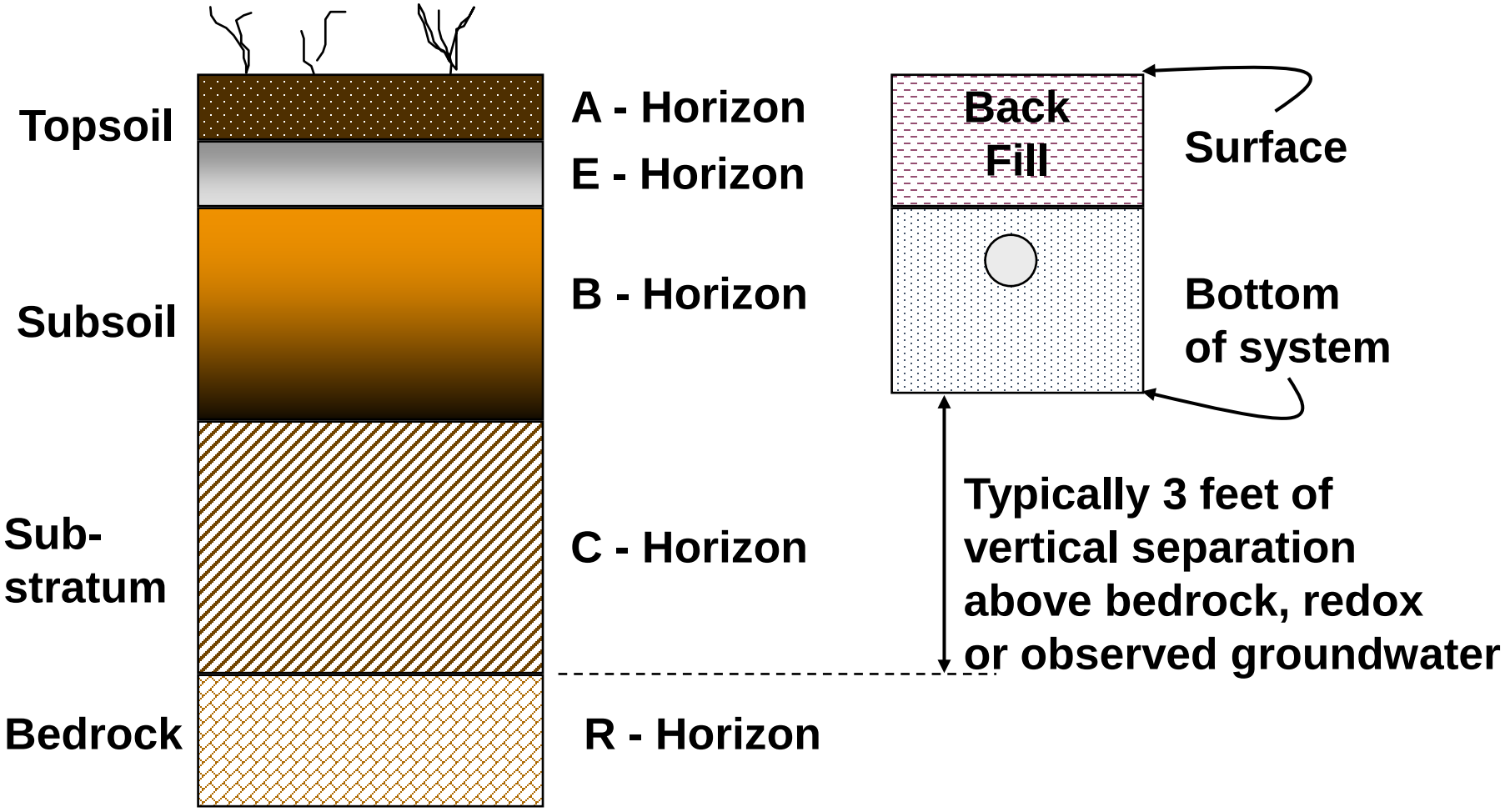
Note b: With >60 to <90% rock fragments

Note c: Requires pressure distribution under sub. (5) (a)

Note d:
- COS – Coarse Sand
- S–Sand
- LCOS – Loamy Coarse Sand
- LS – Loamy Sand
- FS – Fine Sand
- LFS – Loamy Fine Sand
- VFS – Very Fine Sand
- LVFS – Loamy Very Fine Sand
- COSL – Coarse Sandy Loam
- SL – Sandy Loam
- FSL – Fine Sandy Loam
- VFSL – Very Fine Sandy Loam
- L – Loam
- SIL – Silt Loam
- SI – Silt
- SCL – Sandy Clay Loam
- CL – Clay Loam
- SICL – Silty Clay Loam
- SC – Sandy Clay
- C – Clay
- SIC – Silty Clay

Note e:
- PL – Platy
- PR – Prismatic
- BK – Blocky
- GR – Granular
- M – Massive
- 0 – Structureless
- 1 – Weak
- 2 – Moderate
- 3 – Strong

Vertical Separation Concept



Minimum Depth of Soil for Treatment

Table 383.44–3

Minimum Depth of Unsaturated Soil for Treatment Purposes[a] (in inches)

Soil Characteristics	Influent Quality[e] and Percent Coarse Fragments					
Texture[d]	Fecal Coliform >10^4 cfu/100mL			Fecal Coliform ≤10^4 cfu/100mL[b]		
	≤35%	>35 to ≤60%	>60 to ≤90%[b,c]	≤35%	>35 to ≤60%	>60 to ≤90%[c]
COS, S, LCOS, LS	36	60	60	24	36	60
FS, VFS, LFS, LVFS	36			24		
COSL, SL	36			24		
FSL, VFSL	36			24		
L	36			24		
SIL	36			24		
SI	36			24		
SCL, CL, SICL	36			24		
SC, C, SIC	36			24		

Note a: Influent quality as per s. SPS 383.44 (2)

Note b: Requires pressure distribution under sub. (5) (a)

Note c: All coarse fragment voids must be filled with fine earth

Note d:

COS – Coarse Sand	LVFS – Loamy Very Fine Sand	SI – Silt
S–Sand	COSL – Coarse Sandy Loam	SCL – Sandy Clay Loam
LCOS – Loamy Coarse Sand	SL – Sandy Loam	CL – Clay Loam
LS – Loamy Sand	FSL – Fine Sandy Loam	SICL – Silty Clay Loam
FS – Fine Sand	VFSL – Very Fine Sandy Loam	SC – Sandy Clay
LFS – Loamy Fine Sand	L – Loam	C – Clay
VFS – Very Fine Sand	SIL – Silt Loam	SIC – Silty Clay

Note e: The values for fecal coliform are reported as a monthly geometric mean. The geometric mean shall be determined on the basis of measurements taken over 30 consecutive days, with at least 6 measurements occurring on 6 separate days.

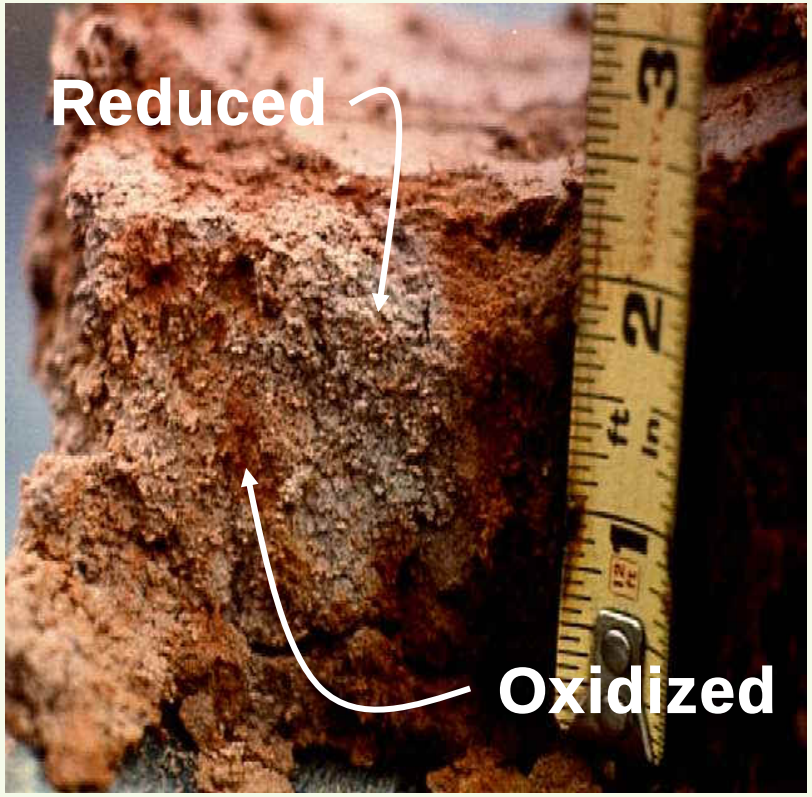
More Soils Definitions SPS 81.01

(202) **“Redoximorphic feature”** means a feature formed in the soil matrix by the processes of reduction, translocation and oxidation of iron and manganese compounds in seasonally saturated soil.

(118) **“High groundwater”** means zones of soil saturation which include perched water tables, shallow regional groundwater tables or aquifers, or zones that are seasonally, periodically or permanently saturated.

(119) **“High groundwater elevation”** means the higher of either the elevation to which the soil is saturated when observed as a free water surface, or the elevation to which the soil has been seasonally or periodically saturated as indicated by the highest elevation of redoximorphic features in the soil profile.

REDOX DESCRIPTION



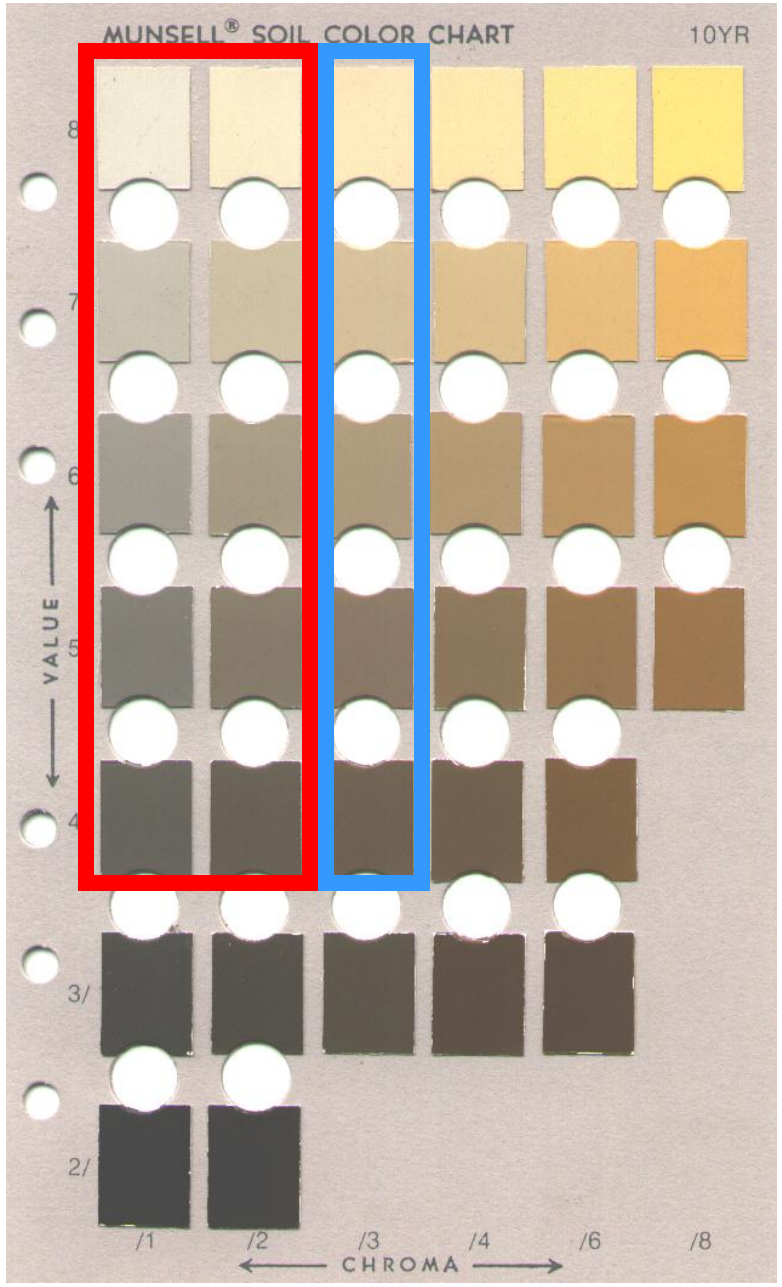
Iron Depletion and Concentration

- Redox feature formation requires:
  - Anaerobic conditions
    - Saturation
    - Near Saturation
  - Organic matter
  - Temperature
  - pH
  - Iron (Fe) and Manganese (Mn)

REDOX DESCRIPTION

Low Chroma Colors

- Value of 4 or more and a chroma of 2 or less.
  - Redox depletions
  - Reducing conditions
- Suspicious conditions with chromas of 3 or less.



REDOX DESCRIPTION

Reduced Matrices

- Soil matrices that have a low chroma color in-situ because of the presence of Fe(II)- Ferrous Iron.
- Color changes in hue or chroma when exposed to air as the Fe(II) is oxidized to Fe(III) – Ferric Iron.

BEDROCK

“Bedrock” means rock that is exposed at the earth’s surface or underlies soil material and includes:

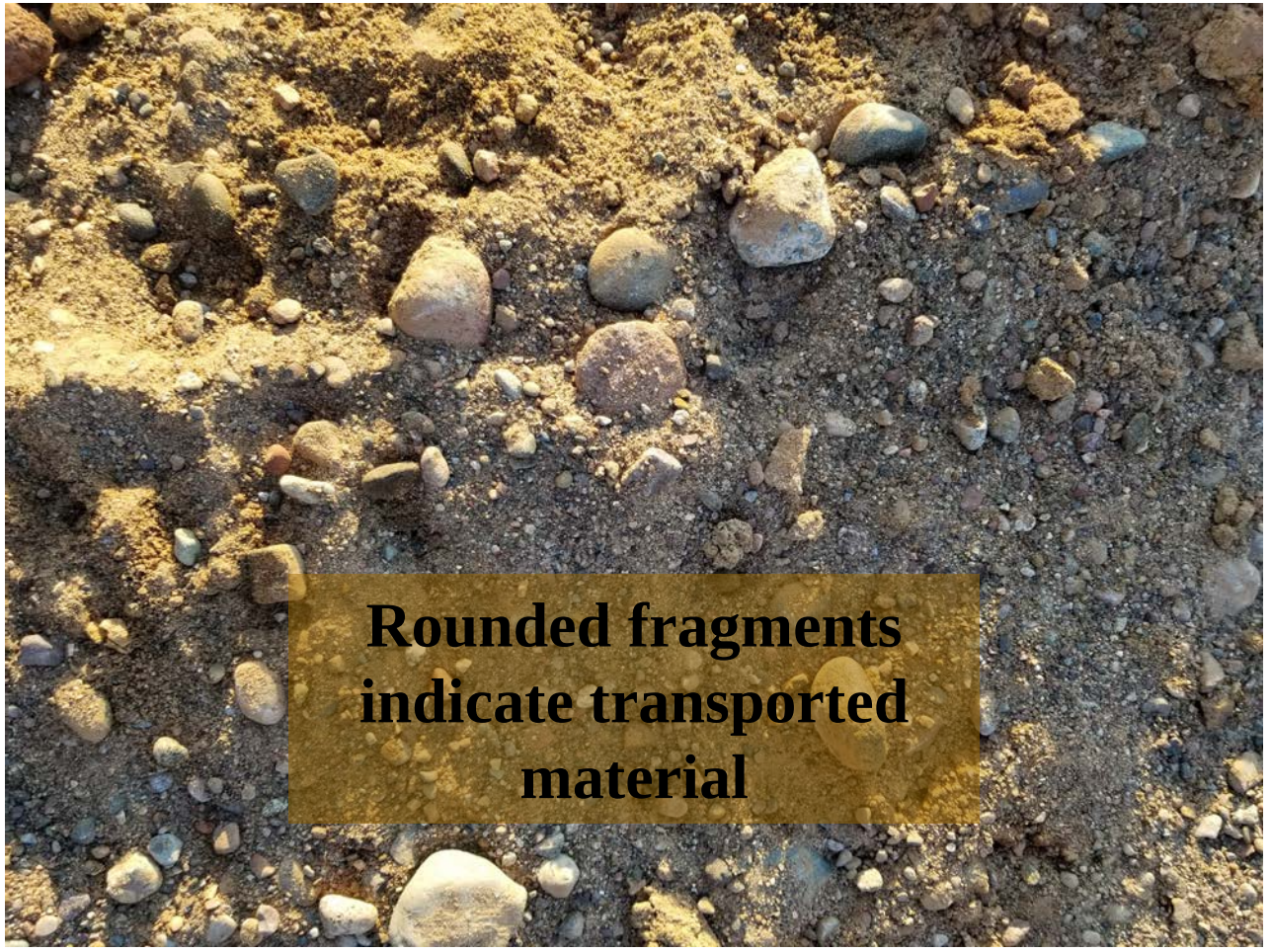
(a) Weathered in–place consolidated material, larger than 2 mm in size and greater than 50% by volume;

AND

(b) Weakly consolidated sandstone at the point of increased resistance to penetration of a knife blade.

BEDROCK

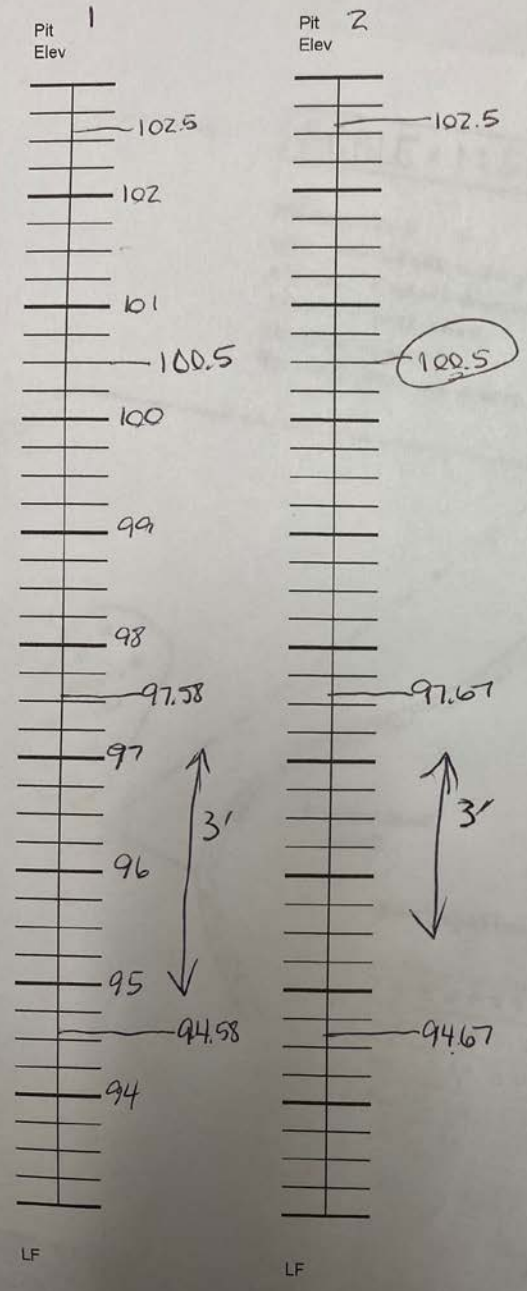

Angular fragments indicate possible weathered in place material

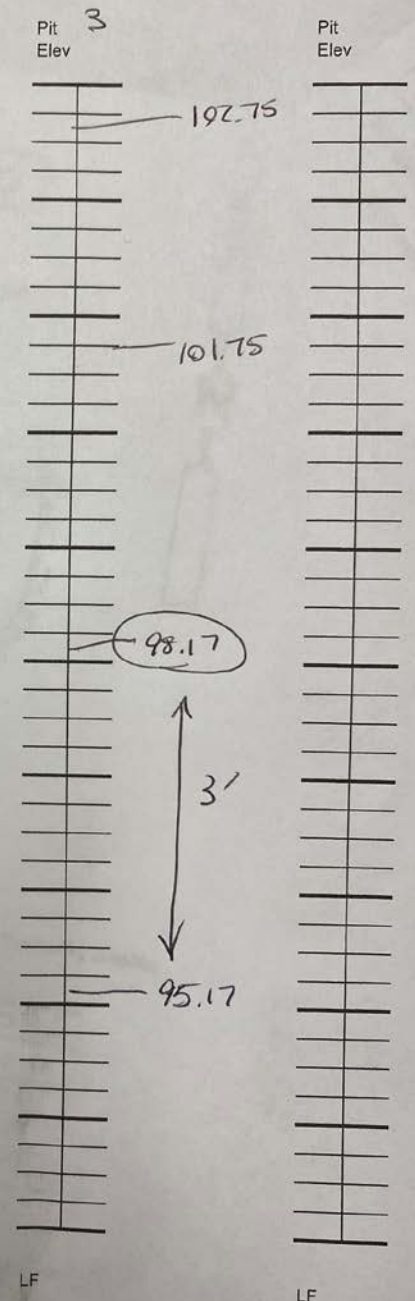

Rounded fragments indicate transported material

Determining System Elevation

- Separation distance to limiting factor – coarse fragments? Pretreatment?
- Under a tension saturated horizon? – Entire system needs to below tension saturation
- Loading rate at system elevation (SPS 383.44(4)(a)1.c.)
- Loading rate in treatment area (SPS 383.44(4)(c)) – design SHALL reflect restrictive soil horizonsin the treatment zone that affect treatment or dispersal
- In-situ soil on sides of system (product approval)

Owner:
System Elevation:
Parcel ID:
CST:





Minimum Depth of Soil for Treatment

3 Boring #

☐ Boring
■ Pit

Ground surface elev. 99.70 ft.

Depth to limiting factor _____ in.

Horizon	Depth In.	Dominant Color Munsell	Redox Description Qu. Az. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/Ft² *Eff#1	Soil Application Rate GPD/Ft² *Eff#2
1	0-8	10YR 3/3	-	sil	3mgr	mfr	cs	3c-vf	0.6	0.8
2	8-15	10YR 5/3	-	sil	2fabk	mfr	cs	2c-vf	0.6	0.8
3	15-19	10YR 5/4	-	sil	2mabk	mfr	gs	1c-vf	0.6	0.8
4	19-24	10YR 5/4	f3d 7.5YR 5/8 & 10YR 6/1	sil	2mabk	mfr	gs	1c-vf	0.6	0.8
5	24-40	10YR 5/4	c3p 7.5YR 4/6 & 7.5YR 5/1	sil	1mabk	mfr-mfi	-	1m-vf	0.4c	0.6

2 Boring # North

☐ Boring
☒ Pit

Ground surface elev. 96.52 ft.

Depth to limiting factor 102 in.

Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/ft² *Eff#1	Soil Application Rate GPD/ft² *Eff#2
1	0-9	7.5yr 3/2	—	sl	2mgr	mvfr	gw	1vff	.6	1.0
2	9-32	" 5/3	—	sl	2msbk	"	"	1vff	.6	1.0
3	32-48	" 4/4	—	s	0-sg	ml	"	1vf	.7	1.6
4	48-102	" 4/3	—	grs	"	"	—	1vf	.7	1.6

* Effluent #1 = BOD_5 > 30 ≤ 220 mg/L and TSS >30 ≤ 150 mg/L

* Effluent #2 = BOD_5 ≤ 30 mg/L and TSS ≤ 30 mg/L

3 Boring #

☐ Boring
☒ Pit

Ground surface elev. 97.6 ft. Depth to limiting factor 10 in.

Horizon	Depth In.	Dominant Color Munsell	Redox Description Qu. Az. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/Ft²	
									*Eff#1	*Eff#2
1	0-7	7.5YR3/2		SIL	1-m-cr	mvfr	cw	2-f	0.4	0.6
2	7-10	7.5YR3/2		SIL	2-m-cr	mfr	cw	2-f	0.6	0.8
3	10-12	7.5YR5/4	c-2-d-7.5yr6/6	SIL	2-m-sbk	mfr	cw	2-f		
4	12-13	7.5YR5/4	c-2-d-7.5yr5/8, 6/2	SIL	2-m-sbk	mfr				

4 Boring #

☐ Boring
☒ Pit

Ground surface elev. 97.5 ft. Depth to limiting factor 10 in.

Horizon	Depth In.	Dominant Color Munsell	Redox Description Qu. Az. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/Ft²	
									*Eff#1	*Eff#2
1	0-6	7.5YR3/1		SIL	1-m-cr	mvfr	cw	2-f	0.4	0.6
2	6-10	7.5YR3/2		SIL	2-m-cr	mvfr	cw	2-f	0.6	0.8
3	10-13	7.5YR3/2	c-2-d-7.5yr6/8	SIL	2-m-sbk	mf4r		1-f		

☒ New Construction Use: ☐ Residential / Number of bedrooms _____ Code derived design flow rate _____ GPD

☐ Replacement ☐ Public or commercial – Describe: _____

Parent material Loamy Till Flood Plan elevation if applicable _____ ft.

General comments and recommendations: Top soil in area has been removed for building site.

1 Boring # ☐ Boring ☒ Pit Ground surface elev. 96.7 ft. Depth to limiting factor 92 in.

Horizon	Depth In.	Dominant Color Munsell	Redox Description Qu. Az. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/Ft² *Eff#1	Soil Application Rate GPD/Ft² *Eff#2
1	0-92	5YR4/4		sl	2msbk	dsh	-	0	0.6	1.0

2 Boring # ☐ Boring ☒ Pit Ground surface elev. 101.2 ft. Depth to limiting factor 90 in.

Horizon	Depth In.	Dominant Color Munsell	Redox Description Qu. Az. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/Ft² *Eff#1	Soil Application Rate GPD/Ft² *Eff#2
1	0-90	5YR4/4		sl	2msbk	dsh	-	0	.6	1.0

* Effluent #1 = BOD ≥ 30 < 220 mg/L and TSS ≥ 30 < 150 mg/L * Effluent #2 = BOD ≥ 30 < 220 mg/L and TSS ≥ 30 < 150 mg/L

☒ New Construction Use: ☒ Residential / Number of bedrooms 4 Code derived design flow rate 600 GPD

☐ Replacement ☐ Public or commercial – Describe: ____

Parent material OUTWASH Flood Plan elevation if applicable NA ft.

General comments and recommendations: AT GRADE

1 Boring # ☐ Boring ☒ Pit Ground surface elev. 97.5 ft. Depth to limiting factor 78+ in.

Horizon	Depth In.	Dominant Color Munsell	Redox Description Qu. Az. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/Ft² *Eff#1	*Eff#2
1	0-14	10YR5/3	------	SIL	2fsbk	mfr	cw	2m	0.6	0.8
2	14-78	7.5YR4/4	------	CL	-0-	mvfi	--	--	0.0	0.0

2 Boring # ☐ Boring ☒ Pit Ground surface elev. 99.0 ft. Depth to limiting factor 82+ in.

Horizon	Depth In.	Dominant Color Munsell	Redox Description Qu. Az. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/Ft² *Eff#1	*Eff#2
1	0-11	10YR5/3	------	SIL	2fsbk	mfr	cw	2m	0.6	0.8
2	11-82	7.5YR4/4	------	CL	-0-	mvfi	--	--	0.0	0.0

3 Boring #

☐ Boring
☒ Pit

Ground surface elev. 100 ft. Depth to limiting factor 82 in.

Horizon	Depth In.	Dominant Color Munsell	Redox Description Qu. Az. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/Ft^2	
									*Eff#1	*Eff#2
1	0-8	10yr 3/2	none	cl	2fsbk	mfr	cs	3m	0.4	0.6
2	8-82	7.5yr 4/4	none	scl (g)	2msbk	mfr	-------	1f	0.4	0.6

4 Boring #

☐ Boring
☒ Pit

Ground surface elev. 98.7 ft. Depth to limiting factor 79 in.

Horizon	Depth In.	Dominant Color Munsell	Redox Description Qu. Az. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	Roots	Soil Application Rate GPD/Ft^2	
									*Eff#1	*Eff#2
1	0-9	10yr 3/2	none	cl	2fsbk	mfr	cs	3m	0.4	0.6
2	9-79	7.5yr 4/4	none	scl (g)	2msbk	mfr	------	1f	0.4	0.6

THANK YOU!

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