Landscapes	
All managed landscapes Pest problems reduced: ants, stinging insects, plant-feeding insects, plant diseases, rodents and other vertebrates.	A written IPM plan includes a list of actions to prevent and avoid pest problems (e.g., replacement of key, pest-prone plants, moving improperly placed plants to more favorable locations, slope modification to improve water drainage, pavement replacement and repair to reduce weed growth) and a timeline for implementation. The IPM plan specifies preventative and avoidance strategies for ongoing grounds management and for new or renovated landscape design / installation. The IPM plan divides turf and landscape areas by basic use level (i.e., athletic fields vs. lawns and general use, high visibility vs. less visible landscape areas). Monitoring frequency and thresholds are appropriate to each level and commonly encountered pests. The IPM plan subdivides turf areas by advanced level of use (i.e., athletic fields with limited use for publicly attended events vs. athletic fields for daily practice and general use). Monitoring schedules and action thresholds are appropriate to each level. Pest-prone plants in the landscape are identified and recommendation for removal and replacement with plants less susceptible to stresses related to pest problems. A comprehensive inspection of all school grounds is conducted by an in-house or contracted professionals for defects in landscape that contribute to a positive pest environment including cracks in walkways and driveways; food, moisture and shelter resources available to pests; moisture, pest or other damage to fences, retaining walls, irrigation and drainage systems, etc.; pest runways, pest fecal matter or other signs of pest activity; etc. A report of all defects is prepared and corrective actions are identified. Professional must be able to identify benefits of recommended changes along with cost impact (which shows pay back in terms of reduced pesticide use). Legible records are maintained of inspection results, including date, pests and/or pest damage found and location, estimate of pest density or damage level, recommendation, actions taken and evaluations of results. Litter is collected and properly disposed of from school grounds at least weekly. Cracks and crevices in paved areas are corrected. At least a rough landscape plant map is prepared: a) noting locations of trees, shrubs and ornamentals; b) dividing the landscape into management units; and c) Copies of the map are updated annually, noting soil fertility tests, pest problems and key plants. Soil in landscape plantings is tested at least every two to five years for nitrogen, phosphorus, potassium and pH. Drainage of soil should be

	tested in various areas especially for shrub beds to determine water movement and irrigation needs. Fertilizers and other soil amendments are applied according to soil and/or plant foliage test results, not on a routine or regularly scheduled basis. Fertilizer applications are split (e.g., one in spring and one in fall) rather than made in one single heavy application. IPM at U of Md, found that fertilizing in mid summer with a slow release product provided the most benefit for the plant. Spring applications provided too much growth (great for sucking insects) and in the fall plant did not receive full benefit – this blew my mind when I learned it! When fertilizers are applied, they are watered into the soil to reduce wind or rain-induced movement from the site. When fertilizers are needed, slow-release forms of nitrogen are used. Identifying soil compaction is part of regular monitoring. Problem areas are corrected and/or traffic redirected. Irrigation of established plants is scheduled according to need and anticipated weather, not on a routine or regularly scheduled basis. Plants of similar water needs should be grouped within irrigation zones. Signs of erosion are minimal. New erosion sites are corrected promptly. Plant debris and leaves are not permitted to accumulate on hardscape (e.g., on sidewalks, parking areas, road and driveways) to avoid pest harborage movement into sewer systems and surface water bodies. Certain ornamentals, leaves and other plant debris harbor pests and should be removed / destroyed. Irrigation, if used, is scheduled to minimize the amount of time leaves remain wet to reduce opportunities for disease development (i.e., plant foliage is dry before nightfall). Recommend soil applied water versus over head, better for plant, reduced evaporation and reduced water usage. Irrigation is allowed to drain before heavy foot or vehicular traffic is permitted in planted areas to minimize compaction. Drip irrigation is used for annual beds and/or high visibility/demand beds.
Planted areas- trees, shrubs and bedding plants Pest problems reduced: aphids, caterpillars, weevils, whitefly, plant diseases, broadleaf and grassy weeds	Landscape plants are scouted at least three times during the growing season to assess plant health and to identify conditions requiring action (e.g., damaged diseased, dead limbs; soil erosion/compaction; insect, disease, weed pests and damage). Develop a management calendar listing all plants in landscape with giant type chart identifying most effective time and type of treatment. Key plants in the landscape are scouted more frequently during critical times of year (i.e., around key pest emergence, egg laying, etc.).

	Scouting follows a regular pattern to ensure all plantings are checked. Scouting results, corrective actions and evaluations of results are noted legibly in writing and these records are maintained for at least three years. Corrective actions are identified and a timeline is established for implementation and evaluation. When renovating, adding new plants or establishing new landscape areas, plant species are selected to address site-specific growing conditions (e.g., tolerance to key pests, pH levels, soil type, light levels, hardiness zone, annual rainfall, human activity and surrounding environment etc.). Plant spacing is adequate to ensure sufficient light, nutrients and water. When renovating, changes in grade or drainage around established trees are avoided unless necessary to correct an existing problem. In temperate areas, fertilizers are not applied after mid-summer or before complete dormancy to avoid delaying dormancy. See commentary above on IPM and fertilizers Perennial beds are mulched to conserve soil moisture, improve organic matter, reduce compaction and moderate soil temperature. Root zones of trees and shrubs are mulched to at least the drip line.
General use turfgrass areas including lawns – lower visibility lawn areas, playgrounds, natural areas. Pest problems reduced: ants, stinging insects including ground-nesting wasps and bees, noxious weeds, wildlife including skunks, moles, gophers, groundhogs	Establish similar management calendar identifying windows of opportunity for scouting / controlling pests. Turfgrass areas are scouted at least 3 times during the growing season to assess plant health and look for any conditions requiring action (e.g. erosion sites, site compaction, destructive insect, disease, or mammalian pest damage, noxious weed populations). Human activity on turf areas is recorded and used in making informed decisions. *(fields that have more use will require more attention during the growing season)* Appropriate corrective actions are identified and a timeline is established for implementation and evaluation. Mowing as needed to maintain function of areas. Natural rainfall to provide these turfgrass areas with water for plant survival. Aeration (solid tine, hollow cone, and/or shatter) conducted on general use turfgrass areas at least once every two years. Aeration should be based on need – playgrounds more frequently – entrance to buildings where pedestrians tend to congregate or walk off of walk ways. Fertilizers and other soil amendments are applied according to soil test results, not on a routine or regularly scheduled basis. When fertilizers are needed, slow-release forms of nitrogen are used.
Athletic fields - practice and competition fields for baseball, football, soccer	Each turfgrass area scouted bimonthly during the growing season to assess plant health and look for any conditions requiring action. Predetermined thresholds for insects, plant diseases, and weeds

and other sports Pest problems reduced: ants, white grubs, turfgrass diseases, broadleaf and grassy weeds	established by collaboratively between Athletic Director, IPM coordinator, grounds manager, and independent IPM consultant. Any corrective response to follow threshold values. Selection of turfgrass varieties based on expected pests, site conditions, anticipated seasonal use, area of country, available resources (seed or sod or combination of both), and with an effort to introduce endophyte enhanced grasses. Turfgrass areas must be irrigated to promote active growth and recovery after games. Aeration to be used 2-6 times each year, at a depth of 3" using a combination of times (solid tine, hollow core, and shatter). Deep tine or shatter to a depth of 8" at least once each year. For core aeration a minimum of 12.5% of soil surface should be impacted with each aeration – (solid tine should not be encouraged unless it is knife type – shatter cannot be used on fields constructed with sand – will alter surface integrity), same for deep tine on sand, cannot go deeper than sand level or foreign soil be introduced into sand. Turfgrass areas should be top-dressed with compost and/or sand in combination with aeration to prepare seed bed, modify soil, and smooth a given field. (Particle analysis must be conducted especially for sand base or sand cap fields) Fertilizers and other soil amendments are applied according to soil test results. A combination of slow and quick release nitrogen fertilizers will be used. Mowing height and frequency done so that no more than 1/3 of the plant height is removed each time the grass is cut. Mowing should be done ideally at three to four inches. Mowing height can be reduced for the first spring and final fall cuts. Overseeding should be done to competition turfgrass areas from August through November based on scouting. Any repair work needs to be accomplished during March through May. Any herbicides used against persistent weeds (e.g., crabgrass, knotweed, and broadleaf weeds) needs to be done in full coordination with annual overseeding program so desirable turf seed is not damaged. (Weed hot spots should be mapped –blanket treatments should be avoided) Persistent insect pests (e.g. billbugs, chinch bugs, white grubs, sod webworms) should be scouted more frequently during critical times of the growing season (e.g., adult emergence, egg laying, larval presence).
Grounds maintenance facilities – buildings housing grounds maintenance equipment and products including fertilizer	A complete inventory of all existing lawn maintenance equipment is maintained. A list of desired equipment to reduce pest-conducive conditions (e.g., aerator, de-thatcher, spring-tooth harrow, flotation tires, etc.) is developed so that these items can be worked into the capital budget over time. Cost must be demonstrated spread over period allowed for amortization (consult with business agent or

	accountant) Fertilizer inventories are maintained and kept separate from the actual product. Fertilizers should be stored in a secure location and kept dry. The storage site should not have a heating system or hot water system in the exact area where fertilizers are stored, nor should flammable liquids stored in the same building.

Please note this is a draft document, information is supplied for end user information only, not a mandate only a reference.

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