

## Soil & Site Evaluator - Need to Know

### **I. The professional will understand the factors of soil development and demonstrate their importance to site evaluations.**

- A. Topography
  - 1. Landscape description
  - 2. Landform description
  - 3. Landscape position
- B. Parent materials **NEED TO EDIT FOR ARIZONA SOIL**
  - 1. Lacustrine
  - 2. Ice walled lake lacustrine deposits
  - 3. Alluvium
  - 4. River terrace deposits
  - 5. Glacial outwash
  - 6. Glacial till
  - 7. Loess
  - 8. Organic soils
  - 9. Bedrock
    - a. Weathering
    - b. Soil formation
    - c. Soil horizon development
- C. Climate
  - 1. Precipitation
  - 2. Temperature
- D. Time of soil development
- E. Vegetation and organisms – RELATED TO WASTEWATER

### **II. The professional will be able to identify and describe physical and morphological soil properties.**

- A. Components of soil
  - 1. Organic matter
  - 2. Pore spaces
- B. Define and determine soil texture
  - 1. Soil separates
  - 2. Soil textural classes
  - 3. Use soil textural triangle to determine soil texture class
  - 4. Field determination of soil texture class
- C. Soil structure
  - 1. Define soil structure
  - 2. Factors influencing soil structure development
    - a. Time
    - b. Physical weathering
    - c. Gluing agent
  - 3. Field identification

- a. Shape
  - b. Grade
  - c. Consistence
- 4. Appropriate sampling procedures
- 5. Significance of soil structure to onsite systems
- 6. Impacts on soil structure
- D. Soil porosity
- E. Soil water movement
- F. Soil colors
  - 1. Influences on soil color
  - 2. Significance of soil color to onsite systems
  - 3. Use of soil color chart
    - a. Hue
    - b. Value
    - c. Chroma
    - d. Natural light conditions
    - e. Moisture
  - 4. Redoximorphic features
    - a. Conditions for formation
    - b. Identification
    - c. Description
      - (1) Concentrations
      - (2) Depletions
      - (3) Gleying
    - d. Limitations
  - 5. Interpretation of soil colors
    - a. Depth to seasonally saturated soil
  - 6. Field determination
  - 7. Mottles
    - a. Any color that differs from the matrix
    - b. Can occur any where in soil
  - 8. Stains and coatings
    - a. Soil component(s) coating soil
    - b. Occur in layers
  - 9. Nodules
  - 10. Other sources of soil color variation
    - a. E horizon formation
- G. Bedrock determination
- H. Lithologic discontinuities
  - 1. Abrupt textural boundary
  - 2. Abrupt structural boundary
  - 3. Abrupt color boundary
- I. Role of soil survey in site evaluation
  - 1. General landscape, landform, and parent material(s)
  - 2. Ranges of field and laboratory determined soil properties
  - 3. Use and management limitations

- J. Soil variability
- K. Disturbed soils
  - 1. Identification
  - 2. Determination
  - 3. Interpretation
  - 4. Solutions

**III. The professional will be able to identify and describe the following external landscape features.**

- A. Landscape position
  - 1. Identification
  - 2. Significance
- B. Slope
  - 1. Determination
  - 2. Significance
- C. Vegetation
  - 1. Identification
  - 2. Significance
- D. Flooding
  - 1. Determination
  - 2. Significance
- E. WELLS IN THE AREA
  - 1. USE OF ADWR WEBSITE
  - 2. FINDING NEARBY WELLS

**IV. The professional will be able to demonstrate knowledge and apply the site evaluation procedures.**

- A. Preliminary evaluation
  - 1. Easements and property lines
  - 2. Ordinary high water level of public water
  - 3. Floodplain designation and flooding elevation
  - 4. Soil survey determination of applicable characteristics
  - 5. Legal lot description
  - 6. Wellhead protection area
- B. Field evaluation
  - 1. Site restrictions
    - a. Utilities
    - b. Trees
  - 2. Setbacks - located, mapped, and displayed on site plan
    - a. Well
    - b. Property lines
    - c. Building
    - d. Water lines
    - e. Easements

3. Surface features
  - a. Vegetation
  - b. Slope percent and direction
  - c. Disturbed or compacted soil
  - d. Flooding or run-on potential
  - e. Landscape position
4. Blue Stake call
  - a. Public utilities
  - b. Private utilities
5. Soil investigation equipment
  - a. Probe - ?? USE (recommend removing from list of acceptable methods, lose ability to determine structure)
  - b. Auger
  - c. Soil pit
6. Soil investigation procedure
  - a. Stake excavation(s) in system area - ?? TEST HOLE STAKES?
  - b. Discovery hole (soil morphology method)
    - (1) Depth of each excavation recorded - ??
    - (2) Depth and description of each horizon
    - (3) Number of excavations needed
  - c. Use of a standard method?
    - (1) ASTM
    - (2) USDA-NRCS
    - (3) Other?
7. System sizing
  - a. sizing by morphology (soil texture, structure, consistence)
  - b. Soil sizing by percolation tests/
8. Site protection
9. Site evaluation reporting requirements
  - a. Preliminary and field evaluations
  - b. All dates of work completed
  - c. Site map drawn to scale and DIMENSIONS NOTED
  - d. Depth to seasonally saturated soil, limiting condition, standing water table or flooding elevation
  - e. Elevation of soil treatment system bottom
  - f. Final soil absorption rate – IS THIS SAR? (yes)
  - g. Items to be shown on site map (vertical and horizontal)
    - (1) Buildings
    - (2) Source of drinking water
    - (3) Contours
    - (4) Slopes greater than 15%
    - (5) Any limiting condition
    - (6) North-south-east-west
    - (7) Roads
    - (8) Property dimensions
    - (9) Trees

- (10) Location of test holes/excavations
  - (11) Other improvements
  - (12)
  - h. Potential construction issues
  - i. Certified statement of the site evaluator
10. Other considerations
- a. Accountability
  - b. Apprenticeship needed?
  - c. Oversight for all soils evaluation?
  - d. Should the designer be able to design from the site evaluation map or must the designer visit the site?
  - e. "Feel" needs to be standardized frequently, ongoing, calibration
    - (1) Needs source of standards for texture
    - (2) Structure is site-specific