



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 INFINITELY MORE GROUND

SOILS CAN CHANGE QUICKLY

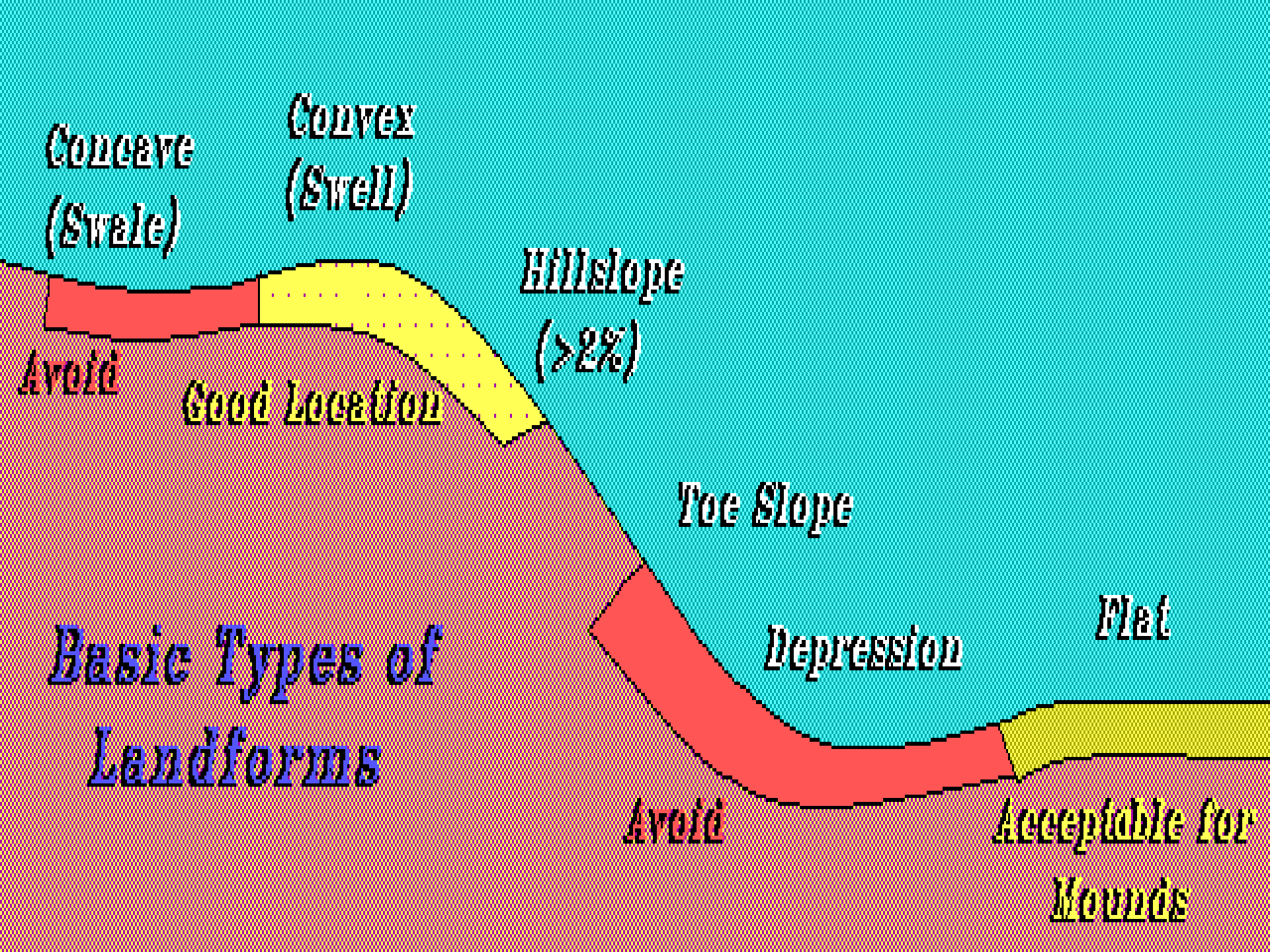
SOIL TESTERS CAN MISS PROBLEMS

LAST CHANCE TO PREVENT FAILURE



AREAS TO AVOID (CONVENTIONAL)

- ◎ CONCAVE LANDFORMS
 - TOESLOPES
 - DEPRESSIONS
 - DRAINAGEWAYS
 - FLOODPLAINS
- ◎ INDICATOR VEGETATION
 - WATER LOVING PLANTS
 - HIGH BASE (pH) PLANTS



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



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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

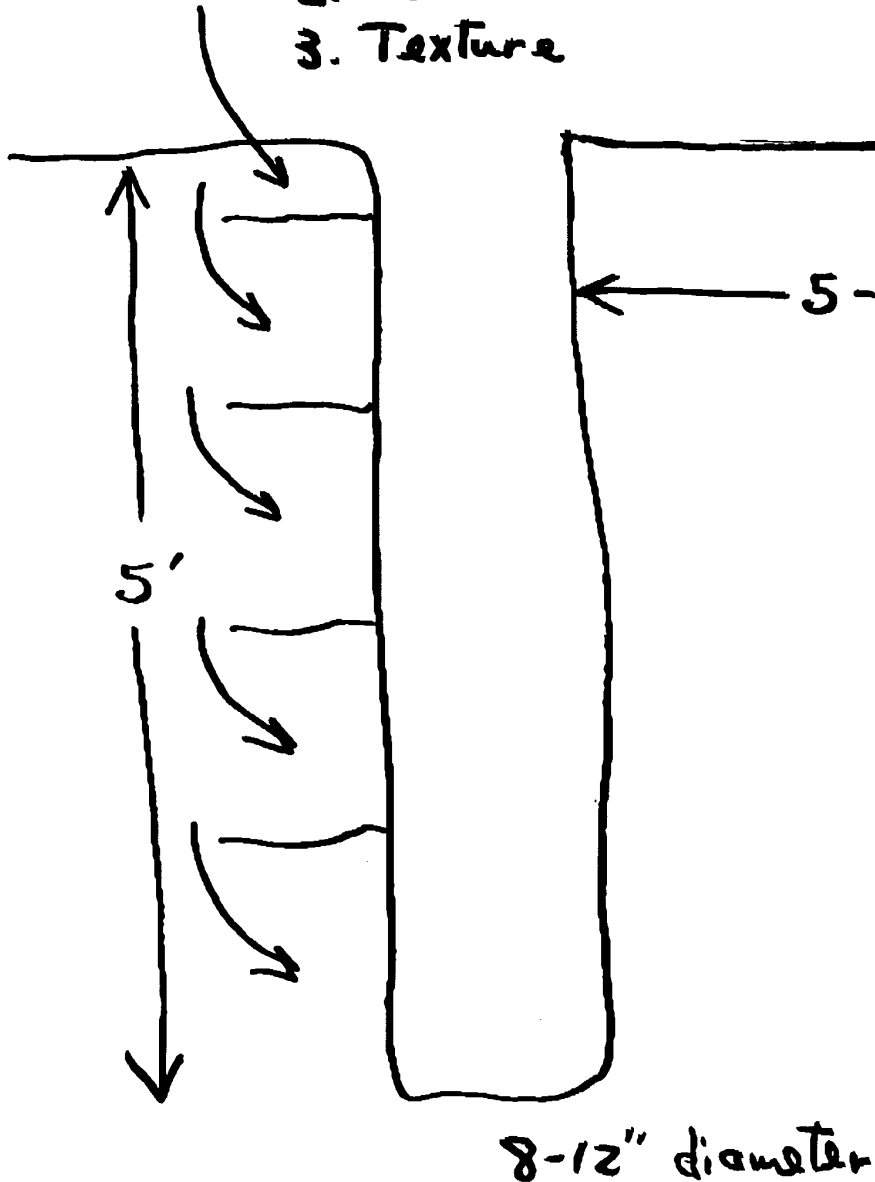
SOIL CHARACTERISTICS

- ◎ PERMEABILITY (PERC)
- ◎ DRAINAGE (SEASONAL WETNESS)
- ◎ DEPTH TO RESTRICTIONS
- ◎ FLOODING FREQUENCY
- ◎ SLOPE

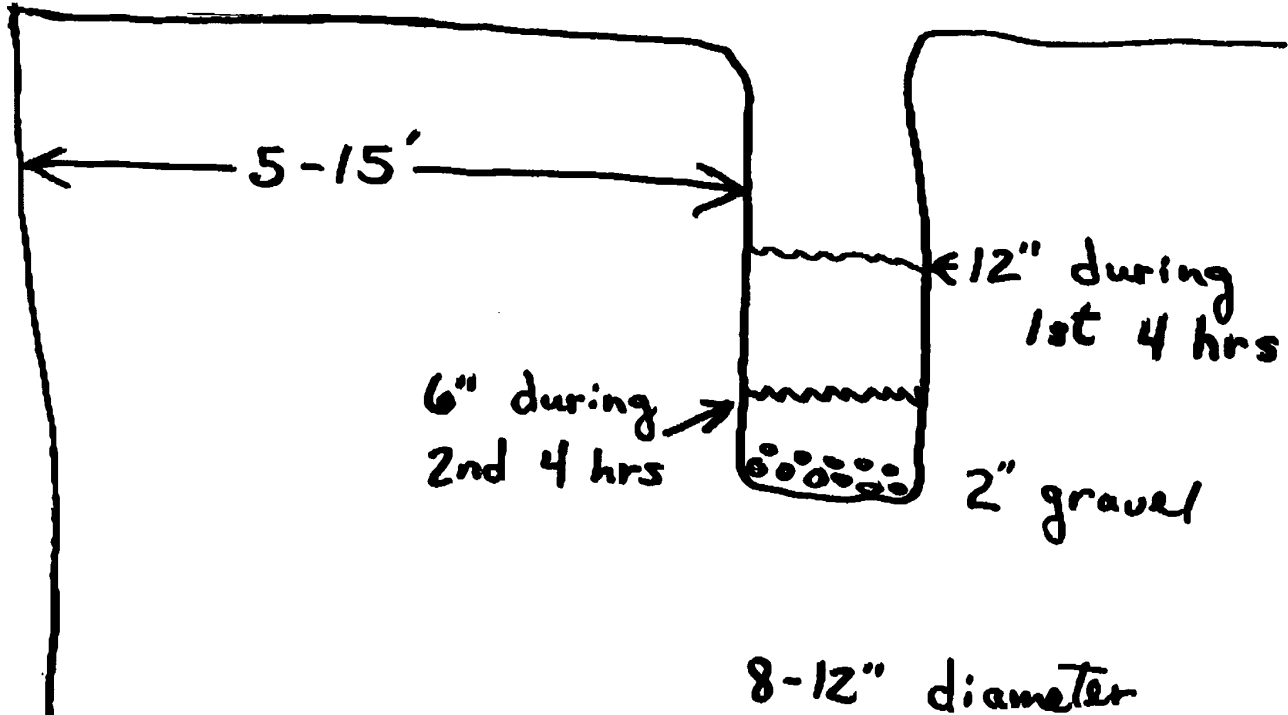
Step 1

Describe

1. Depth
2. Color
3. Texture

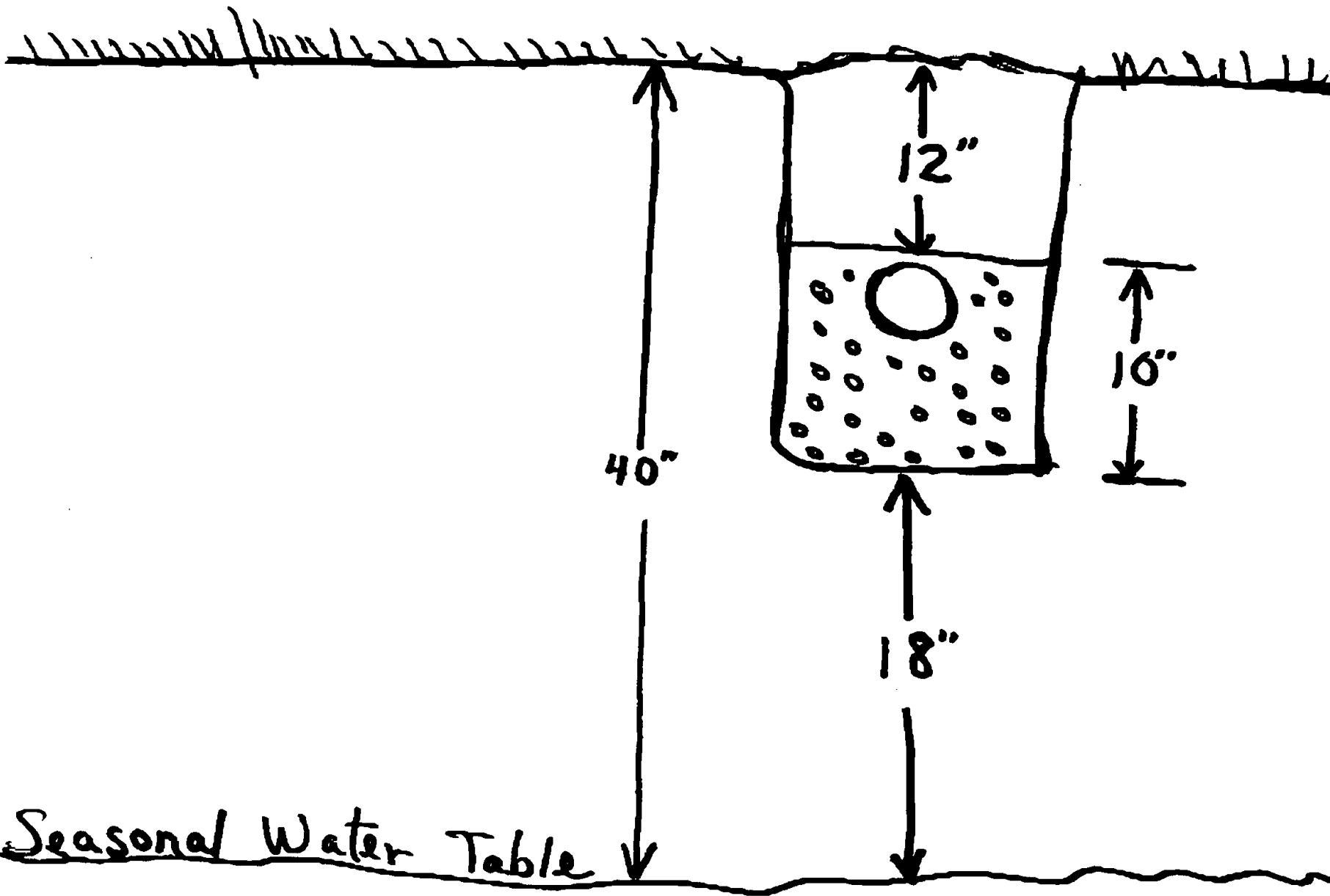


Step 2

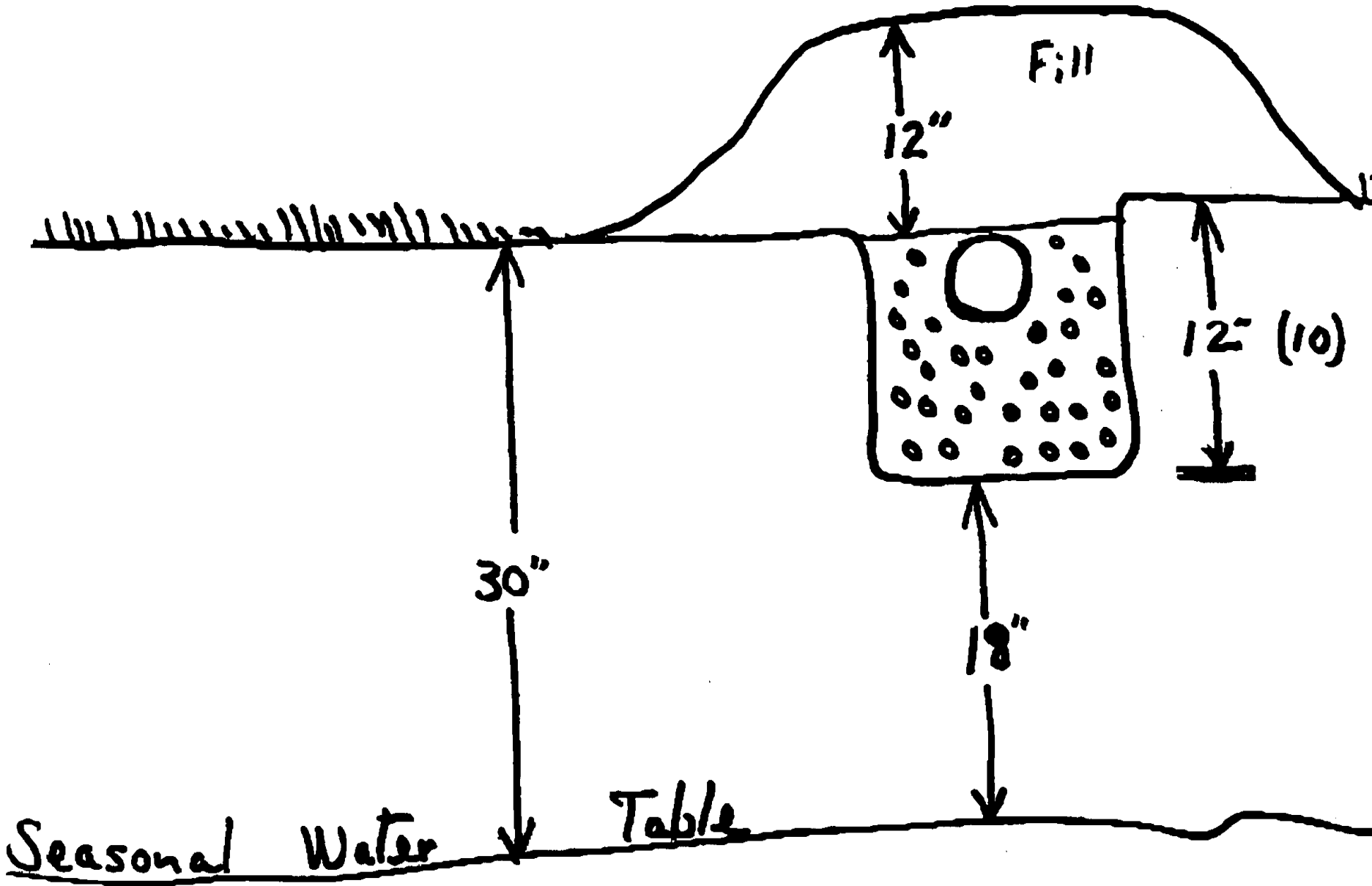


SOIL LIMITATIONS PER RULES (CONVENTIONAL)

- 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

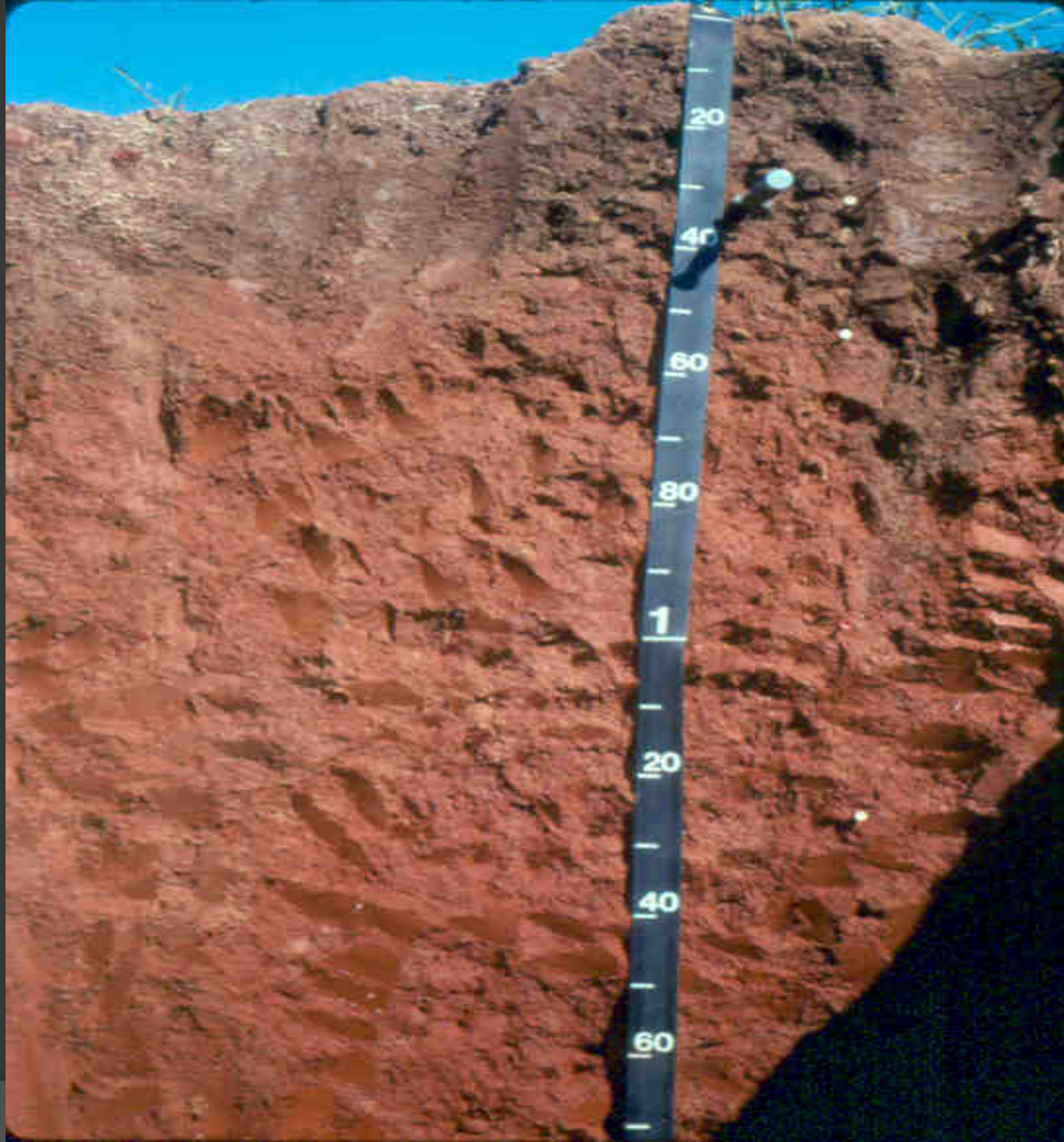






GOOD DRAINAGE COLORS

- ◎ 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)



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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)