

# LANDSCAPE DESIGN AND MAINTENANCE<sup>1</sup>

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**Abstract.** Landscape development of utility company properties enhances their appearance and reduces undesirable visual impact created by overhead electrical structures and equipment. Proper site selection, landscape design, implementation of the landscape plan and subsequent maintenance are all important components of an effective grounds development program.

The landscaping of utility properties has been and remains a necessary requirement in maintaining a good relationship with the observing public in the communities we serve. This activity has been an "in house" forestry responsibility at our company for many years. Grounds development work has been designed and implemented on approximately 900 electric substations, 350 gas regulator stations, 45 service buildings and 10 generating plants that have been added to our integrated system over the years. Most of our landscape effort has been and continues to be in the area of electric substation construction. Consequently, these remarks will be directed toward that subject.

Site selection for a substation is a necessary prerequisite to landscape development. A general location of the proposed station along with several suitable sites within the general location is suggested by the engineering department. A field evaluation of the potential sites is undertaken next to pick the preferred site. The evaluation group is composed of engineering, forestry and right of way personnel. Factors considered in the selection include accessibility of electric lines, compatibility with the planned land usage of the area, topography, presence of natural vegetation, soil conditions and cost.

When the preferred site has been selected, the right of way department acquires a 120-day option from the owner to purchase. During the option period, the site is surveyed, soil testing completed and a study of local zoning ordinances is made by the legal department. A general layout drawing of the proposed substation on the site is prepared by

the engineering department and from this information a landscape plan is developed. This plan will frequently consist of a perspective together with a landscape plan that is suitable for presentation to local governmental agencies when a rezoning, zoning variance or special use permit is required for the site. If soil conditions, legal aspects and zoning of the site are favorable, the option is exercised and the site is purchased.

Landscape design, properly done, blends the intrusion of the newly constructed facility with the surrounding landscape. It should be an attempt to make the facility "fit in" with the neighborhood (Fig. 1). Our company policy dictates that the amount of landscape development warranted at a particular site is determined by the quality of the landscaping of the adjacent area. Visual impact, which is probably the greatest aesthetic concern, can be substantially reduced by proper site selection. Silhouetting is effectively eliminated by a back drop of trees or a hillside behind the substation structure (Fig. 2). This greatly reduces the visual impact of the structure against the sky. Hilly terrain is also useful in reducing visual impact by shielding either partially or all of the station from view. In developing the site, vegetative screens can be incorporated into the landscape plan and are effective in softening hard visual lines created by buildings, fences, drives and electrical structures and equipment. Screens also have some value for noise suppression, although earthen berms are more effective.

Provision should be made in the landscape plan to accommodate the mobile substation. Usually, sometime during the life of the station, the mobile unit will be required to replace it, either because of failure or for substation enlargement. Plantings should be arranged so that the mobile substation can be brought on the site and removed without seriously damaging the landscaping.

Consideration is given to selecting small tree species and low growing shrubs in the landscape

<sup>1</sup>Presented at the annual convention of the International Society of Arboriculture in Toronto, Ontario in August 1978.

plan. This will avoid future interference with overhead exits out of the substation. Winter hardiness, disease resistance and shrubs with good natural form are all factors to be considered in plant selection.

Lawn seed should be suited to the soil type. A mixture that is predominantly creeping red fescue is favored where soils are sandy and in shady areas. A mixture that is predominantly Kentucky Blue Grass is normally used in clay and loamy soils and sunny areas.

Provision for watering lawns and plants at certain stations is determined by the amount of visual exposure and degree of landscape development. Very few of the substations on our system currently have watering facilities.

Spreading evergreens have been used as foundation plantings around substation fences in the past, but these plantings are very subject to damage from runoff of soil sterilants from the substation yards and of root growth into the sterile

area. We have pretty much discontinued this type of planting because of the experienced mortality and the ever-increasing pressure to partially screen the structures with larger trees. Implementation of the landscape plan normally takes place during the spring and fall planting seasons. If seeding is required during the hot summer months due to construction delay, the seeding is mulched to insure germination and provisions are made to water the newly planted shrubs. Topsoil should be stockpiled when grading the substation site initially and replaced on the lawn areas before seeding. Generally we avoid slopes of more than 33% to insure success of the planted ground cover.

Two types of contracts with landscape contractors are utilized. One type is a short form specific contract designed for one project. At least three bids are taken with the contractors bidding on labor and material to complete the landscaping according to specifications in the required time. The other type we use is a general contract that has a

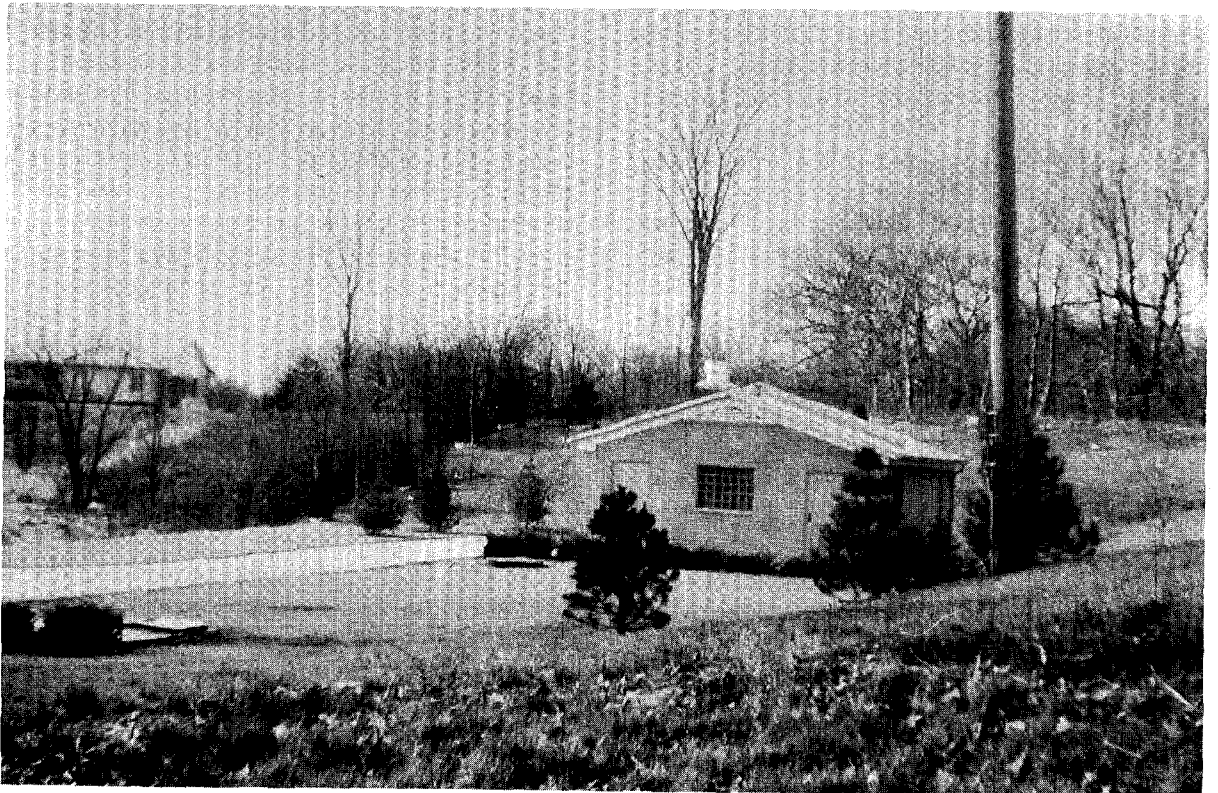


Fig. 1. The landscape design should blend the facility into the neighborhood.

term of one year. Again, at least three bids are required and the contractors are bidding on a schedule of units such as seeding cost per acre, plant material cost by size and species and other units as requested in the bid invitation.

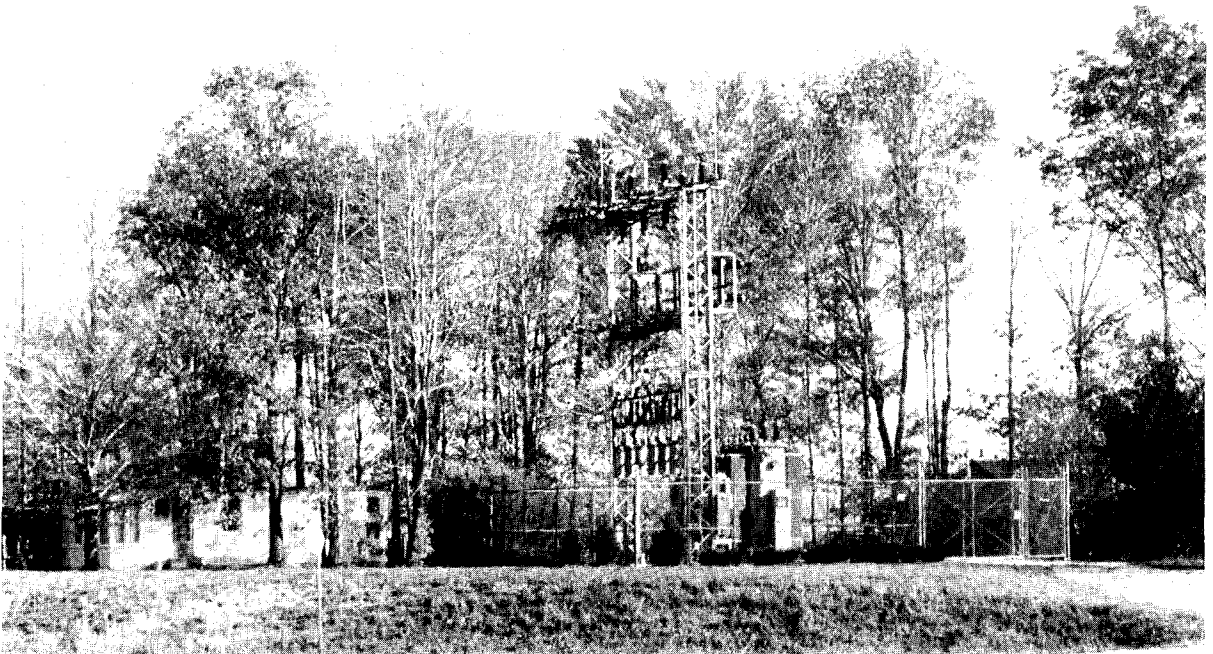
When a bid has been accepted, the price per unit remains in effect for one year. The advantage of the longer term contract is to make contract services more quickly available without having to take bids and write a separate contract for each job. Only pre-qualified bidders should be considered as competent contractors.

A current Michigan law, known as "The Michigan Soil Erosion and Sedimentation Control Act," has made it necessary to control erosion on a temporary basis as construction is progressing and to make final restoration when construction is complete. We are most affected in the construction of EHV tower lines and large EHV substations. Response time for erosion control, as required by law, can be as short as 15 days from

the time of surface disturbance until temporary erosion control measures are in place. The general contract arrangement is very useful in meeting these legal requirements.

Lawn and shrub maintenance around existing substations is provided by the substation operators or in some cases temporary summer help. Service building landscape maintenance is frequently handled by landscape contractors. This is done on an annual maintenance contract, written and controlled by buildings and grounds personnel at the facility. The forestry landscape architect acts as backup for these various maintenance units by being available for consultation either in the office or in the field. A grounds maintenance guide is also available to these maintenance personnel. The original landscape plan is retained in the forestry office and revised as necessary.

Maintenance procedures now permit the use of herbicides for control of weeds in shrub beds and



**Fig. 2. Silhouetting is eliminated by a backdrop of trees.**

the elimination of grass around poles, down guys, fences and other obstructions to mowing in the lawn areas. These materials must be used prudently and carefully to avoid unwanted damage to the landscaping. However, they do speed up lawn mowing and reduce time required for hand trimming and weed pulling. Shrubs and trees are periodically trimmed as required.

Landscape development is also provided on the system for miscellaneous projects such as sand dune stabilization at generating sites along Lake Michigan and recreational development in con-

junction with the river land properties.

#### Literature Cited

1. Michigan Water Resources Commission, Department of Natural Resources, Lansing. A Better Environment Through Soil Erosion and Sedimentation Control — Act 347 or 1972, p 9.
2. Consumers Power Company Guidelines for Environmental Quality Control of Substations and Lines, p 1-10.

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## ABSTRACTS

Jackson, J.P. 1978. **Forest fraternities.** *American Forests* 84(3): 17-19, 41-42.

Deciduous forest covers a wide range of soil types and climatic conditions. Most of the tree species, however, have their own limited ranges of tolerance. Wherever they thrive, native trees seem as choosy about their neighbors as they are about soil and climate. They tend to grow in predictable associations. These associations show their best development where they are undisturbed by human influences. Elevation differences of more than 2,000 feet allow for local variations within the already diverse tree association. Where generous precipitation combines with poor drainage, as along the floodplains of major rivers, the forest is referred to as hydrophytic. To see the opposite of floodplain forests — the xerophytic types of drier areas — you need to visit the western edge of the forest region. Of all tree associations west of the Appalachians, the most extensive is oak-hickory forest. The forest fraternities described are valuable as irreplaceable museum pieces of primeval America.

Payne, B.R. and S. Strom. 1975. **The contribution of trees to the appraised value of unimproved residential land.** *Valuation* 22(2): 36-45.

One method of determining the contribution of trees to the value of unimproved land would be to locate and appraise properties that are exactly comparable except for their forest cover. Simulation of an actual site, using a scale model, offers a means of limiting variation in property values to that caused by changing the amount or distribution of trees. We constructed a model at a scale of 1 inch to 16 feet for a 12-acre tract of open land. Trees were arranged on the model to simulate variations in the amount and distribution of forest cover. The models were photographed. Appraisals of the seven site variations were completed by 16 professional appraisers. Arrangements with trees were valued more highly than arrangements without trees.