# COMPLETING THE SITE ASSESSMENT CHECKLIST

***Suggested Tools and Materials***

Cornell pH test kit and instructions
soil texture by feel instructions
wash bottle filled with water
at least 4 gallon jugs of water
paper towels
measuring tape
yardstick
shovel and trowel
plastic bags
wristwatch or timer
weed identification manual
ornamental plant identification manual
hand pruners
pencil/pen and extra paper

***Optional tools:*** diameter tape, penetrometer, soil probe, vials containing alcohol for unknown insects, infrared thermometer

**1. Site Location**

Note the address of the site. You may also wish to note the nearest cross streets and/or page and grid of the maps your firm uses.

**2. Site Description**

A brief overview of the site including: general use or function, approximate size, accessibility, general topography (steep hill, gentle slope, etc.)

**3. Climate**

**a.** ***USDA Hardiness Zone***

Check the USDA hardiness zone of the site. If planting in containers above ground you may want to regard the site as a zone colder than listed, as trees in containers are more susceptible to cold winter temperatures than trees in the ground.

**b.** ***Microclimate Factors***

***Re-reflected heat load:*** Determine if the site, or some portion of it, has heat pockets due to reflected and reradiated heat loads from pavement, automobiles, buildings or other surfaces. This can cause a tree to heat up and lose water from its leaves at a faster than normal rate. These pockets are often south facing and have a tremendous amount of heat load. On sunny days, these areas will be noticeably warmer than nearby spots. Drought-resistant trees should be chosen in these situations.

***Frost pocket:*** Frost pockets are often found in low areas at the bottom of a slope or bowl. Cooler air, being heavier, collects in these areas, lowering air temperatures.

***Wind:*** Excessively windy sites will often place stress on trees, particularly those with large leaves which may result in leaf tatter. Also, trees in these sites may need supplemental watering to prevent them from drying out as quickly. Signs of excessive wind are trees leaning or growing in the same direction. Plants will have stunted growth on the side that faces the full force of the prevailing wind. Wind tunnels are common in urban areas where wind is funneled between tall buildings.

***Other:*** Are there other factors that might affect the climate or precipitation levels? For example, are there wide rain shadows formed by the overhang of a building? Is the site located near a large body of water that may moderate the climate?

**c.** ***Sunlight Levels***

Shady sites determined by the sun and shade patterns around buildings may limit the choice of trees. Consider that a site has full sun if it receives more than 6 hours of direct sunlight. Partial sun has direct sun (often morning sun) for less than 6 hours, or filtered light (as would be common under a tree with fine textured eaves) for most of the day. An area is consider shady if it receives little or no direct sunlight, or if it receives less than 6 hours of filtered light.

**d.** ***Irrigation Levels***

Note the presence or absence of an automatic irrigation system. If possible record the method of delivery (overhead, drip, mini-sprinkler), the weekly amount of water applied and the rate at which it is applied. You may wish to test the system by setting out collection containers in different on the site and running the system for a specified amount of time to test the delivery rate. Comparing the actual amount delivered with the manufacturer's specifications for the system will indicate its efficiency.

**4. Soil Factors**

**a.** ***Range of pH Levels***

Check the pH for several areas on the site. Pay particular attention to the pH near sidewalks and parking areas, concrete or masonry buildings or foundations. These limestone-containing materials in the street environment result in the high ph levels (from neutral to alkaline) of most urban soils. Note the range of levels on the front side of the checklist. Note the sample locations and exact readings on the sketch on the back of the checklist.

**b.** ***Texture***

In the field, test the soil texture using the soil texture-by-feel technique, and record the results on the checklist. If you must know the exact soil texture, record the general soil type on the checklist and collect several samples to be analyzed by a soils lab. A sandy soil will suffer less from the effects of compaction but may be less able to supply water to trees. Conversely, compaction may render a heavy clay soil too wet, making oxygen less available.

**c.** ***Compaction Levels***

There are several ways to test for soil compaction. A simple one is to use a penetrometer. Record the average depth of penetration at which the probe measures 300 psi. Alternately, you may take several soil cores using a soil probe and analyze them for soil density. Perhaps the simplest test is to dig a small pit and gauge the difficulty of hand digging. Repeat the 'shovel test' in several spots.

**d.** ***Drainage Characteristics***

Determining the drainage characteristics of your site is a multi-faceted task.

***Presence of mottled soil:*** The strongest indication of poor drainage is mottled soil. Dig a soil pit at least 12" to 15" deep and remove several clods for examination. Clods that have grey mottling and/or have a foul odor indicate poor drainage.

***Low-lying topography:*** Study the topography for low-lying areas that collect surface runoff and that may be poorly drained.

***Indicator plants:*** Plants that indicate poorly drained (wet) sites include Willow, Pin Oak, Swamp White Oak, and Tupelo. Plants that indicate moist soils are sycamore and tulip trees. Plants that indicate well-drained sites are sugar maple, red oaks and hickories.

***Percolation test:*** To perform a percolation test, dig a pit approximately one foot deep. Fill the pit with water and allow this water to drain completely. Once the water has completely drained, refill the pit with water, measure the depth of water in the pit and note the time. After 15 minutes, note the depth of water and calculate the rate of drainage in inches per hour. (The initial filling and draining of the pit is to saturate the soil to test more closely for gravitational water movement.) Classify the soil into one of the three drainage classes: poorly drained (< 4"/hr); moderately drained (4"-8"/hr); or excessively drained (> 8"/hr).

**e.** ***Other Soil Considerations***

***Indications of soil layer disturbance:*** Look for areas that show evidence of regarding cuts or fills. Clues include mature trees that do not show a trunk flare (due to soil piled against the trunks), or have retaining walls near their bases. You may wish to dig a pit

approximately two feet deep in order to examine the soil horizons, especially if the site has recently had construction activity. Soil layers that are noticeably lighter in color than lower layers indicate that subsoil has been spread on top of the original grade. Conversely, the absence of a rich brown, organic layer at the top may indicate that the topsoil has been removed.

***Evidence of recent construction:*** Clues include newly-pave surfaces, turf that is noticeably thinner than in surrounding areas, new retaining walls, soil 'humps' or subsidence, and the like. Also consider the route or routes taken by heavy equipment into the site and where materials were stored during construction.

***Presence of construction debris:*** Construction debris is likely on almost all construction sites, particularly if tipping fees for debris are high in your area, and if construction involved the renovation or removal of a building or pavement.

***Noxious weeds present:*** Use a guide to identify weeds. Pay particular attention to perennial noxious weeds that must be eradicated before landscape installation. Perennial weeds that are commonly found in urban landscapes include: bindweed, poison ivy, mugwort, wild violet, nutsedge, quackgrass, and healall.

***Evidence of excessive salt usage/salt injury*:** Look (particularly near walks and parking areas) for white powder that has precipitated out on the soil surface. Prostrate knotweed is a weed that indicates salty compacted soil. Brown needle tips, marginal leaf scorch, or witches' broom on ornamentals indicate salt injury. Carefully examine areas where salt-laden snow has been dumped. These areas are likely to have high soil salt concentrations.

***Erosion of soil evident:*** Determine the extent and severity of soil erosion. Note the presence and size of eroded gullies, rills, or soil slumps. Factors that affect soil erosion include: rainfall intensity, quantity, and runoff; slope length and gradient; amount of stabilizing plant material or other erosion control practices; the infiltration rate and the structural stability of the soil.

***Evidence of soil contamination:*** Look for signs of dumping by restaurants or open-air food stalls of wash water, old dumping areas, construction dumping areas, oil and gas dumping, and the like.

***Usage that compacts soil:*** Is the area used for open-air markets or parties? Are there pathways that pedestrians have created? Is the area sometimes used for parking? Are there other social activities that are planned for the site that tend to compact the soil?

**f.** ***Specific Soil Problems***

Use this space to record specific soil problems that occur on the site.
Problems might include an inability to surface drain a site, possible soil chemical contaminants, and the like.

**5. Structural Factors**

**a.** ***Limitations to above-ground space***

***Overhead wire height:*** Describe the location and estimate the height of over head utility wires.

***Proximity to buildings and structures:*** Note the location of buildings and structures on the back of the checklist. Check the box on the front side of the checklist if you anticipate buildings or structures having an impact on the canopy space of landscape plantings.

***Other:*** Are there any other limitations to above-ground space? Examples include: building or planting setbacks, emergency access lanes that must be kept clear, heat vents, and signs that must be readable from the road.

**b.** ***Limitations to below-ground space***

***Utilities:*** Mark utilities on the sketch. Identify individual utilities if possible. Know that you must hand dig within two feet on either side of the marked line.

***Estimate rooting volume:*** In order to estimate the available rooting volume of a planting site, measure the length and width of available soil, and multiply area by the estimated depth of rooting. Remember that compacted soil will have a very shallow rooting depth.

**6. Visual Assessment of Existing Plants**

**a.** ***Species***

Identify the species of plant. The more specific identification is, the better. You may wish to collect leaf and/or bud samples to bring back to the office for identification of obscure plants or plants not in leaf.

**b.** ***Size***

Approximate the height and spread of the plant material using the following field method: Place a yardstick (or other object of known height) against the trunk. Step back so that the whole tree is in your sight. While holding a pencil or pen at arm's length, line up the top of the yardstick with the tip of the pencil. Using your thumbnail, mark the base of the ruler on the pencil. Sighting up the tree, determine how many 'rulers' fit into the tree. Multiply this number by the length of the yardstick for a height approximation. Use the same method to estimate the canopy spread. You may also wish to note the diameter of the trunk at breast height (4.5' above ground level).

**c.** ***Growth rate***

Quantify this year's annual shoot extension by measuring the twig length between growth tip (terminal bud) and the bud scale scar. Past years' growth is the length between bud scales. Measure several branches growing in the sun in the upper 2/3 of the canopy. Record the average growth rate. Less than 2" of growth is considered poor, 2" to 6" is moderate growth, and greater than 6" per year is vigorous growth.

**d.** ***Visual Assessment***

***In general:*** Note aesthetic quality and general health of each plant. Indicate mechanical injury to plant parts. Also note the presence of insects or disease. Keep in mind that diseases and insects often attack stressed trees and may not be the primary cause of health problems.

***Trunk assessment:*** Look for evidence of mower or string trimmer damage at the base of the trunk. Also look for excessive suckering or bark splitting. Note any trees that do not exhibit a trunk flare (indicative of recent regrading activity or that it was planted too deep).

***Roots:*** Note excessive surface rooting and girdling roots. These may signify poor drainage, too-deep planting, and/or compacted soils. Test the stability of newly planted trees by gently rocking them. If there is excessive movement, the trees may have root problems, or the roots were never able to establish after transplanting.

***Leaves and branches:*** Stressed trees often exhibit small, off-color leaves that drop early in the fall. Also note trees whose leaves show marginal leaf scorch and whose branches have tip die-back. If there is significant die-back, is it all on one side of the canopy or is it on both sides? Do all of one species on the site exhibit the same symptoms? Note the presence of witches' broom, watersprouts, or other abnormalities.