SOILS AND SEPTIC TANK SYSTEMS

BASIC INSTALLERS COURSE
SHARED RESPONSIBILITY

- **SOIL TESTER**
  - SITE EVALUATION
    - PERCOLATION
    - OTHER

- **PUBLIC HEALTH ENVIRONMENTALIST**
  - PLAN REVIEW
  - INSPECTION & PERMITTING

- **INSTALLER**
  - INSTALLS ACCORDING TO PERMIT
INSTALLERS VIEW POINT

SEES INFINETELY MORE GROUND
SOILS CAN CHANGE QUICKLY
SOIL TESTERS CAN MISS PROBLEMS
LAST CHANCE TO PREVENT FAILURE
AREAS TO AVOID
(CONVENTIONAL)

 CONCAVE LANDFORMS
  • TOESLOPES
  • DEPRESSIONS
  • DRAINAGEWAYS
  • FLOODPLAINS

 INDICATOR VEGETATION
  • WATER LOVING PLANTS
  • HIGH BASE (pH) PLANTS
Basic Types of Landforms

- Concave (Swale)
- Convex (Swell)
- Hillslope (>2%)
- Toe Slope
- Depression
- Flat

Locations:
- Avoid
- Good Location
- Acceptable for Mounds
CONDITIONS TO AVOID (CONVENTIONAL)

- WET
  - SMEARING
  - COMPACTION
- PLASTIC CLAYS (GUMBOS)
- OTHER RESTRICTIVE LAYERS
  - BEDROCK
  - SOFT ROCK
  - PANS (FRAGIPANS)
  - SEASONAL WATER TABLES
BEDROCK (HARD)

- CANNOT DIG WITH SPADE
- OUTCROPS ON SLOPES
- ASSOCIATED WITH SPRINGS
- CAN PERCH WATER
- TILTED - CONDUIT TO WATER TABLE
**SOFT ROCK**

- CAN DIG WITH SPADE (DIFFICULT)
- EASILY DUG WITH BACKHOE
- MISSED OR IGNORED BY TESTER
- CAN PERCH WATER
- CAN CAUSE SLOW PERCOLATION
- CAN ALSO BE TILTED
- BY ITSELF – LIKELY INADEQUATE TREATMENT
SOIL CHARACTERISTICS

- PERMEABILITY (PERC)
- DRAINAGE (SEASONAL WETNESS)
- DEPTH TO RESTRICTIONS
- FLOODING FREQUENCY
- SLOPE
Step 1
Describe
1. Depth
2. Color
3. Texture

8-12" diameter

Step 2

5-15'

6" during 1st 4 hrs

12" during 2nd 4 hrs

8-12" diameter

2" gravel
SOIL LIMITATIONS PER RULES (CONVENTIONAL)

- LESS THAN 5 MIN/INCH PERC
- GREATER THAN 60 MIN/INCH PERC
- ANY RESTR. FEATURE W/IN 30 IN.
- FREQUENT FLOODING
- SLOPES GREATER THAN 25%
Seasonal Water Table
PERMEABILITY

- DETERMINED BY PORE SPACE
- SIZE & SHAPE DETERMINED BY TEXTURE
  - SAND (COARSE)
  - SILT (MEDIUM)
  - CLAY (FINE)
  - GRAVEL (TEXTURAL MODIFIER)
WETNESS COLORS

- GRAY
  - SPOTS (MOTTLES)
  - SOLID COLOR
- RED & YELLOW MOTTLES
- BLACK
  - ORGANICS
  - MANGANESE
GOOD DRAINAGE COLORS

- SOLID COLORS (NO MOTTLES)
  - YELLOW (GOOD)
  - BROWN (BETTER)
  - RED (BEST)
EXCEPTIONS TO COLOR INDICATORS

- **WETNESS INDICATORS**
  - RELIC (OLD)
  - INHERITED (PARENT MATERIAL)
- **BROWN SOILS (SOME HAVE PANS)**
- **RED SOILS (SOME ARE CLAYEY)**
  - LOW SHRINK-SWELL (GOOD)
  - HIGH SHRINK-SWELL (BAD)
INSTALLER INDUCED PROBLEMS

- **COMPACTION (MORE LIKELY)**
  - YELLOW & BROWN SOILS
  - LOAMY, SILTY, SOME SANDY
  - WHEN EXCESSIVELY WET
  - RUBBER TIRE VS. TRACK

- **SMEARING (MORE LIKELY)**
  - CLAYS
  - TOO WET
FLOODING

- DEFINED – ANNUAL EVENT
- PROPOSED - > 50% CHANCE
- INDICATORS OF FREQUENT FLOODING
  - ORIENTED DEBRIS
  - WATER LINES ON TREES
  - SUSPENDED TRASH
  - STREAM CHANNELING/SCOURING
SLOPE

- STEEP SLOPES (>25%)
  - APPENDIX I
  - TRENCH SPACING
  - TRENCH DEPTH
- BENCHING OUT
  - MAY ENCOUNTER RESTRICTIVE LAYERS
SUMMARY

 WETNESS COLORS
  • GRAY (SUBSOIL)
  • BLACK (SURFACE)

 PERMEABILITY
  • PORE SIZE/SPACE
  • TEXTURE
  • CLAY TYPE

 OTHER RESTRICTIONS
  • PANS
  • ROCK (HARD & SOFT)