

CHAPTER 12

PLANT MATERIALS

12-1. Introduction.

Plants and natural ground covers add diversity and seasonal change to children's outdoor play areas. Plant materials should be integrated into play areas. Plant materials enhance site aesthetics, provide shade, and support memorable play experiences. People of all ages respond to natural ground covering, flowering shrubs, deciduous trees, banked borders of flowers, herb gardens, and imaginative garden designs. This chapter describes the uses of plants and natural ground covering in children's outdoor play areas, play activities supported by plant material, and plant selection criteria.

12-2. Uses of Plant Material.

The variety of functional uses that plant material can serve should be considered when developing a conceptual design for children's outdoor play areas. Additional guidance is provided in TM 5-803-13/AFM 126-8.

a. *Barriers.* Plant material should be used to create or enhance barriers and enclosures. Turf and ground cover create natural edges to define play component areas. Plants provide more depth, interest, and spatial variety than fencing.

b. *Screens.* Plant screens of evergreen trees and shrubs can serve as visual barriers. Vine-covered fences and densely branched deciduous plants may also serve these purposes. Design requirements and the plant's natural characteristics, such as height, spread, and density, should be matched to create a low-maintenance screen.

c. *Transitions.* Transitional plantings alert children to changes in activities or use of spaces. Plants soften the transition between indoors and outdoors, allowing people to adjust more easily to changes in light levels.

d. *Landmarks.* Objects with a clear visual identity, such as trees, large shrubs, and familiar groupings of plants, function as landmarks. Landmarks provide the user with a memorable sense of place and a feeling of security.

e. *Climate Modification.* Vegetation is an effective climate modifier. Plants provide a greater variety of microclimates than manmade structures. For children's play areas, adequate shade is extremely important in hot climates. Natural shade in play areas encourages day-long summertime use. Trees and shrubs also provide shelter from the wind. Spreading, deciduous tree species provide shade in summer and shed leaves to let in winter sun.

f. *Erosion Control.* Both weather and children at play can cause significant erosion in play areas. Plants with shallow, lateral root systems bind the soil to resist erosion. Creeping species of ground cover generally have good powers of rejuvenation and are suitable for heavily used areas. Ground covers with wide leaves rather than fine leaves are more durable. Broad-leaved deciduous trees help control erosion by extending the runoff time and promoting percolation of water back into the ground. Tree roots stabilize soil on hillsides and insulate loose soil from precipitation and wind. Trees and shrubs used as windbreaks mitigate the erosion caused by wind.

g. *User Contact and Mitigation.* Opportunities for user contact with plant materials should be provided while protecting plants from permanent damage.

(1) *Barriers.* Barriers, such as low walls, should be used to protect plants from excessive damage and provide children with plant contact.

(2) *Plant Selection.* Plants best suited for survival in children's outdoor play areas should be selected.

(3) *Circulation.* Pathways that consider anticipated circulation routes should be provided to avoid unnecessary erosion and replanting.

(4) *Restrict Access.* Human access to planting areas should be restricted when necessary to reduce environmental impacts. Foot traffic may be discouraged by providing plant materials with denser branching.

h. *Play.* The use of plant materials to support play activities is described in detail in this chapter.

i. *Sensory Stimulation.* Plants and ground covers provide greater sensory stimulation than synthetic, manufactured objects. Plants respond to weather variations and seasonal cycles, and provide varied textures, colors, forms, fragrances, and sounds.

(1) *Identity.* Distinctive plantings and specimen plants should be included to provide visual identity and to create a sense of place in children's outdoor play areas.

(2) *Seasonal Change.* Plant types that display seasonal change should be selected to provide sensory stimulation and educational opportunities. The effects of seasonal change on climate modification efforts should be considered.

(3) *Movement.* Plants can enhance the experience of movement through the play area. Plants can

be used along paths to create a sequence of views, textures, smells, light, shade, and color.

(4) *Form, Texture, and Color.* Plant material with varied forms, textures, and colors should be selected to provide diversity in play areas. A variety of leaf textures should be included: evergreen with deciduous; shiny with rough; serrated with smooth; and thin with thick. In addition, plants should be selected for seasonal change: evergreen vs. deciduous; color through the seasons; early leaves; late flowers; and flowers and fruit.

12-3. Plants in Play Activities.

Plants and natural ground covers should be integrated into the design throughout the play area, but the play value of plant material itself should also be considered. Together with soil, sand, and water, plant materials provide opportunities for manipulative play that are quite different from the static, unchangeable character of fixed play equipment. Plants and ground covers provide opportunities for exploring nature; playing with leaves, seeds, and branches; social interaction; climbing; constructive play; and field play.

a. *Exploring Nature.* When designing with plant material, the natural plant communities and the animal habitat created should be considered. Natural habitat conditions should be closely replicated to compliment the regional ecosystem.

(1) *Wildlife.* Small animals are an environmental education resource for children. Native plant communities should be included as wildlife habitats in children's outdoor play areas. Plants that bear fruits, cones, and seeds should be provided. These attract birds, squirrels, butterflies, and insect populations. Habitat areas should not be overly manicured to remove materials that animals depend upon for survival.

(2) *Natural Areas.* Woods and natural areas should be left in a rough state. However, thorny material, poisonous or rash-producing plants, and dead branches and twigs at eye or neck height should be removed. Natural areas provide children with opportunities to observe nature and participate in dramatic play.

b. *Plant Parts.* Plants provide a variety of play and learning materials that are virtually free of cost, including leaves, flowers, fruit, nuts, seeds, and sticks. Plants should be selected for craft, culinary, and dramatic play potential.

c. *Social Interaction.* Natural environments create comfortable places for social activity. Trees and shrubs should be used to create a variety of gathering spaces that can be used by all ages. Spaces for large and small group gatherings should be pro-

vided in children's outdoor play areas. Mature shrubs make excellent private places and refuges for young children.

d. *Climbing.* Some trees and shrubs provide excellent support for climbing. Consider planting some trees or large shrubs that support climbing.

e. *Construction.* Children use branches to construct play materials. Trees and shrubs also provide branches that can be used for suspending play items, such as flags and banners. For these activities, species with low, spreading, horizontal branches should be selected.

f. *Field Play.* Turf should be used on sports playing surfaces, and in unstructured recreation areas, including surfaces of mounds and slopes. Small turf areas may be provided for toddlers and for infant crawl areas.

124. Selection Criteria.

Plant selection should be coordinated with the installation design guide or plant list.

a. *Design Function.* Materials should be selected that meet the intended design functions described in this chapter.

b. *Local Conditions.* Plant material that requires minimal maintenance and is suited to local conditions, such as climatic extremes and soil types, should be selected. The civil or installation engineer or local horticulturist should be contacted for guidance.

c. *Native and Introduced Species.* A mix of native and introduced plants should be selected. Native plants provide hardy background planting and are usually more resilient. Introduced species are region-hardy plants that add variety and interest.

(1) *Native Plants.* Native species are adapted to the region, have local ecological and cultural significance, and offer children learning opportunities. Native plants are hardier and less likely to incur disease or insect problems. Native plantings should be used to provide a foundation of plant material for play, exploration, and learning activities.

(2) *Introduced Species.* In children's outdoor play areas, a mix of species is often preferred. Introduced species should be used selectively to increase play area diversity, enhance sensory variety, and increase the resiliency of the plant setting.

(3) *Varied Plant Material.* Native and introduced species should be used to provide a variety of flowers, foliage, and colors, and varied forms.

d. *Drought Resistance.* Extreme weather conditions place considerable stress on plants; many plants cannot tolerate such conditions. Drought-tolerant species should be selected for children's outdoor play areas. These species conserve water.

e. Hardiness. Plants in children’s play areas must be capable of withstanding a high degree of human activity. Species that are quick-growing and heal quickly after breaking should be selected.

f. Low-maintenance. Select plant material with limited maintenance requirements.

(1) *Plant Quality.* Plants should be of a size and quality that will survive the high impact of a children’s play area.

(2) *Plant Maintenance.* Plant areas used by children will never be maintenance-free. Designers should consider that expert vegetation management should be provided in areas used by children. Pruning regimes and other maintenance procedures should respond to play requirements and child safety. Plants should be selected that will minimize maintenance requirements unless required for play.

g. Size. Larger, mature plants are able to withstand impact of human activity better than smaller, younger plants. Shrubs should be selected which are as large as economy will allow. Trees with a minimum 50 mm (2-inch) diameter trunk should be selected.

h. Access to Plants. Specific design strategies are needed to provide maximum access to plant materials and to avoid creating hazards for children with disabilities. Guidelines for providing access to plant materials are provided in this chapter.

i. Child Safety. Child safety requirements are an important selection criterion for plant materials in children’s outdoor play areas. These requirements are described in this chapter.

12-5. Accessibility.

Plant materials can create intimate, touchable elements that are accessible to children with disabilities. These materials attract all children, providing excellent opportunities for interaction, shared experiences, and integration. For this reason, every effort should be made to integrate plants into the design throughout the play area, rather than restricting plants to segregated nature areas. Guidelines for maximizing accessibility to plant materials follow.

a. Access to Plants. Opportunities for close contact with plant materials should be provided.

(1) *Accessible Height.* Plant species should be selected that provide play experience at a height of 460 to 1200 mm (18 to 48 inches). This optimizes access for children who use wheelchairs or cannot bend down. Containers or raised beds offer an excellent means for bringing plant material to this height.

(2) *Trees.* In order to allow disabled children to build an accessible tree house or to experience the feeling of being in the treetops, low-branching and weeping type trees and low-growing vegetation should be provided.

(3) *Accessible Pathways.* Accessible pathways should be provided that allow children using wheelchairs or assistive walking devices to get up close to plants for play. Natural ground covers are not accessible surfaces for people who use wheelchairs, canes, walkers, or crutches.

(4) *Raised Beds and Transfer Points.* Providing raised turf areas should be considered to allow children who use wheelchairs to transfer onto the turf. Raised beds or trellises for ground covers also provides opportunities for direct contact with plant material.

b. Shade. Shade is important for some children and adults with disabilities. A diversity of shaded, partially shaded, and nonshaded areas should be provided to meet a wide range of needs.

c. Sensory Experiences. A variety of sensory experiences should be provided using plants, such as texture, fragrance, wind effects, sound, and seasonal color. Plants with interesting smells and shapes are particularly beneficial to children with visual disabilities.

d. Hazards for Children With Limited Vision. Low-hanging branches over main pathways should be pruned under 2000 mm (80 inches) high (TM 5-803-13) (fig 12-1).

12-6. Child Safety.

Child safety factors should be considered in the selection and maintenance of plant materials.

a. Surfacing Considerations. Falls from or onto plant material and slip hazards are important considerations.

(1) *Safety Surface.* Turf and natural ground covers should not be used as safety surfaces in play equipment use zones.

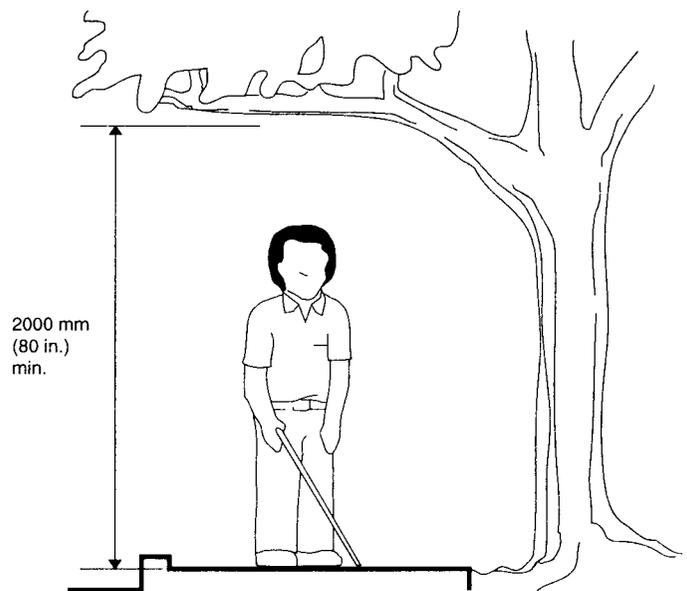


Figure 12-1. Headroom Along Pathways.

(2) *Plant Parts.* Trees and shrubs that shed plant parts should not be located where excessive shredding will create a hazard, such as over pathways, or where shedding will create a severe maintenance issue.

(3) *Branching Plant Material.* Plant material with flexible branches should be used where children may run through plant material.

b. Guying and Staking Methods. Protrusion and entrapment criteria should be applied to staking methods. Horizontal stakes or tree guards should be used. Diagonal guy wires which create trip hazards will not be used.

c. Pests. Use of plant materials that attract harmful pests should be avoided.

d. Undesirable Plant Characteristics. Harmful or undesirable plant material should be eliminated from play areas, such as plants with thorns, those that excrete sticky sap, trees that drop large limbs, and plants that require excessive pruning to discourage climbing. Short turf species are less likely to conceal sharp or foreign objects. Plants with berries or fruit should be avoided in play areas intended for children under 3 years.

e. Visual Barriers. Carefully consider visibility when designing with plant materials, and avoid creating visual barriers. Visibility should be provided from adjacent housing and from the street. Clear lines of visibility should be provided to all parts of the play area from more than one location within the play area.

f. Pesticides and Fertilizers. To the extent possible, natural methods of pest management and weed control will be employed. This process can be facilitated by selecting pest- and disease-resistant plant species. Species that require extensive fertilization should be avoided.

g. Poisonous Plants. The great majority of plants are highly beneficial and perfectly safe for chil-

dren's play areas. However, there are a number of naturally occurring poisons in the plant world. Some poisons are highly concentrated in certain plant species and can be dangerous to humans if ingested. Others may cause dermatitis or allergic reactions. For example, one or two seeds from a castor bean plant (*Ricinus communis*), if chewed and swallowed, may be deadly to young children. In some plants, poisons are concentrated in certain plant parts. Others are poisonous when raw or unripe, and edible when cooked or ripened. The seriousness of the reaction depends on the amount of plant material eaten as well as the condition and tolerances of the person affected. Young children are likely to have more pronounced responses to plant toxins than adults simply because of size.

(1) *Identify Poisonous Species.* There are over 700 known poisonous plants in North America. Designers should be familiar with poisonous local species. A local horticultural expert should be contacted for assistance in plant identification. The American Medical Association *Handbook of Poisonous and Injurious Plants* is an excellent comprehensive reference for more information.

(2) *Eliminate Poisonous Plants.* Poisonous plants will not be provided in children's outdoor play areas. Existing poisonous vegetation will be removed.

12-7. Plant List Development.

Based on criteria presented in this chapter, a list of local plants and ground cover should be developed that identifies the most appropriate regional species for each use, such as play, wildlife habitat, and shade. A list of local species that are highly poisonous or otherwise unsuitable in children's play areas should also be developed. These lists should be used to evaluate existing plantings in children's outdoor play areas, select additional species, and develop new designs.