**Soil - Need to Know**

1. **The professional will understand the factors of soil development and demonstrate their importance to site evaluations.**
   1. Topography
      1. Landscape description
      2. Landform description
      3. Landscape position
   2. Parent materials
      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
         1. Weathering
         2. Soil formation
         3. Soil horizon development
   3. Climate
      1. Precipitation
      2. Temperature
   4. Time of soil development
   5. Vegetation and organisms
2. **The professional will be able to identify and describe physical and morphological soil properties.**
   1. Components of soil
      1. Organic matter
      2. Pore spaces
   2. 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
   3. Soil structure
      1. Define soil structure
      2. Factors influencing soil structure development
         1. Time
         2. Physical weathering
         3. Gluing agent
      3. Field identification
         1. Shape
         2. Grade
         3. Consistence
      4. Appropriate sampling procedures
      5. Significance of soil structure to onsite systems
      6. Impacts on soil structure
   4. Soil porosity
   5. Soil water movement
   6. Soil colors
      1. Influences on soil color
      2. Significance of soil color to onsite systems
      3. Use of soil color chart
         1. Hue
         2. Value
         3. Chroma
         4. Natural light conditions
         5. Moisture
      4. Redoximorphic features
         1. Conditions for formation
         2. Identification
         3. Description
            1. Concentrations
            2. Depletions
            3. Gleying
         4. Limitations
      5. Interpretation of soil colors
         1. Depth to seasonally saturated soil
      6. Field determination
      7. Mottles
         1. Any color that differs from the matrix
         2. Can occur any where in soil
      8. Stains and coatings
         1. Soil component(s) coating soil
         2. Occur in layers
      9. Nodules
      10. Other sources of soil color variation
          1. E horizon formation
   7. Bedrock determination
   8. Lithologic discontinuities
      1. Abrupt textural boundary
      2. Abrupt structural boundary
      3. Abrupt color boundary
   9. 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
   10. Soil variability
   11. Disturbed soils
       1. Identification
       2. Determination
       3. Interpretation
       4. Solutions
3. **The professional will be able to identify and describe the following external landscape features.**
   1. Landscape position
      1. Identification
      2. Significance
   2. Slope
      1. Determination
      2. Significance
   3. Vegetation
      1. Identification
      2. Significance
   4. Flooding
      1. Determination
      2. Significance
4. **The professional will be able to demonstrate knowledge and apply the site evaluation procedures.**
   1. 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
   2. Field evaluation
      1. Site restrictions
         1. Utilities
         2. Trees
      2. Setbacks - located, mapped and displayed on site plan
         1. Well
         2. Property lines
         3. Building
         4. Water lines
         5. Easements
      3. Surface features
         1. Vegetation
         2. Slope percent and direction
         3. Disturbed or compacted soil
         4. Flooding or run-on potential
         5. Landscape position
      4. Gopher state one call
         1. Public utilities
         2. Private utilities
      5. Soil investigation equipment
         1. Probe
         2. Auger
         3. Soil pit
      6. Soil investigation procedure
         1. Stake borings in system area
         2. Elevation for each boring recorded
      7. System sizing
         1. sizing by morphology
         2. Soil sizing by percolation tests/permeameter
      8. Site protection
      9. Site evaluation reporting requirements
         1. Preliminary and field evaluations
         2. All dates of work completed
         3. Site map drawn to scale
         4. Depth to seasonally saturated soil, limiting condition, standing water table or flooding elevation
         5. Elevation of soil treatment system bottom
         6. Final soil sizing factor
         7. Potential construction issues
         8. Certified statement of the site evaluator