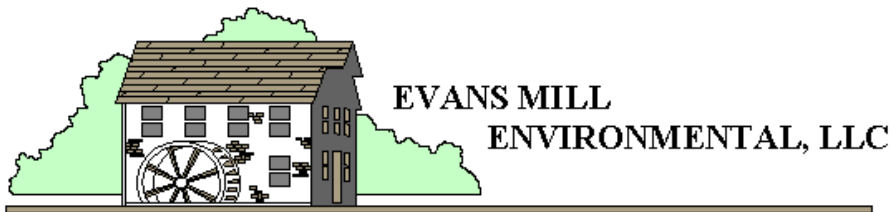



ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN & INSTALLATION

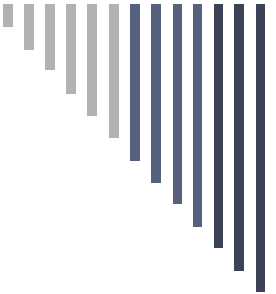
PRESENTED TO CHESTER COUNTY ENGINEERS

18 NOVEMBER 2010



PRESENTED BY:

SUSAN AHERN



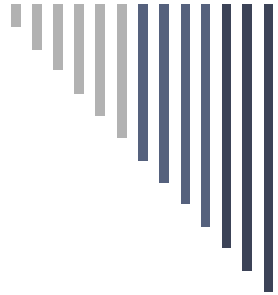
ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ SCOPE OF PRESENTATION

- OVERVIEW OF ONLOT PROGRAM ISSUES THAT AFFECT SYSTEM DESIGN
- MENU OF ONLOT SYSTEM TYPES
- DESIGN ISSUES AND CONSTRAINTS
- WHAT HAPPENS BETWEEN SYSTEM DESIGN AND INSTALLATION?



PRESENTED BY: SUSAN AHERN



ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ OVERVIEW OF ONLOT PROGRAM ISSUES THAT AFFECT SYSTEM DESIGN

- STATUS OF REGULATORY CHANGES
- ENVIRONMENTAL HEARING BOARD DECISIONS
- GOOD NEWS

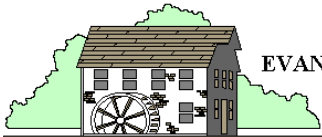


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ENVIRONMENTAL, LLC

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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ STATUS OF REGULATORY CHANGES

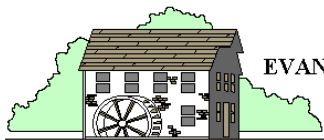
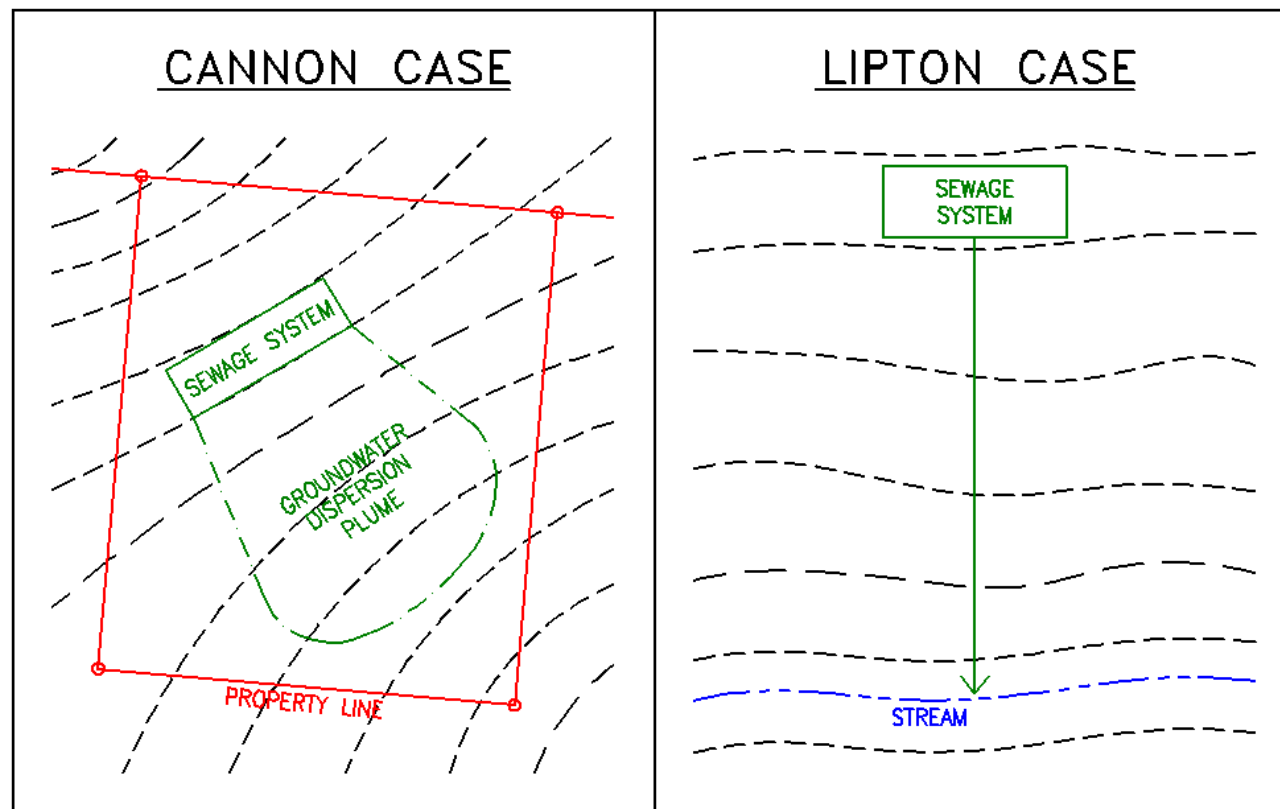


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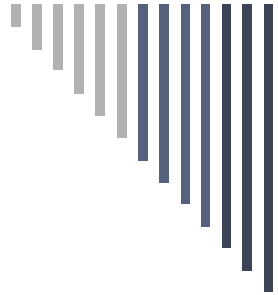
ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ ENVIRONMENTAL HEARING BOARD DECISIONS



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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ GOOD NEWS

NEWS

AUGUST 2009

DEP APPROVES
ORENCO'S ADVANCED
TREATMENT SYSTEM
FOR DENITRIFICATION

NEWS

DEP APPROVES
USE OF EZ FLOW
BUNDLES AS AN
AGGREGATE
SUBSTITUTE

NEWS

JANUARY 4, 2010

DEP APPROVES
THE USE OF DRIP
SYSTEMS WITH
PRIMARY EFFLUENT

NEWS

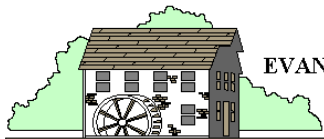
JANUARY 4, 2010

DEP APPROVES
THE USE OF DRIP
MICROMOUNDS WITH
10" LIMITING ZONES

NEWS

FEBRUARY 4, 2010

DEP APPROVES
ELJEN'S GEOTEXTILE
SAND FILTER AS
AN ADVANCED
TREATMENT SYSTEM



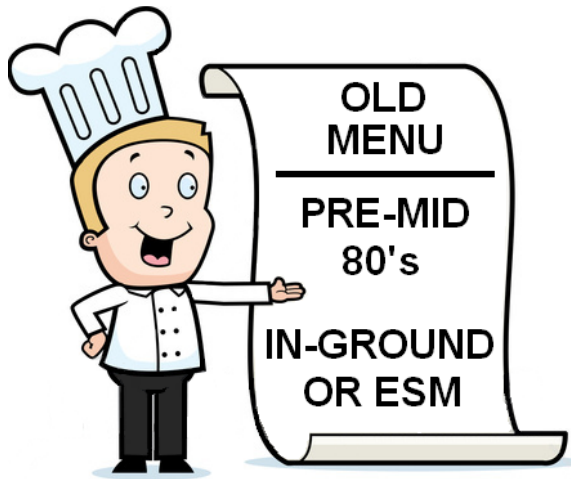
EVANS MILL
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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ MENU OF ONLOT SYSTEM TYPES

■ OLD MENU (PRE-MID 1980'S)



□ STANDARD IN-GROUND SYSTEMS

- BEDS
- TRENCHES
- SUBSURFACE SAND FILTERS

□ ELEVATED SAND MOUNDS

□ ALL GRAVITY UNLESS LIFT PUMP NEEDED

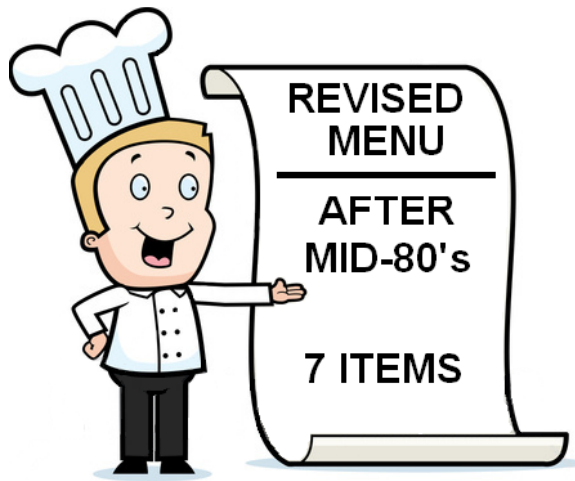


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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ MENU OF ONLOT SYSTEM TYPES

■ REVISED MENU (MID 1980'S)



□ STANDARD IN-GROUND SYSTEMS

- BEDS
- TRENCHES

□ SUBSURFACE SAND FILTERS

- NO MORE GRAVITY FLOW
- NOW HAD TO BE PRESSUED-DOSED

□ ELEVATED SAND MOUNDS

- NOW HAD TO BE PRESSUED-DOSED

□ IRSIS'S WERE INTRODUCED



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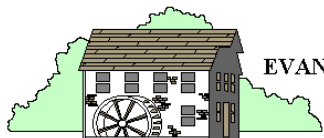
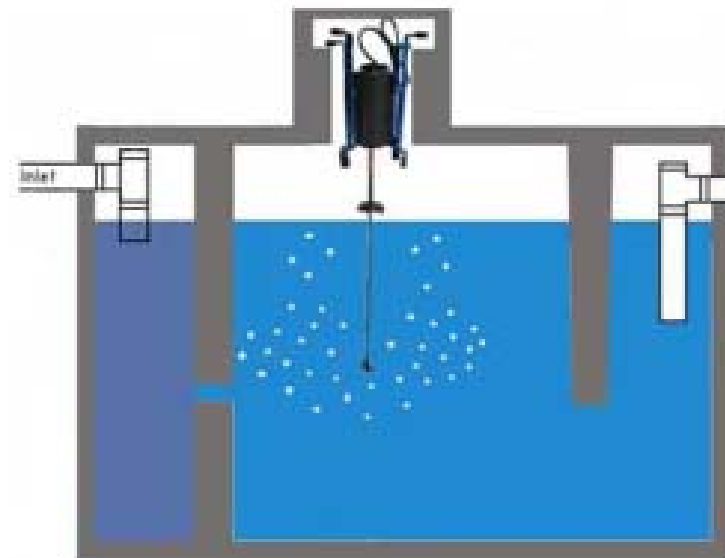
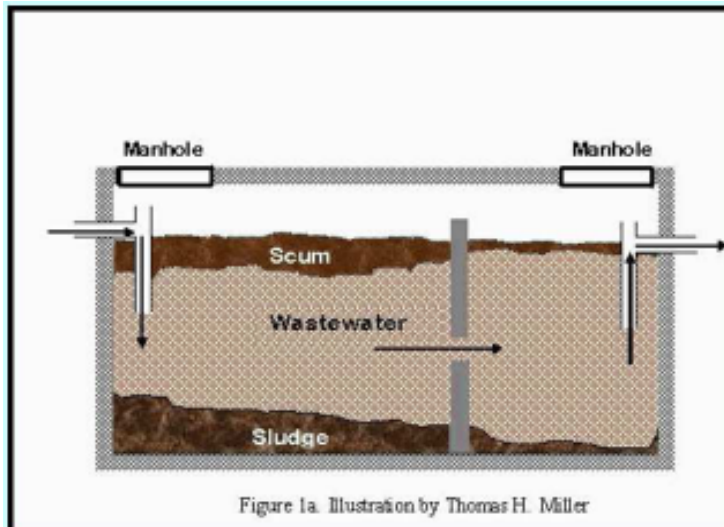
ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

TREATMENT OPTIONS LIMITED (PRE 2000)

□ SEPTIC TANKS

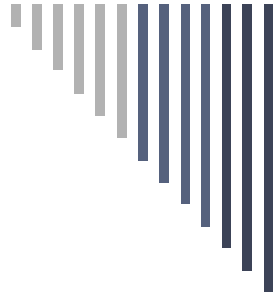
□ AEROBIC TANKS

■ MAY GET 1/3 REDUCTION IN
ABSORPTION AREA



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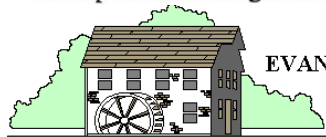
ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

■ BASIC MENU OF ONLOT SYSTEM TYPES (PRE-2000 ish)

Conventional Onlot Sewage Disposal System Matrix

System	Slope	Minimum Suitable Soil Depth to a Seasonal High Water Table Limiting Zone	Minimum Suitable Soil Depth to a Rock Limiting Zone	Percolation Rate
Seepage Bed	0-8%	60 inches ⁽¹⁾	60 inches ⁽¹⁾	6-90 minutes per inch
Standard Trenches	0-25%	60 inches ⁽¹⁾	60 inches ⁽¹⁾	6-90 minutes per inch
Elevated Sand Mound Bed	0-12%	20 inches ⁽¹⁾	20 inches ⁽¹⁾	3-180 minutes per inch
Elevated Sand Mound Trenches	0-12%	20 inches ⁽¹⁾	20 inches ⁽¹⁾	3-180 minutes per inch
Subsurface Sand Filter Bed	0-8%	72 inches ⁽¹⁾	72 inches ⁽¹⁾	>90 minutes per inch at 12 to 36 inches and 3-90 minutes per inch at a depth between 36 and 60 inches
Subsurface Sand Filter Trenches	0-25%	72 inches ⁽¹⁾	72 inches ⁽¹⁾	>90 minutes per inch at 12 to 36 inches and 3-90 minutes per inch at a depth between 36 and 60 inches
IRSIS	0-4% Agriculture 0-12% Grassed 0-25% Forested	10 inches	16 inches	Test not required

⁽¹⁾ The top of the limiting zone must be at least four feet below the bottom of the absorption area aggregate.

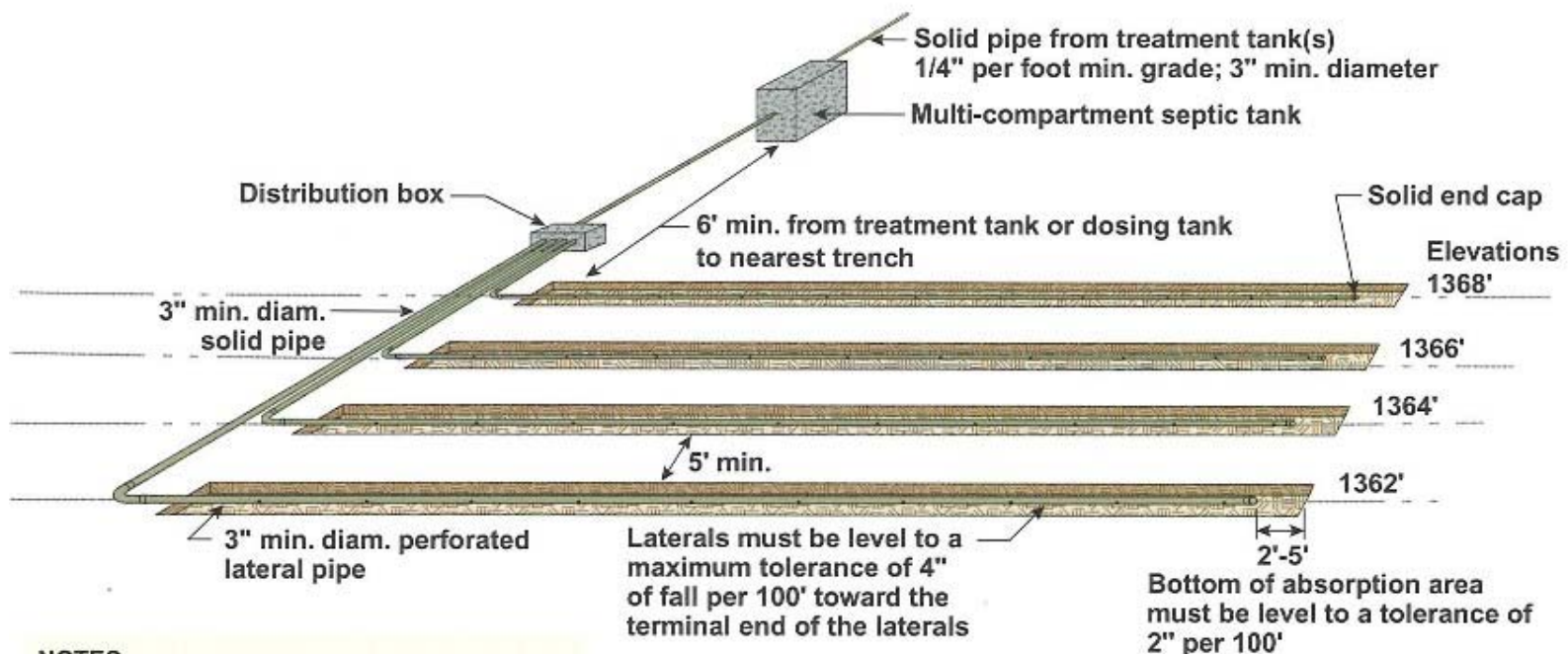


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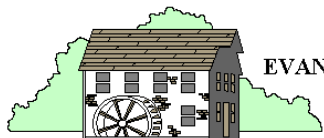
ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ GRAVITY FLOW TRENCH W/ DISTRIBUTION BOX



NOTES:

- Trenches must be constructed on contour.
- Maximum lateral length is 100 feet.

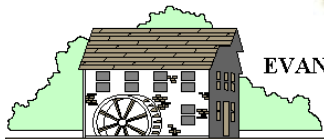
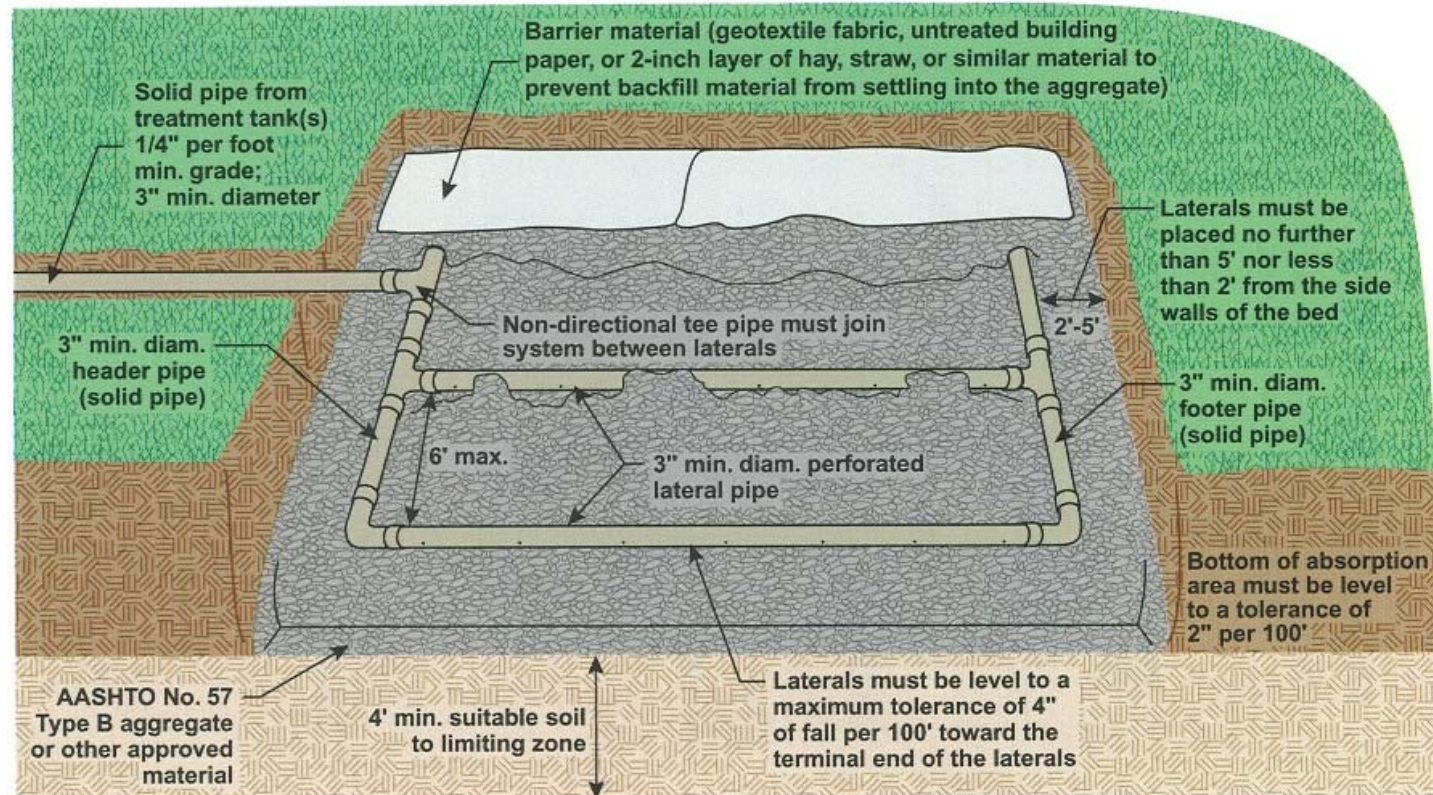


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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ GRAVITY FLOW BED WITH HEADER PIPE

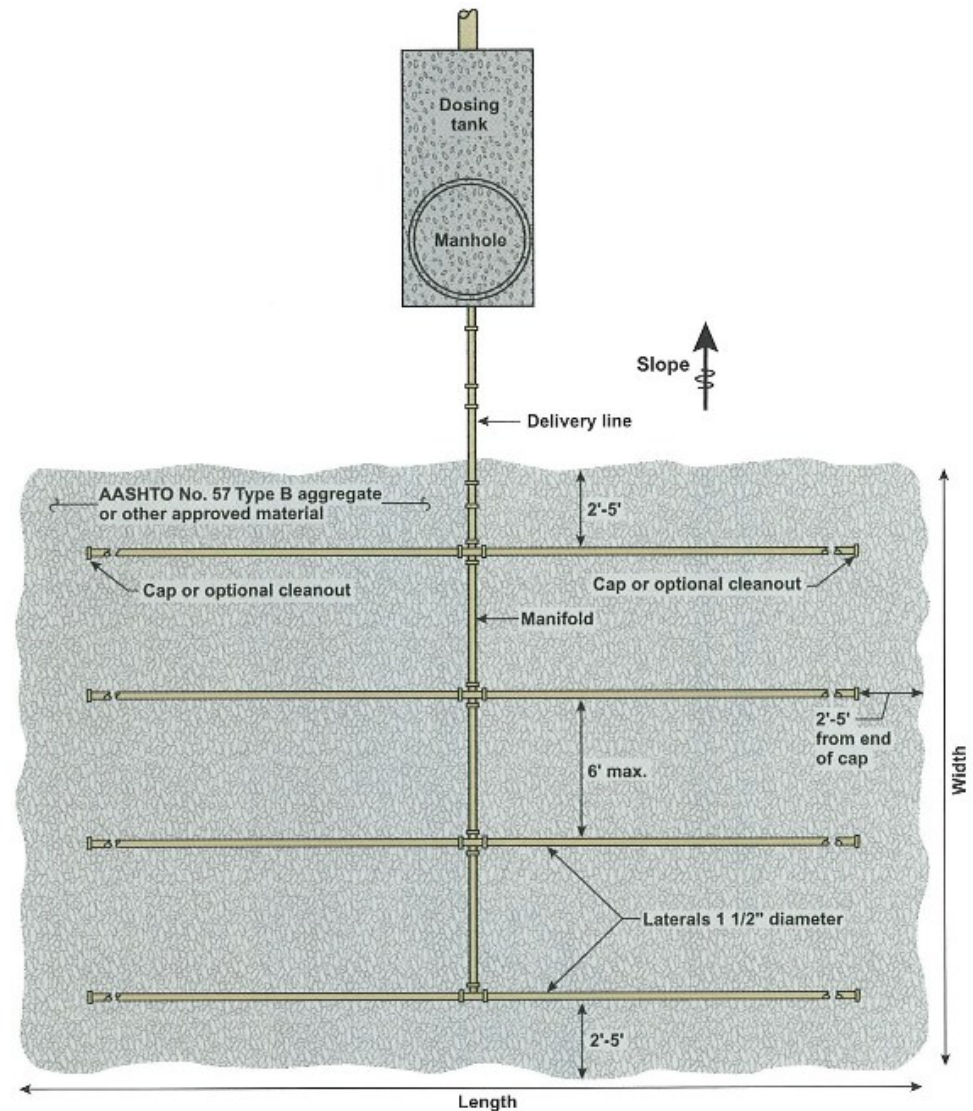


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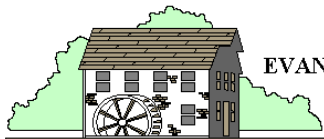
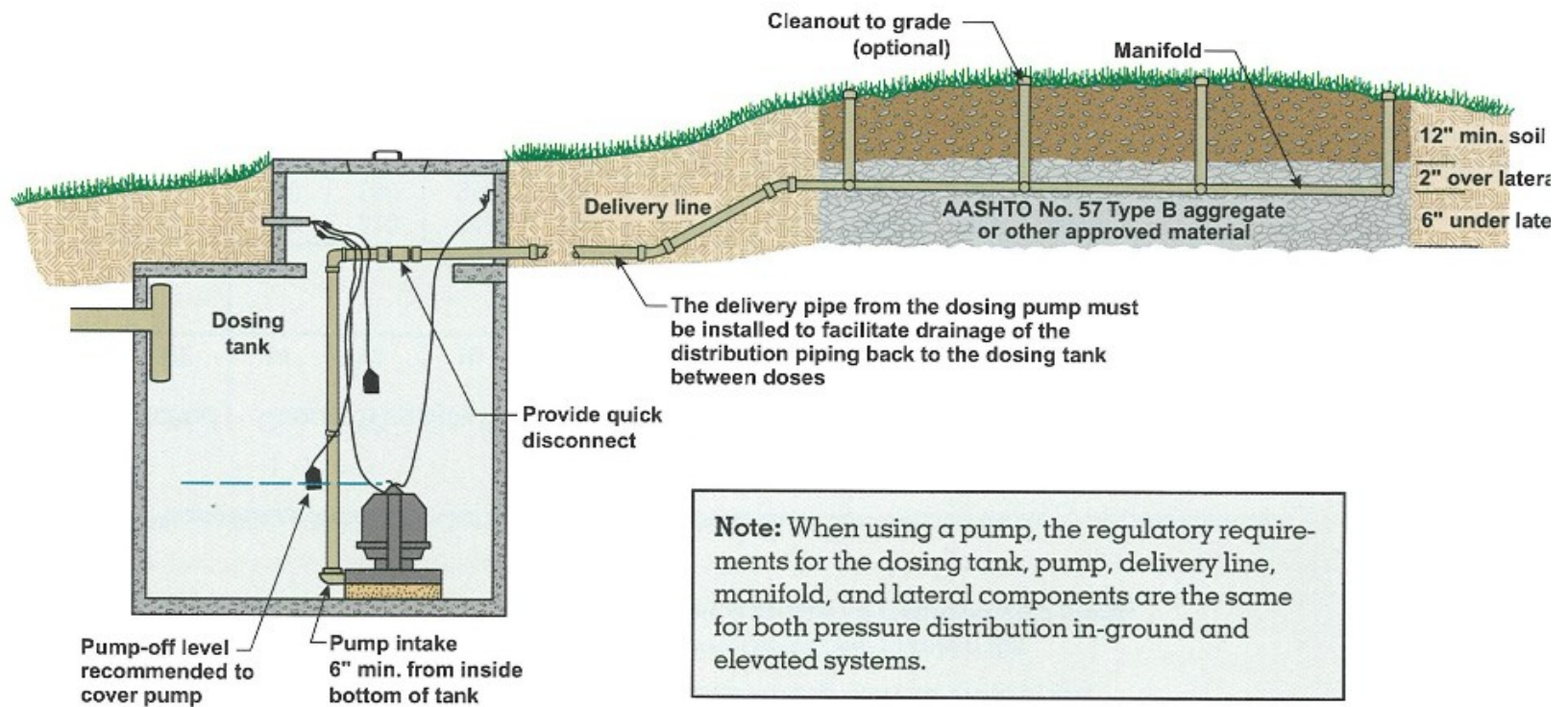
Year	Percentage
2014	10%
2015	15%
2016	20%
2017	25%
2018	30%
2019	35%
2020	40%
2021	45%
2022	55%

PRESENTED BY: SUSAN AHERN



ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ PRESSURE DISTRIBUTION TO IN-GROUND BED

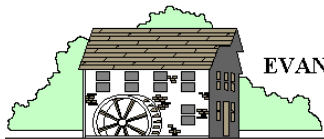
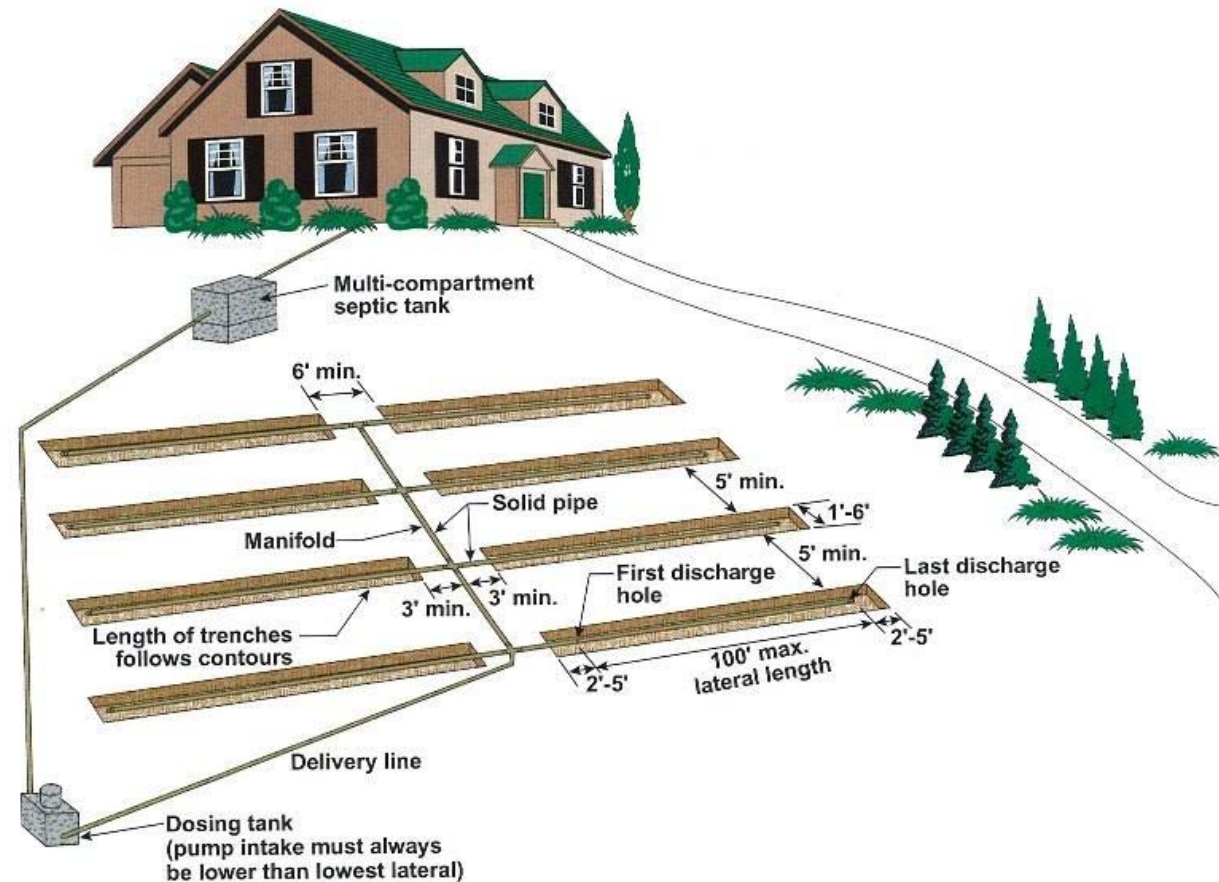


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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ PRESSURE DISTRIBUTION TO IN-GROUND TRENCH SYSTEM

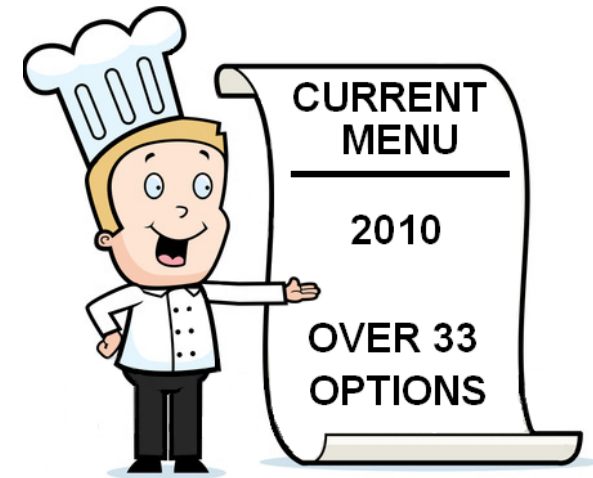
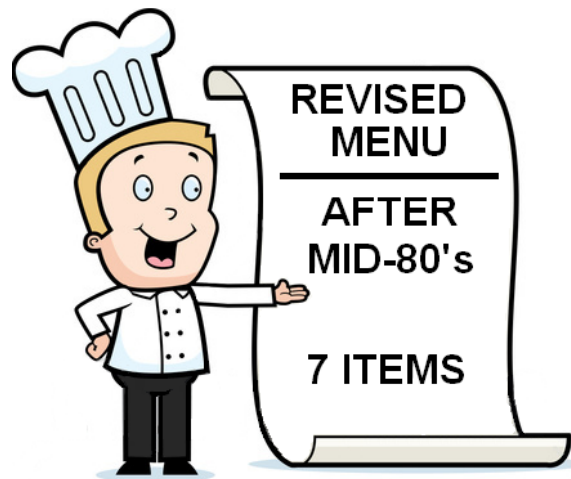
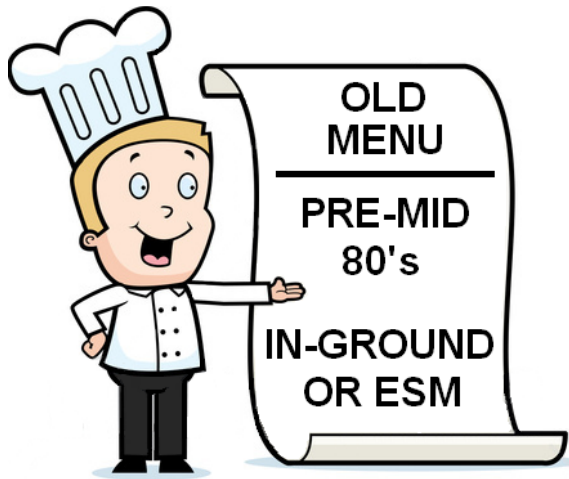


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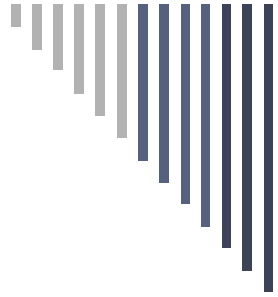
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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ MENU TREND OF ONLOT SYSTEM TYPES



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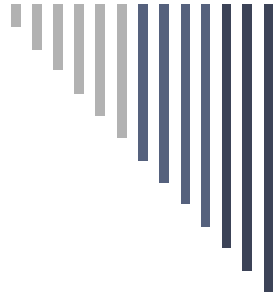


ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

- ☐ CURRENT MENU OF ONLOT SYSTEM TYPES INCLUDES:
 - ☐ CONVENTIONAL SYSTEMS IN CHAPTER 73
 - ☐ ALTERNATIVE SYSTEMS GUIDANCE DATED
 - ☐ PADEP WEBSITE LISTINGS OF APPROVED ALTERNATE SYSTEMS (STARTED JANURARY 2010)

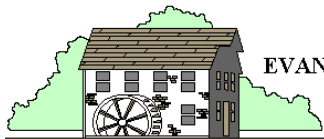


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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

HERE'S A SAMPLING OF SOME OF
THE MORE COMMON AND/OR
NEWER TECHNOLOGIES

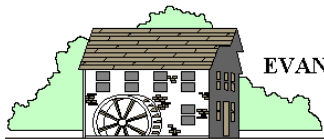
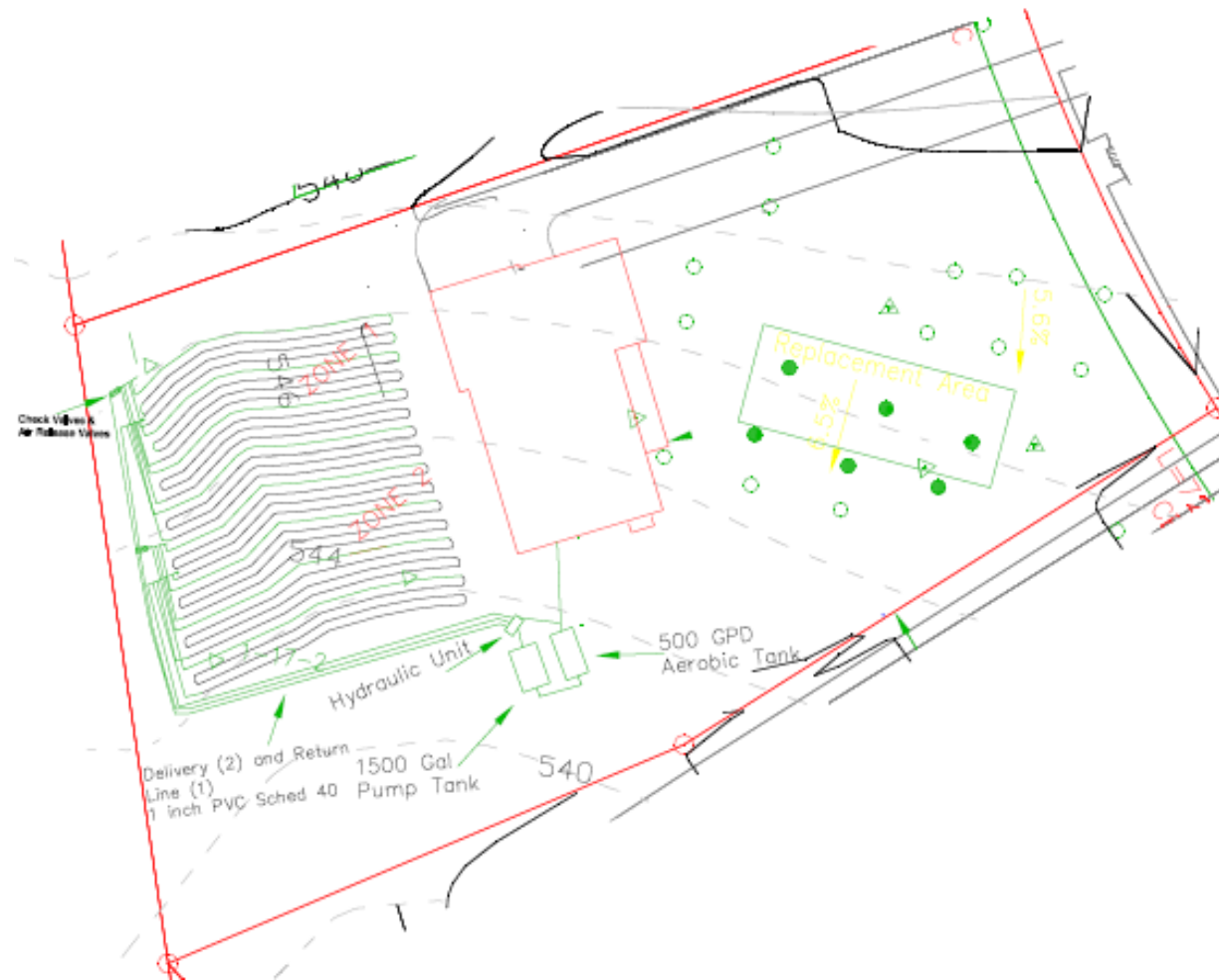


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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ DRIP DISPERSAL SYSTEM

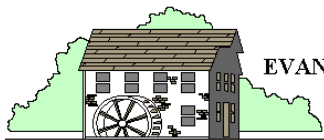
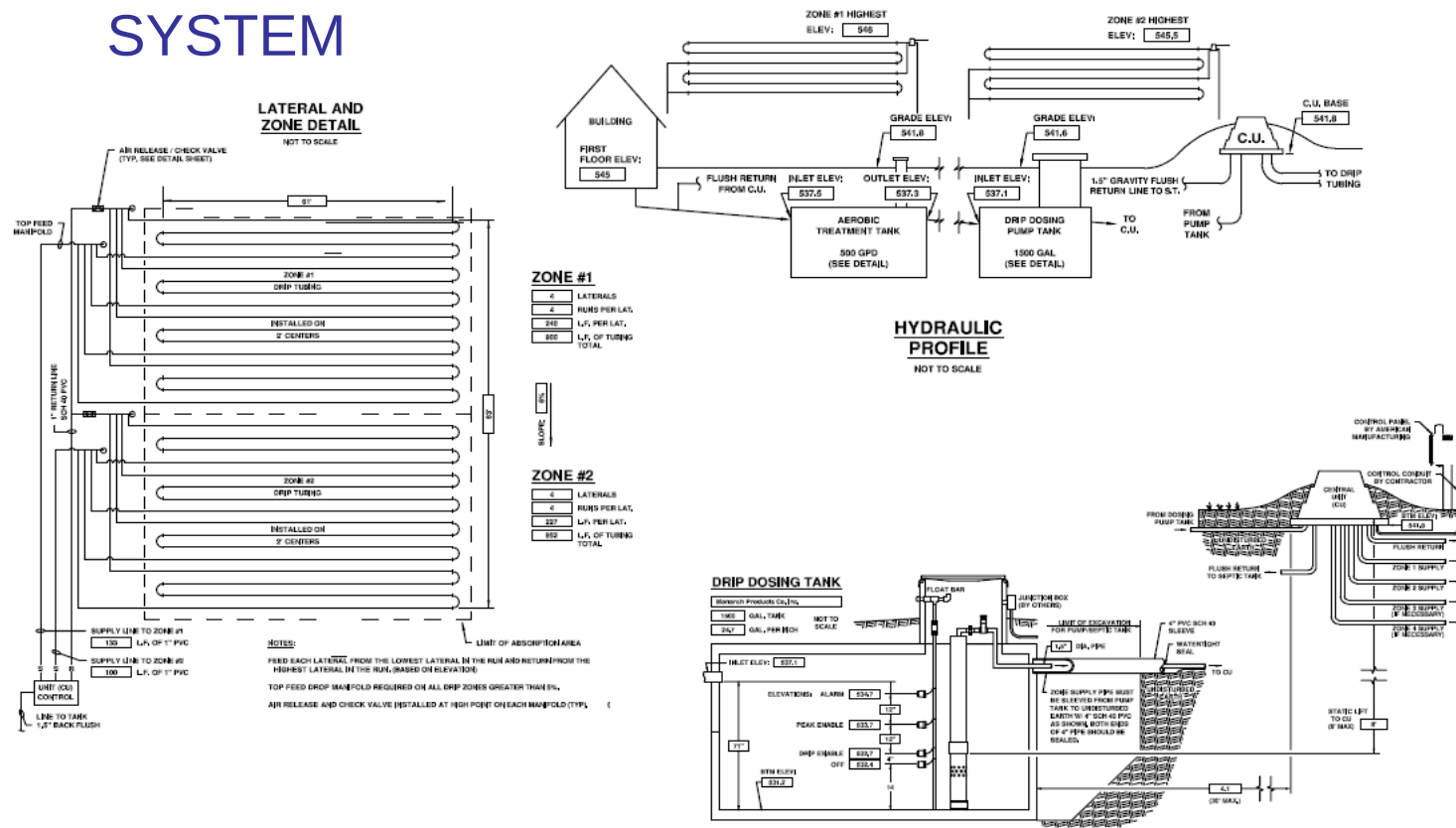


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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ DRIP DISPERSAL SYSTEM

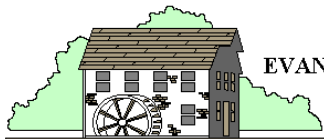


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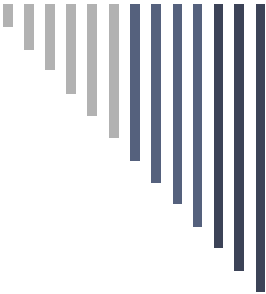
ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ RESIDENTIAL SAND MOUND WITH INFILTRATOR CHAMBERS



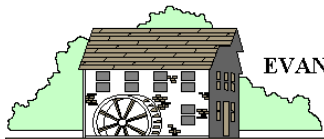
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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ LARGER SAND MOUND WITH INFILTRATOR CHAMBERS



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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

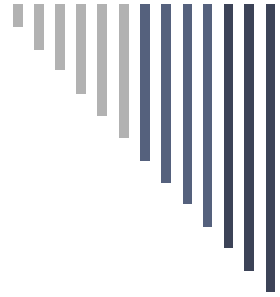
□ RESIDENTIAL TRENCH SYSTEM WITH INFILTRATOR CHAMBERS



ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

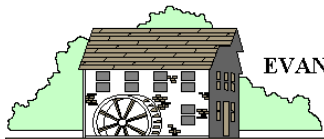
□ LARGE SEEPAGE BED WITH
INFILTRATOR CHAMBERS





ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ AIRPORT SYSTEM WITH INFILTRATOR CHAMBERS

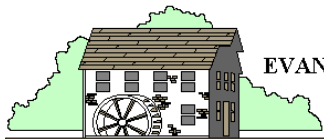


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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ EZFLOW BUNDLES- SUBSTITUTE FOR AGGREGATE



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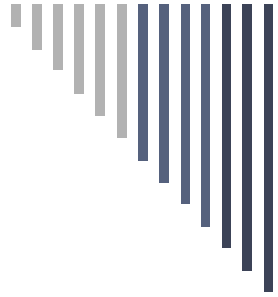
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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ SAND MOUND INSTALLATION WITH EZFLOW BUNDLES

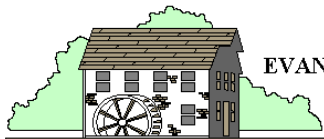


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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ INFILTRATOR SEPTIC TANK



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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

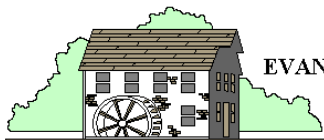
□ ECOFLOW PEAT FILTER WITH AT-GRADE



PRESENTED BY: SUSAN AHERN

ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ ELJEN GEOTEXTILE SAND FILTER

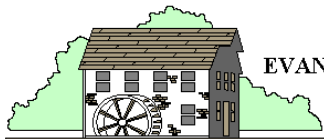


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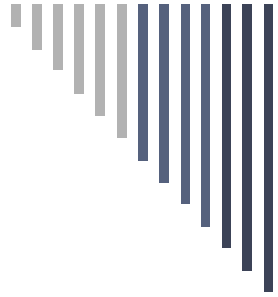
ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ ELJEN GEOTEXTILE SAND FILTER AND AN ADVANTECH SYSTEM



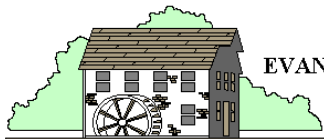
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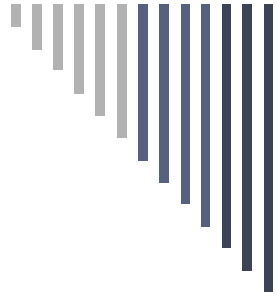
ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ ADVANTEX SYSTEM WITH CONCRETE TANK



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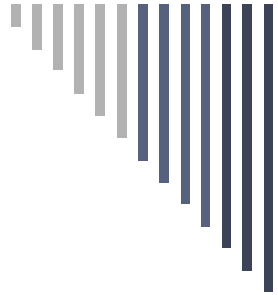


ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ ADVANTEX SYSTEM WITH ORENCO TANK

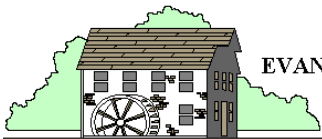


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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ OVERVIEW OF AN ADVANTEX RESIDENTIAL INSTALLATION

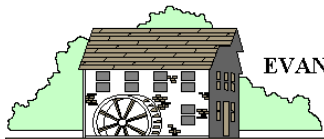


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PRESENTED BY: SUSAN AHERN

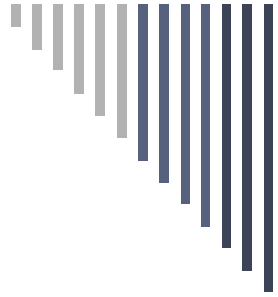
ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ LARGER ADVANTEX INSTALLATIONS



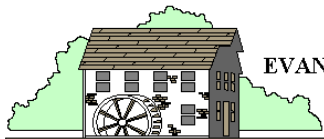
EVANS MILL
ENVIRONMENTAL, LLC

PRESENTED BY: SUSAN AHERN



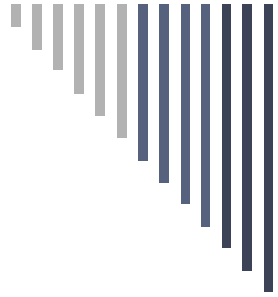
ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ NEED TO GET NITRATES DOWN TO 2-3 PPM?



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ENVIRONMENTAL, LLC

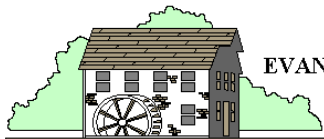
PRESENTED BY: SUSAN AHERN



ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

WHAT ARE COMMON DESIGN ISSUES AND
CONSTRAINTS?

HOW CAN WE DEAL WITH THEM?



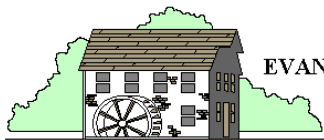
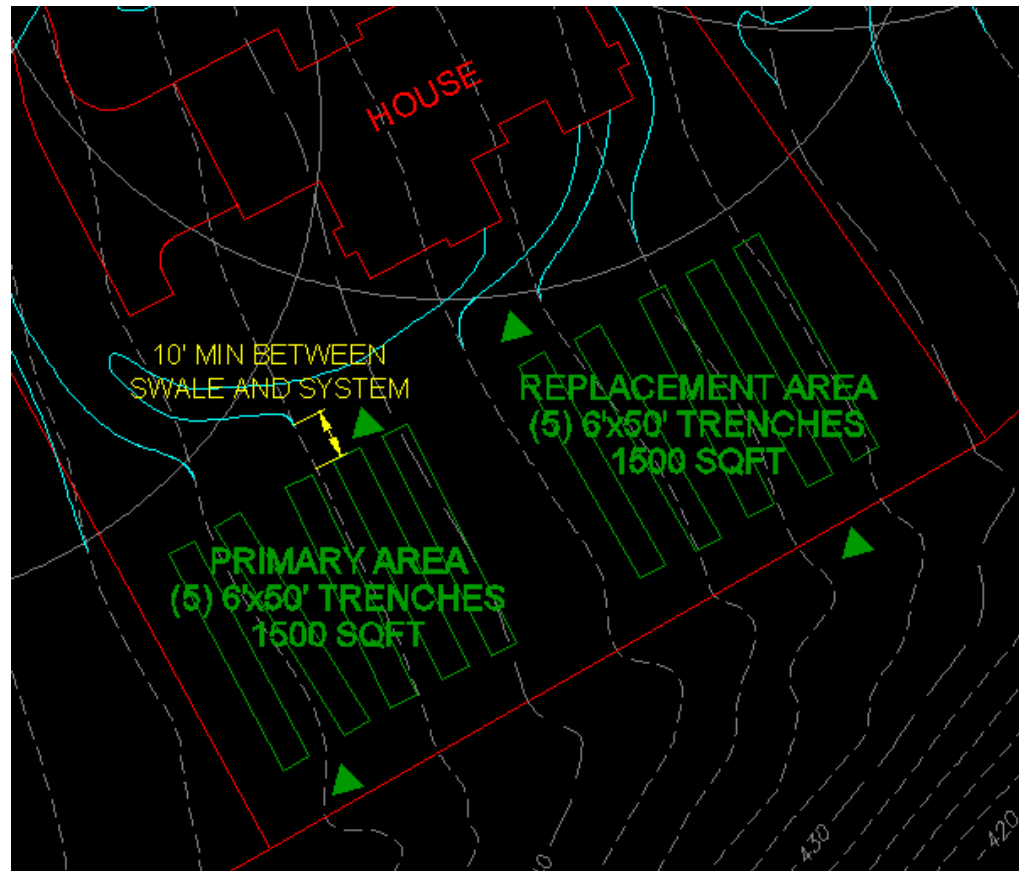
EVANS MILL
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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ COMMON DESIGN ISSUES AND CONSTRAINTS

□ SWALES



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ENVIRONMENTAL, LLC

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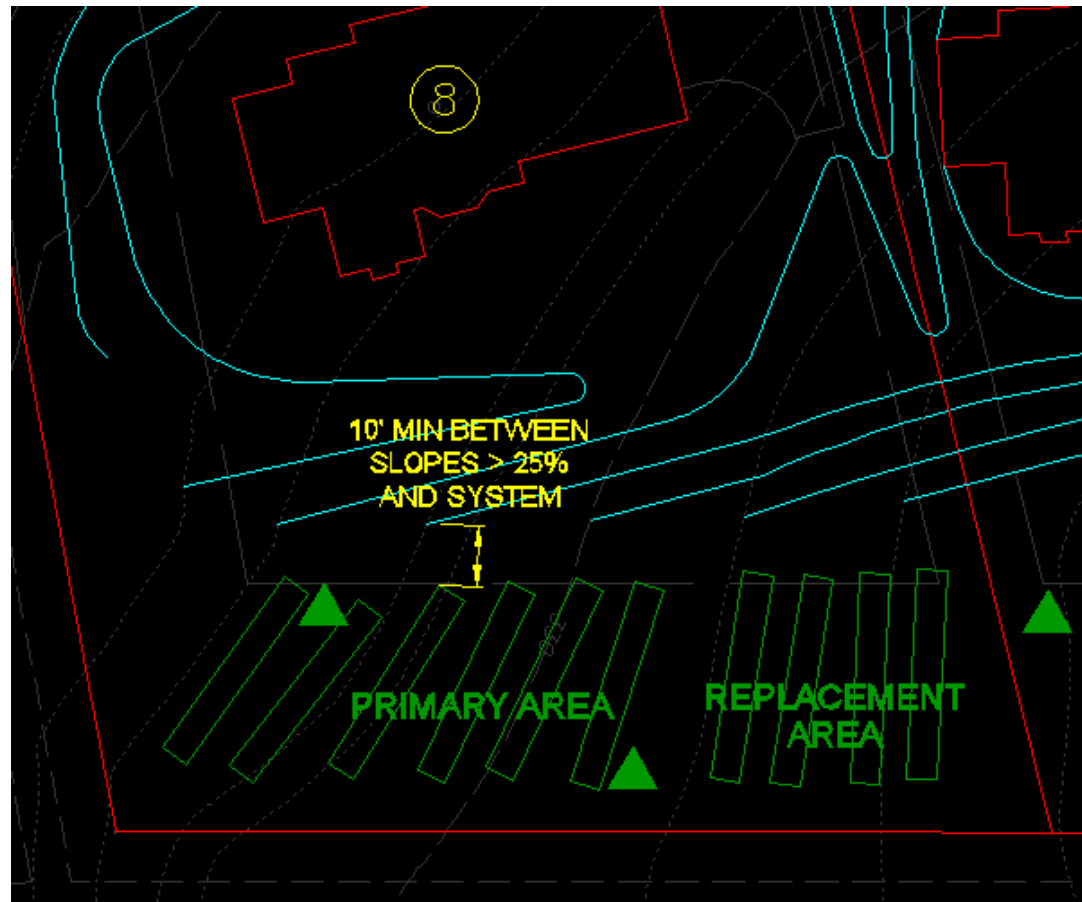
ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ COMMON DESIGN ISSUES AND CONFLICTS

□ GRADING AND SLOPES



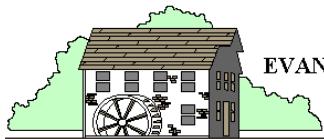
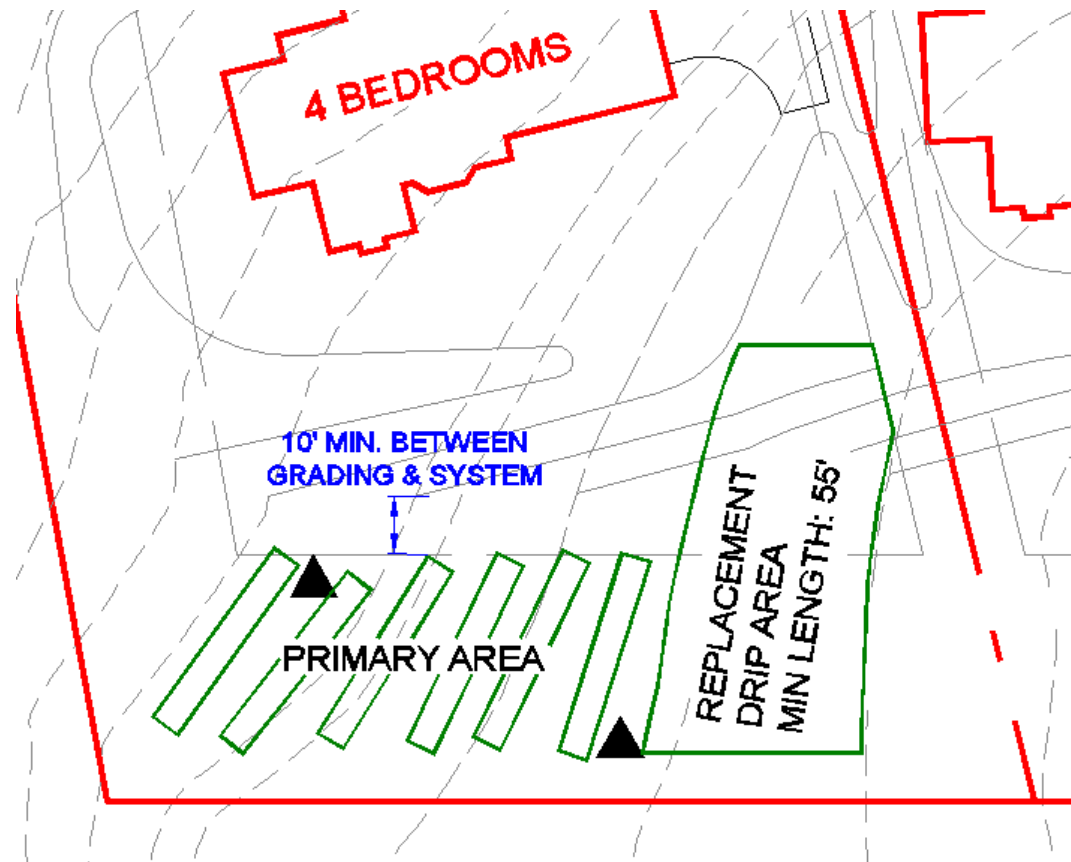
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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ COMMON DESIGN ISSUES AND CONSTRAINTS

- GRADING CONFLICT
NEED TO MAINTAIN THE
HORIZONTAL LINEAR
LOAD FOR DRIP TUBING;
LENGTH MIN. 55'



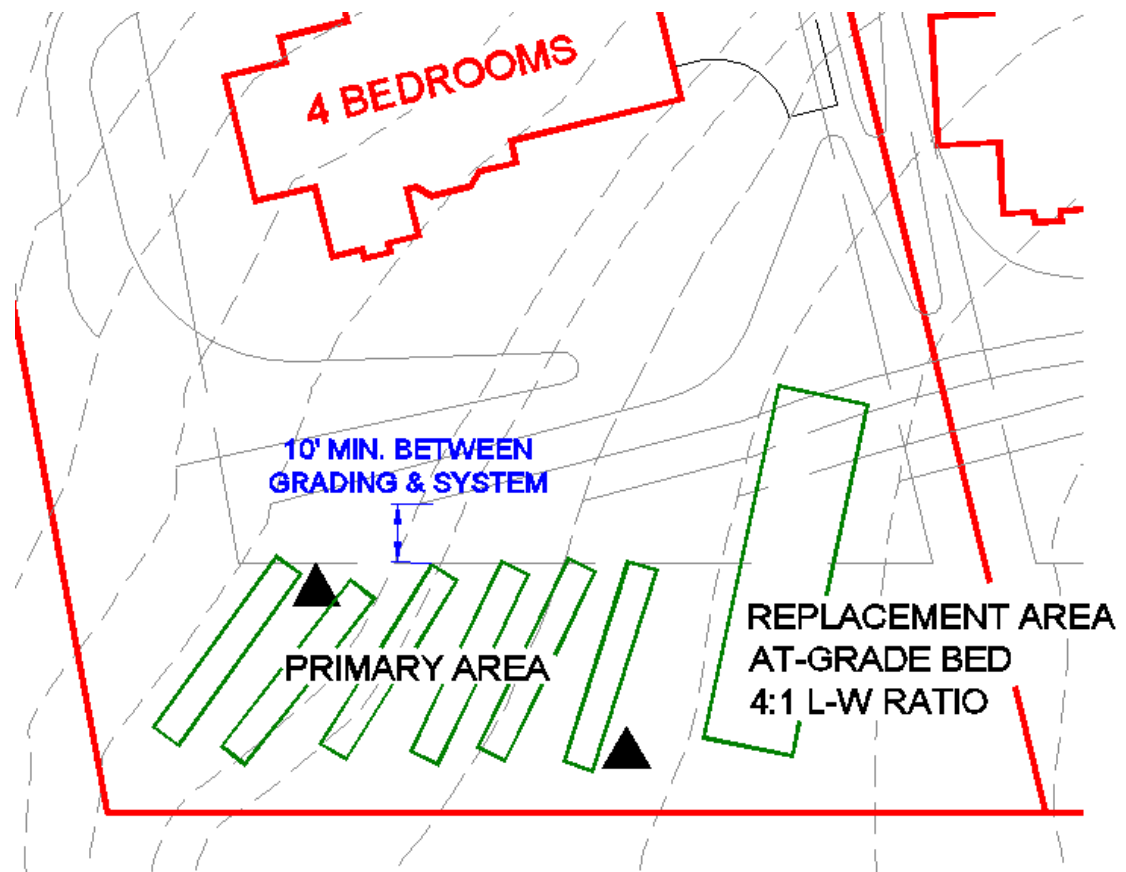
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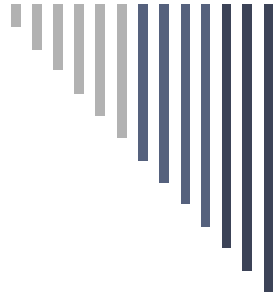
ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ COMMON DESIGN ISSUES AND CONSTRAINTS

- GRADING CONFLICT
NEED TO MAINTAIN 4:1
LENGTH TO WIDTH RATIO
FOR THE AT-GRADE BED



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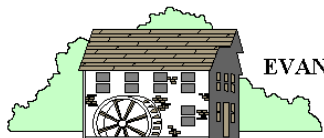
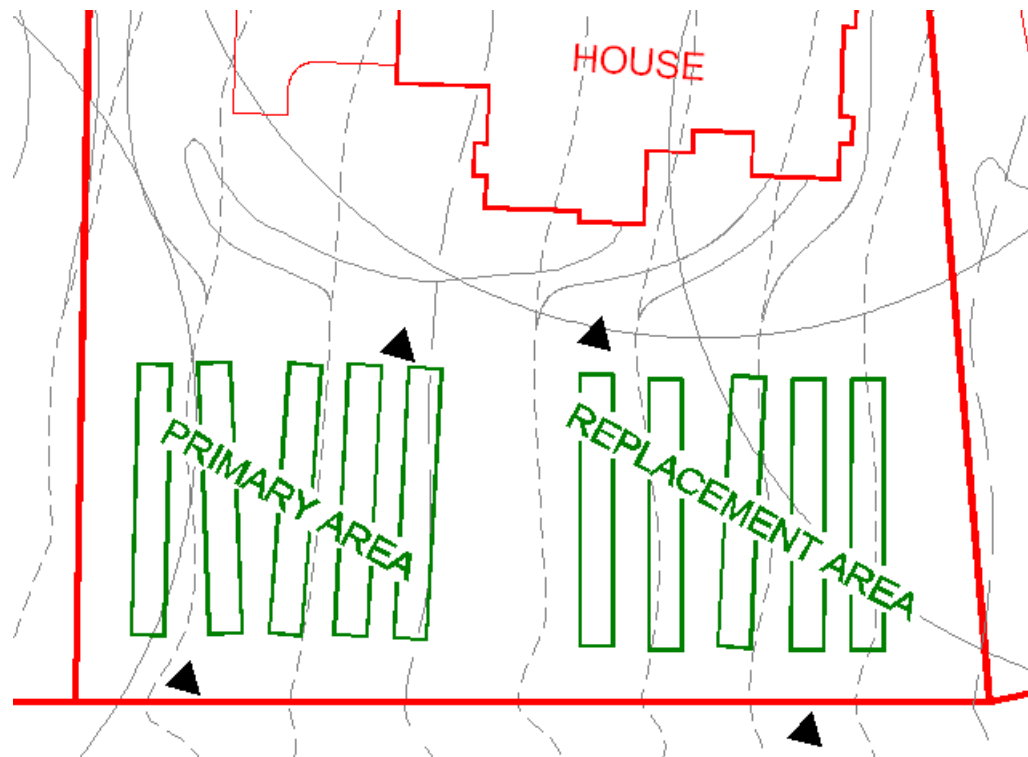


ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ COMMON DESIGN ISSUES AND CONSTRAINTS

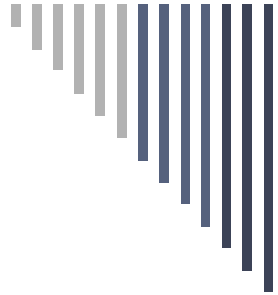
□ WELLS ?

NEED TO MAINTAIN MIN. 100'
FROM WELLS TO
ABSORPTION AREAS, AND
50' FROM WELLS TANKS



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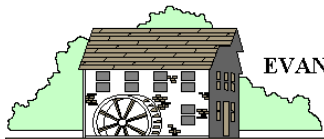
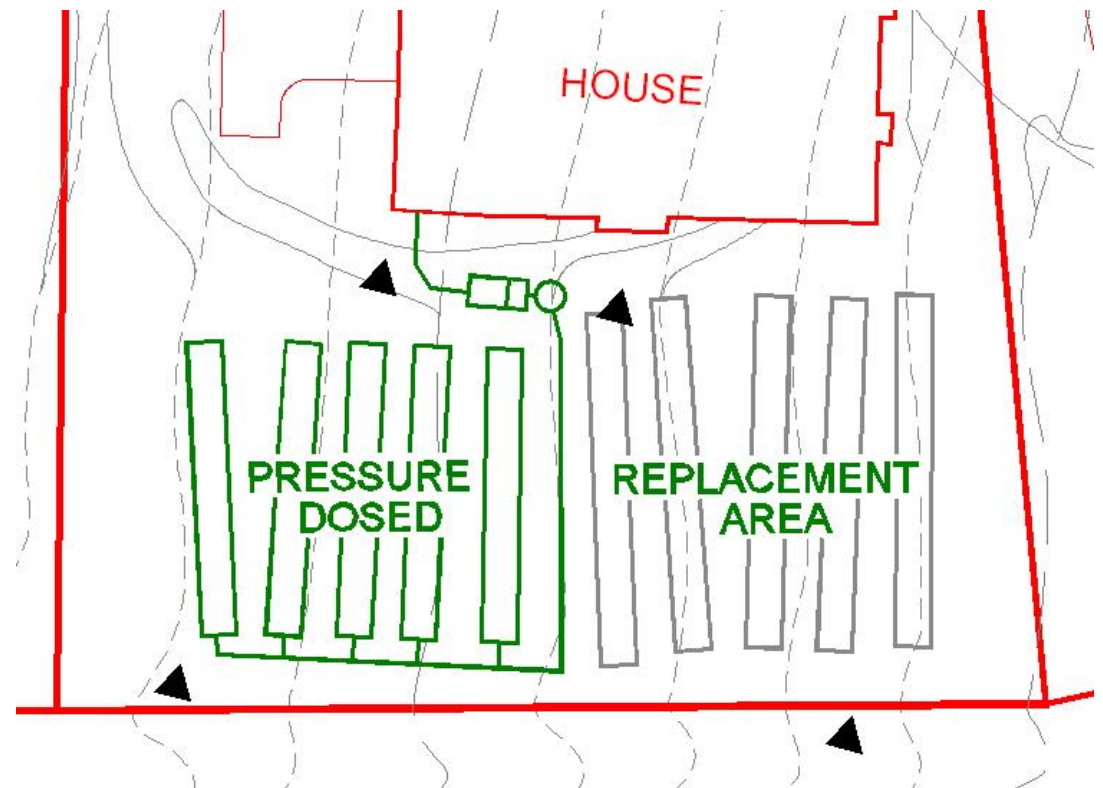
ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ COMMON DESIGN ISSUES AND CONSTRAINTS

□ DESIGN CONFLICTS

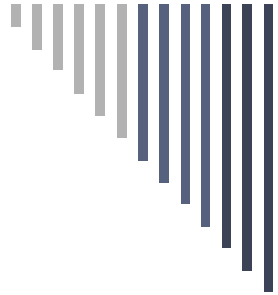
WHAT ABOUT TANKS AND
ISOLATION DISTANCES?

- 10' FROM HOUSE
- 10' FROM SWALE
- 10' FROM DRIVEWAY
- 6' TO TRENCHES
- ARE TANKS 10' FROM SWALE?



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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

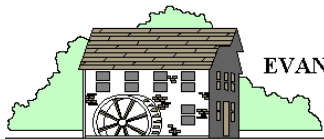
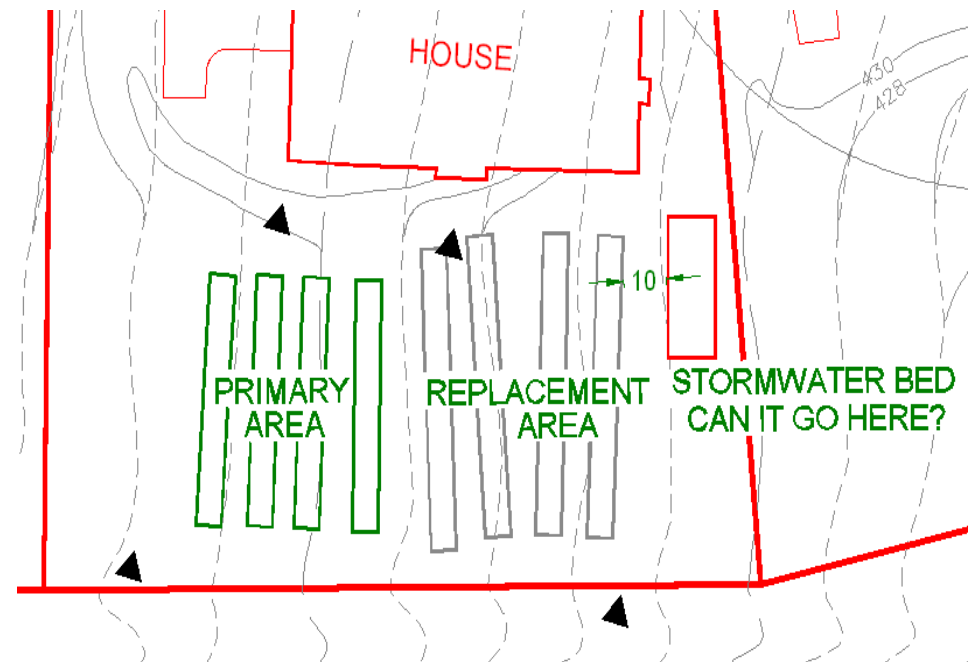
□ COMMON DESIGN ISSUES AND CONSTRAINTS

□ DESIGN CONFLICTS

WHAT ABOUT ISOLATION
DISTANCES TO STORMWATER PITS?

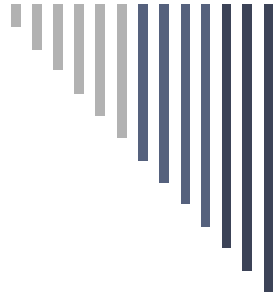
CHAPTER 73 REGULATIONS SAY
MIN. 10' TO ABSORPTION AREAS

CHAPTER 73 DOES NOT SPECIFY A
MIN. ISOLATION DISTANCE TO
TANKS; PRACTICE HAS BEEN 10'



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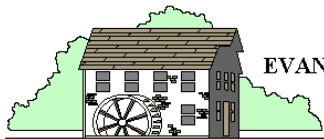
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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

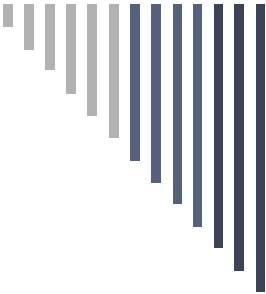
□ WHAT HAPPENS BETWEEN SEWAGE PERMIT DESIGN AND SYSTEM INSTALLATION?

- HOUSE MODEL CHANGES TO BIGGER FOOTPRINT
- # OF BEDROOMS INCREASED FROM 4 TO 5
- BUYER WANTS TO ADD SUNROOM ON BACK OF HOUSE
- WHAT ABOUT THE SWIMMING POOL
- NEED MORE STORMWATER INFILTRATION AREA
- OVERALL LOT GRADING CHANGES



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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ HOW DO WE DO BETTER?

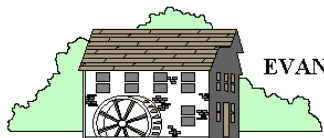
- COMMUNICATION IS KEY;
- TEST AREA USED FOR PLANNING MAY NOT BE THE IDEAL SYSTEM LOCATION;
- COORDINATION BETWEEN BUILDING PERMIT AND SEWAGE PERMIT;
- SYSTEM STAKEOUT DURING HOUSE STAKEOUT;
- PROTECTIVE FENCING AROUND PRIMARY AND REPLACEMENT SYSTEMS;



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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

- ❑ YOU CAN'T ALWAYS PLAN FOR HUMAN OVERSIGHT-
LIKE FORGETTING TO TURN OFF THE WATER

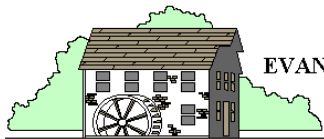


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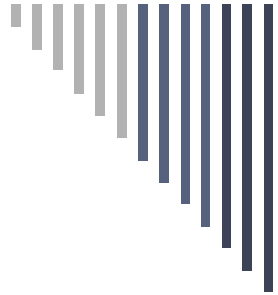
ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

□ THERE WILL ALWAYS BE UNEXPECTED CHALLENGES!



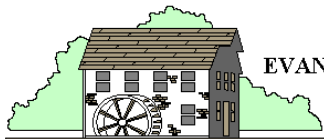
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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

- NEVER PROBLEMS
- JUST CHALLENGES



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ESSENTIAL ISSUES IN ONLOT SEWAGE SYSTEM DESIGN AND INSTALLATION

PRESENTED TO CHESTER COUNTY ENGINEERS

18 NOVEMBER 2010

**THANK YOU FOR THIS
OPPORTUNITY**

THIS PRESENTATION AND
REFERENCED MATERIALS
AVAILABLE ON EME WEBSITE



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