



Master plan for landscape development of the Montana State College campus
by Richard Leland Post

A thesis submitted to the Graduate Faculty in partial fulfillment of the requirements for the degree of
MASTER OF SCIENCE in Horticulture
Montana State University
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Abstract:

A master landscape plan was developed for the Montana State College Campus= Enlarged maps were made of individual buildings, groups of buildings and some open space areas= All of the existing plants on the campus were identified, catalogued and located on the maps. The existing plants were used in their present location in most cases. However, it was necessary to replace some plants that were out of place or did not fit into the landscape design.

All new plants were selected on the basis of their form, hardiness, and period of display. Their compatibility and relationship to the kind and location of building was also considered. The map for each unit is labelled so that anyone familiar with landscape design can initiate and develop the landscaping program.

Changes in the present landscape plans were suggested, and in some cases a completely new plan of design was recommended.

In each case where major changes or new plans were made, the author has given his' reasons for such changes. In all cases an attempt was made to improve the appearance of the individual buildings and the campus as a whole.

A plan for the establishment of an arboretum was presented. The -arboretum would provide visitors, faculty and students with an area on the campus where they could observe a large display of named ornamental plants. It would also serve as an experimental area for the testing of new plants.

It was suggested that the best procedure for carrying out the landscape plans would be to complete a unit at a time, rather than partially completing several units.

A general plan was suggested for the care and maintenance of the ornamental plants and open spaces in order to maintain the aesthetic value of the campus.

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MONTANA STATE COLLEGE CAMPUS

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ABSTRACT

A master landscape plan was developed for the Montana State College Campus. Enlarged maps were made of individual buildings, groups of buildings and some open space areas. All of the existing plants on the campus were identified, catalogued and located on the maps. The existing plants were used in their present location in most cases. However, it was necessary to replace some plants that were out of place or did not fit into the landscape design.

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INTRODUCTION

The original landscape or building plan for the Montana State College Campus was prepared by Cass Gilbert, an architect in New York City. Many changes in this plan have been made in recent years as a result of the construction of new buildings and the relocation of streets and walks. Recently it was determined that a master plan of landscape development should be prepared for the campus. The objective of such a plan was to create a functional design for a campus which would be a pleasant place to live and work, and where a study of the selection and placing of plant materials would have some educational value.

In the past the campus landscaping has been done in a partial or piece-meal basis, with no renewal program. To cite an instance, many plants have outgrown their site and become unsightly. Because of this many plants have outgrown their original sites and in other areas plants have died and not been replaced, so that the lack of a plan is obvious.

It seems desirable that the campus should have a park-like atmosphere with areas for play and relaxation in addition to the improvement in the appearance of the buildings. It was the purpose of this study to develop a landscape plan for the entire campus, keeping in mind its present condition and future expansion. Special emphasis was given to the preparation of a design that considered recreational areas, aesthetic values, compatibility of plant materials, and the relation of the materials to the building sites. It was also necessary to catalogue all plants now grown on the campus and to consider the introduction of new genera and species.

LITERATURE REVIEW

In designing landscapes, the design is often a matter of personal tastes rather than a strict adherence to rules. Large area designs such as might be developed for commercial sites, community parks and college campus have not been reported in the literature to any great extent. However, many of the principles considered when landscaping homes can be used for larger areas.

Gardening and landscaping are closely related and have been for many years. Wright (16) states in his history of the garden, that landscaping has been practiced by people from the earliest historic era and perhaps even in prehistoric times. Mumford (11) considers that gardening began when people congregated and formed communities, which would be in the prehistoric period. Wright (16) also states that the garden progressed with time, and landscape design was made to fit into the culture of the era. He mentions the great cultures as Babylonian, Greek, Roman, Medieval, Baroque and the present. Thus it is apparent that many centuries of work and research have gone into the development of the garden and its counterpart, landscape design. As the garden progressed, it became more formal and reached its peak in this respect in the Baroque era. In the latter part of the Baroque era, Capability Brown, an English landscape architect was a leader in the development of the naturalistic garden or informal garden.

In the Orient the naturalistic garden was refined to a delicate art. It was started in about the year five B.C. Harada (8) states that the garden design of the Japanese started as part of their religion and the

placement of the plants in the garden had spiritual meaning. We have derived much of our current informal garden design from this early Japanese art.

One of the principles used today, according to Eckbo (4), is to landscape for living. In other words relate the landscape to living by achieving an aesthetic composition that is in harmony with the site and at a scale that is in close relationship to the people. Treat the trees and shrubs in such a manner as to create a strong spatial relationship with the building. It is also important to take into consideration the view as seen from the inside as well as from the outside of the building.

Lynch (9) points out that the physical features of the site are important in landscape design. The topography of the land, its exposure, and the traffic around the building all aid in the analysis of the site for the purpose of ranging the physical environment for best land usage.

Baumann's (2) theory on design is to give the illusion that everything grew spontaneously, and to have no part of the landscape isolated. He suggested that if walls or terraces are used, no sharp contrasts between them and the surrounding terrain should be made, and that buildings should look as if they were set into the landscape and be surrounded by vast areas of turf.

According to Shephard (14) a good knowledge of the site, architectural structures, and plant materials are an absolute necessity. Both native and cultivated materials should be used, and when used properly conform to the surroundings in which they are placed; thus, creating the unity which should be strived for. The total effect is to have a design that is contemporary, free, and with a pleasant tie between architecture and nature.

Rose (13) considers the garden as an out-door room. The sky is the ceiling, which is made interesting by the pattern of the overhead leaves and branches of trees and vines, or by architectural structures, such as canopies or solid shelters. The walls define the boundary of the room by the trunks of trees, border shrubs, or fences. These vertical lines may be solid, transparent, loose, or dense but they must have a relationship to the eye level. The floor of the garden is the turf, ground cover, or type of paving used, and best results are obtained when a combination of hard materials, such as brick, stone, concrete or other paving material are used with soft materials such as turf, soil, flowers and ground cover plants. The idea is to attain a relationship of volume rather than a landscape that lies in one plane. The total effect should be one of space sculpture rather than a house-plus-garden relationship. Plant forms add a great deal to the garden. It is not so much the number, variety or color of the plants used, as their placing and relationship to one another that makes the design a good one. Height in relation to man, form of the plant, and the spacing are the important features of a plant's role in the garden.

Grant and Grant (7) report that the importance of proper use of plants is related to their scale, texture, color, accent, and uniformity. Trees are used as accent points while shrubs and herbaceous plants carry the lines of the tree to the ground. Drifts, which are used for flower and shrub beds are designed from natural drifts such as those formed by snow and wind. A drift should be a free form with natural free flowing lines and bold flowing curves. A foundation planting should accomplish four

things: 1) make a transition between the vertical lines of the building and the horizontal lines of the ground, 2) accentuate the building, 3) decorate and 4) soften the lines of the building. For the best effect, the foundation planting should be in scale with the building.

As stated by Eckbo (5) the design of a landscape depends on four factors: 1) the form which exists in the building lot, 2) the technical problems of the building lot, 3) the functions of the building or lot, and 4) the physical properties of the materials to be used. In carrying out the design process, special attention should be given to rhythm, repetition of material, balance of the design composition, and emphasis. The latter is accomplished by the use of certain elements such as a pool, tree, vistas or other object of special interest.

Most of the principles mentioned in the review of literature were considered and used when preparing the landscape designs for the various buildings and areas on the Montana State College Campus.

MATERIALS AND METHODS

A complete ornamental plant inventory was made of the Montana State College campus. This included the identification of the plants as well as their location on the campus. The keys used for plant identification were, "Manual of Cultivated Trees and Shrubs" by Alfred Rehder (11), "Manual of Cultivated Plants" by L. H. Bailey (1), and "The Flora of Montana, Part II" by W. E. Booth and J. C. Wright (3).

Maps of each of the buildings on the campus were enlarged from a general campus map having a scale of one hundred feet to an inch, to a scale of sixteen feet to one inch. A few areas were reduced to a smaller scale because of their size. A scale of twenty five feet to one inch was used for the parade field south of Lewis and Clark Hall, the Health and Physical Education building and fifty feet to one inch for Gatton Field. Several copies of these enlarged area maps were made. Existing plants were placed in their relation to the building on one copy of the map and were used as references for the new design. The other copies were used for the new landscape designs. After a new design was completed, it was copied in India ink on tracing vellum. The existing plants to be retained, and new plants to be added, were drawn on the vellum copies in scale with building and at their relative mature size. Each plant or plants of the same species were identified by a code number corresponding to a number in the key of Plant Materials which lists both the common and the scientific names of the plant. The term "flowers" used on the plans refers to annuals and perennials which were intended to add color to the design. In certain cases, the kind of flowers has been suggested.

Three permanent copies of each plan were made by the Ozalid Process (6). One copy will be filed with the Physical Plant for reference in ordering and planting the plants. The other two copies are to be filed in the Horticulture section of the Plant and Soil Science Department for reference purposes and as spare copies, in the event that one should be lost.

Exposure of the photographic paper and dry development of the paper are the two steps involved in the Ozalid Process (6). The original tracing paper copy is placed over Ozalid paper, and after insertion in the machine, is exposed to ultraviolet light. The dyestuff chemicals of the photographic paper are decomposed by the light except where it was covered by the opaque lines on the tracing paper after which the exposed print is dry developed by an alkaline medium produced by ammonia vapors. A kodolith negative was prepared so that the pictures could be multilithed.

The plants used in the campus plan were selected according to size, shape, and season of interest. Features of interest considered include the flowers, bark, fruit, leaf texture, and general shape. Selection also included an attempt to use a large representation of plant materials for educational purposes. Hardiness was another basis for plant selection. The majority of the species now growing, and those suggested in the new plans are rated as hardy in zones I, II, III, and a few in the marginal zone IV (12, 15, 17, 18, 19), but known to be hardy in Bozeman. An exception to this has been made for plant materials used in the rather protected inner court yard of Hannon Hall, where more exotic, less hardy plants were suggested for future planting. Most of these plants are rated as being hardy in zones four through six.

Possible sources of plant materials may be found in the "Plant Buyer's Guide" by H. G. Mattoon (10).

TREES USED - EXISTING AND NEW PLANTS

Scientific Name	Common Name	Zone	Height
<i>Abies balsamea</i>	Balsam Fir	3	80'
<i>Abies concolor</i>	Concolor Fir	4	120'
<i>Abies homolepis</i>	Nikko Fir	4	90'
<i>Acer ginnala</i>	Amur Maple	2	20'
<i>Acer glabrum</i>	Rocky Mountain Maple	4	25'
<i>Acer negundo</i>	Boxelder	2	60'
<i>Acer platanoides</i>	Norway Maple	3	90'
<i>Acer platanoides</i> 'Schwedler'	Crimson King Norway Maple	2	90'
<i>Acer platanoides</i> globosum	Globe - Head Norway Maple	3	25'
<i>Acer platanoides</i> 'Olmsted'	Olmsted Columnar Norway Maple	3	30'
<i>Acer platanoides</i> variegatum	Harlequin Maple	3	90'
<i>Acer saccharum</i>	Silver Maple	3	120'
<i>Aesculus carnea</i>	Red Horse Chestnut	3	75'
<i>Aesculus hippocastanum</i>	Horse Chestnut	3	35'
<i>Betula mandshurica=platyphylla</i>	Birch	2	65'
<i>Betula papyrifera</i>	Paper Birch	2	90'
<i>Betula pendula fastigiata</i>	Columnar White Birch	2	60'
<i>Betula pendula gracilis</i>	Catleaf Weeping Birch	2	60'
<i>Carpinus caroliniana</i>	American Hornbeam	2	36'
<i>Celtis occidentalis</i>	Hackberry	2	90'
<i>Cercis canadensis</i>	Eastern Redbud	4	36'
<i>Chionanthus virginicus</i>	Fringetree	4	30'
<i>Cornus florida rubra</i>	Pink Flowering Dogwood	4	40'
<i>Crataegus coccinioides</i>	Kansas Hawthorn	5	21'
<i>Crataegus mollis</i>	Downy Hawthorn	4	30'
<i>Crataegus monogyma compacta</i>	Globe Hawthorn	4	30'
<i>Elaeagnus angustifolia</i>	Russian Olive	2	20'
<i>Fraxinus americana</i>	White Ash	3	120'
<i>Fraxinus excelsior pendula</i>	Weeping European Ash	3	40'
<i>Fraxinus nigra</i>	Black Ash	2	80'
<i>Fraxinus quadrangulata</i>	Blue Ash	3	80'
<i>Fraxinus pennsylvanica</i>	Green Ash	2	60'

