Residential On-Site Sewage Systems:

Installer Certification Exam Review

Rule 410 IAC 6-8.3

(revised and republished on May 9, 2014)

IOWPA – February 17, 2021

Indiana State Department of Health

Environmental Public Health Division

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Indiana State Department of Health

Rule 410 IAC 6-8.3 Training

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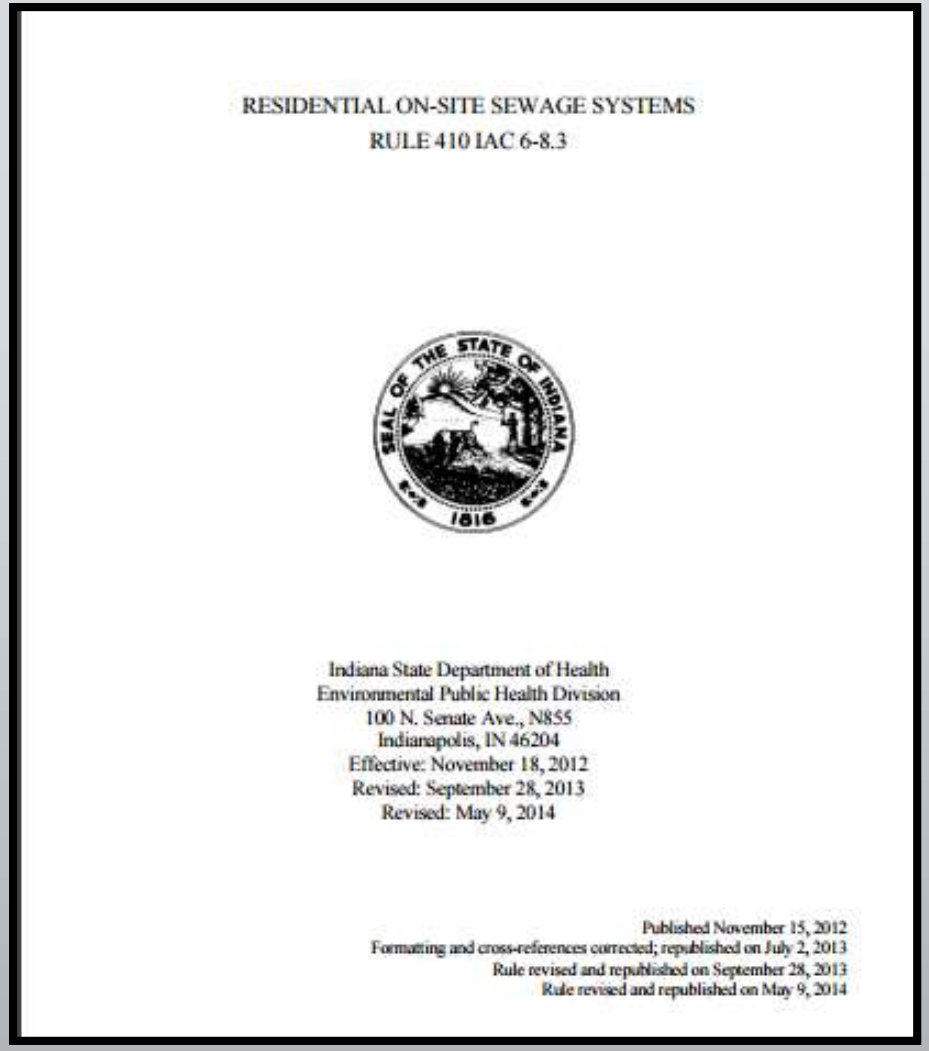

RESIDENTIAL ON-SITE SEWAGE SYSTEMS

RULE 410 IAC 6-8.3

Indiana State Department of Health
Environmental Public Health Division
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Tables and Figures

page ii

Definitions…Say What?

- Common industry lingo and phrases
- Helpful for the exam

- Sections 1-50

Section 6 - Bedroom

(1) Could be used for sleeping and contains

- 70 square feet
- An operable window or exterior door
- A closet (new construction)

(2) Recorded affidavit

Section 7 – Bedroom Equivalent

Jetted bathtub

≥125 gallons

Section 12 – Design Daily Flow (DDF)

- Calculated

No. of bedrooms and bedroom equivalents X 150 gallons per day

- Peak flow
- Daily sewage flow from a residence

No. Bedrooms	DDF (gpd)
2	300
3	450
4	600
5	750
6	900

Section 15 – Dwelling or Residence

- Seasonal or permanent human habitation or for sleeping
- 1 or 2 families
- Associated outbuildings for private use

Section 34 – Residential Outbuilding

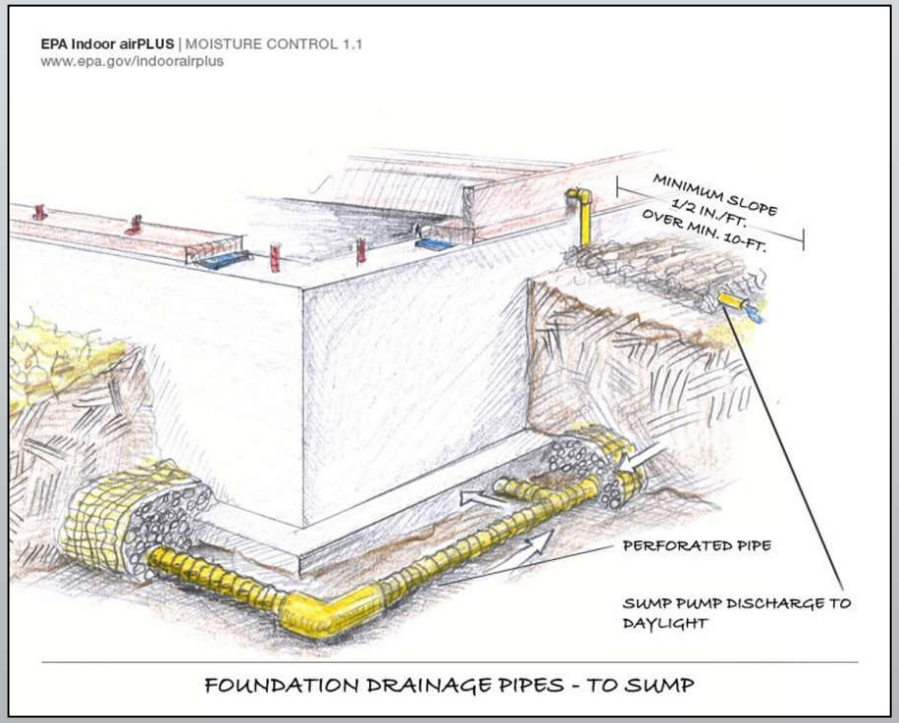
- Private use of owner
- No seasonal or permanent human habitation or sleeping

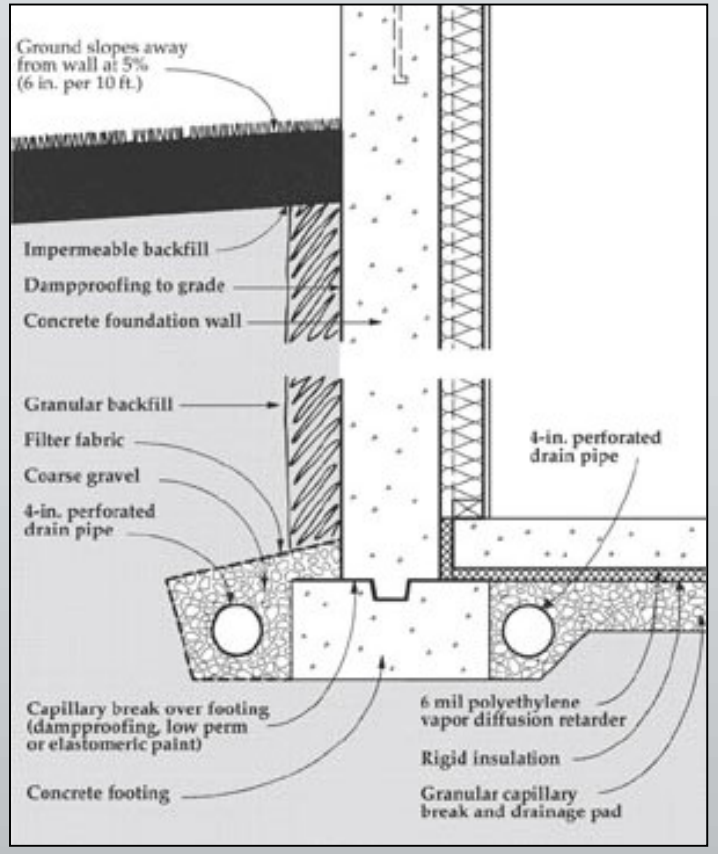
Section 14 – Drainageway

- Channel portion of landscape
- Surface or rain water runoff gathers intermittently to flow to a lower elevation

Section 17 - Foundation Drain

Removes ground water from around a home or from a basement.





Section 18 – Health Officer

Health Officer of a local board of health

Section 21 – Local Health Department

IC 16-20, or

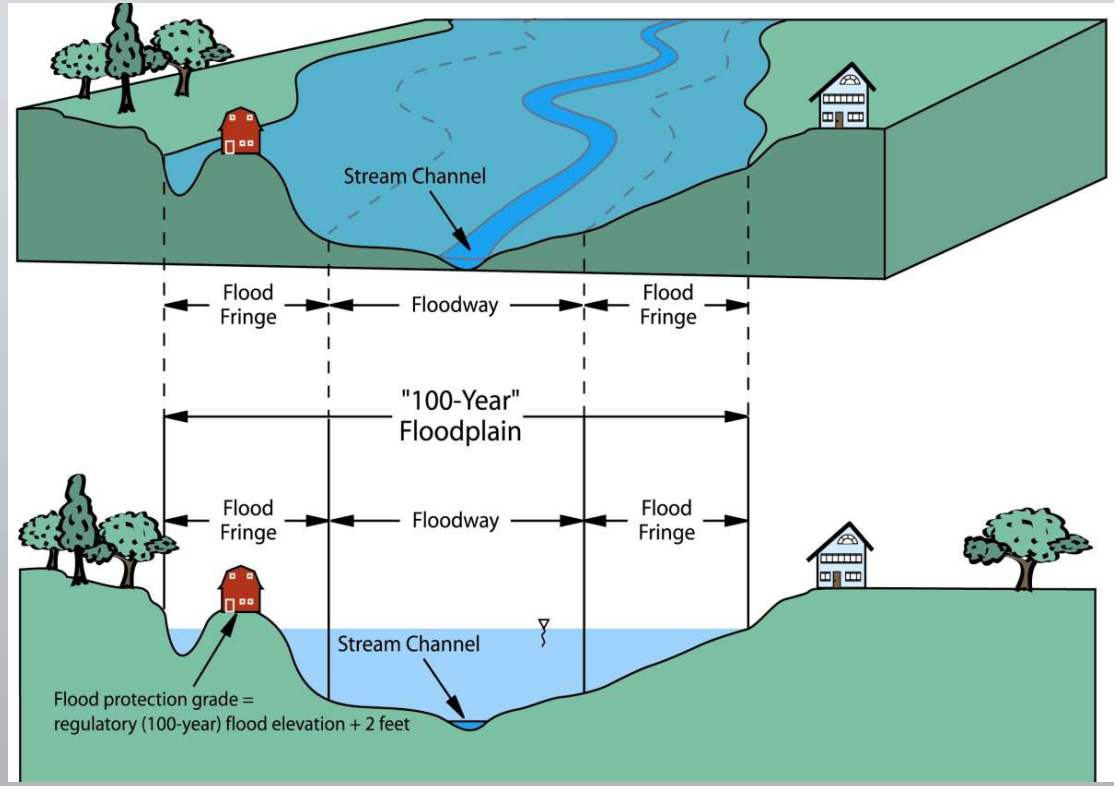
Duly authorized representative

Public Health

Prevent. Promote. Protect.

Section 30 – Regulatory Flood Elevation (RFE)

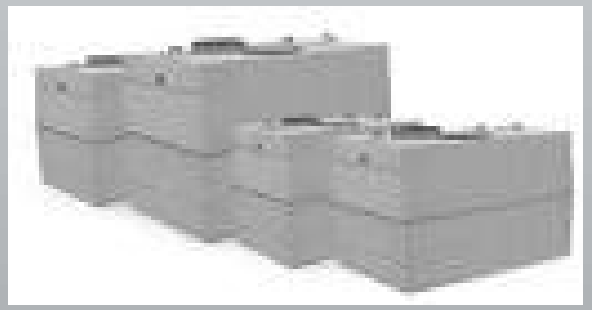
- AKA Base Flood Elevation, 100 year floodplain
- Elevation of surface water resulting from a flood
- 1% probability of equaling or exceeding
- Indiana Dept. Natural Resources



Section 32 – Residential Onsite Sewage System Or Onsite Sewage System (OSS)

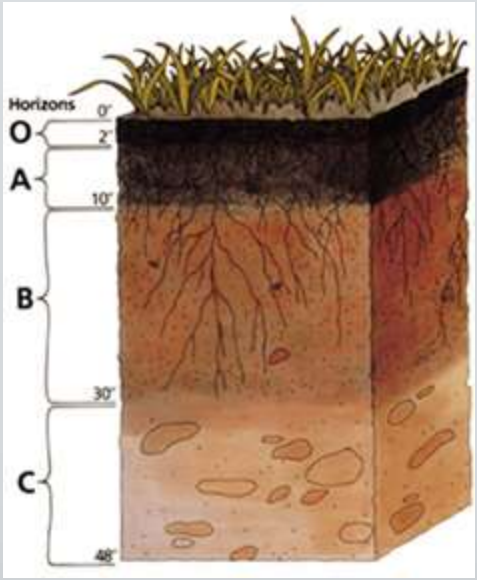
- Equipment and devices necessary for proper conduction, collection, storage, treatment and on-site disposal
- Can serve
  - A 1 or 2 family dwelling
  - A residential outbuilding
  - 2 single family dwellings with a total of 5 bedrooms or less (DDF ≤ 750 gpd)

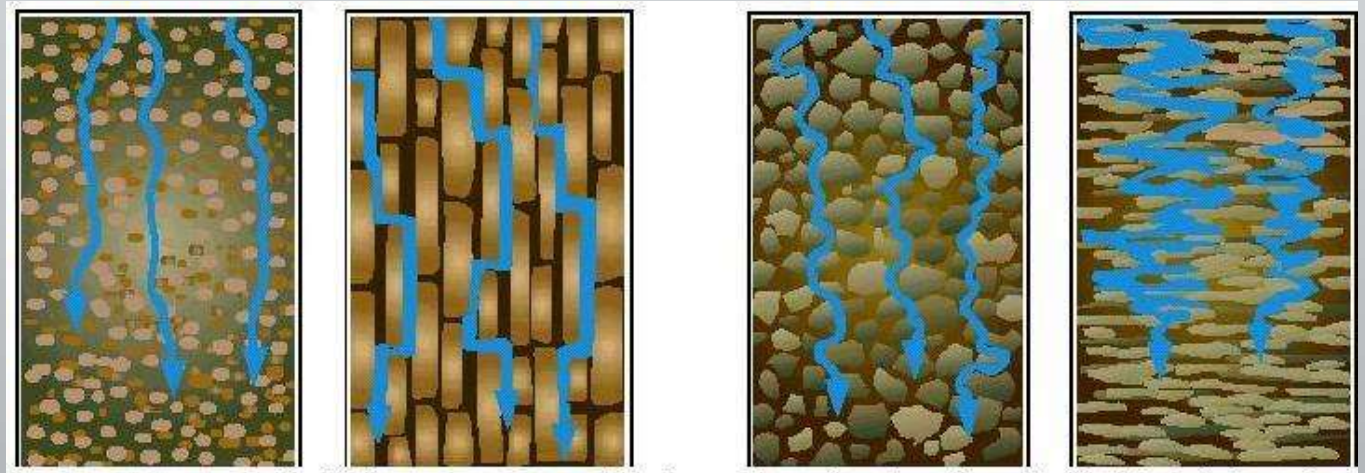
- Equipment and devices including, but not limited to residential sewers, septic tanks, soil absorption systems temporary sewage holding tanks, sanitary vault privies



Section 42 – Soil Absorption

Process that uses **SOIL** to **<u>treat</u>** and **<u>disperse</u>** effluent septic tank

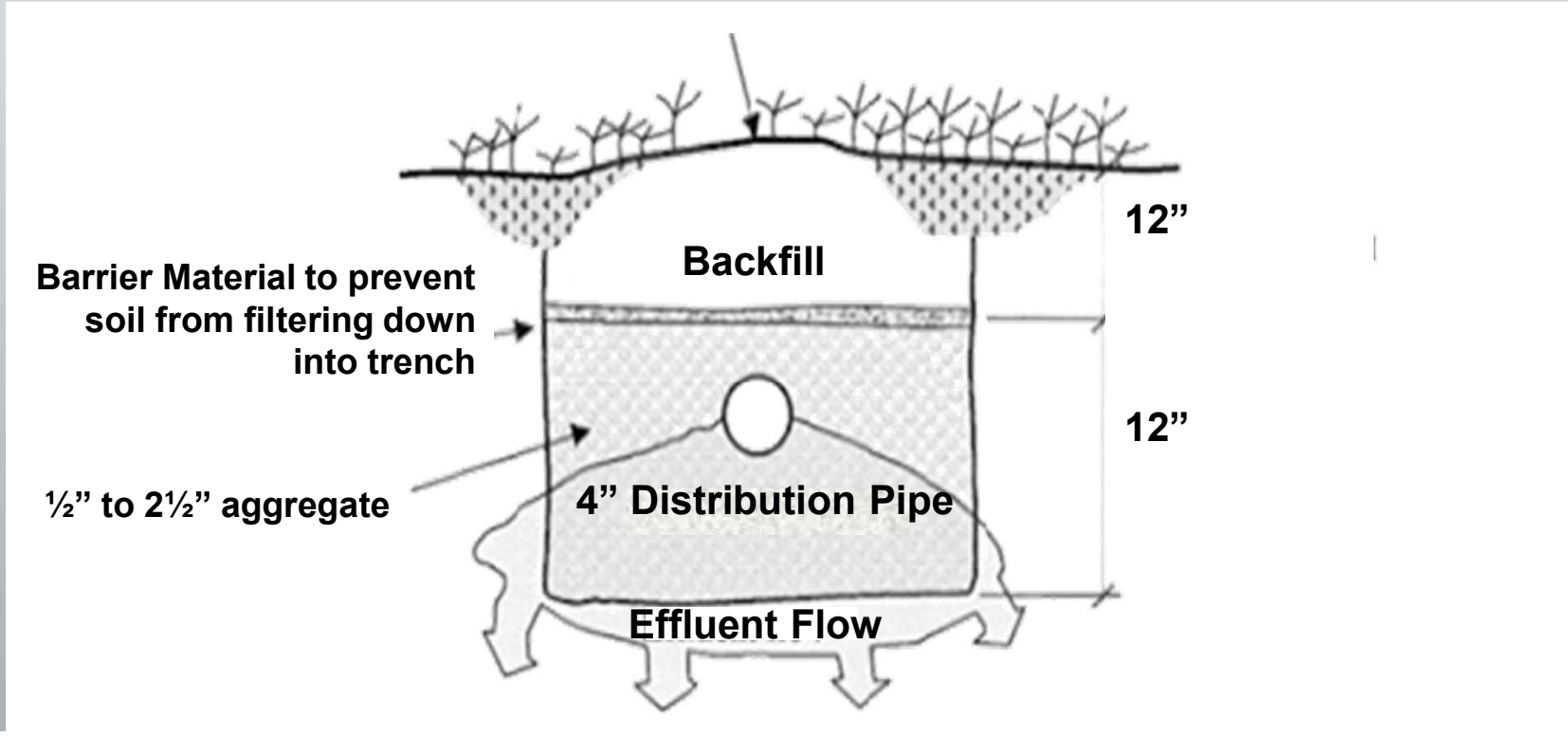




Preferential flow - gravitational water movement through granular, prismatic, subangular blocky, and platy soils s (left to right).

Section 43 – Soil Absorption System or Soil Absorption Field

- Pipes or chambers laid in trenches
- Pipes laid in an elevated bed
- Effluent is discharged to treat and disperse



Section 33 – Residential Onsite Sewage System Failure

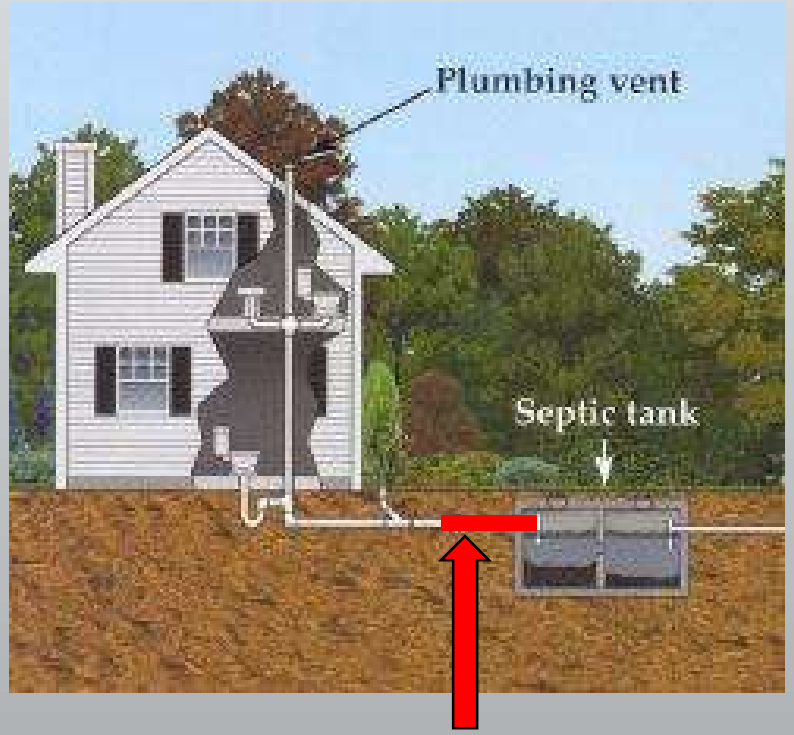
An onsite sewage system that exhibits:

1. Interference with home plumbing (i.e. backup)
2. Ponding, seepage or discharge to ground surface or surface waters.
3. Discharge that causes contamination of potable, ground or surface waters.

A failure is a HEALTH HAZARD

Section 35 – Residential Sewer

Begins 5’ outside the foundation of the residence or structure



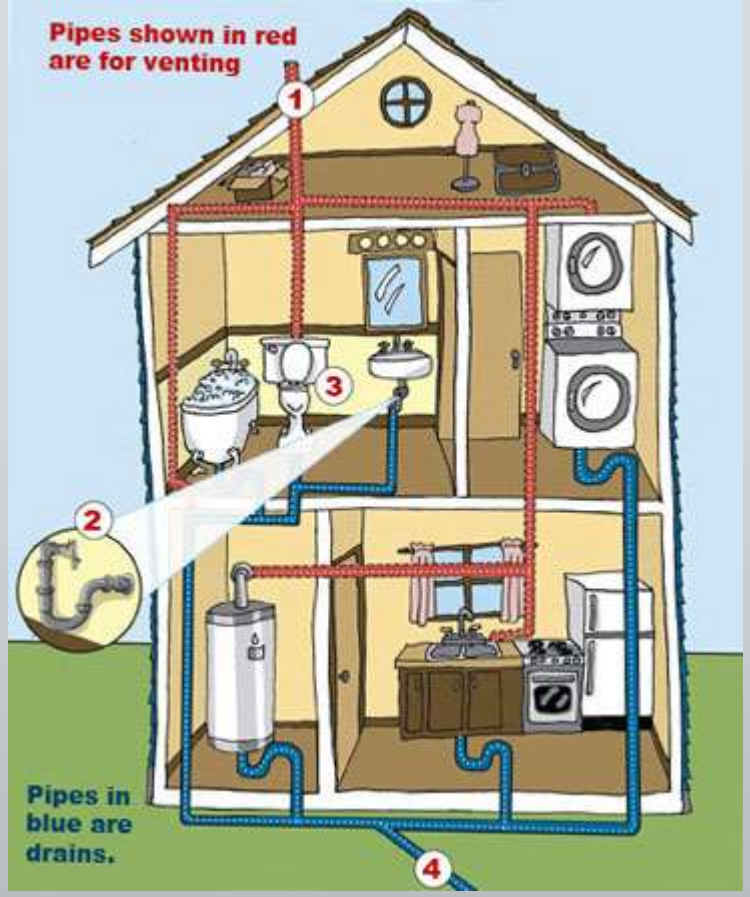
Carries solids and liquids to septic tank

Section 41 – Sewage

All water-carried waste derived from ordinary living processes.

Includes black and gray water:

- Toilets
- Hand sinks
- Tubs
- Showers
- Laundry
- Kitchen drains
- Water softener



Section 48 – Start of Construction

Any site activity undertaken for the erection of the structure to be served by a residential on-site sewage system or the delivery of manufactured housing

Section 50 – Technology New to Indiana (TNI)

- Not described in the rule
- Onsite sewage
  - Treatment or disposal
  - Processes
  - Components
- ISDH approval
- Section 52 (h)

Indiana State Department of Health

Environmental Public Health Home > Technology New to Indiana > Approved Technologies

APPROVED TECHNOLOGIES

The department maintains the list below of TNI that have been listed for use in Indiana. Where applicable, a link for each technology is provided to the department standards for that technology. These standards are the basis for plan review, construction approvals, training, design and installation, and operation and maintenance (O&M), if applicable.

Information is grouped under four technology categories: "Components," "Secondary Treatment Units," "Soil Absorption Fields," and "Pretreatment Devices,"

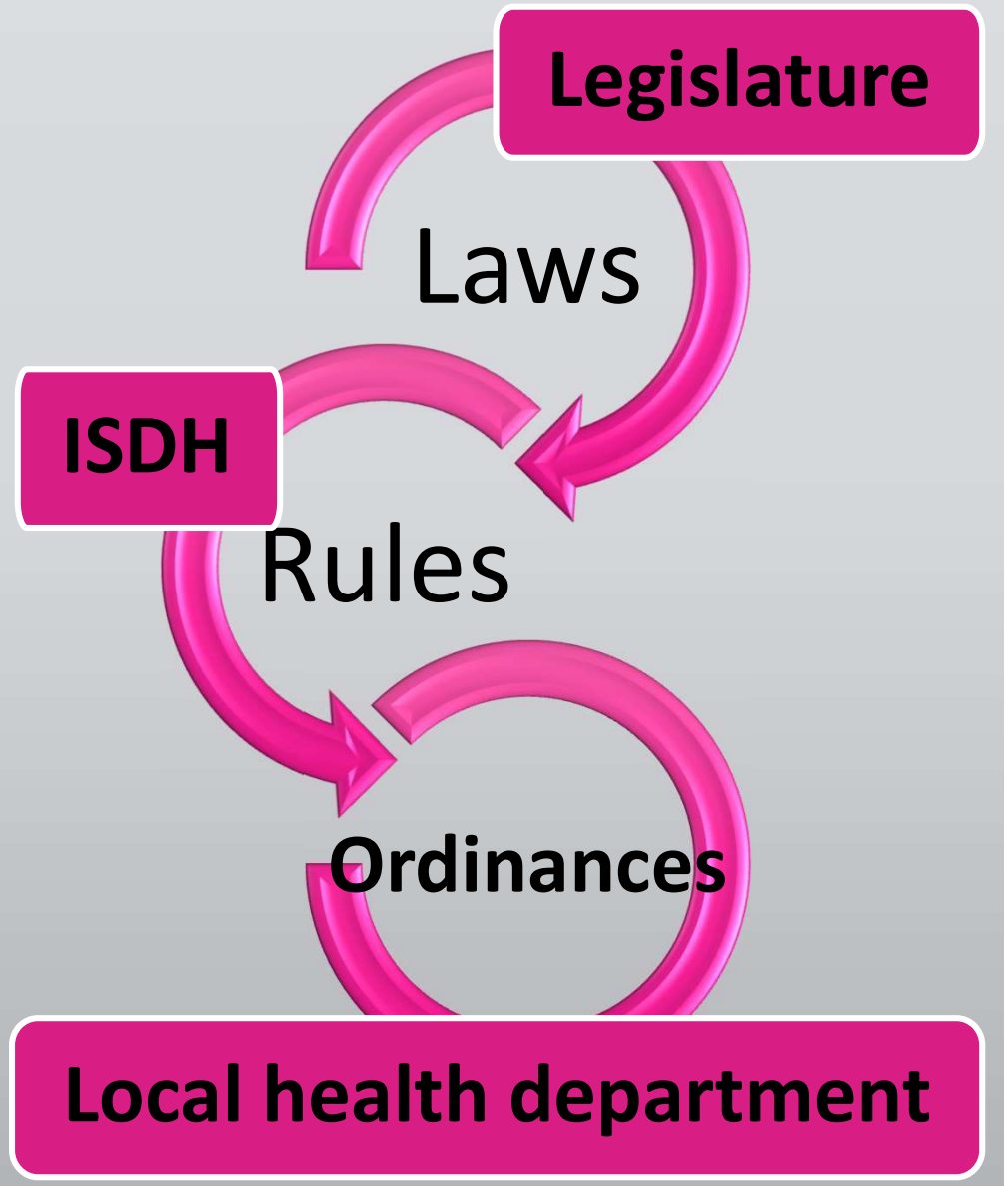
Each listing includes the following:

- Manufacturer information (listed alphabetically by manufacturer's name);
- The name of the technology;
- Its status: general approval, conditional approval, and project-by-project approval;
- Date of approval;
- Description of the technology;
- Brief comments regarding the approval; and
- A link to the standards that are the basis for plan review, construction

Sec 51: Administrative Authority

Who's in charge?

- LHD administers the Rule
- Ordinances may be more stringent
- ISDH can review the LHD OSS program
- LHD has the right to enter upon property for inspection, testing, observation, etc.



Sec 52
General sewage disposal requirements

- (a) No person can dispose of organic or inorganic matter from a dwelling or OSS that would cause a health hazard or water pollution into the waters of the state.

Sec 52
General sewage disposal requirements

(b) Design, construction, installation, location, maintenance and operation of OSS shall comply with this Rule.

(c) S. E. 11, “The Sanitary Vault Privy”, 1986 Edition

(d) A dwelling either utilizes a sanitary sewerage system OR an OSS that includes a septic tank and a SAF that has not failed.

Sec 52
General sewage disposal requirements

e) ISDH approved Temporary Holding Tank

1) to prevent continued discharge

2) soil conditions preclude prompt construction with permit issued

3)part of a sewage disposal plan or <1 year*

(f) LHD approved Temporary Holding Tank

1) occupancy while OSS is being replaced/renovated

2) Soil conditions prohibit OSS installation, but permit issued

Sec 52
General sewage disposal requirements

g) Local board of health may NOT approve the use of any other residential OSS technology unless written approval from ISDH is:

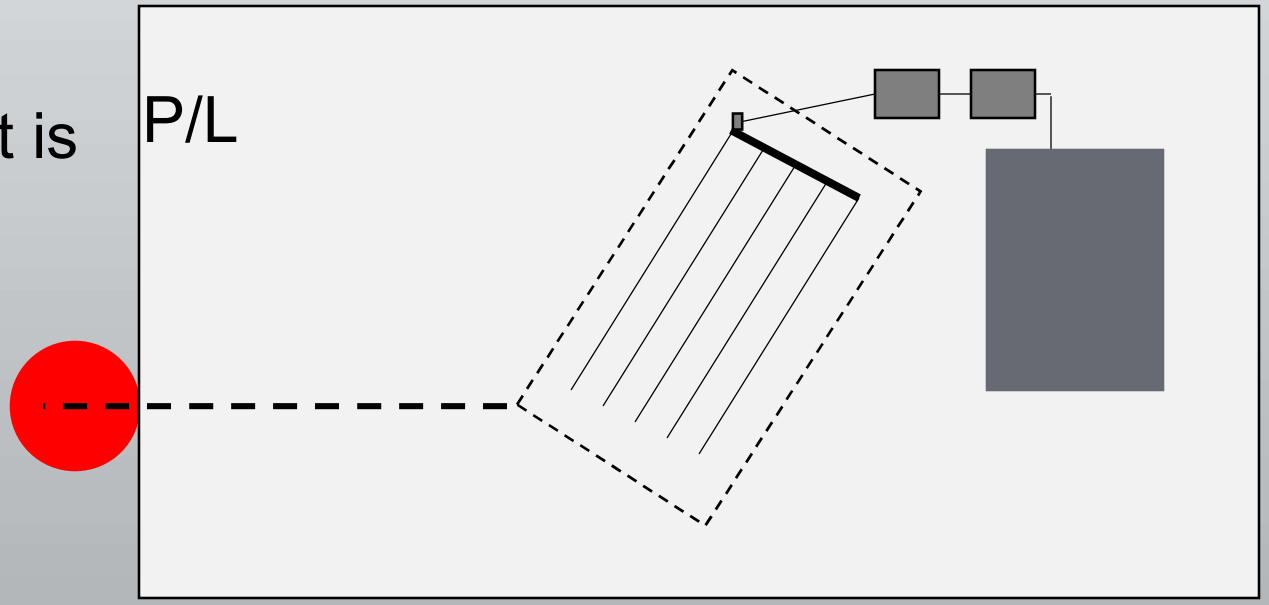
1) issued, under subsection (h), for LHD to issue construction permits for the use of the technology; or

2) obtained for specific applications.

Sec 52
General sewage disposal requirements

- (h) ISDH my approve TNI
- (i) **OSS** and **drainage** on the property or have an easement

Easement is needed.



Sec 52
General sewage disposal requirements

j) Residential OSS shall NOT be used for **roof drains, foundation drain, swimming pool main drains, hot tub drains or area drains**. NOT for disposal of chemical wastes that would pollute ground water or inhibit solids settling or digestion in the septic tank.

k) Jetted bathtub >125 gallons = bedroom equivalent

Onsite System Permit Types

Construction

- Sec 53
- Sec 9 (defined)

Operating

- Sec 54
- Sec 25 (defined)

Section 53
Construction Permit

a) The owner…shall obtain a written construction permit…prior to the following:

1) Start of construction of a residence;
2) Placement of a manufactured, modular, or mobile home;
3) Construction of outbuilding with plumbing
4) Replacement of a dwelling (etc) that has plumbing.
5) Reconstruction of a dwelling that has plumbing
6) Expansion or remodeling that increases the bedrooms or DDF.
7) Addition/alteration/replacement/repair of an existing OSS
8) Installation of an OSS for an existing residence without an OSS

Section 53
Construction Permits

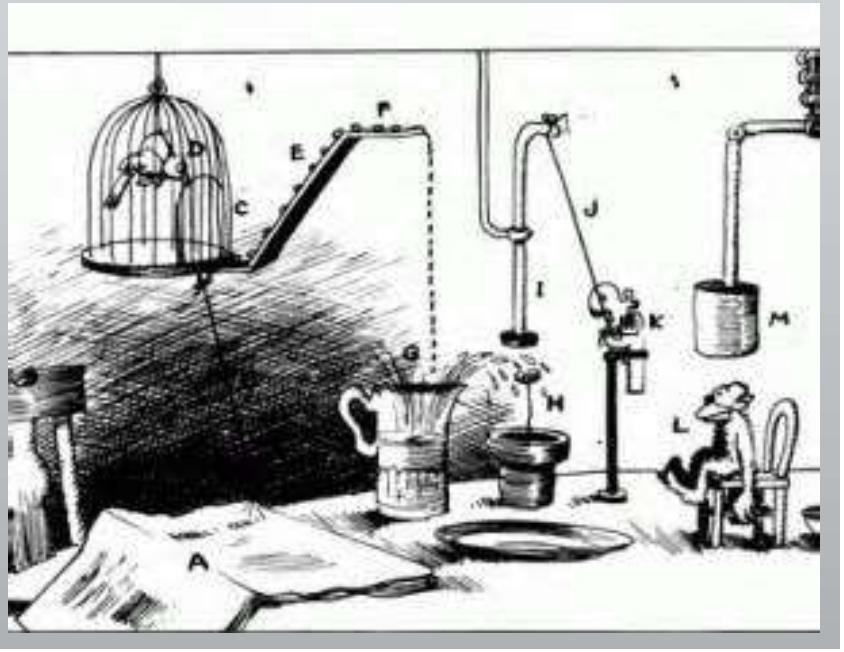
b) LHD cannot permit **TNI** for new, repair or replacement without written approval of the department, except for Sec. 52 (g).

General Delegation for TNI provided in writing

- Reduced sizing for chambers
- Sand lined systems

For a specific application

- Site specific
- Written approval for *each* project.



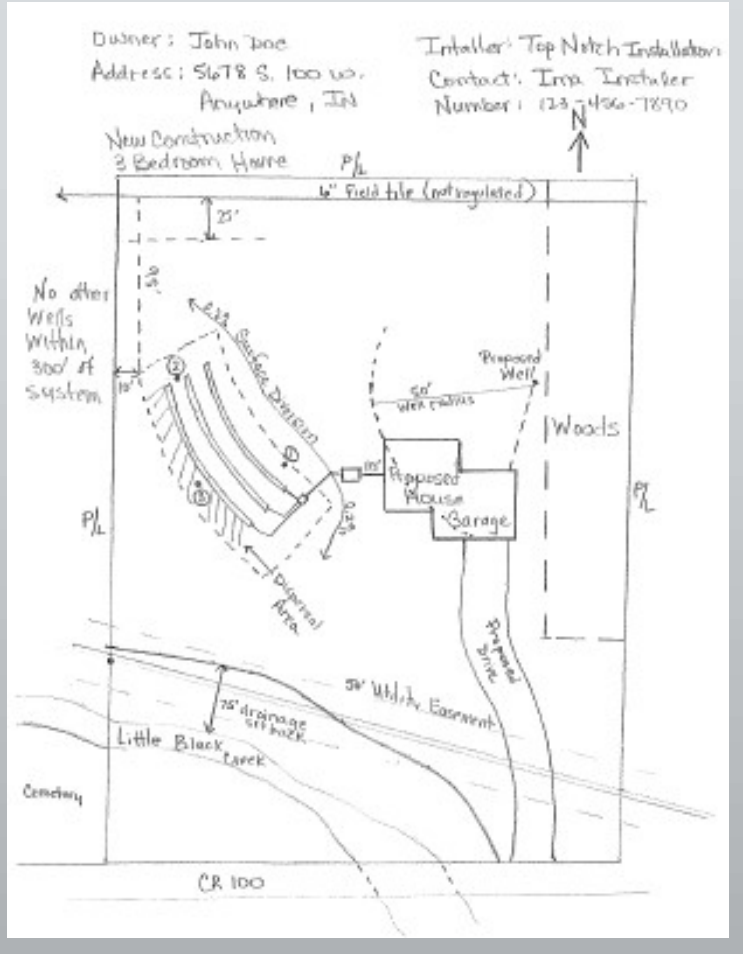
Section 53
Construction Permits

c) Approval of a site by the local plan commission or the county recorder does NOT constitute approval by the local health officer.

Section 53
Construction Permits

d) Construction permit application:

1. Form with project info
2. On-site soils evaluation
3. Written plans of sufficient clarity that compliance with the rule can be verified
4. Any other info deemed necessary by Health Officer/designee



Section 53
Construction Permits

e) Owner is responsible for OSS design that is appropriate for the site and is approved by LHD.

f) LHD may require scale drawings of site and OSS

g) LHD has ~~45 days~~ to issue or deny the OSS construction permit

July 2019 – Reduced to 30 days

Section 53
Construction Permits

h) No construction on the OSS if the site is disturbed/altered after the on-site evaluation until a new on-site evaluation is conducted and a construction permit is in place.

Section 53
Construction Permits

How does the FIRST SENTENCE read?

i) An absorption system replacement for a residential OSS **shall** meet or exceed the minimum provisions of this rule.

Section 53
Construction Permits

i) When replacement (due to failure) and the SAF cannot meet the provision of the rule then **best judgment** of the LHD, based on:

1. Site limitations
2. Written OSS troubleshoot and diagnosis
3. Written onsite soils evaluation

Section 53
Construction Permits

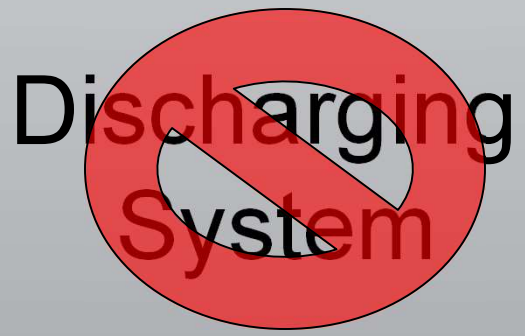
j) Soil absorption system replacement SHALL NOT be :

1) Contrary to 52(a) and 60(h), and

52(a) – cannot discharge

60(h) – aeration tanks

2) Deeper than 48 inches below final grade.



Section 53
Construction Permits

k) Permit denial

l) Notification for **Final Inspection:**

1) Local health board published procedure, or

2) At least 48 hr/2 working days before covering if LHD has no published procedure.

m) Permit revocation

Requirements of the construction permit are not completed until the health officer/staff is satisfied with the installation.

Section 54
Operating Permits

a) LHDs may require written Operating Permits in accordance with IC 16-19-3-27 (b)(2)

1) Written, issued by HD and signed by HO
2) Renewal Timeframe: 3-5 yrs (system type)

b) Identifies components requiring maintenance

c) Contents of permit

d) Owner provides documentation to HD

e) Operating Permits in violation may be revoked

Section 55
Violations: permit denial and revocation

(a) Owner shall correct failure within time limit set by health officer (HO).

(b) If any component is found to be defective; malfunctioning; or in need of service the HO may require repair, replacement or service to that component.

(c) HO may serve a violator with a written order stating violation and time limit for correction.

Section 55
Violations: permit denial and revocation

(d) Property owners (contract with owners) that receive a written order shall comply with the rule within the time limit specified.

(e) HO may deny an application or revoke a permit, for reasons including (and more):

1. Design does not meet rule and/or ordinances
2. Failure to comply with rule and/or ordinance
3. Failure to comply with condition of permit
4. Failure to disclose relevant facts
5. Misrepresentation
6. Any change relating to the design, construction, or use of the OSS not approved by the LHD.

Section 55
Violations: permit denial and revocation

(f) The written denial or revocation shall state:

1. The basis for the denial or revocation
2. The method for compliance, if applicable.
3. The time frame for compliance, if applicable.
4. That the owner has appeal rights
5. The procedure for registering any such appeal.

(g) The parties involved may agree to use procedures set forth in IC 4-21.5.

Sec 57 (A)

Table I
Pay attention to footnotes

Table I – Separation Distances		
Minimum Distance in Feet from	Septic Tank and Other Treatment Units, Dosing Tank, Lift Station	Soil Absorption System
Private water supply well[1,2]	50	50
Private geothermal well[1,2]	50	50
Commercial water supply well[1]	100	100
Commercial geothermal well[1]	100	100
Public water supply well, lake,[1,3,4] or reservoir[1,3,4]	200	200
Other pond, retention pond, lake, or reservoir[3]	50	50
Storm water detention area[3, 5]	25	25
River, stream, ditch, or drainage tile[6]	25	25
Buildings, foundations, slabs, garages, patios, barns, aboveground and belowground swimming pools, retaining walls, closed loop geothermal systems, roads, driveways, parking areas, or paved sidewalks	10[7]	10[8]
Front, side, or rear lot lines	5	5
Water lines continually under pressure	10	10
[illegible]	[illegible]	[illegible]

[1]The distances enumerated shall be doubled for soil absorption systems constructed where there exist horizons, layers, or strata within thirty-four (34) inches of the ground surface with a soil loading rate greater than seventy-five hundredths (0.75) gallons per day per square foot as determined from Table IV of section 70(b)(8) of this rule, unless that hazard can be overcome through on-site sewage system design.

[2]The separation distance to a private water supply well abandoned in accordance with 312 IAC 13-10-2(e) may be reduced to ten (10) feet.

[3]Measured from the normal or ordinary high water mark.

[4]See subsections (b) and (c)

[5]Storm water detention area: area designated for the temporary detention of storm water, with the outlet located at the lowest elevation of the depression.

[6]See section 59(f) of this rule for subsurface drainage system separation.

[7]Patios without footers, aboveground swimming pools, and sidewalks may be located within ten (10) feet of septic tank, as long as no required access points are obstructed.

[8]A minimum separation of ten (10) feet is required on all sites.

Septic tanks,
Dosing tanks,
Lift stations,
Soil absorption fields.

Section 57 - Separation Distances

b) OSS at least 200’ from public water supply lake/reservoir, unless secondary treatment is used
   1) Min. requirements of rule
   2) NSF/ANSI standards & approved by ISDH

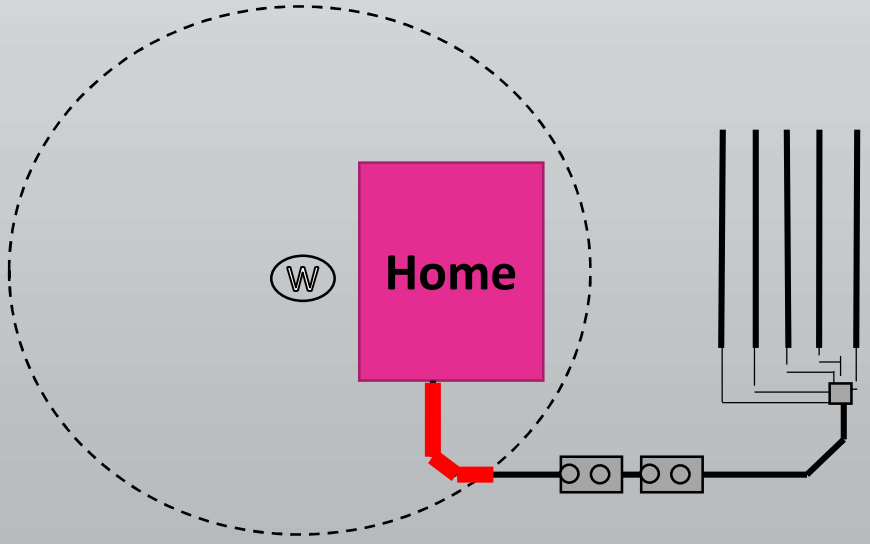
c) Maintained for life of system

Section 57 - Separation Distances

d) Sewers <50’ to well or suction line

1) Waterworks grade ductile iron with Tyton or mechanical joints OR Pressure rated pipe, SDR ≤ 26, with compression gasket joints
2) No closer than 20’ to dug/bored wells or 10’ to drilled/driven wells

1. Pressure Rated Pipe
2. SDR 26 or less
3. Compression Gasket Joints

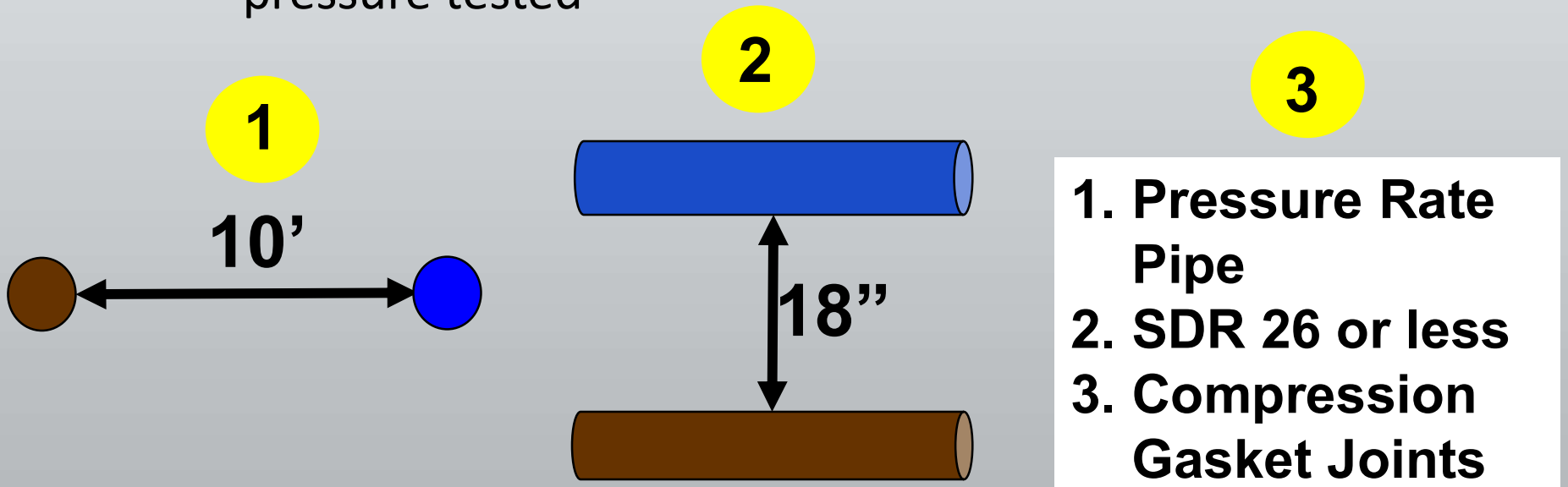


50’ well radius

Section 57 - Separation Distances

e) Water lines and sewer lines not in same trench

1) Horizontal separation of 10’
2) Where crossing is necessary, min. 18” vertical clearance with water line on top
3) Impossible to maintain horizontal/vertical separation, sewer must be constructed of “upgraded pipe” and pressure tested

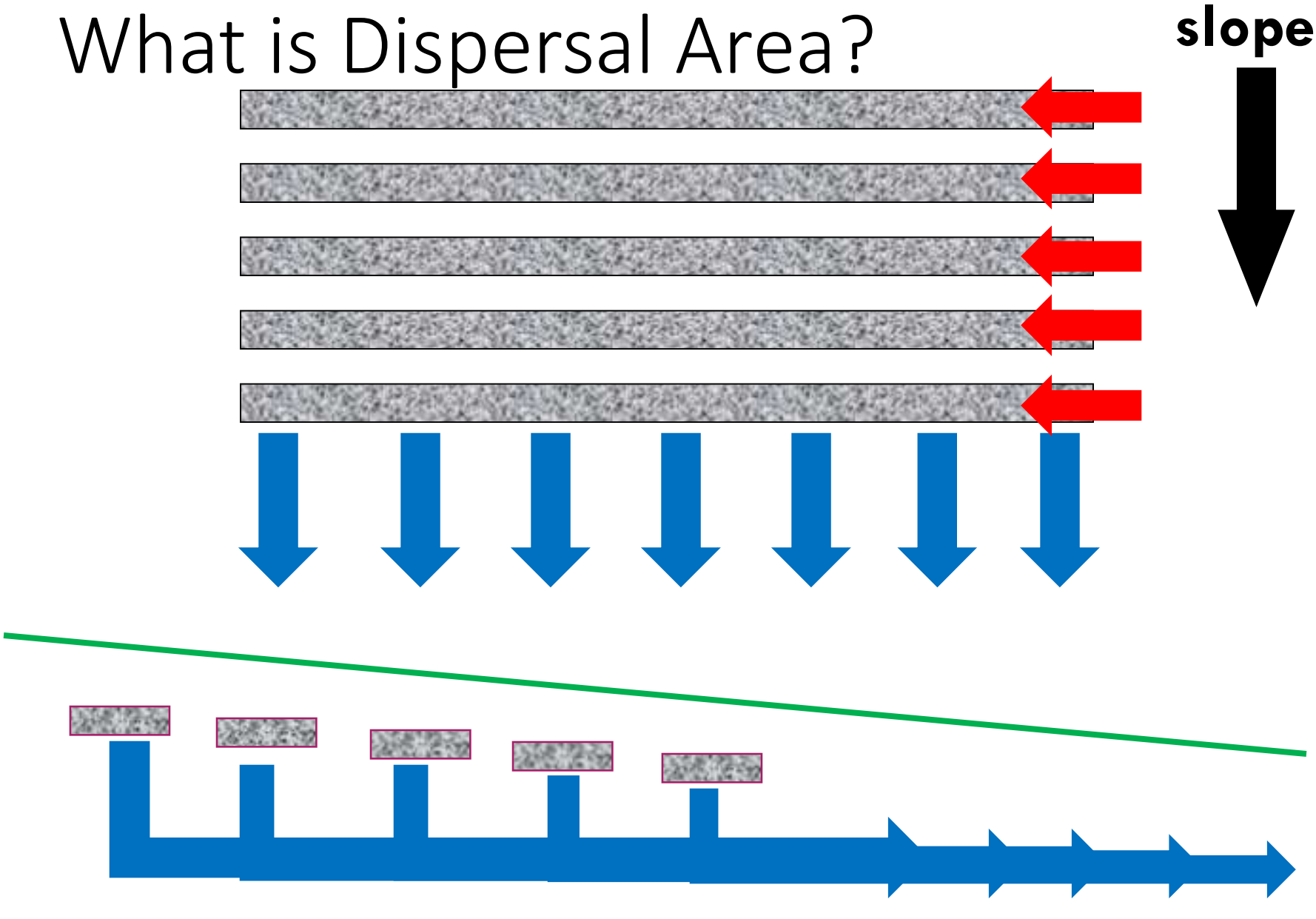


Section 58 - Dispersal Area

What is dispersal area?

an area adjacent to a **soil absorption field, located where water would move away from the soil absorption field,** and used for **unimpeded dispersal of clean water** in widely separated position to protect and **allow the soil absorption field to accept more wastewater for treatment**.

What is Dispersal Area?



Section 58 - Dispersal Area

a) Dispersal Area is required when
  - SLR ≤ 0.50 **OR**
  - Limiting conditions in top 60”
    - Bedrock
    - Densic material
    - Dense Till
    - Soil with fragic properties, or
    - Layers Transitional to dense till

Limiting Layer

b) Location of dispersal area

c) When the conditions of a) are not met, the minimum dispersal area shall be 10’

Reminder: The separation distances table also requires at least a 10’ separation on all sites.

Section 58 - Dispersal Area

c) Table II (footnotes!)

Table II	
Minimum Dispersal Areas for Soil Absorption Fields	
Slope ≤ ½%; no subsurface drainage	¼ width of soil absorption field on both sides of the SAF
Slope > ½%; no subsurface drainage	½ width of soil absorption field on downslope side of SAF
Any Slope; with subsurface drainage	10 feet

- Minimum 10’ and Maximum 25’
- No buildings, etc in dispersal area
- Level sites, located on both sides, parallel to long axis of system
- Sloping sites, located downslope
- Use of drain to decrease dispersal area, drain must meet requirements
- Minimum 10’ and Maximum 25’

Section 58 - Dispersal Area

d) No compacted soil material

e) Location

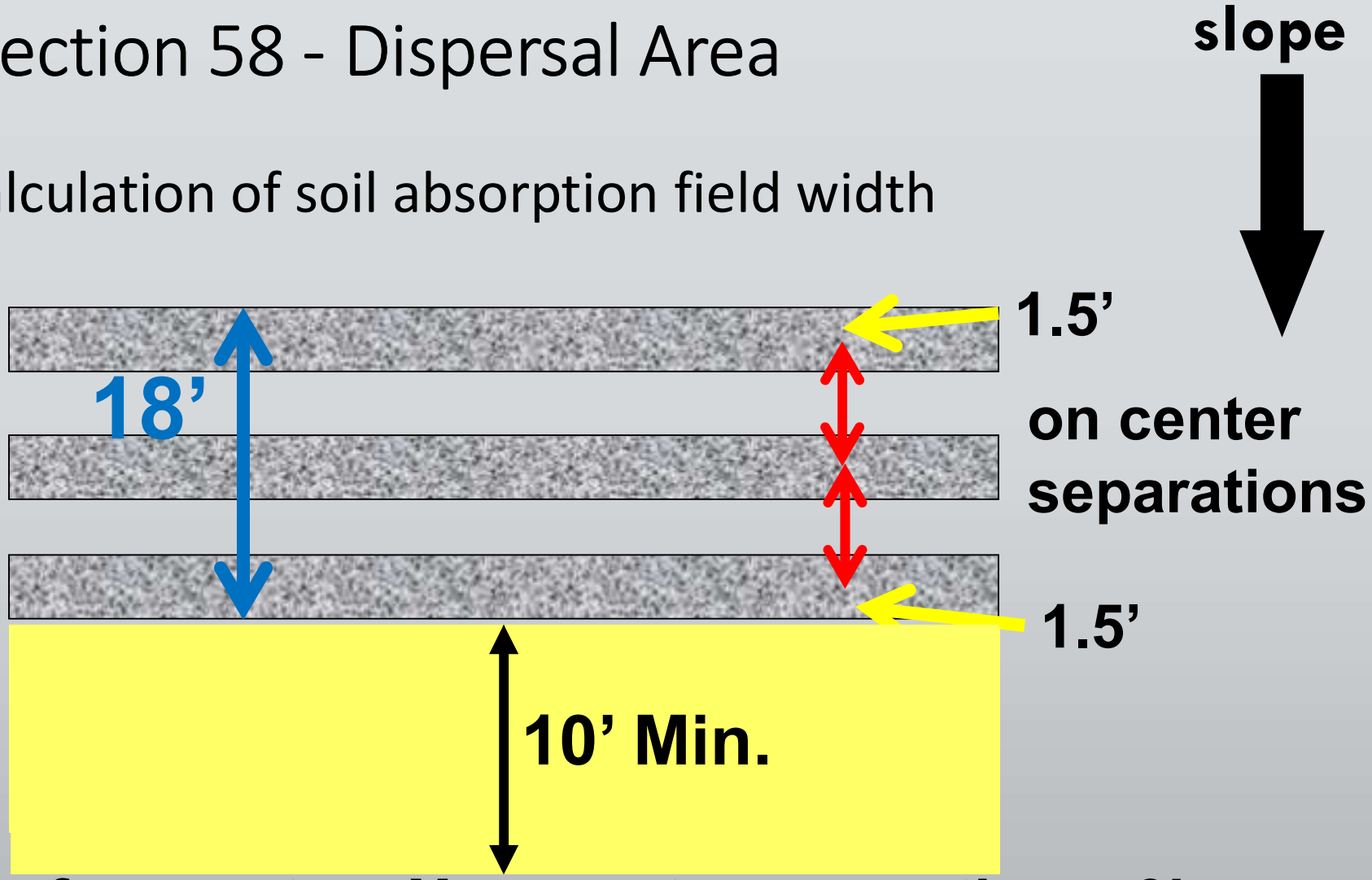
1) Must be on the property for lots platted after 1/1/11 (or with easement on adjacent property)

   Lots platted prior to 2011, must still have dispersal area, but it may be on adjacent property without an easement.

1) Nothing to impede water flow
2) Not in a closed depression
3) Sites with >1/2% slope, nothing can slope back to the SAF

Section 58 - Dispersal Area

Calculation of soil absorption field width



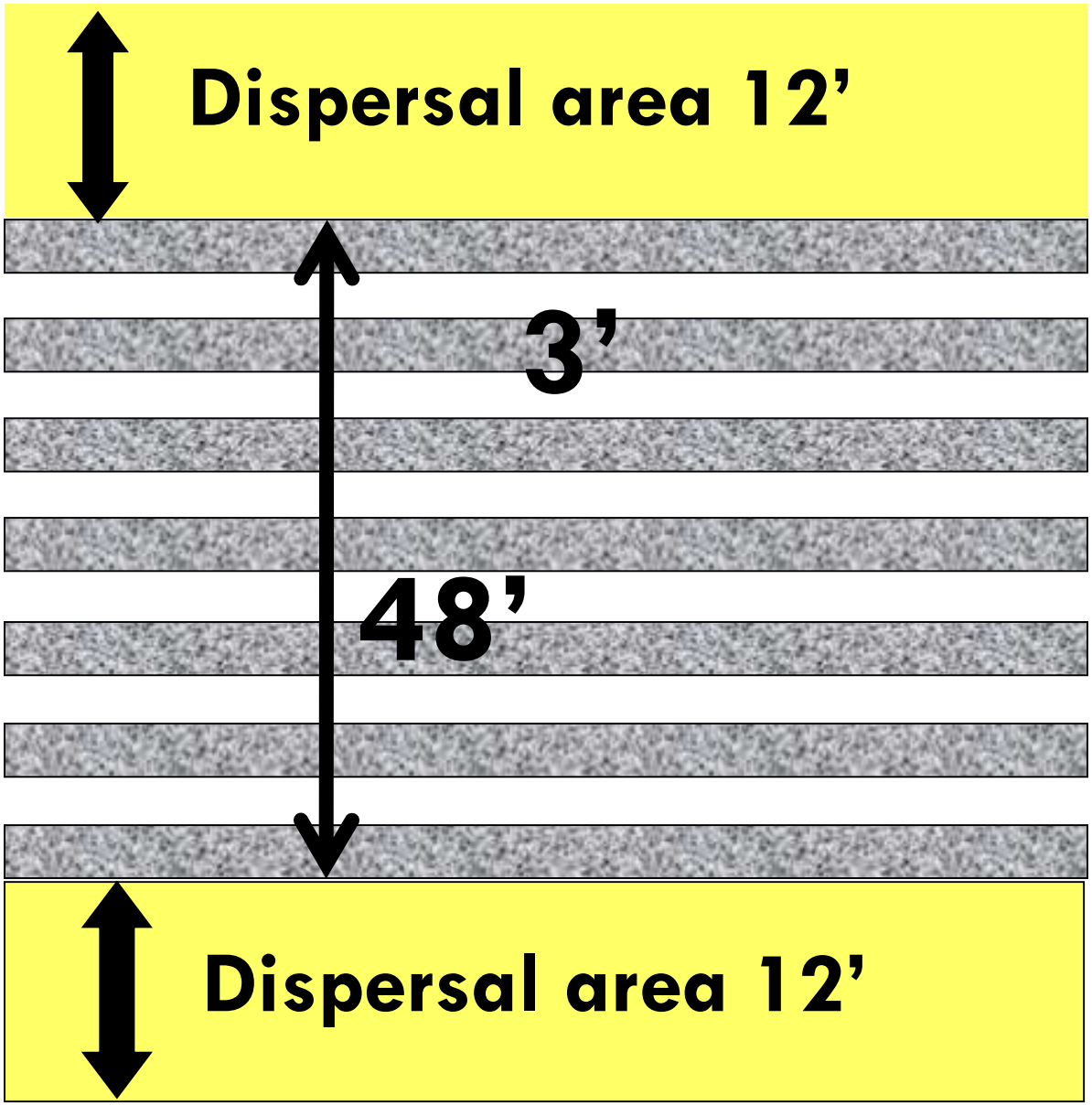
# of on centers X on center separation + 3’

2 X 7.5’ + 3’ = 18’

Section 58 - Dispersal Area

Calculation of soil absorption field width

Dispersal Area: ≤½ % & no drainage



6 X 7.5' + 3' = 48'

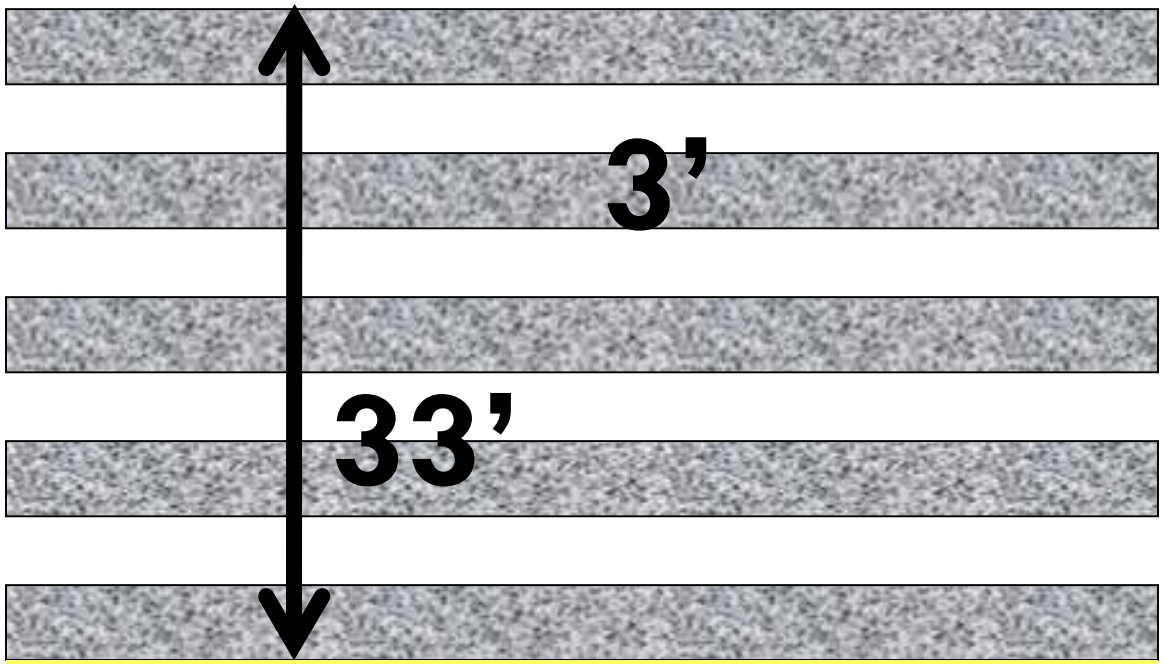
} 7.5' o/c

DISPERSAL AREA
= ¼ WIDTH SAF

48' x ¼ = 12'

10' min - 25' max

Dispersal Area: >½% & no drainage



slope

} 7.5’ o/c

DISPERSAL AREA
= ½ WIDTH SAF

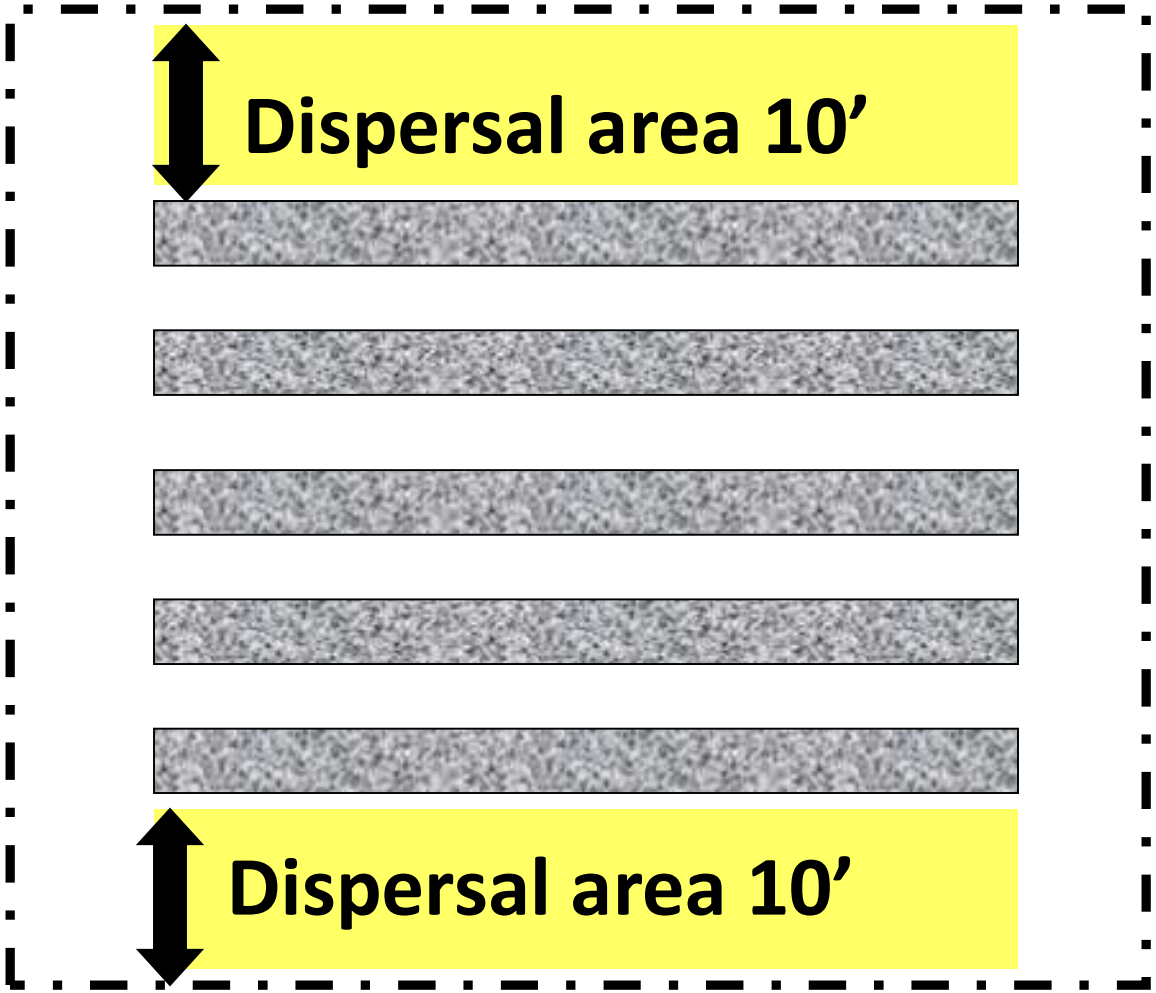
Dispersal area

16.5’

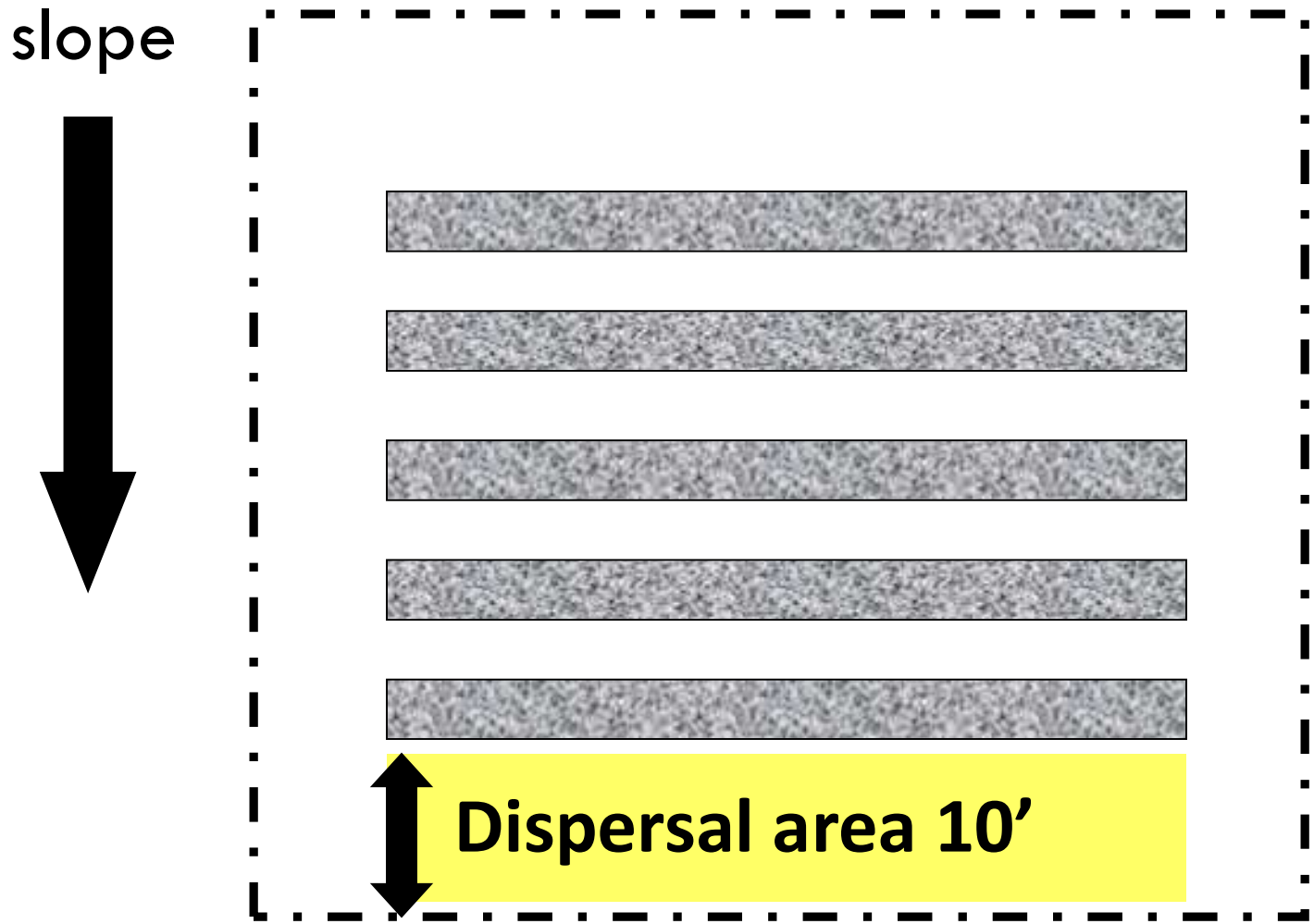
33’ x ½ = 16.5’

10’ min – 25’ max

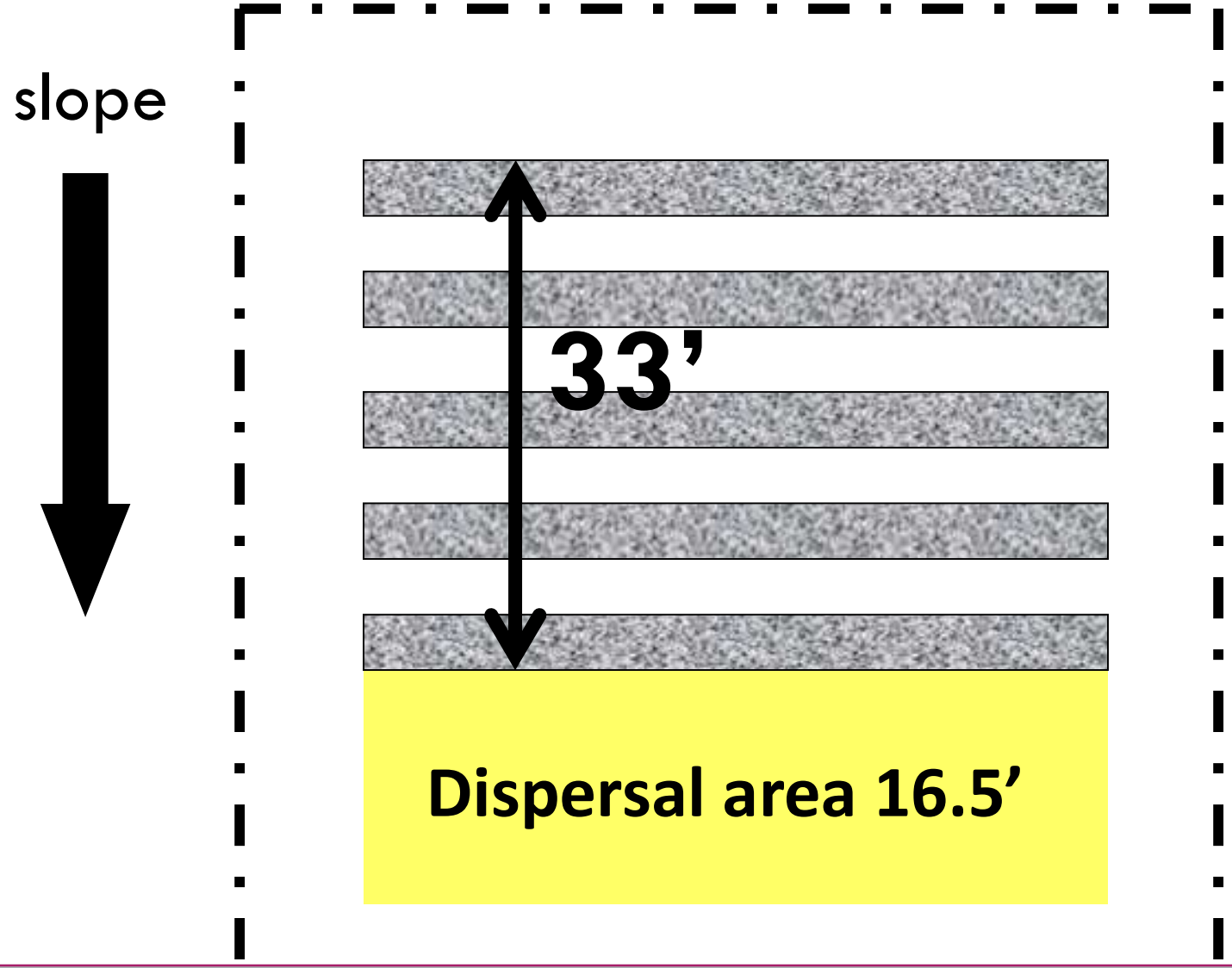
Dispersal Area: perimeter drain, ≤½%



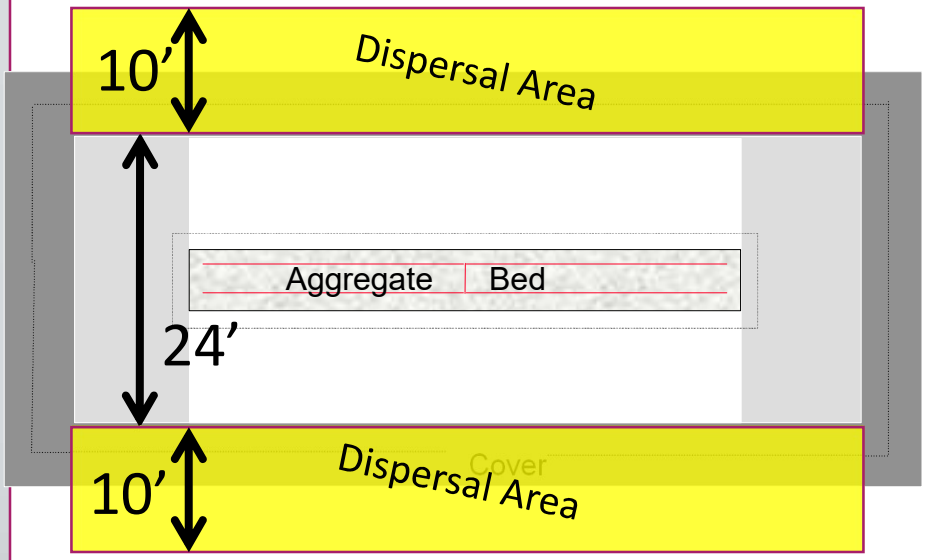
Dispersal Area: perimeter drain, >½%



Dispersal Area: interceptor drain, >2%



Dispersal Area Elevated Sand Mound



Level Site, 24’ wide basal area, no drainage

Width of sand is 24’

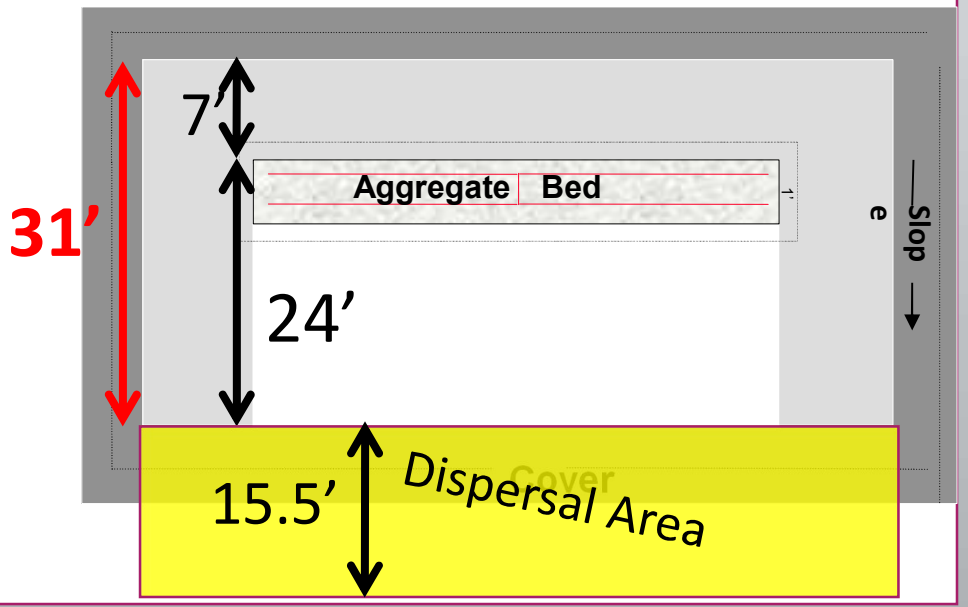
24’ X ¼ = 6’

Minimum dispersal area is 10’

Sloping Site, 24’ wide basal area, no drainage

Width of sand is 31’

31’ X ½ = 15.5’



Question 1

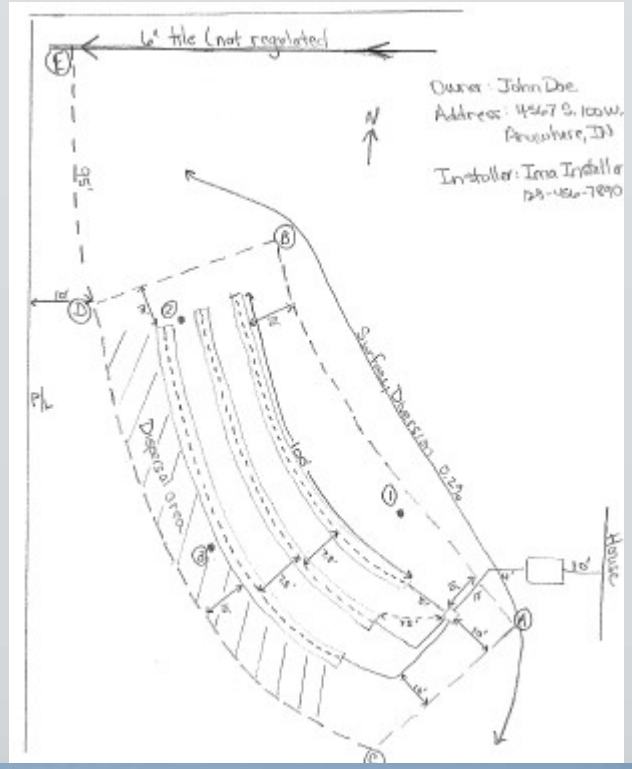
1. What 2 things are minimally required for a home to be considered to have an on-site sewage system?

- [ ] A. A septic tank and a drywell.
- [ ] B. A grinder pump and a 2-compartment septic tank.
- [x] C. A septic tank and a soil absorption field that has not failed.
- [ ] D. A septic tank and a subsurface drainage system that surrounds the entire system.
- [ ] E. Leach lines and a discharge tile.

Section 59 - Drainage

a) Surface diversion:

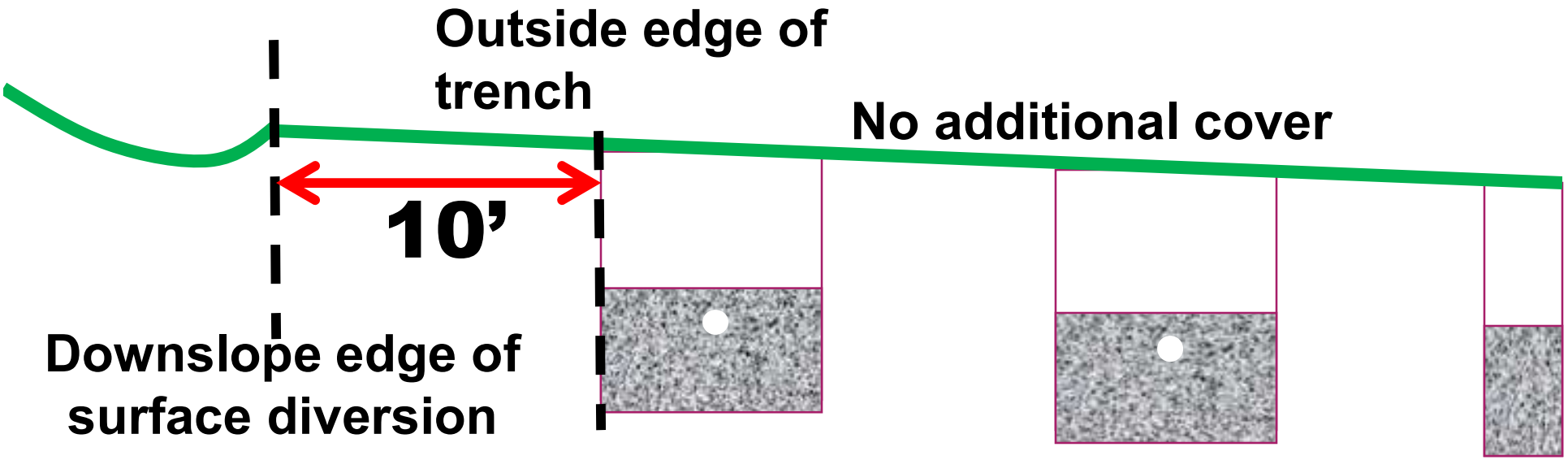
1) Eliminate effects of upslope competitive water
2) Minimum 0.2% grade
3) Sufficient depth and width to move surface water away from the soil absorption system



Section 59 - Drainage

4) A surface diversion shall be located:

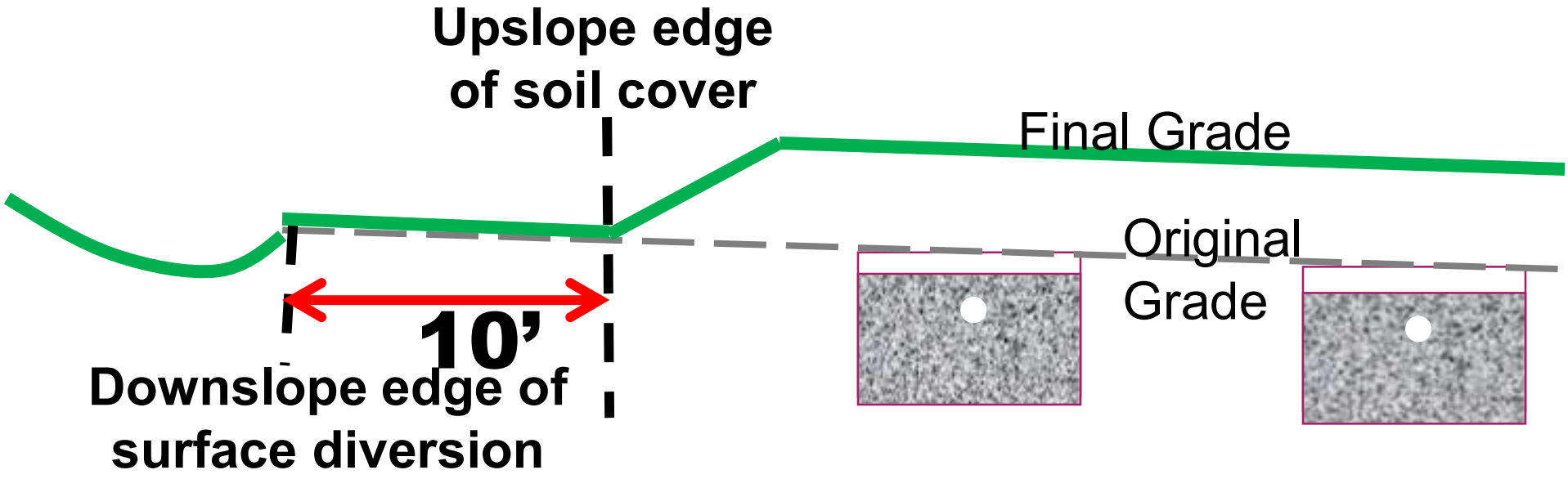
for **subsurface trench** onsite sewage systems that **do not require additional soil cover**, at least **10 feet** from the soil absorption system, as measured from the **downslope edge of the surface diversion** to the **outside edge of the nearest soil absorption system trench**



Section 59 - Drainage

4) A surface diversion shall be located:

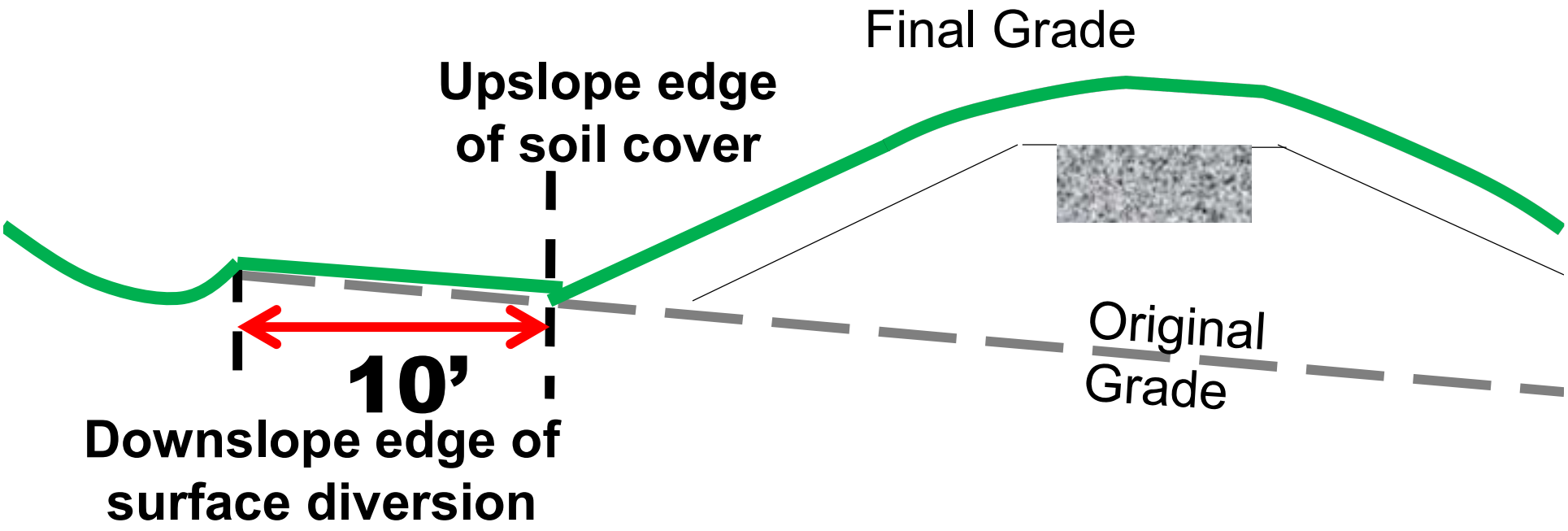
for subsurface trench onsite sewage systems that **require additional soil cover**, at least **10 feet** from the soil absorption system, as measured **from the downslope edge of the surface diversion to the upslope edge of the additional soil cover**; or



Section 59 - Drainage

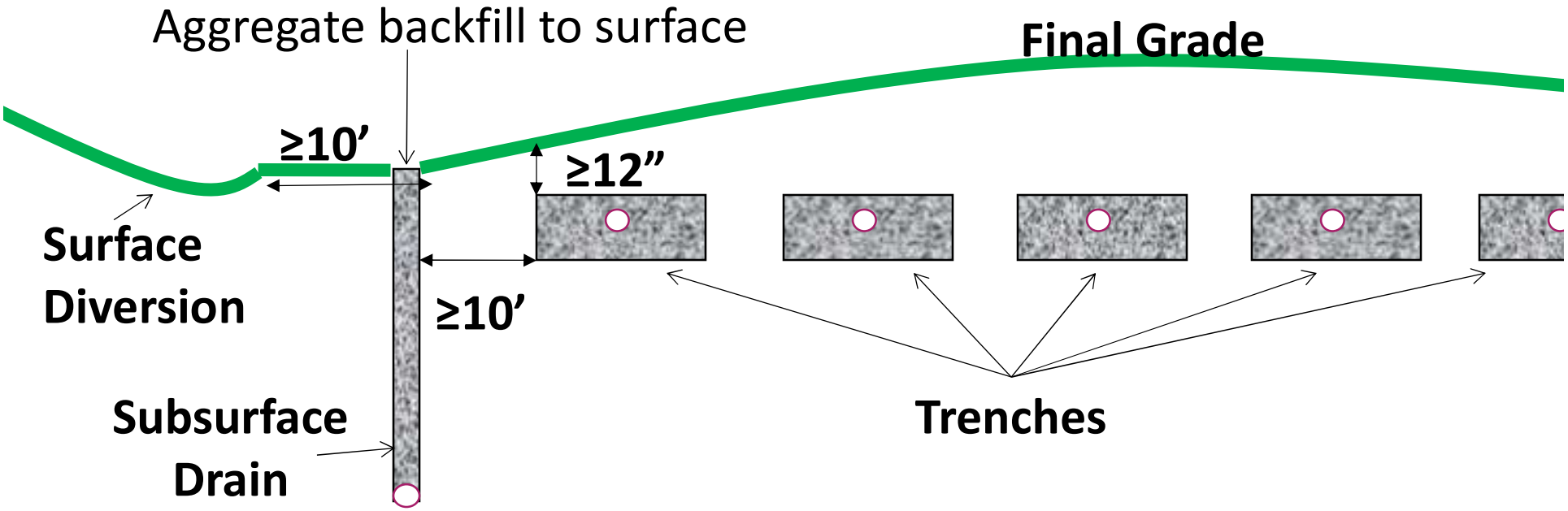
4) A surface diversion shall be located:

for **elevated sand mound** onsite sewage systems, **at least 10 feet** from the soil absorption system, **as measured from the downslope edge of the surface diversion to the upslope edge of the soil cover**



Section 59 - Drainage

5) A surface diversion may be used in combination with an onsite subsurface drainage system.



Subsurface Drainage

Section 49 – Subsurface Drainage System

Any pipe with or without a layer of gravel, stone, or coarse sand, placed below the surface of the ground and designed or constructed in such a manner as to

1. Effectively lower a seasonal high water table; or
2. Prevent movement of subsurface water into a soil absorption system site

Includes:

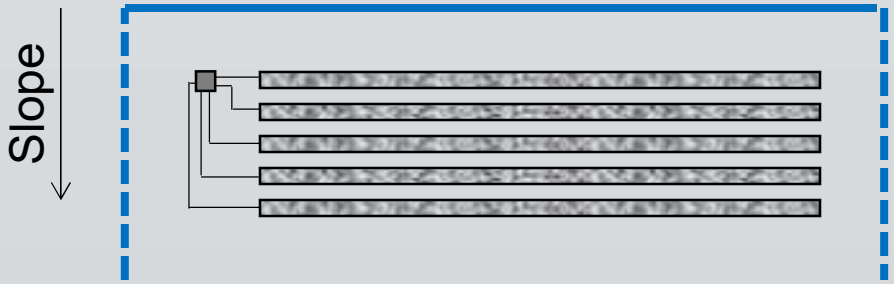
Section 20 – Interceptor Drain

Section 27 – Perimeter Drain

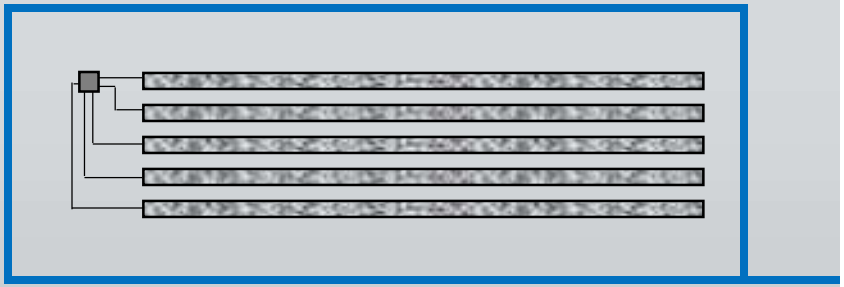
Section 39 – Segment Drain

Sections 20, 27, 39 (Definitions)

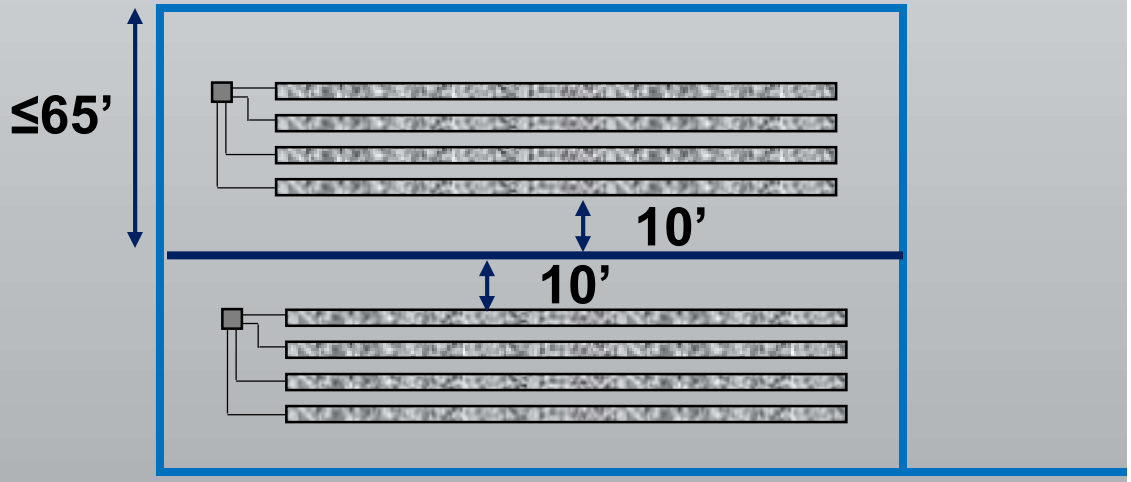
- Interceptor
  - Required on >2% slope
  - High side(s) of system



- Perimeter
  - Required on 0–2% slope
  - May be used on >2% slope

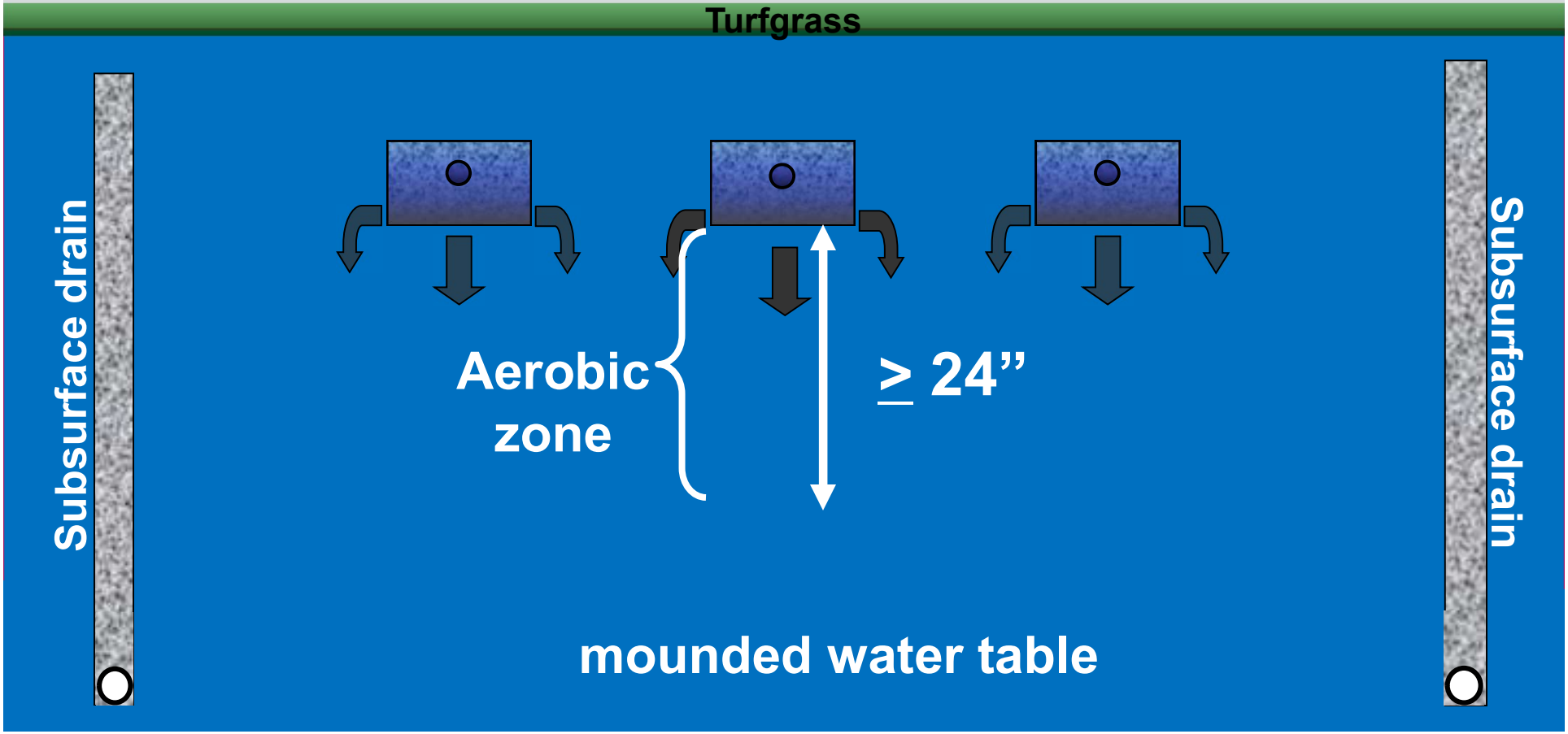


- Segment
  - Between 2 parts of a system
  - ≤65’ spacing



Section 59 - Drainage

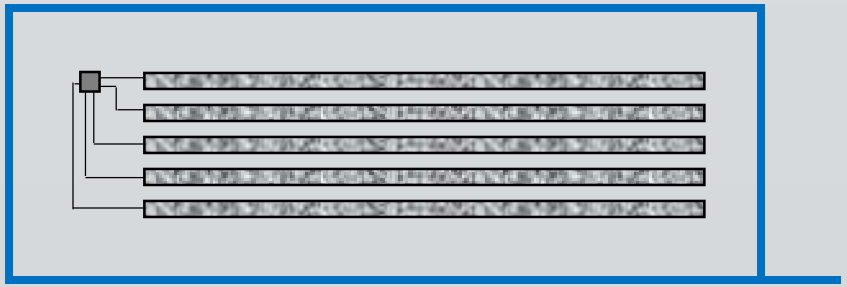
b) Designed and constructed to effectively lower a seasonal high water table



Section 59 - Drainage

c) Site slope ≤2%

- Drain surrounds system
- Perimeter



Site Slope >2%

- Drain <u>may</u> be constructed on upslope side only
- Interceptor
- LHD may require perimeter

Section 59 - Drainage

d) Depth *The deepest*

- 2” into massive clay, glacial till, or fragipan
- When the drain cannot be constructed at that depth:
  - Subsurface trench SAF
    ≥36” below the elevation of the adjacent trench bottom
  - Elevated Sand Mound SAF
    ≥32” below existing grade OR

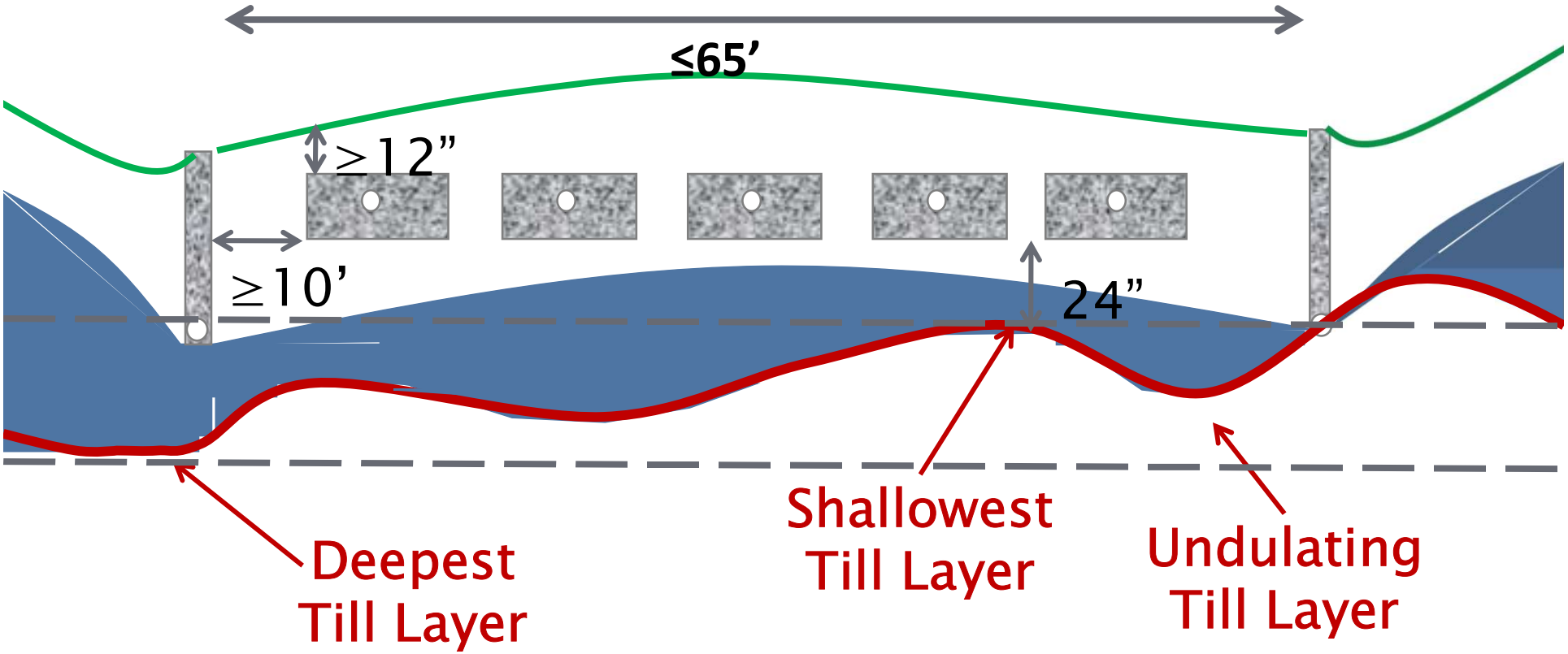
e) Calculations

Section 59 - Drainage

2 inches into massive clay, glacial till or fragipan??

- Undulating horizon
- Shallow SHWT

Seasonal high water table is not adequately lowered

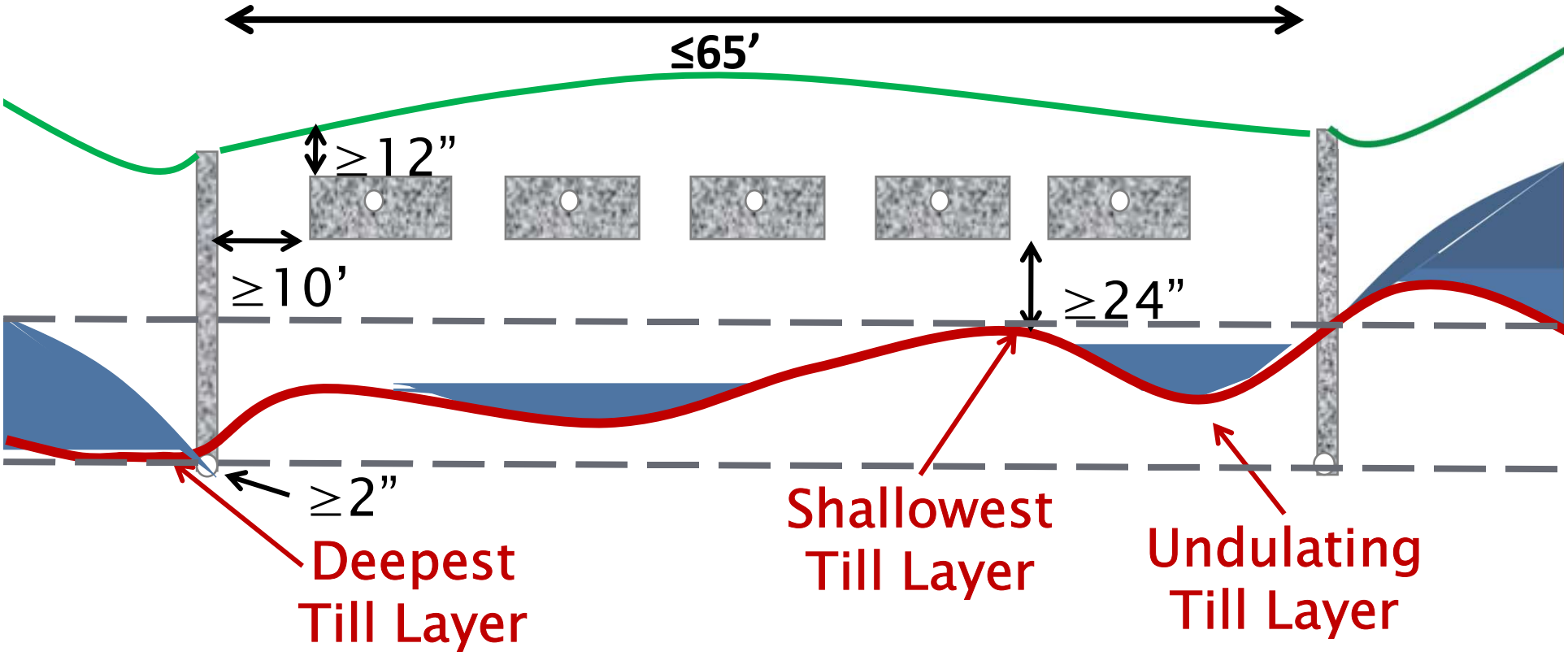


Section 59 - Drainage

2 inches into massive clay, glacial till or fragipan

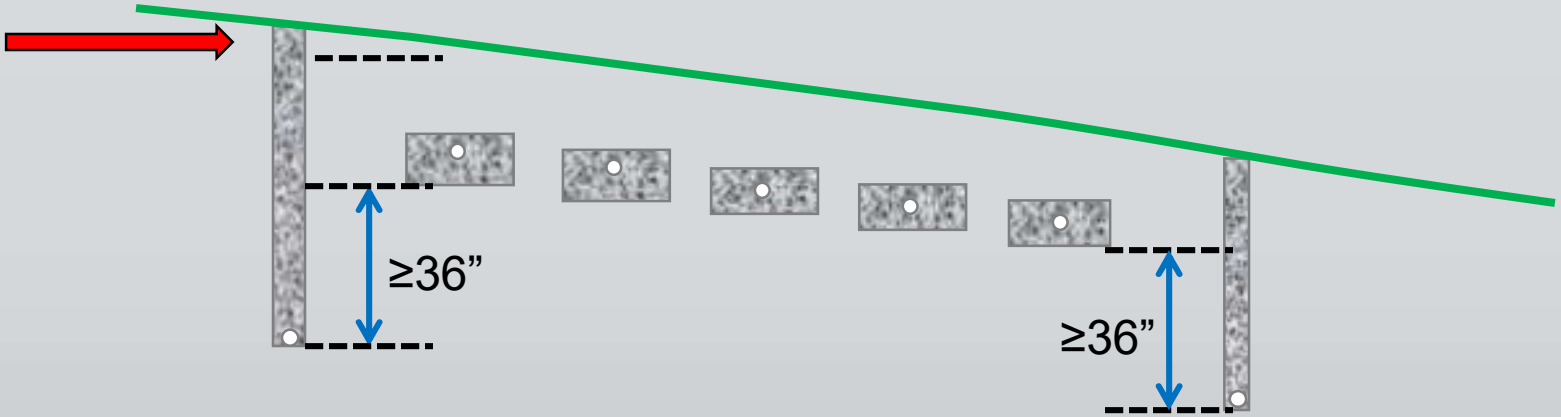
- Shallow SHWT
- Undulating horizon
- **Deepest** identified in the SAF area

Seasonal high water table is adequately lowered

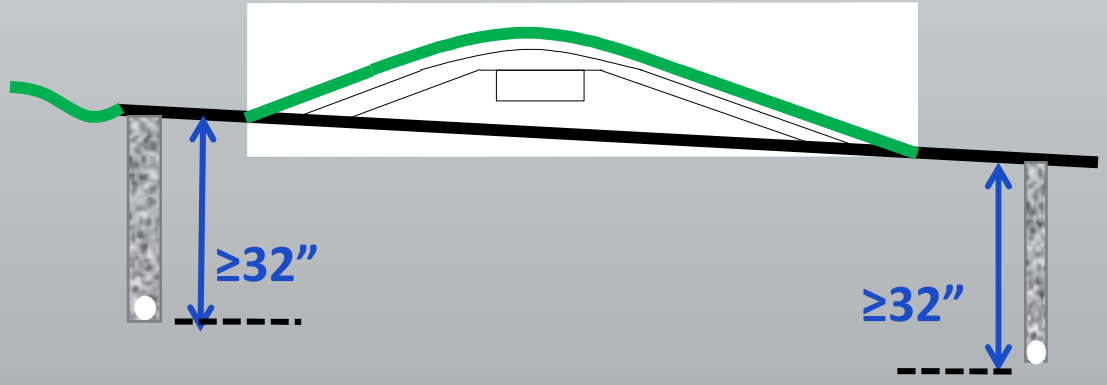


Section 59 - Drainage

OPTION: 36” below the elevation of the adjacent trench bottom elevation



OR 32” below the ground surface for ESM



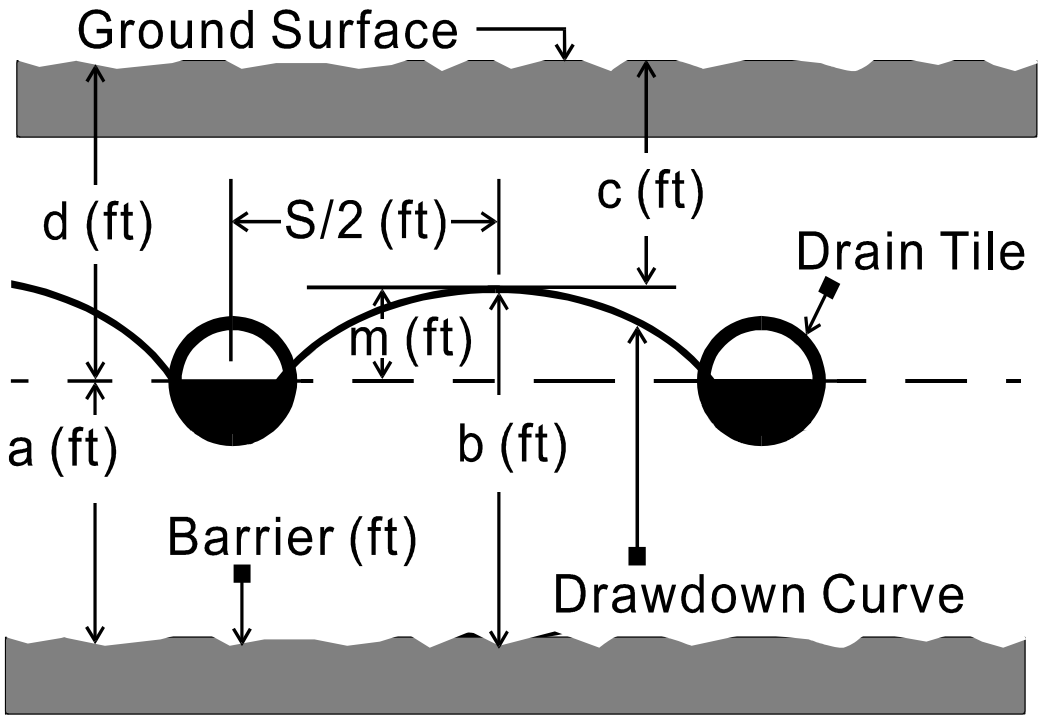
Section 59 - Drainage

e) OPTION: Drainage Calculations

$$S = [\{ 4P (b^2 - a^2) \} / Q_{md}]^{½}$$

Trenches – 24” of unsaturated soil under trench bottom

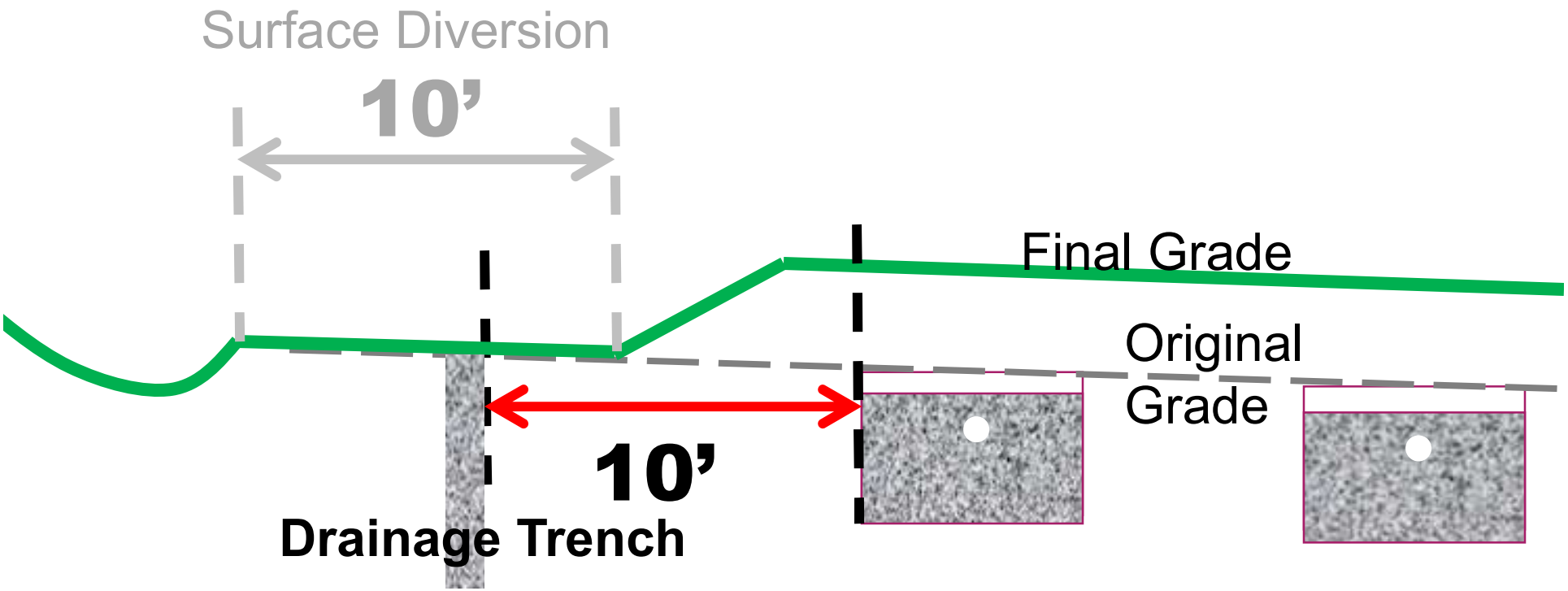
Elevated sand mound – 20” of unsaturated soil from original grade



Section 59 - Drainage

f) Subsurface trench SAF

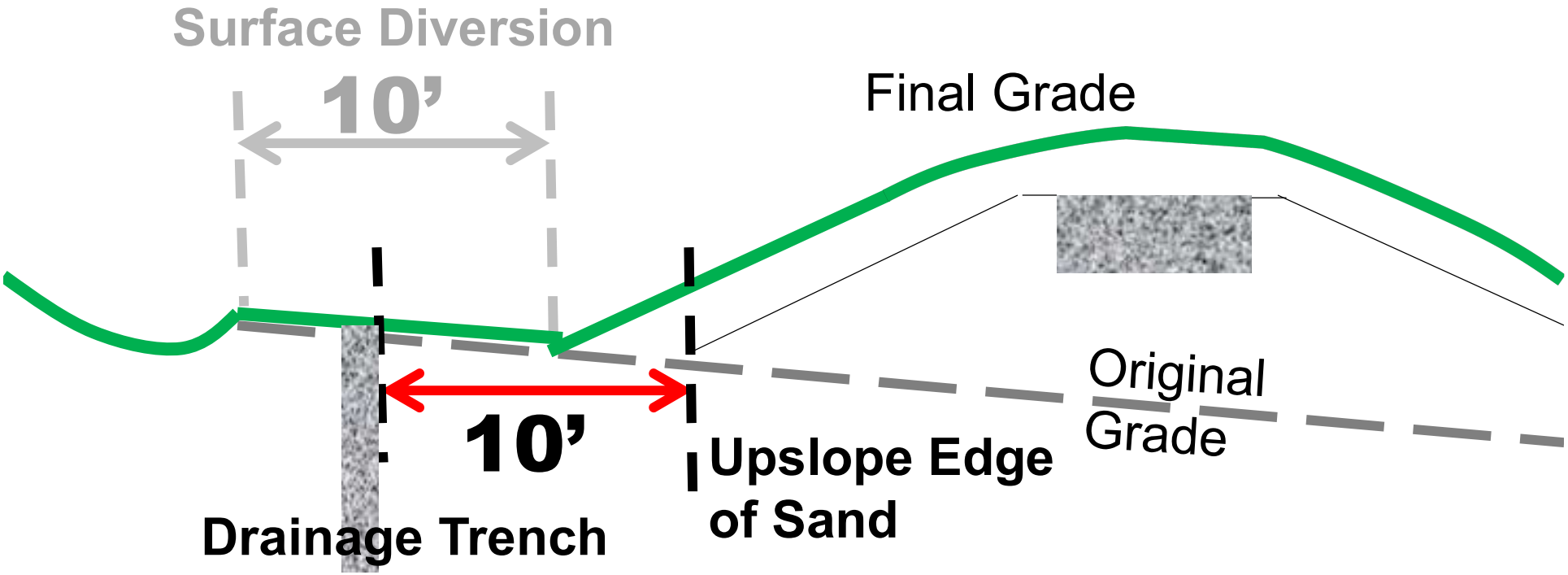
1) ≥10’ from the outside edge of the nearest SAF trench



Drainage – Section 59

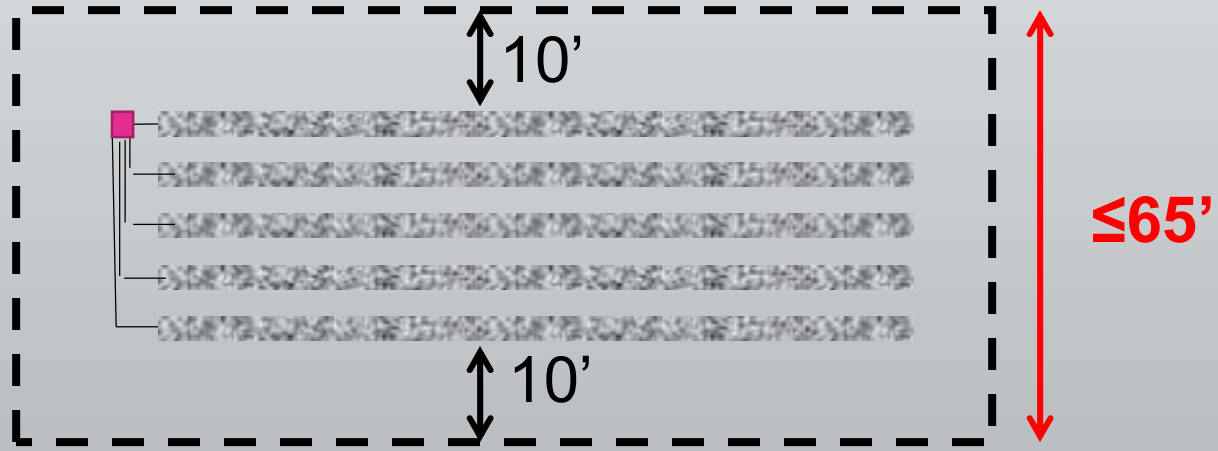
f) Elevated sand mound SAF

2) ≥10’ from the outside edge of the INDOT Specification 23 sand



Section 59 - Drainage

3) Spacing of perimeter and segment drains **parallel to the trench lengths along the contour of the site** must be less than or equal to sixty-five (65) feet, unless a greater spacing is determined through calculations.



4) Drain cannot cross the soil absorption system

Section 59 - Drainage

g)Subsurface drain pipe

1) Minimum 4” tile

2) Slotted

3) Wrapped in geotextile fabric when installed in:

sands, loamy sands, sandy loams, fine sandy loams, loams, silt loam, or silts

Also wrapped…

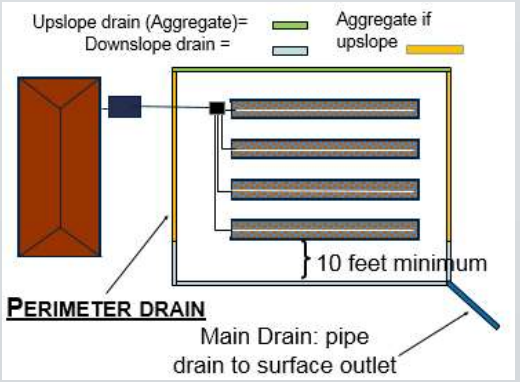
L) When INDOT Spec sand is used for backfill

Section 59 - Drainage

h) Slope required

1) 0.2% for 4” tile
2) 0.1% for 6” tile
3) No sags in the line

Section 59 - Drainage

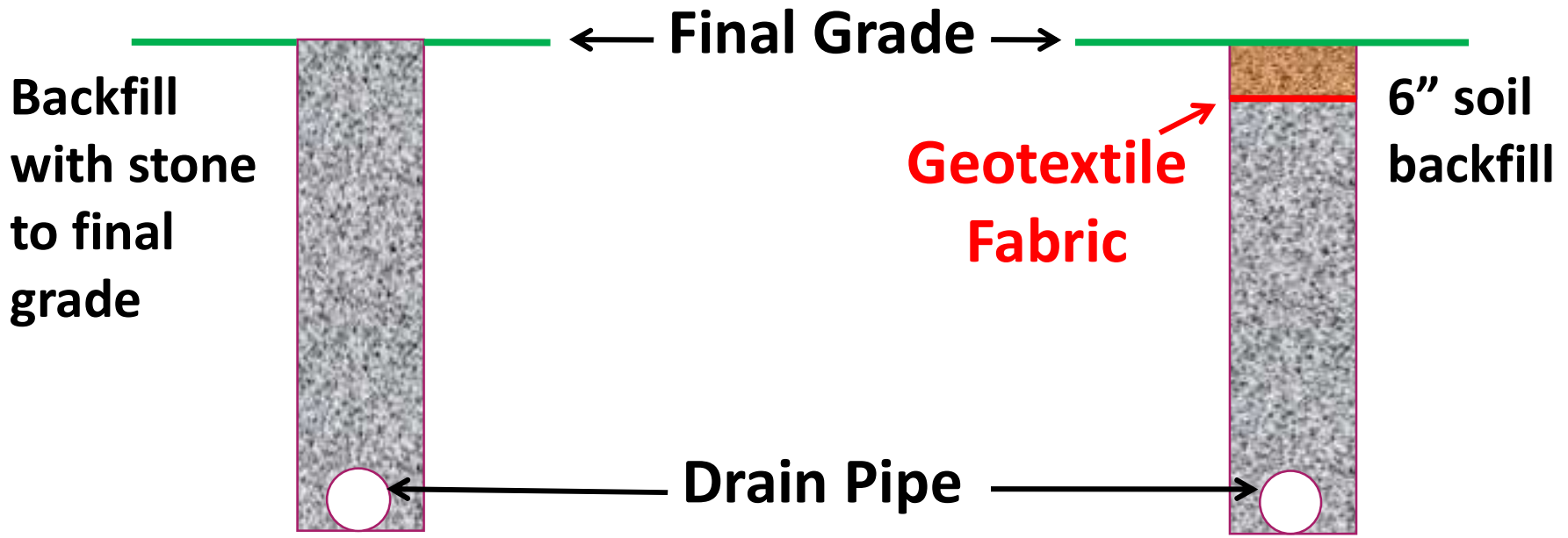


i) **<u>Upslope</u> drain trench backfill**

To final grade or to within 6” of <u>final grade</u>

m) If aggregate backfill not to surface, the aggregate must be covered with geotextile fabric

j) <u>Sides, downslope or segment</u> drains may backfilled in the same manner



Section 59 - Drainage

k) Drain trench aggregate backfill

- Washed aggregate
  - Section 68
  - INDOT Specifications 8 thru 11
  - INDOT Specification 23 sand – **pipe** must be wrapped with geotextile fabric

Section 59 - Drainage

n) Drain must flow by gravity

o) Tile outlets must have guards

Section 56
On-site evaluation

a) Before issuance of a permit**,** a soil profile description is required

b) Soil scientist to use guideline of NRCS

c) Soil profile to 5 ft depth or non-penetrable layer

d) Conduct <u>prior</u> to application and plan submittal

e) Written soil evaluation shall contain topographic and soil characteristic info

f) Subsurface drainage will require 80 in. deep evaluation, soil characteristics and particle size family.

Question 2

2. What is the minimum required slope for a 4” subsurface perimeter drain and the outlet tile?

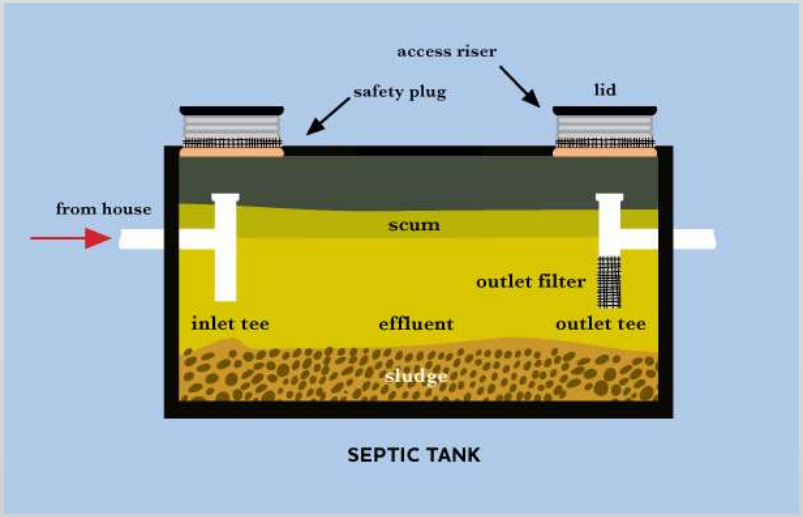
- [ ] A. There is no required slope.
- [ ] B. The tile must be laid level throughout the drain.
- [ ] C. 0.1%
- [x] D. 0.2%
- [ ] E. 2%

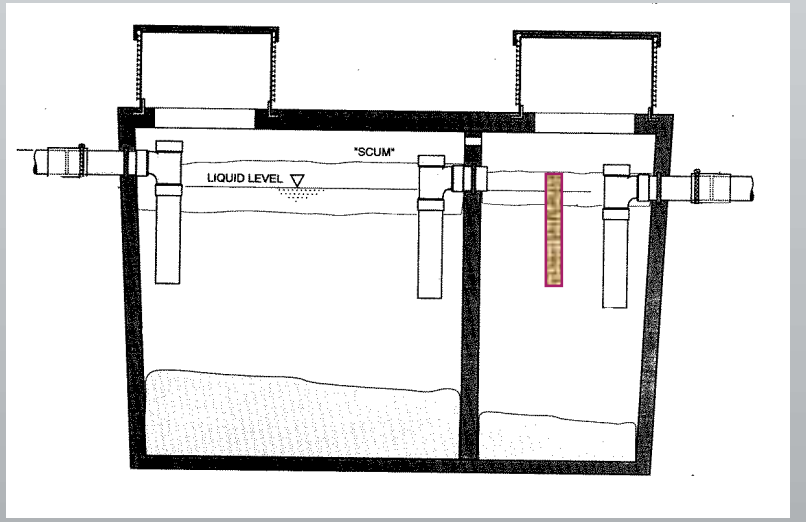
Tanks

- Section 60 Septic Tank General Requirements
- Section 61 Septic Tank Construction Details
- Section 62 Dosing Tanks
- Section 63 Septic and Dosing Tank Installation and Maintenance

Section 60-Septic Tank General Requirements

a) Septic tanks shall be
   1) Watertight
   2) Protected from Corrosion
b) No cast in place, concrete block, wood or metal
c) Minimum capacity
d) Must discharge to SAF
e) Two compartment tanks
   1) First compartment 1/2 to 2/3 of capacity
   5) Access riser to surface on both compartments





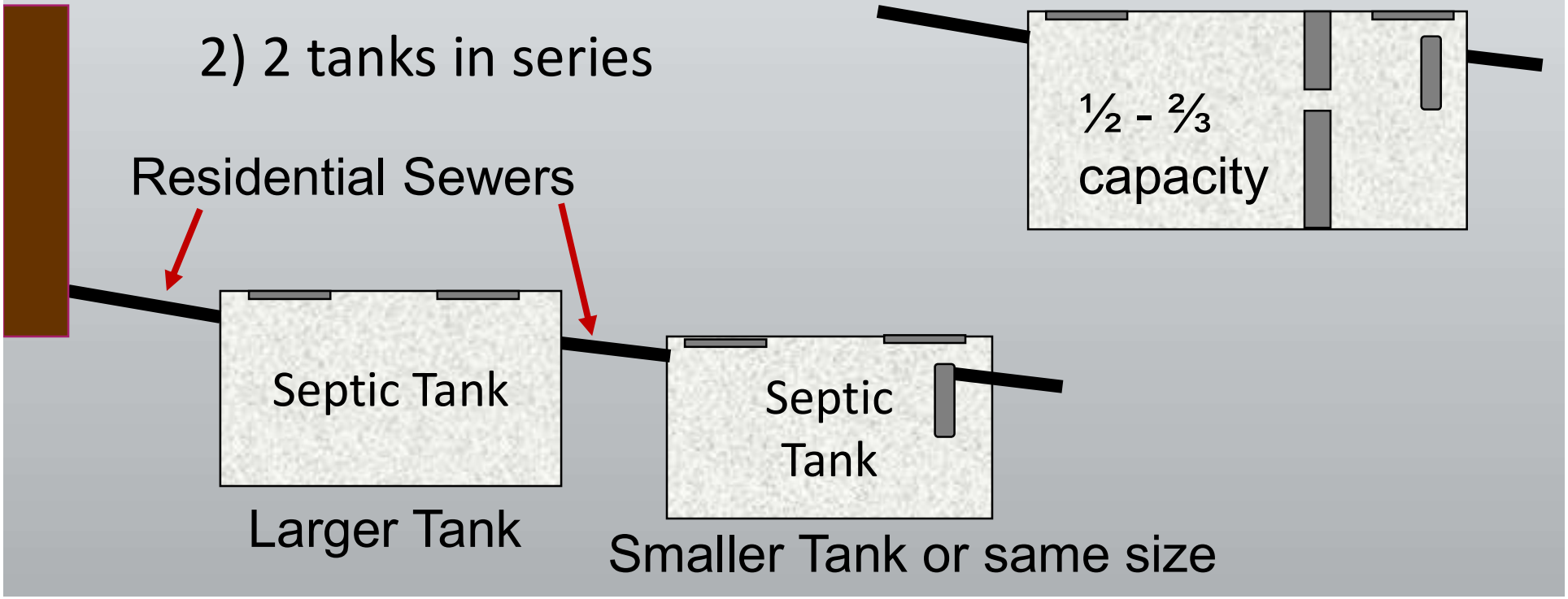
Section 60 -Septic Tank General Requirements

f) Tanks in series, no tank less than 750 gallons and larger tank must be upstream.

g) If grinder pump precedes septic tank

1) 2 compartment tank or

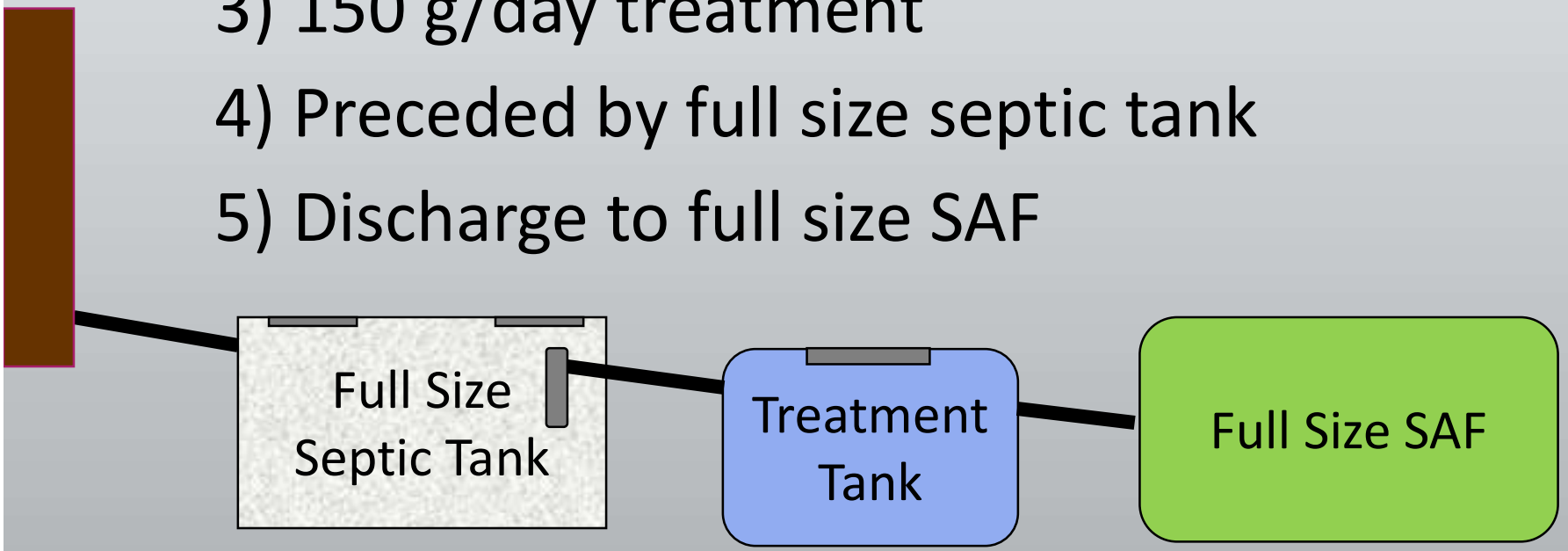
2) 2 tanks in series



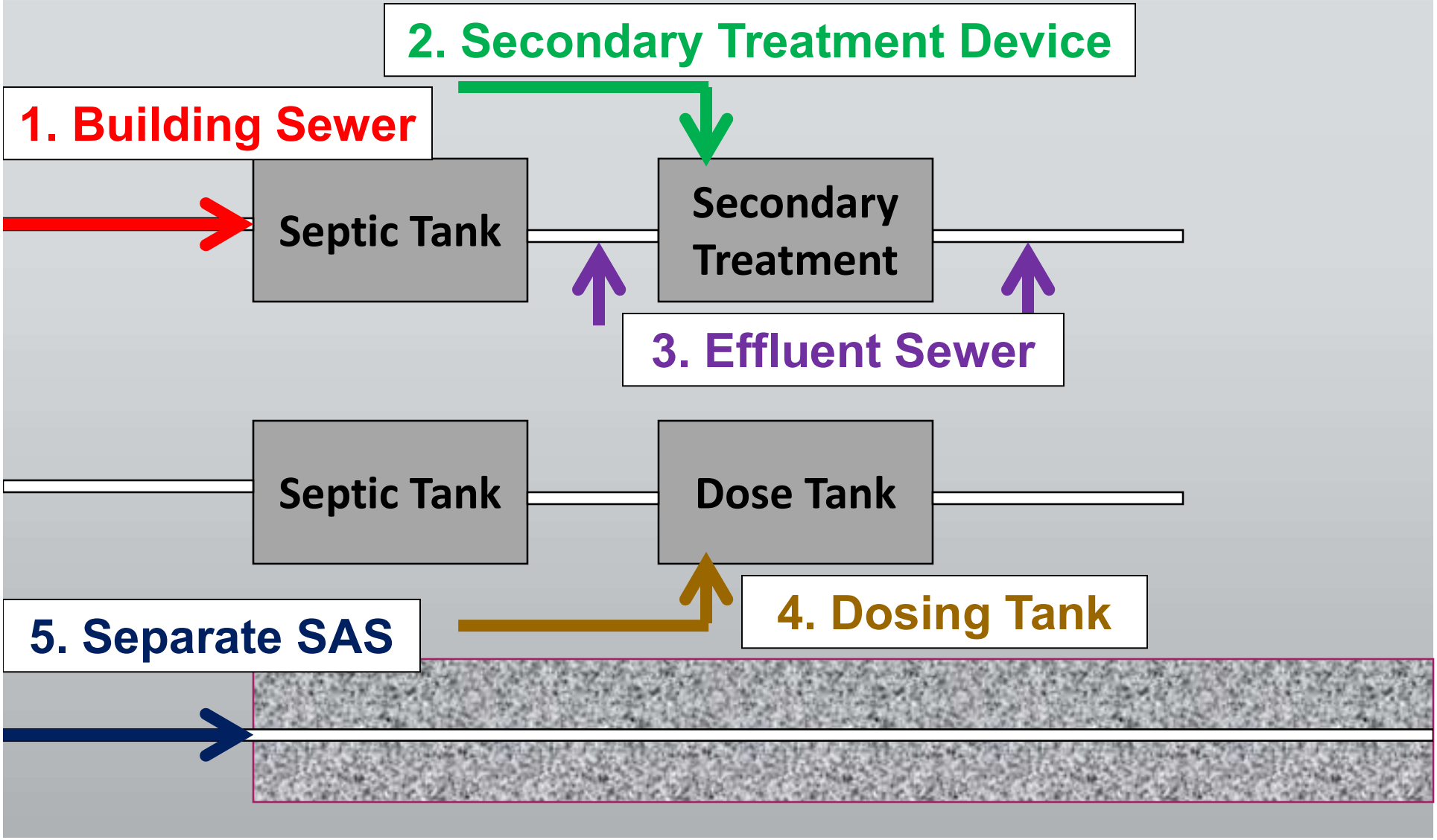
Section 60 - Septic Tank General Requirements

h) Tanks fitted with aeration units

1) NSF/ANSI Standard 40, class 1 plant
2) Current registered certification mark
3) 150 g/day treatment
4) Preceded by full size septic tank
5) Discharge to full size SAF



Sec 60 Septic Tanks – General
(i) Water Softener Backwash



Section 61 - Septic Tank Construction Details

Buy tanks from an approved supplier!

d) All new tanks must have outlet filter

o) Access openings

1) 1 per compartment (18” minimum)

2) An access over inlet, outlet, tee or baffle on divider wall (no size requirement)

3) Access must allow for maintenance, cleaning and servicing

p) Risers

2) Lower section

- cast into lid or
- sealed to top with butyl sealant

3) Fitted with watertight, securely fastened covers

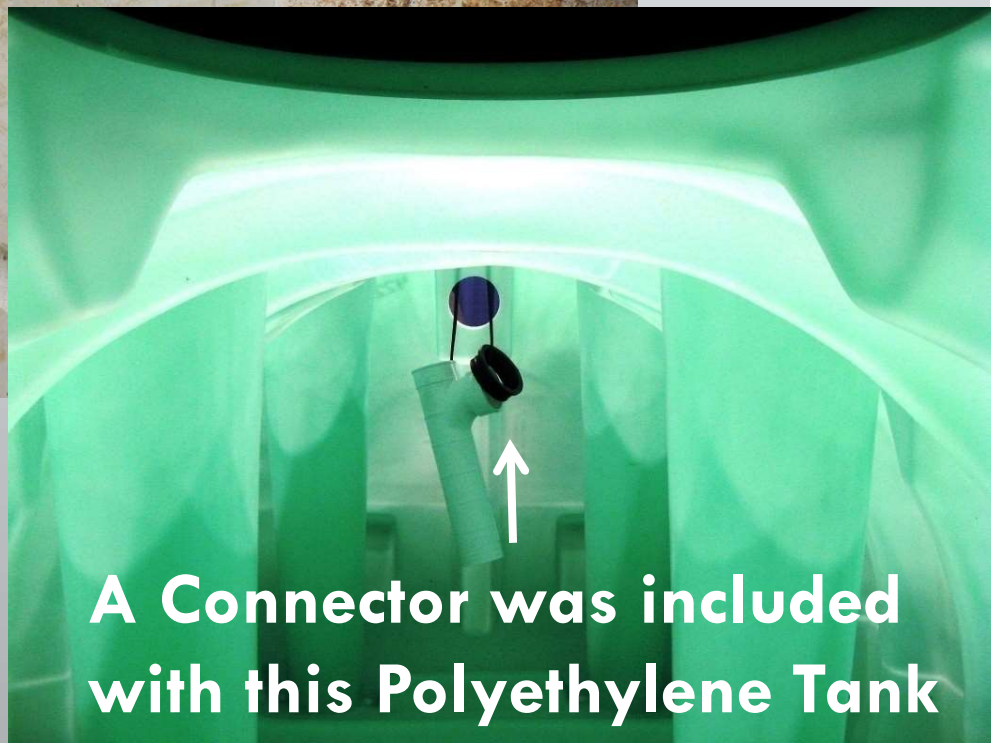
Section 61
Septic Tank Construction Details

q) Pipe Connector requirements:

- Each pipe penetration shall be sealed with a flexible, watertight connector
- Precast concrete tanks shall use cast in place connectors conforming to ASTM C1644-06
- Poly tank connectors must conform to ASTM 923-08.

An example of a Flexible, Watertight Connector


Flexible, Watertight
connector installed


A Connector was included
with this Polyethylene Tank

Section 63 - Tank installation and maintenance

a) Installed level on
   1) Undisturbed soil
   2) Sand
   3) Aggregate ≤1½”
   4) Engineered base

b) All drain holes plugged

c) Watertight securely fastened covers

d) Risers to or above final grade
   6) Watertight cover fastened to riser
   7) Childproof plug (IC 16-41-25-3)

f) Sewer joints between tanks sealed according to manufacturer’s instruction to be watertight

Section 64 - Outlet Filters

a) Required in all new septic tanks
b) LHD may require in existing tanks for repair, replacement
c) Location – outlet end of last tank in series or last compartment, secondary basin
d) 18” access opening with riser required
e) Use an outlet filter on the approved list!
f) Use an outlet filter on the approved list!

Section 64 - Outlet Filters

g) Filter alarm may be used

h) Filter/cartridge must remain in service for life of septic tank

i) Manufacturer to provide installation and maintenance instructions

- accessible w/out entering tank

j) Serviced per manufacture's recommendations but no less than each time tank is pumped

- Cleaned and washed so waste enters septic tank
- Exchange

Section 66 - Distribution Box Specs

b) Minimum interior dimensions is 12”

c) Watertight removable lid, may have riser to ground surface

g) Split flow equally among effluent ports

1) Ports at same elevation

2) Same diameter

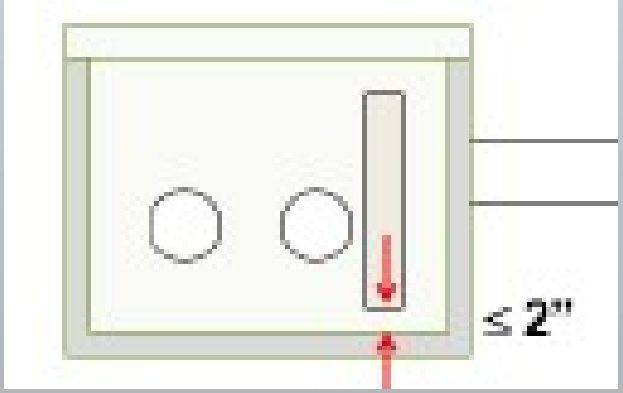
3) At least 1” below influent port

Sec 66 (e) and (f) - Distribution Box Specs

90°elbow turned down with weep hole

Sanitary Tee

Baffle



Distribution Box in Profile

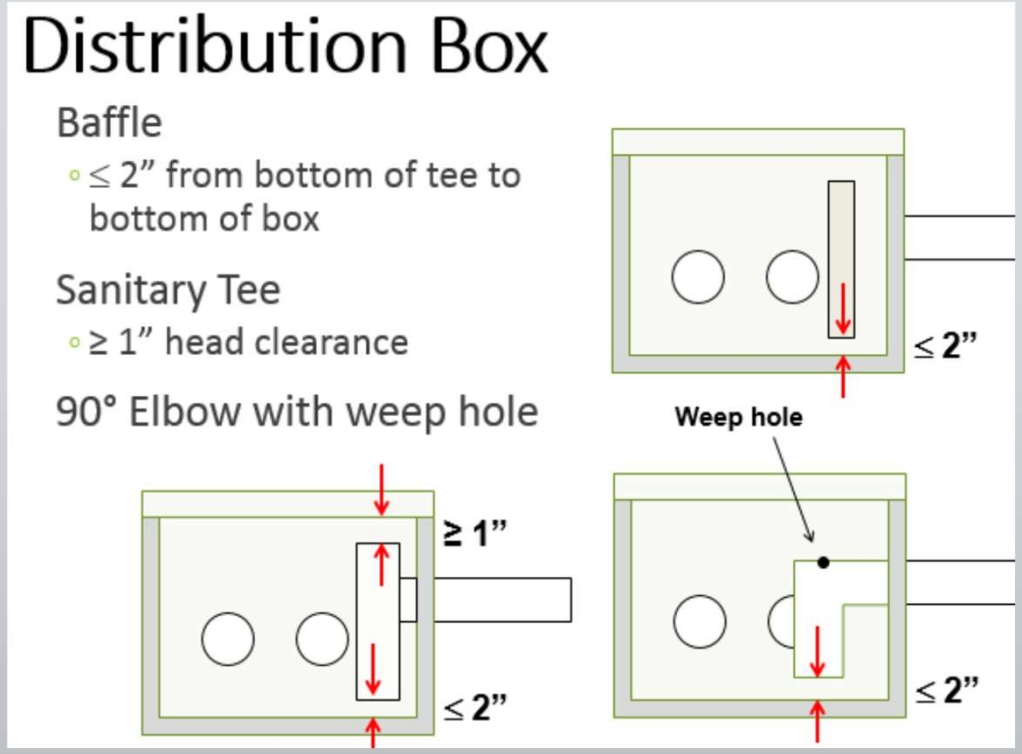
Baffle, tee or elbow:

Within 2 inches of the bottom of the box.

Weep hole to serve as a vacuum break

Sanitary tee:

At least 1 inch clearance from the lid.



Section 67 - Pipe Specs

a) Piping in OSS

1) Gravity Sewer pipe (PVC and ABS)
2) Pressure sewer, effluent force main, manifold, pressure distribution laterals (PVC and ABS)

b) Gasketed compression joints used on sewers ≤10’ from water lines

c) SAS gravity distribution laterals

Can also be used for laterals

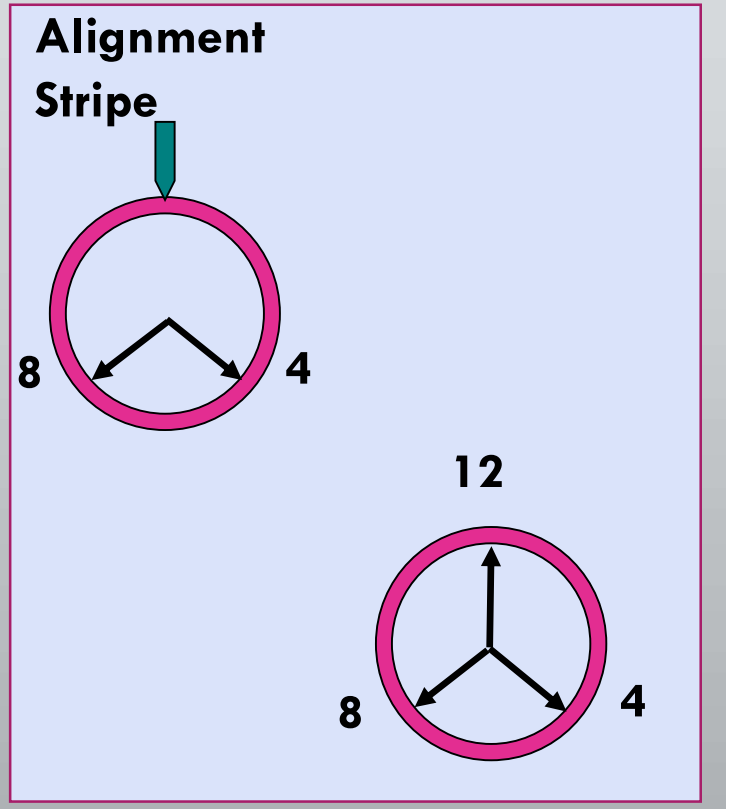
Can also be used for gravity

Section 67 - Pipe Specs

d) Hole placement in gravity distribution laterals

- 2 or 3 rows of holes
- Separated by 120°
- 5/8” or 3/4” hole diameter
- 5” spacing or less

e) Subsurface drainage



Section 68 - Aggregate

a) Gravel, stone or other ISDH approved

b) Aggregate

1) ½" – 2 ½"

2) Larger than openings in pipe

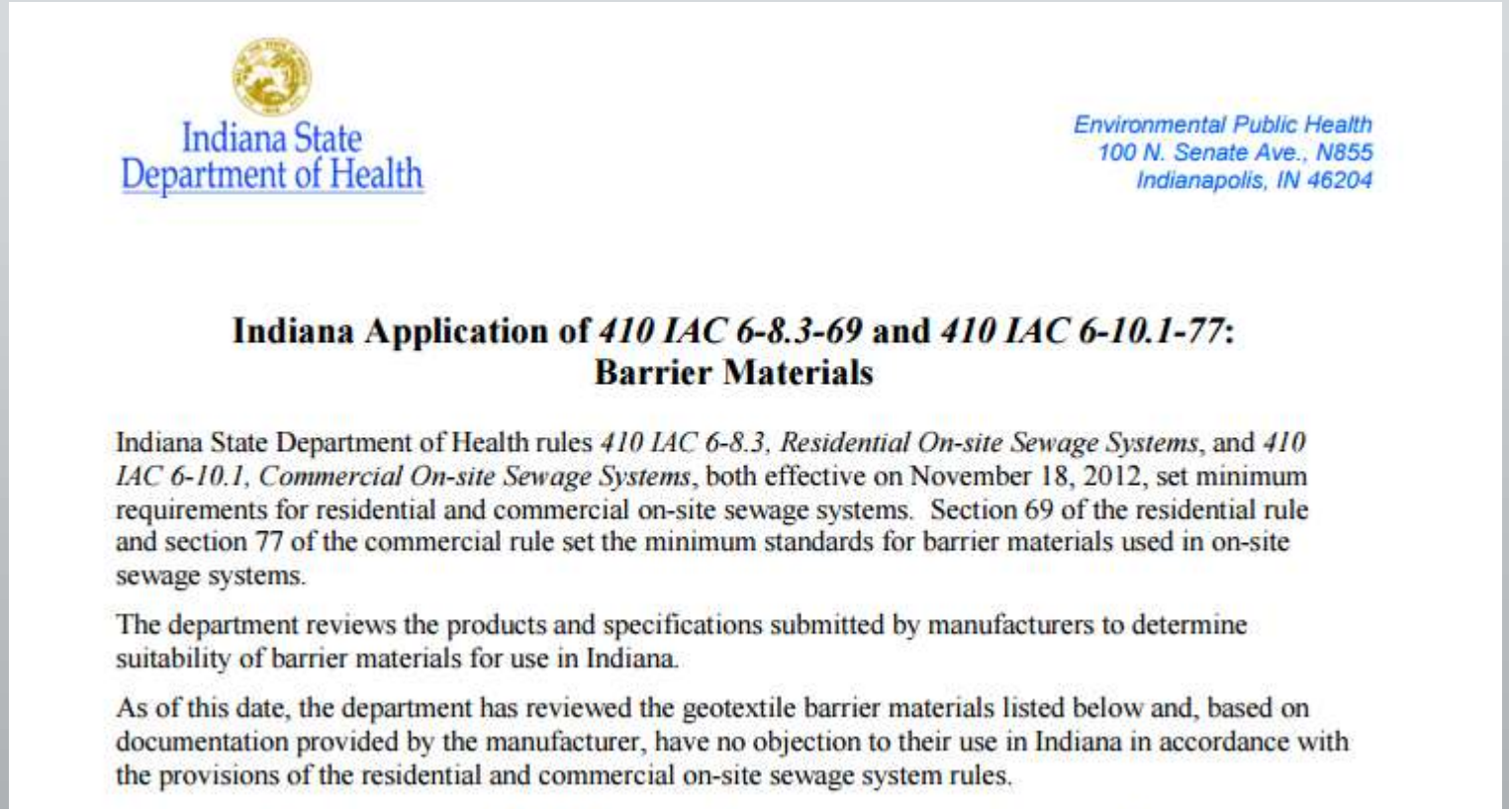
c)Tire chips may be used in place of stone for soil absorption fields on a one-for-one basis, nominal size 2" (½" – 4")

d) Fines, sand, and clay shall be removed from the aggregate prior to its placement in the trench.

NOTE: While not considered aggregate, chambers are allowed by code to be used in subsurface trenches in place of stone and pipe – definition of Soil Absorption System (Sec 43)

Section 69 - Barrier Materials

- Synthetic fabric, either spun bonded or woven
- Use a product off of the ISDH approved list



Indiana State Department of Health

Environmental Public Health
100 N. Senate Ave., N855
Indianapolis, IN 46204

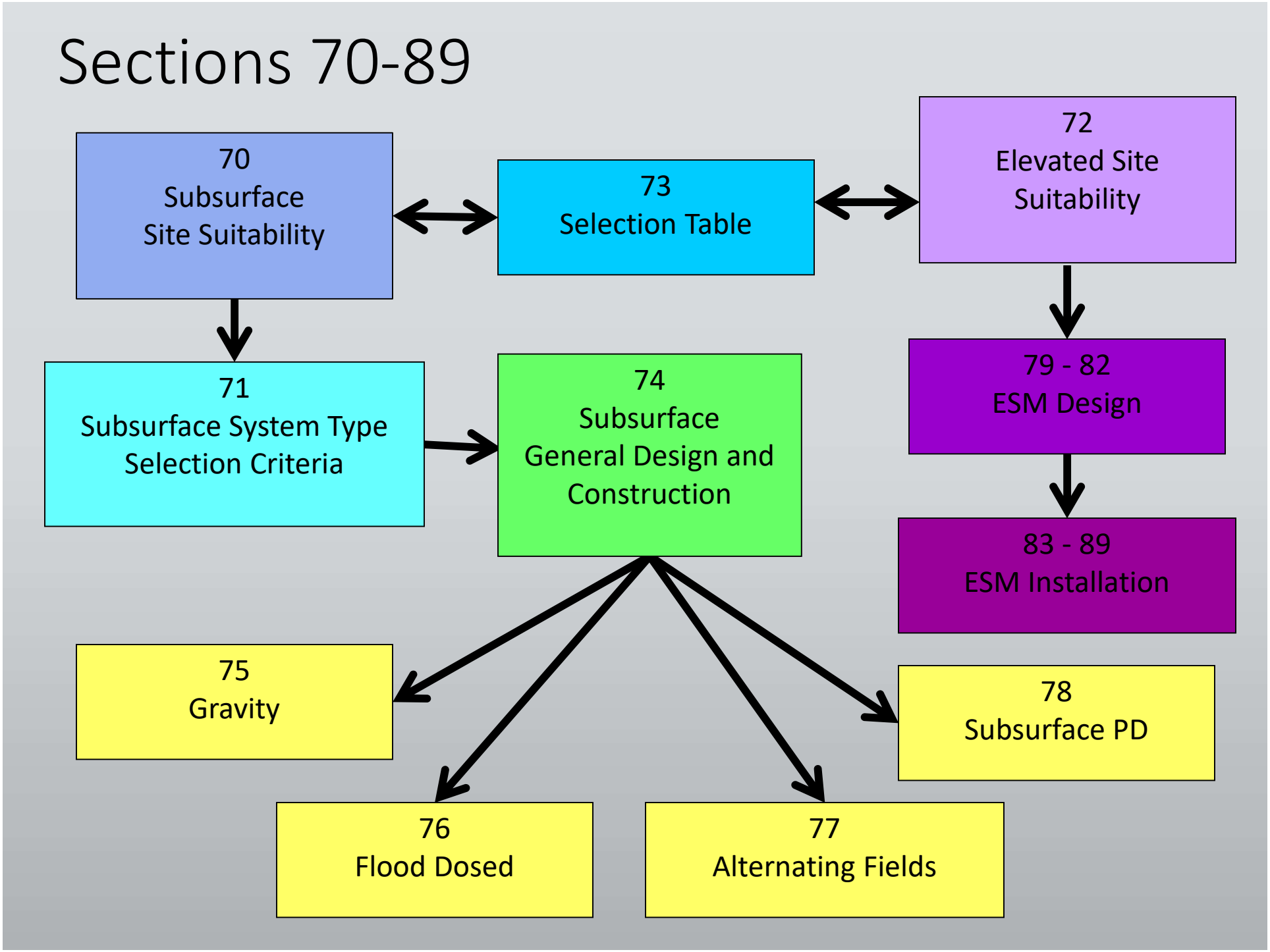
Indiana Application of *410 IAC 6-8.3-69* and *410 IAC 6-10.1-77*: Barrier Materials

Indiana State Department of Health rules *410 IAC 6-8.3, Residential On-site Sewage Systems*, and *410 IAC 6-10.1, Commercial On-site Sewage Systems*, both effective on November 18, 2012, set minimum requirements for residential and commercial on-site sewage systems. Section 69 of the residential rule and section 77 of the commercial rule set the minimum standards for barrier materials used in on-site sewage systems.

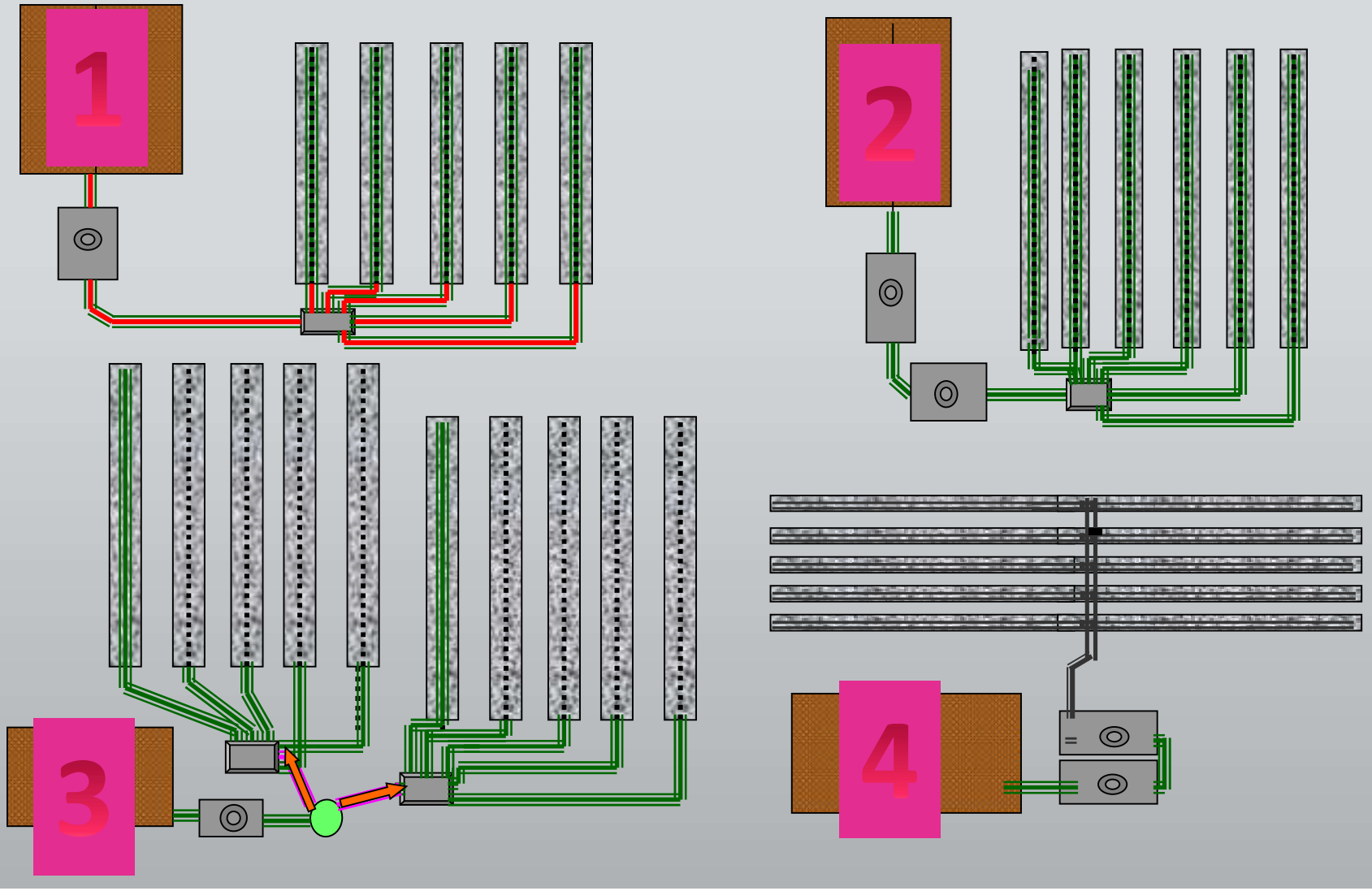
The department reviews the products and specifications submitted by manufacturers to determine suitability of barrier materials for use in Indiana.

As of this date, the department has reviewed the geotextile barrier materials listed below and, based on documentation provided by the manufacturer, have no objection to their use in Indiana in accordance with the provisions of the residential and commercial on-site sewage system rules.

Sections 70-89



Subsurface Trench OSS
Soil absorption field technologies



Subsurface Trench OSS

Site Suitability – Section 70

(a) Site evaluation, soil evaluation and DDF.

(b) Site conditions must be met:

1) Sufficient area (separation and dispersal)
2) Appropriate topographic position
3) ≤ 15% slope
4) Proportionate loading of effluent.
5) Seasonal high water table
6) 7 & 8) Limiting layers identified and addressed
   - Wisconsin glacial till soils WITH EFFERVESCENCE
   - Coarse fragments
   - Soil loading rates ≥0.25 and ≤1.2

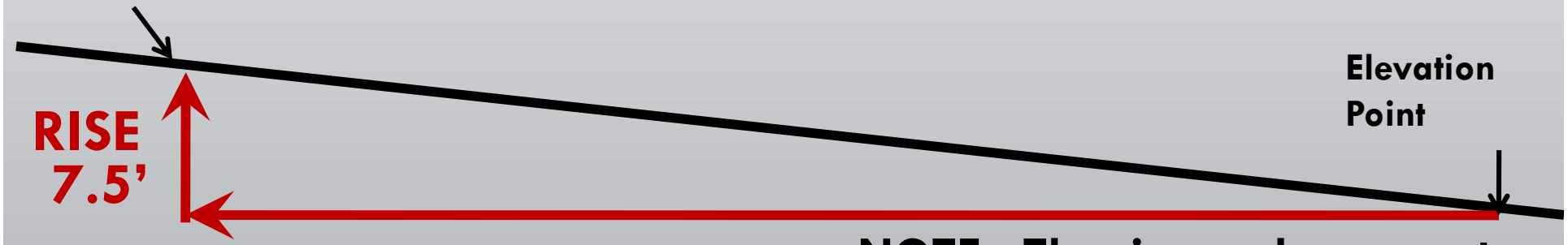
Slope Calculations

- **Slope = $\frac{\text{RISE}}{\text{RUN}}$**

Slope = 7.5’/100’ = 0.075

- **Percent slope = Rise / Run X 100**

% Slope = 0.075 X 100 = 7.5%



NOTE: The rise and run must have the same dimension label. Either both in feet OR both in inches.

Slope Calculations

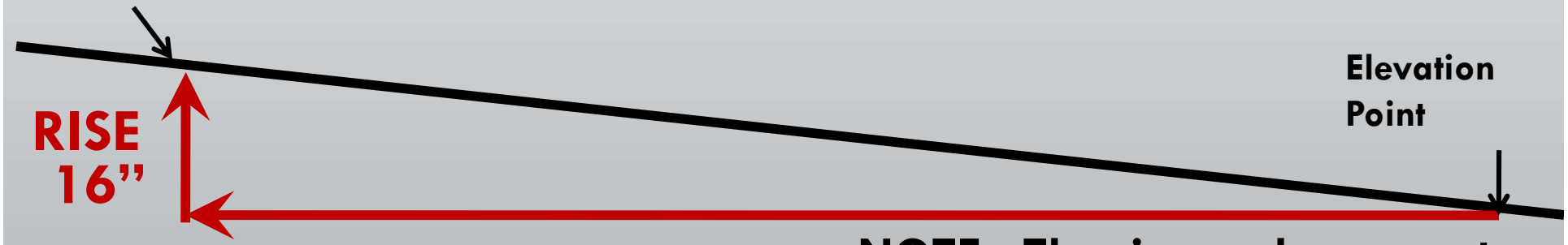
16” = 1.3 feet

- **Slope = $\frac{\text{RISE}}{\text{RUN}}$**

Slope = 1.3’/40’ = 0.0325

- **Percent slope = Rise / Run X 100**

% Slope = 0.0325 X 100 = 3.25%



NOTE: The rise and run must have the same dimension label. Either both in feet OR both in inches.

Subsurface trench OSS

Site Suitability – Section 70

(c) subsurface trench soil absorption systems shall NOT be constructed as follows:

1) In areas of runoff
2) Trench bottoms below RFE
3) Areas that pond
4) Drainage ways (wholly or partly)
5) On sites with compacted soil at a depth greater than 12 inches (unless an ISDH approved method is used).

Subsurface trench OSS
Selection Criteria – Section 71

(a) site evaluation, on-site soil evaluation, and DDF.

(b) Gravity

1. ≥450 gallon DDF (3+ bedrooms)
2. SLR between 0.25 and 0.75 gpd/ft^2
3. 30” of soil between trench bottoms and limiting layer
4. Max 500 LF of absorption trench bottom

(c) Gravity

1. <450 gallon DDF (1-2 bedrooms)
2. SLR between 0.25 and 0.75 gpd/ft^2
3. 24” of soil between trench bottoms and limiting layer
4. Max 500 LF of absorption trench bottom

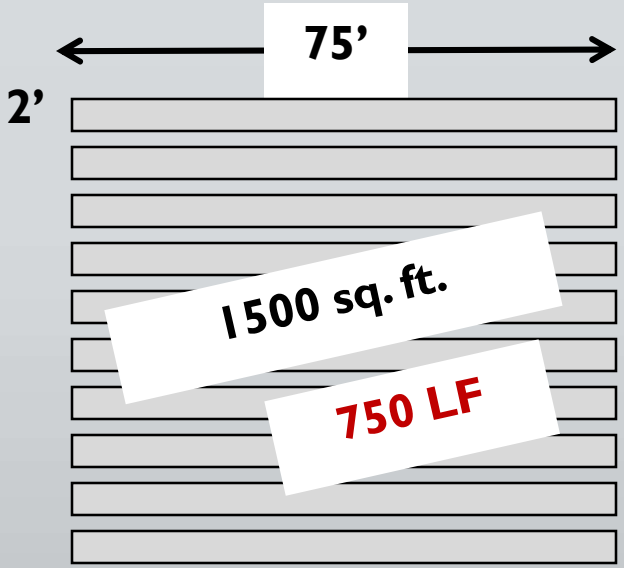
Limiting Layers

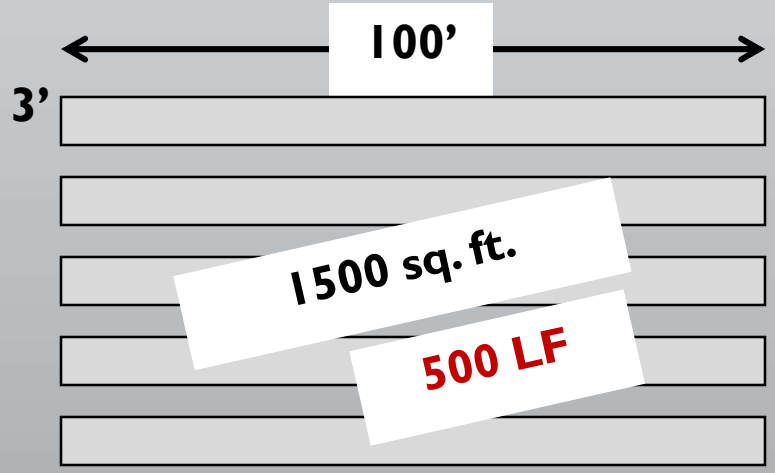
- Soil loading rate <0.25
- Soil loading rate >1.2 (for any system)
- Soil loading rate >0.75 (for anything other than pressure distribution)
- Wisconsin age glacial till with effervescence
- Coarse Fragments
  - < 20% clay and > 35% coarse fragments, by volume, or
  - ≥ 20% clay and > 60% coarse fragments, by volume.

Another way of looking at that…

Gravity Systems

- Maximum 500 **lineal feet**.
- The wording is NOT:
  - 1500 ft^2, or
  - 3 bedroom, or
  - 5 trenches, or…





Subsurface Trench OSS
Selection Criteria – Section 71

d) Alternating Fields or dosed using a pump:

1. SLR between 0.25 and 0.75 gpd/ft^2
2. 24” of soil between trench bottoms and limiting layer

e) >500 LF of trench length requires pump assisted distribution.

f) 1.2 gpd/ft^2 SLR within 24 inches of the absorption trench bottom requires pressure distribution.

Question 3

3. Which of the below is true about a distribution box?

- [ ] A. All outlet ports must be at the same elevation.
- [ ] B. The distribution box must have a water-tight, removable lid.
- [ ] C. The minimum interior dimension of a distribution box is 12”.
- [ ] D. All outlets must be the same diameter.
- [x] E. All of the above.

410 IAC 6-8.3-73 Table for on-site sewage system selection

Sec. 73. On-site sewage system selection may be summarized in Table VI as follows:

Table VI - Table for On

Subsurface Trench OSS

	Site Requirements	G		Alt /FD	FD	PD	Elevated Sand Mound On-site Sewage Systems (Sec. 72)
	Slope	≤15%		≤15%	≤15%	≤15%	≤6%
DDF	Design Daily Flow	≥450	<450	Any	Any	Any	Any
0.25-0.75 SLR	Acceptable Loading Rate Range for determining system size	≥0.25 ≤0.75	≥0.25 ≤0.75	≥0.25 ≤0.75	≥0.25 ≤0.75	≥0.25 ≤1.20	≥0.25 ≤1.20
Separation <0.25	Distance from Trench Bottom (ground surface for mounds) to Layer with a Soil Loading Rate < 0.25 gpd/ft²	≥30	≥24	≥24	≥24	≥24	≥20
Separation >1.2	Distance from Trench Bottom (ground surface for mounds) to Layer with a Soil Loading Rate > 1.20 gpd/ft²	≥30	≥24	≥24	≥24	≥24	≥20
Separation 1.2	Distance from Trench Bottom (ground surface for mounds) to Layer with a Soil Loading Rate = 1.20 gpd/ft²	≥30	≥24	≥24	≥24	Press. Dist. required for SLR = 1.20	≥0
Separation W.till	Distance from Trench Bottom (ground surface for mounds) to a Soil Horizon Developed from Wisconsin Glacial Till That Shows Effervescence[3]	≥30	≥24	≥24	≥24	≥24	≥20
Sep. C F (35%)	Distance from Trench Bottom (ground surface for mounds) to Soil Horizon with < 20% Clay and > 35% Coarse Fragments by Volume	≥30	≥24	≥24	≥24	≥24	≥20
Sep. C F (>60%)	Distance from Trench Bottom (ground surface for mounds) to Soil Horizon with > 20% Clay and > 60% Coarse Fragments by Volume	≥30	≥24	≥24	≥24	≥24	≥20
Separation SH_20	Distance from Trench Bottom (ground surface for mounds) to Seasonal High Water Table[2]	≥24	≥24	≥24	≥24	≥24	≥20
Lineal ft. limit	Total Lineal Feet of Trench	≤500	≤500	≤500 for Alt. Fields	Any	Any	N/A

Section 74
Subsurface Trench General Design

(a) Minimum absorption area based on:

1) # of bedrooms and equivalents
2) Most restrictive SLR within 24 inches of trench bottom
3) Absorption area = DDF/SLR= FT^2

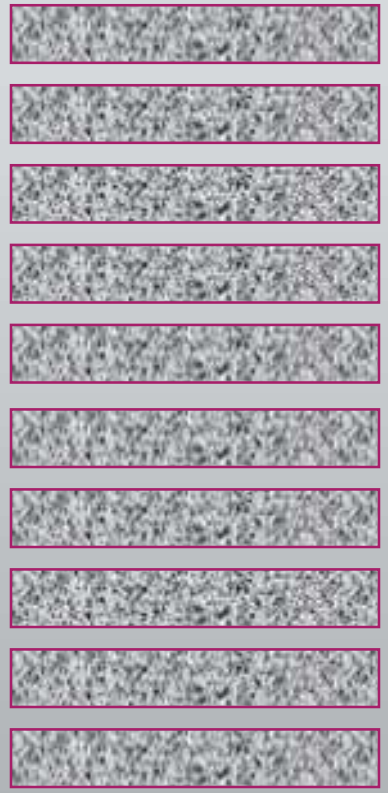
Example:

DDF = 3 bedroom x 150 gallons = 450 gpd

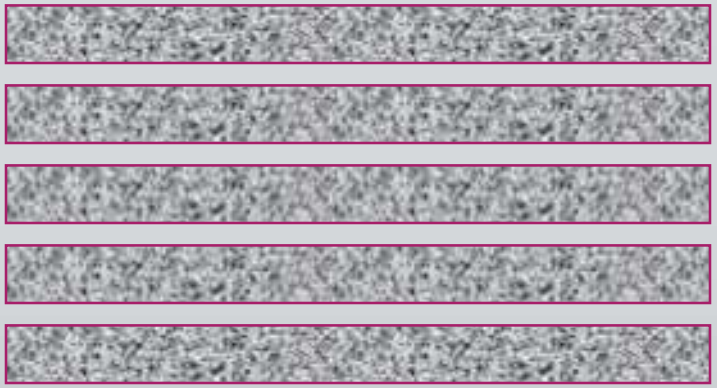
Absorption Area = 450 / 0.3 = 1500 ft^2

Section 74
Subsurface Trench General Design

(b) Long and Narrow as site permits (Trenches ≤100')



- 1500 sq. ft. required
- Design:
  10 laterals
  3' wide
  50 long



- 1500 sq. ft. required
- Design:
  5 laterals
  3' wide
  100' long

500'

Section 74
Subsurface Trench General Design

(c) Meet separation distances

(d) Protect the site from vehicular disturbance before, during and after construction

(e) Proper soil plasticity for installation

(f) Vegetation removed without causing compaction.

(g) Proper design or removal of trees

(h) Do not smear the sidewalls or bottom of the trenches

Section 74
Subsurface Trench General Design

i) Residential Sewer – Min. 4”, positive slope
   1) Min. 4” in 25’ (1.34%)
   2) Max. 36” in 25’ (12%)

j) Residential Sewer - 6” sewer
   1) Min. 2” in 25’ (0.67%)
   2) Max. 36” in 25’ (12%)

k) A vertical drop may be installed in a residential sewer. Each vertical drop shall have a cleanout located immediately upslope.

Section 74
Subsurface Trench General Design

(l) Effluent sewers shall be minimum 4” diameter and have 2.4”/100’ (0.2% slope)

(m) Sewer and effluent sewer joints must be watertight and withstand pressures exerted on them

(n) Trenches constructed along contour

(o) Trench min/max depth

10” from original grade

36” from final grade

Section 74
Subsurface Trench General Design

(p) Trench min/max width: 18in-36in.

(q) Min. separation distance: 7.5 ft oc

(r) Max length 100 ft (except Pressure Distribution)

(s) Trench & distribution laterals to be level throughout length & width

(t) Distribution laterals & trenches shall NOT be tied together at distal ends.

Section 74
Subsurface Trench General Design

(u) Distribution lateral distal ends capped

(v)-(w) Aggregate envelope for perforated pipe

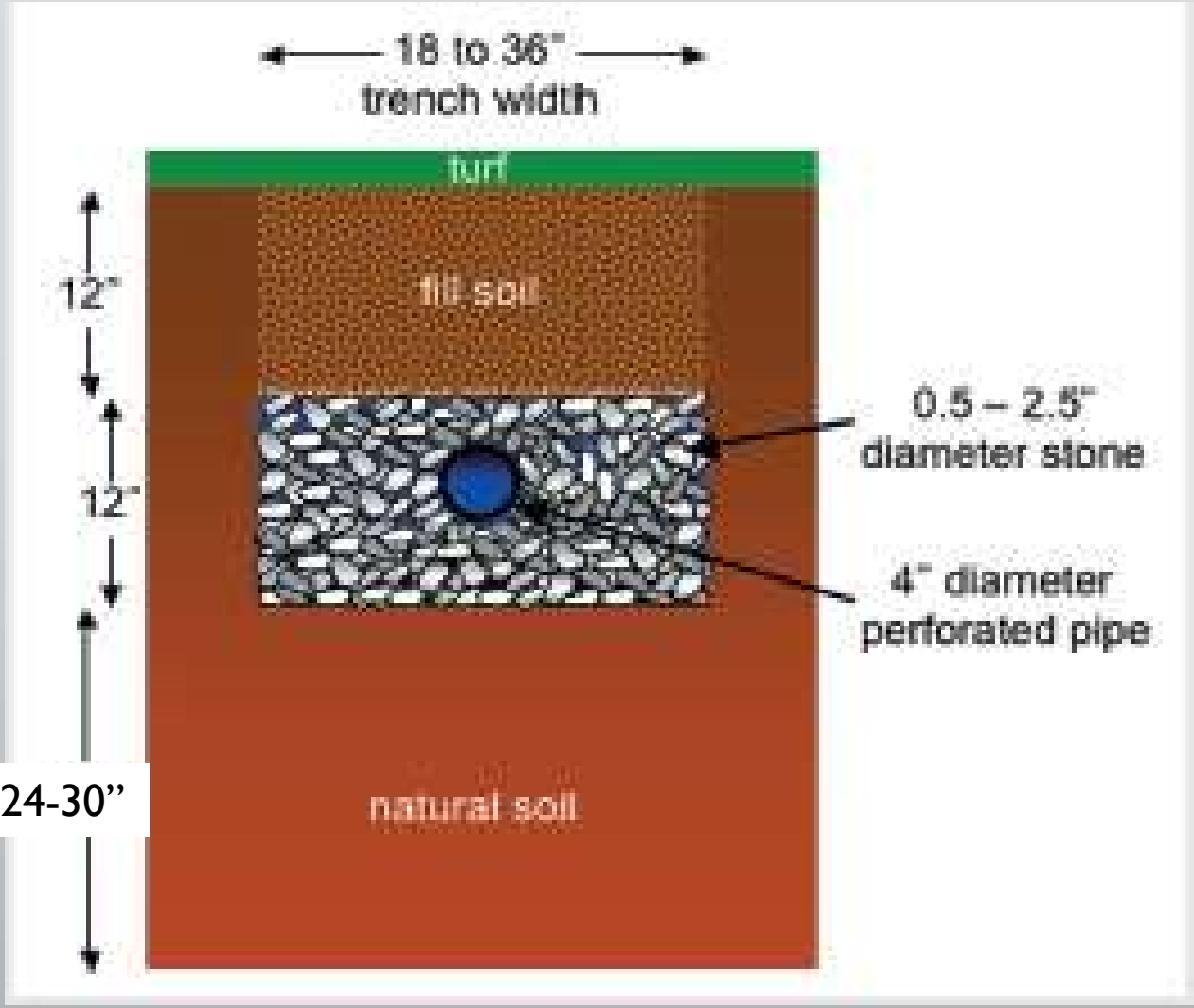
6” – 4” – 2”

(x) Barrier material over Aggregate

(y) 12” of cover over aggregate and crowning over SAF.

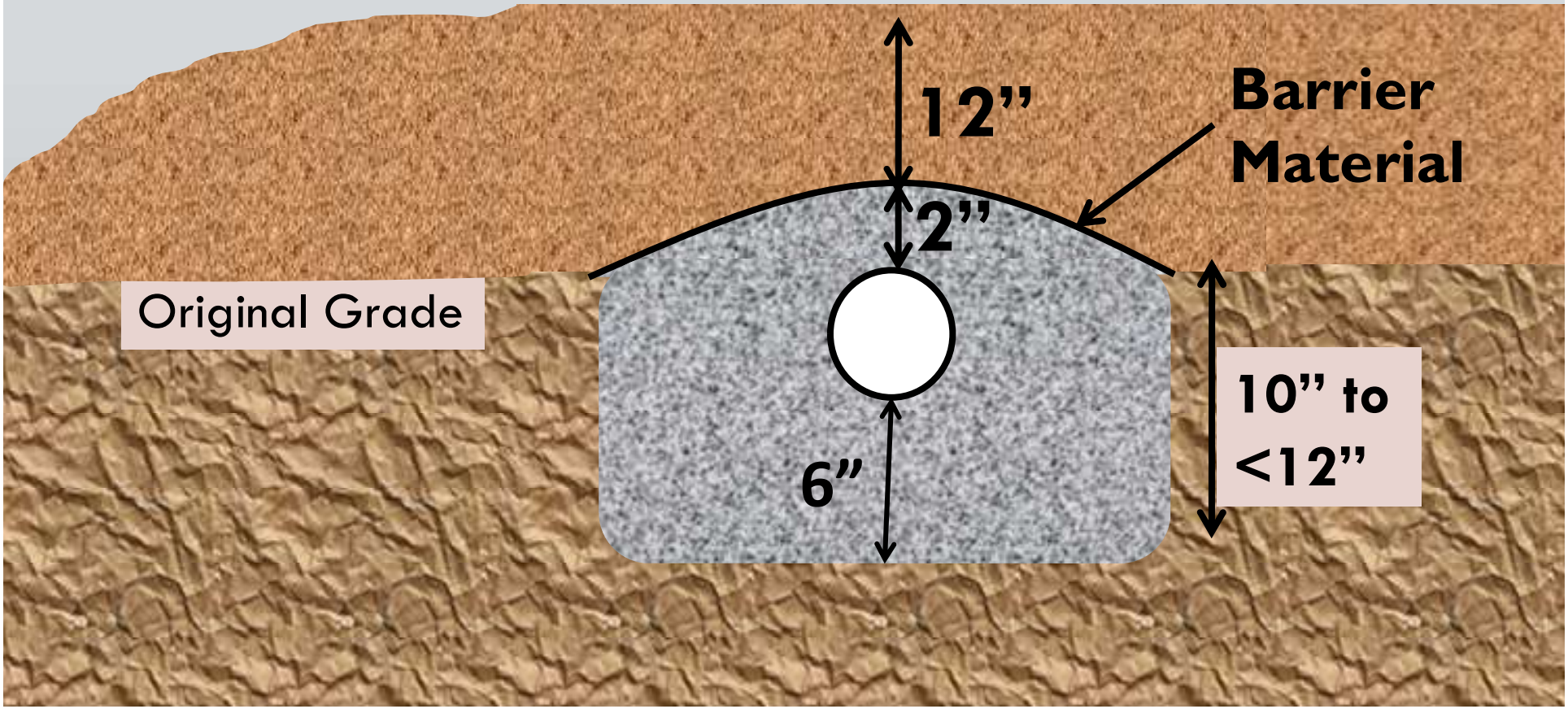
(z) Tire chips, if used, shall be removed from ground surface at cleanup

Another way of looking at that…



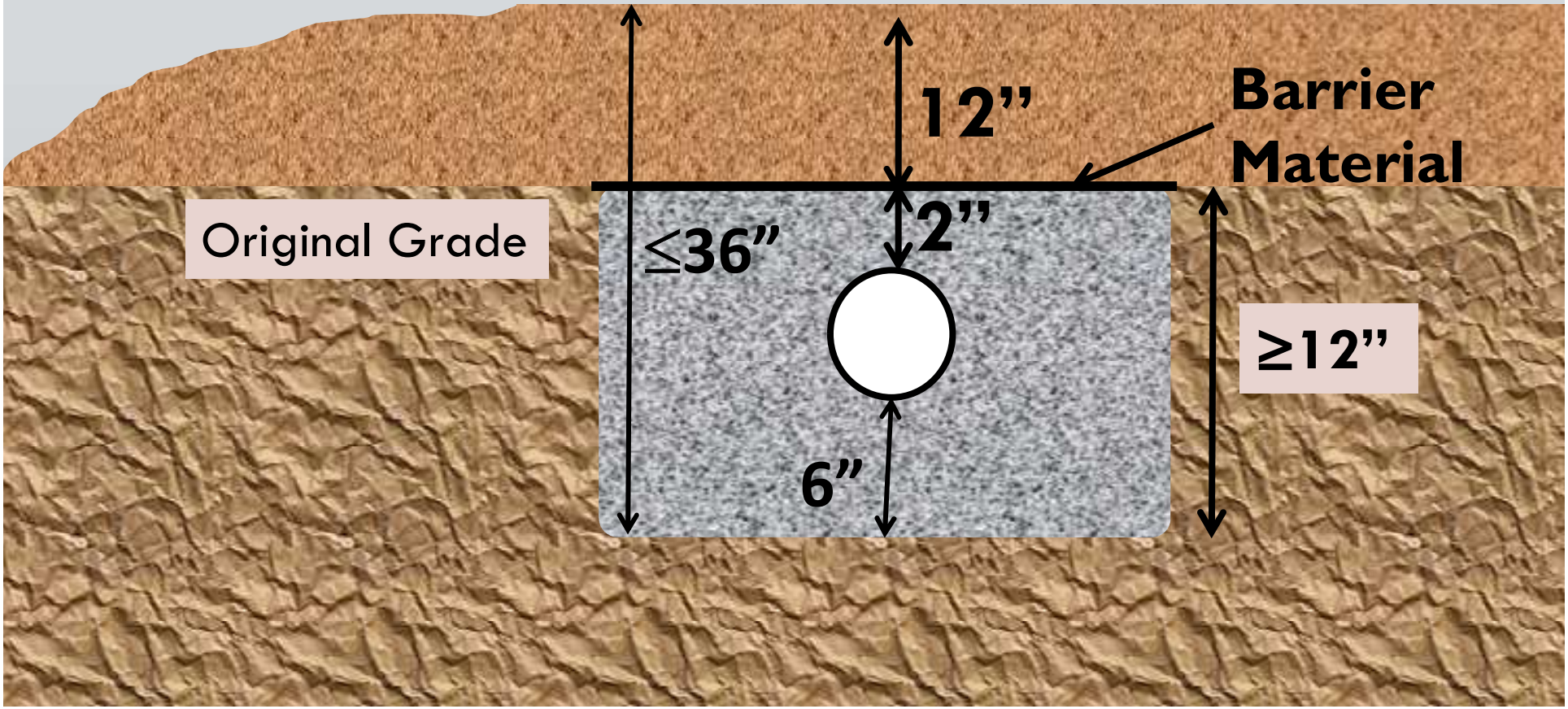
Another way of looking at that…

- Shallow trenches



Another way of looking at that…

- Trenches 12” plus



Section 74
Subsurface Trench General Design

- Chambers are approved for use in subsurface trench soil absorption field systems only
- Requirements are covered in
  - Indiana Standards for Chamber Trench Soil Absorption Field Technology
    Revised December 22, 2009
- Chamber Technology is not approved for use in elevated sand mounds

Section 75
Subsurface Trench Gravity OSS Design and Construction

(a) Section 74 and this section

(b) D-box between septic tank and SAF with each trench connected directly to d-box with effluent sewer.

(c) Installed level / materials

(d) Effluent sewer pipe backfill requirements prior to and after the d-box.

(e) Outlets with same invert elevation

Section 75 (d)

- Installation of effluent sewer pipe
  - When installed **prior to the distribution box**, effluent sewer pipe shall be bedded according to manufacturer requirements with debris-free soil material or aggregate without damaging the pipe
  - When installed **after a distribution box**, effluent sewer pipe shall be stabilized, bedded and backfilled without damaging the pipe with debris-free soil material to prevent the migration of effluent along the outside of the pipe

Section 75
Subsurface Trench Gravity OSS Design and Construction

(f) Effluent sewer extends into aggregate in trench

(g) Gravity distribution laterals 4 in. diameter

(h) Gravity distribution laterals shall be level / hole placement

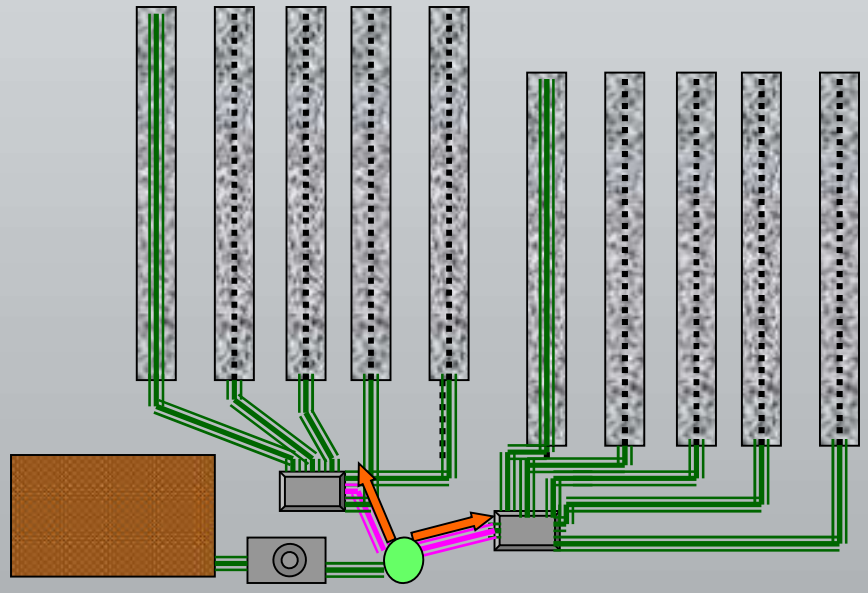
(i) 5 ft. between d-box and proximal end of trench

Section 77
Alternating Fields OSS
Design and Construction

(a) Sections 74, 75 and this section

(b) Each side of the soil absorption field shall contain the total SAF ft^2

(c) Diversion valve with riser to the surface between septic tank and d-box.



Discussion/Questions

Exam is:

- An individual evaluation
- Multiple Choice & True-False question format
- 3-tiered exam
  - A – Septic Tanks, Gravity, Drainage (100 Q)
  - B - Pump Assisted (40 Q)
  - C - Elevated Sand Mounds (40 Q)
- Open Rule / Open Note
- Not a timed exam
- Passing is 80%

Indiana State Department of Health