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OUTDOOR LIGHTING & ILLUMINATION MASTER POLICY PLAN

A PLANNING STUDY

University of Idaho
MOSCOW CAMPUS

DRAFT 6/6/84

UNIVERSITY OF IDAHO
CAMPUS OUTDOOR LIGHTING AND ILLUMINATION MASTER POLICY PLAN
MOSCOW, IDAHO

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TABLE OF CONTENTS

TABLE OF ILLUSTRATIONS

I. introduction and summary of recommendations

I. INTRODUCTION AND SUMMARY OF RECOMMENDATIONS

A. Purpose: The purpose of the Campus Outdoor Lighting and Illumination Master Policy Plan is multifold:

- o It seeks to offer guidance to correct a serious physical plant deficiency about which there have been years of user complaints.
- o It establishes a method to identify outdoor lighting needs, ways to set priorities, establishes design criteria and standards, and identifies schedules for implementing the improvements.
- o It provides design guidance to University personnel and its representatives on all outdoor lighting issues to ensure that decisions involving lighting will "be made in a rational, consistent and creative manner." 1/

The master plan for campus outdoor lighting and illumination is a concrete outgrowth of several of the goals and policies constituting the structure of the February 1982 Long Range Planning Guide. 2/ The outdoor lighting master plan helps to give form and functional clarity to the basic campus planning concept of the pedestrian "academic core" and the vehicular circulation "ring road" system described in the critical goals and policies contained in the Long Range Planning Guide which are central to the philosophy and recommendations contained in this Campus Outdoor Lighting and Illumination Master Plan.

In the Long Range Plan 3/, Goal XII states that the University seeks to "develop plans for expansion, upgrading and improved maintenance, and management of facilities and grounds to provide a safe and secure campus environment." The recommended implementation of capital projects described in this outdoor lighting and illumination master plan are consistent with the stated strategy of Goal XII which directs the University to "expand the campus Long Range Development Plan to define land utilization, develop new building sites, and address infrastructure requirements, such as parking, vehicular and pedestrian circulation, open spaces, campus entrances and lighting requirements."

B. Summary of Recommendations: Section VIII, RECOMMENDATIONS, beginning on Page 33, describes four important levels of decision and action which need to occur in order to successfully implement the contents of the master plan. The most critical are as follows:

1. At the POLICY LEVEL the University should:

   - o Commit sufficient resources towards providing a safe and secure well-lit circulation environment.

1/ Long Range Planning Guide for the University of Idaho, Moscow Campus, February 1982; Introduction, PPs.

2/ Ibid; among others: Circulation Goal III, Policies 1, 2 and 5 PP. 15; Parking Goal IV, Policy 3; Building Facilities Goal V, Policy 1; Open Space and Design Goal IV, Policy 1.

3/ Long Range Plan for the University of Idaho, Draft Dated 4/16/84, PP 54 thru 57.

- o Rigorously continue to upgrade its outdoor lighting and illumination system.

- o Provide adequate funds annually to ensure the completion of all projects by 1994. (See Illustration No. 6 on Page 30)

- o Commit itself to implementation of the highest priority projects during fiscal years 1984-86. (See Illustration No. 5 on Page 29)

2. At the PLANNING LEVEL the University should:

   - o Periodically update this outdoor lighting and illumination master plan so that it reflects current needs and trends.

   - o Initiate, as soon as possible, the preparation of detailed design contract documents leading to construction of the highest priority lighting projects.

   - o Initiate the preparation of a master plan and conceptual design of the campus circulation infrastructure and specifically identify those highest priority projects which need implementation simultaneously with the 1984-86 lighting projects.

   - o Coordinate the detailed design and construction of the highest priority lighting and circulation system improvements to achieve greatest combined cost savings.

   - o Initiate discussions with the Washington Water Power Company toward the eventual purchase of those portions of their existing street lighting system which overlap into the campus environs.

3. At the DESIGN LEVEL the University should:

   - o Use high pressure sodium lamps on all outdoor lighting conditions except at special use areas and features.

   - o Develop an outdoor lighting system which is standardized, simple and cost effective to implement.

   - o Provide outdoor lighting and illumination that will be of a unified type and nature for all pedestrian and vehicular circulation demands.

   - o Provide lighting to acknowledge those unique areas of the campus which serve special needs.

   - o Plan the lighting so that it will enhance those portions of the campus having unique features and traditions.

4. At the MANAGEMENT AND OPERATIONS LEVEL the University should:

   - o Direct all campus lighting questions and inquiries to one central authority who has the knowledge and sensitivity to make appropriate decisions regarding required action.

- Continue with its existing program to change over all street mercury vapor lamps to high pressure sodium wherever it is economically feasible.

- Avoid temporary solutions to any problem area as they tend to be "permanent" and can be misleading in both character and intent.

- Avoid use and installation of fixtures and poles which violate the design principles, criteria and standards set forth in the master plan and which plainly do not satisfy all requirements.

- Avoid the expediency of "plunking" a light on a building wall or in the ground just to provide light in a badly needed area. Such solutions are ugly, distract from the aesthetic qualities of the buildings and grounds, and nearly always blind the approaching pedestrian.

- Avoid direct burial of lights as they are difficult to maintain and protect from vandalism.

II. history and methodology

II. HISTORY AND METHODOLOGY

A. History: The history behind the Outdoor Lighting and Illumination Master Policy Plan begins "on September 24, 1981 when the ASUI Senate passed Senate Bill #100 sponsored by Senators Tom Naccarato and Andrea Reimann. This bill created a special ASUI ad hoc committee for the investigation of the campus lighting at the University of Idaho. This committee's purpose was to seek and solicit the personal safety of students at the University, to define any problem areas on campus, and to investigate the financial impact of various lighting proposals which meet the needs of the student body." The result was a report prepared by the Student Committee and presented to the University administration in January 1982 discussing traffic patterns and illumination issues and problems in various areas of the campus. Based upon these recommendations, five areas were identified for immediate improvement.

On July 20, 1982, the University contracted Robert Perron, Landscape Architect, and Dick Cook, Professional Electrical Engineer, to perform the necessary professional services to address the immediate outdoor lighting and illumination concerns of the University. After the initial improvements were completed in the spring of 1983, the University requested that the consultants prepare a comprehensive set of recommendations addressing campus-wide outdoor lighting needs. This master plan is a result of that charge.

Numerous people have made important contributions to this master plan. A few of these are: David C. McKinney, Financial Vice President; Kenneth A. Hall, Physical Plant; D. Nels Reese, Facility Planning; Carol Grupp, Risk Management; Bob MacPherson, Safety; Jori Adkins, Physical Plant; Corky Bush, Student Advisory Services; Joanne Reece, Facility Planning; Jane Freund, ASUI Senator; Kate Grinde, Facility Planning; and Scott Green, Past President, ASUI.

B. Methodology: The methodology has been one of plan-design-build, all at the same time. The planning process employed in preparation of the master plan has been organic in order to respond to the unique needs of the University. On the one hand, it has employed a series of structured meetings and briefings with the Student Outdoor Lighting Committee and other mixed user groups, and on the other hand, unstructured meetings, discussions and walking tours with members of the University faculty, Facility Planning and Physical Plant staff.

The planning process has covered nearly a two-year period. During this time, it has included addressing some of the University's most pressing outdoor lighting deficiencies via both temporary and permanent construction while also addressing long-range needs and concerns.1/ Since lighting on the campus at this time is poor in quality and quantity, part of the objective in the initial construction projects was to test appropriateness of light solutions as well as user response. In several instances, it was found that pressing site improvement projects had to be hastily designed and constructed before the related lighting improvements could be implemented. Examples of this occurred in both the Gault Hall and Administration Building parking lots. It is foreseen that a similar symbiotic site and lighting improvement project relationship will increasingly occur as other campus areas are addressed.

1/ See Illustration No. 8 on Page 32 for the location and extent of these improvements.

III. definitions

III. DEFINITIONS

To assist the reader's understanding of this master plan, a number of terms and words are defined:

Primary Campus

For purposes of this planning document, the campus is considered to be that geographic area circumscribed by the Moscow-Pullman Highway, Nez Perce Drive, Deakin-Sweet-Blake Avenues and Perimeter Drive. The primary campus also includes the west extension of Sixth Street to Perimeter Drive and the satellite Veterinary Science Complex west of Perimeter Drive.

Secondary Campus or City-Campus Zones

These areas lie predominantly on the periphery of the academic core where the street lighting is generally under the jurisdiction of Washington Water Power Company or the responsibility of a private property owner. They are situated in areas generally referred to as campus but are "secondary" to the major academic core.

Safety

Safety is freedom from danger, injury or damage and is discussed in three contexts: 1) Physical safety related to bodily accidents or incidents between people and moving vehicles and bicycles; 2) Collisions by pedestrians, vehicles and bicycles with stationary or inanimate objects, i.e., steps, walls, curbs, poles, trees, buildings; and 3) Provisions for emergency vehicular and personnel access.

Security

Security is that quality which assures freedom from fear of danger. It is defined as: 1) Personal security from assault by another human being; 2) Psycological feeling of well being from fear of the unknown lurking in the shadows or adjoining environment; and 3) Provisions for police and security personnel access to thwart theft, vandalism and property damage in both public and private domains.

Watt

A term used to measure the amount of electrical energy consumed.

Lumen

The lamps (light bulbs) used in various lighting equipment are rated in lumens. The lumen is frequently used as a term to express the output of a light source.

Lamp

Light source such as incandescent, flourescent, mercury, metal-halide, high pressure sodium (H.P.S.).

Foot Candle

This is a unit of illumination. It is defined as the illumination on a surface one square foot in area on which is uniformly distributed one lumen of light.

Coverage Factor

The coverage factor is the minimum number of directions from which a point or area should be lighted depending upon the use of the area. For example, a coverage factor of two is required for parking areas and for protective lighting to reduce the effect of shadows between automobiles, piles of materials and similar bulky objects.

Quality of Lighting

This term refers to the distribution of brightness and color rendition in a particular area. The term is generally used to describe how light can favorably contribute to visual performance, visual comfort, safety and aesthetics for specific tasks.

Reflector

A device used to redirect the light by the process of reflection.

Refractor (Diffuser or Lens)

A device such as a glass bank, globe, or bowl designed to redirect (scatter) in order to control the direction of the light.

Luminaire (Fixture)

A complete lighting device consisting of a light source, together with its globe, reflector, refractor and housing. The pole, post or bracket is not considered a part of the luminaire.

Visibility

This term refers to the ability to be seen or to facilitate seeing or the distinctness with which objects may be observed. There are four visual factors that must be considered in planning effective security lighting -- size, brightness, contrast and time. Size is an important consideration in that larger objects reflect a greater amount of light. The comparative brightness of objects is important in that brightly polished silver reflects a greater intensity of light to an area than tarnished silver with the same lighting source. Contrast is important in that an object placed against a strongly contrasting background will seem to reflect more light to the eye than when the object and the background are alike. Time is critical because it requires less time to see accurately under good illumination than it does with poor lighting.

Light Level

See "Footcandle".

Beam Spread

The angle that generally represents the lighting distribution to within ten percent of the maximum beam intensity.

Downlight

Type of luminaire that directs the light down rather than "spreading" the light.

Brightness

The visual contrast between the apparent "brightness" of the luminaire diffuser and the surrounding "environment".

Louver

A series of baffles used to shield the light source from unwanted light.

High Pressure Sodium Lamp

A high intensity discharge (H.I.D.) lamp in which light is produced by radiation from sodium vapor operating under a partial pressure.

Mercury Vapor Lamp

Same as H.P.S. except using mercury vapor.

Metal Halide Lamp

Same as H.P.S. except using different types of metal halides in combinations of metallic vapors such as mercury.

Ballast

A device used to generate the necessary circuit conditions for starting and operating an electric discharge lamp, i.e., H.P.S. flourescent, etc.

IV. GOALS AND POLICIES

The purpose of the Outdoor Lighting and Illumination Master Policy Plan is to provide guidance towards the eventual development of a safe and comfortable campus environment for students, faculty, staff, guests and visitors.

The outdoor lighting and illumination goals and supporting policies state the philosophy of the lighting program, and give concrete instructions on how it is to be planned, designed and implemented.

The goals and policies are structured in two sets with a connecting "bridge". The first set, I through IV, describes the purpose of the lighting, its expected level of service, its application and desired qualities and characteristics. Goal V discusses implementation and is the "bridge" to Goals VI and VII which describe specific physical projects and areas of the campus and their intended night lighting considerations.

Goal I: PROVIDE OUTDOOR LIGHTING AND ILLUMINATION OF APPROPRIATE LEVEL AND QUALITY WHICH WILL CONVEY A FEELING OF SAFETY AND SECURITY TO ALL USERS OF THE CAMPUS. This is the most important goal! Its purpose is to ensure adequate nighttime campus movement for all students, faculty, staff, visitors, guests, handicapped and elderly. It is the basic issue and purpose of the Outdoor Lighting and Illumination Master Policy Plan.

This goal is supported by three policies. The first two have to do with providing a safe and secure campus environment for the user. The third policy has to do with helping people find their way around the campus in an orderly and convenient manner.

Policy #1: Develop and maintain a SAFE well-lit pedestrian and motorized vehicular and bicycle circulation system throughout the campus.

Discussion: This policy acknowledges that there are at least three aspects to providing a safe nighttime campus environment. First, there is the issue of ensuring physical safety through adequate and appropriate illumination as it relates to physical accidents involving people, motorized vehicles and bicyclists with one another. Second, there is that type of safety pertaining to collisions by people, motorized vehicles and bicyclists with inanimate objects; and third, there is physical safety as it pertains to providing a reasonable and clear environment for purposes of adequate emergency access to ambulances and fire vehicles.

Policy #2: Develop a level of nighttime lighting on the campus to ensure the SECURITY of its users and its physical assets.

Discussion: This policy acknowledges that there are at least three types of security which need to be addressed by campus

lighting. The first of these is to ensure the personal security of the users insofar as possible from premeditated assault by another human being. The second aspect would be to ensure insofar as possible an emotional or psychological sense of well being by the user. (This relates to the fear of the unknown which people perceive as "lurking in the dark"). The third aspect would be to provide security for the physical assets of the campus against theft, vandalism and general property damage and for access by police and security personnel.

Policy #3: Develop a lighting system which will help people find their way around the campus in an orderly and convenient fashion.

Discussion: This pathfinding policy establishes the basis for "minimum measurable light levels" in the campus circulation environment. It acknowledges that good lighting as well as appropriate signing and graphics are crucial to helping people find their way about the nighttime university.

Goal II: PROVIDE A SYSTEM OF OUTDOOR LIGHTING AND ILLUMINATION WHICH WILL BE ENERGY COST-EFFECTIVE TO USE, MAINTAIN AND SERVICE. This goal is supported by five policies. They discuss, respectively, the cost importance of energy conservation, standardization of equipment, maintenance, servicing, and ongoing system evaluation related to future additions and expansions.

Policy #1: Develop outdoor lighting which will ensure the highest quality of illumination at the lowest energy cost without compromising the objectives described in the policies related to Goal I -- SAFETY AND SECURITY.

Discussion: This policy acknowledges that the existing outdoor lighting system on the campus is, for the most part, ineffective, outdated and energy consumptive. It will need to be remodeled over a period of time as funds become available. This policy also acknowledges the ongoing rapid advance of energy conservation technology relating to lighting fixtures and equipment. Insofar as possible, the type and kind of lighting employed on new construction and remodeling programs should take advantage of those advances in conservation technology.

Policy #2: All major luminaires, poles and related system equipment should be standardized.

Discussion: This policy acknowledges the importance of gradually implementing an outdoor lighting and illumination system which is made up of readily available standard components and equipment. Custom designed or specialty components should be avoided except on unique applications and in special conditions. The intent of this policy is to lower the long-term

IV. goals and policies

cost of replacing broken fixtures or discontinued equipment components. Its further intent is to simplify the purchase and inventory process. Insofar as is practical, the operating system should employ parts which are easy to replace and that are readily available on an indefinite basis from reputable suppliers and vendors. It is extremely important that the primary components of the operating system be available to the University on a long-term basis.

Policy #3: Develop an outdoor lighting system which is easy and cost effective to maintain.

Discussion: This policy is an amplification of Policy #2. It acknowledges that the first cost is typically the lowest cost for this type of capital improvement. Policy #3 defines "ease and cost effective maintenance" in terms of indefinite durability as well as the ability to repair and replace damaged or malfunctioning parts simply and effortlessly. For a discussion about the implications of this policy, see Section VI, Design Standards. Typical examples include encouraging the use of nonbreakable plastic lenses and concrete poles with an integrated exposed aggregate finish.

Policy #4: Develop an outdoor lighting system which is easy and cost effective to service.

Discussion: This policy is integrally related to preceeding Policy #3. Its specific definition and application are in reference to the ease and simplicity of replacing parts and components. Specific issues related to this are discussed in Section VI, Design Standards. Typical examples include fixture hinged door assemblies and the use of captive screws on hinged assemblies. The purpose of this policy is to ensure that the long-term servicing of the system will be as hassle-free as possible!

Policy #5: Plan and design into the outdoor lighting system an ability to respond to change with a minimum of disruption of service and disturbance of physical plant.

Discussion: This policy acknowledges the beneficial nature of foresight in all planning and design. Every implemented project should automatically allow for future expansion into other sections or areas of the campus. Provision should always be made to allow for additional circuiting, controls, etc.

Goal III: DESIGN THE OUTDOOR LIGHTING AND ILLUMINATION SYSTEM SO THAT IT IS ATTRACTIVE IN APPEARANCE, APPROPRIATE TO ITS ENVIRONS AND ADDS TO THE BEAUTY OF THE CAMPUS.

This is the goal governing aesthetics of the outdoor lighting and illumination system. From a user perception viewpoint,

the nighttime intent of this goal is to create a unity of illumination that will visually weld all areas of the campus into a single neighborhood or community. Again from the user's viewpoint, the daytime intent of this goal is to see a lighting fixture and pole furniture system which is visually unified and an integral part of the campus architecture and landscape. A common well-designed vocabulary of pole and fixture type is important to the accomplishment of this goal. Section V, Design Criteria, and Section VI, Design Standards, discuss the intent of this goal at greater length.

Goal IV: PROVIDE OUTDOOR LIGHTING AND ILLUMINATION OF A UNIFIED TYPE AND NATURE FOR ALL PEDESTRIAN CIRCULATION AREAS AND MOTORIZED VEHICULAR DOMAINS ABOUT THE CAMPUS. This goal gives specific direction to the type, quality and extent of the desired outdoor lighting and illumination. It addresses very important user-sensitive physical development issues. Four policies give content to this goal.

Policy #1: Develop an even illumination level with luminaires whose appearance offers continuity and smoothness to pedestrian and vehicular traffic flow.

Discussion: This policy acknowledges the need for an even light level in all pedestrian and vehicular areas. It recognizes that the luminaires from area to area must be of arrangement and design to provide a "minimum level of illumination" that has continuity of appearance (see Goal I). The luminaire design must provide a smooth transition between various sectors of the campus so as to project a single facility image rather than many small sites disconnected from one another (see Goal III).

Policy #2: Develop a pattern of illumination which is graduated in levels of intensity at right angles to the direction of pedestrian movement.

Discussion: This policy seeks to eliminate the problem of "blindness" which the user encounters when moving abruptly from a brightly illuminated environment into one which is dark, and vice versa.

Policy #3: Develop a level of illumination which meets the needs of the handicapped user.

Discussion: This policy recognizes the special lighting needs of the handicapped person to safely traverse stairways, ramps, landings, building exits, pedestrian-ways, curb cuts, etc.

Policy #4: Develop a lighting system that provides a smooth blending together of the perimeter campus areas with the surrounding private sector.

Discussion: This policy acknowledges that for a campus facility to fit in and become part of a larger community, it must not be an island of light when compared to the deficient lighting in surrounding neighborhood areas. The lighting system must be so designed that the transition of light levels from the inner campus areas, with their higher intensity, to the neighboring City of Moscow, under the jurisdiction of Washington Water Power, be even and gradual.

Goal V: PLAN AN OUTDOOR LIGHTING AND ILLUMINATION SYSTEM WHICH IS PRACTICAL, MEETS THE NEEDS OF THE USER, AND WHICH CAN BE IMPLEMENTED ON A PHASED BASIS AS FINANCIAL RESOURCES ARE AVAILABLE.

This goal addresses the implementation process. It is the "bridge" between Goals I through IV and Goals VI and VII to follow.

Policy #1: Develop an annual ongoing planning and decision-making process which will identify and review all campus outdoor lighting needs, examine evaluation criteria, establish priorities for development and determine costs for implementation.

Discussion: This policy acknowledges that the need for comprehensive outdoor lighting improvements on the campus are great, yet must be phased over a considerable period of time. Because of this reality, they must be implemented as funds are available because needs, user patterns and technology are subject to constant change. Implementation of all projects should be subjected to prior review and evaluation to update their estimate of needs, priority level extent and cost. Such review should be taken into account and be coordinated with other capital site improvements and building projects.

Policy #2: As part of the continual re-evaluation of the campus outdoor lighting needs discussed in Policy #1 of this goal, a process for concurrent assessment of project scheduling and implementation procedures should be developed.

Discussion: This policy recognizes that funding for a specific set of projects in any given implementation is never guaranteed. Consequently, implementation schedules and methodologies must remain in flux. Therefore, an annual re-examination of project priorities, schedules and options must be undertaken well in advance of each funding and implementation period.

Policy #3: At appropriate intervals, all implemented projects should be rigorously evaluated after completion of construction.

Discussion: The purpose of this policy is to analyze the quality, quantity and economic performance level of every installation. There is a need to continually assess and update each new phase based upon a critical evaluation of those previously implemented. Changes in technology, user needs, activity patterns and safety and security perceptions require that the system be as up-to-date as possible and provide the highest level of service to the user.

The next two goals and their policies address particular outdoor lighting concerns on a number of important physical development issues related to special projects and unique campus areas. These goals are intimately related to implementation of Goal I, in terms of specificity and intent.

Goal VI: PROVIDE APPROPRIATE OUTDOOR LIGHTING AND ILLUMINATION FOR THOSE AREAS OF THE CAMPUS WHICH SERVE SPECIAL USES AND/OR ARE LOCATED IN KEY AREAS OF THE CAMPUS.

Policy #1: Develop a type of lighting system which will provide adequate lighting to special user needs, such as game areas, special gathering points, campus entrances, outdoor classrooms, terraces, etc.

Discussion: This policy acknowledges the unique lighting requirements for pedestrian crosswalks and for different outdoor activities and activity areas. Wherever possible, the design of these lighting systems should uniquely facilitate the user needs of these areas without being obstructive and imposing on the environment.

Goal VII: PROVIDE SPECIAL OUTDOOR LIGHTING AND ILLUMINATION TO THOSE PORTIONS OF THE CAMPUS WHICH HAVE UNIQUE FEATURES AND TRADITIONS.

Policy #1: Develop a lighting system for those individual parts of the campus which in addition to meeting the needs of pedestrian and vehicular traffic, give special enhancement to the aesthetic or historic character of the area.

Discussion: This policy acknowledges that the University of Idaho is endowed with a unique cultural educational tradition manifest in a beautiful and historically significant older area centered around the Administration Building. Lighting of this area should respond to the special attributes of the buildings and landscape in this portion of the campus.

V. design criteria

V. DESIGN CRITERIA

GENERAL

Design criteria have been developed to assist the University staff, consultants and vendors in understanding the design intent and construction requirements of all exterior campus lighting projects. These criteria elaborate upon and give specific design direction to the goals and policy statements set forth in Section IV of this document. Their chief purpose is to assist the architect/engineer in providing lighting installations in keeping with the overall campus lighting master plan. This presentation of design criteria begins with a discussion of rationale for the light levels which form the basis of the illumination level standard.

A. Lighting Levels

1. Lighting or illumination levels are based upon consideration of a number of variable factors, including, but not limited to, the following:

   a. The woman user's feeling as to what constitutes a safe and secure nighttime walking environment.

   b. The handicapped user's need for an adequately lighted surface condition to ensure safe passage.

   c. The specific nature of the activity area or corridor needing illumination, i.e., walkway, bikeway, parking lot, building entrance, specialized activity space, etc.

   d. The type, extent, and seasonal variation of vegetation, such as trees, shrubs, grass, groundcover, etc.

   e. Building masses and reflective qualities of surface materials.

   f. Spill lighting contributed from adjacent areas or building interiors. This must be analyzed to determine the extent of contribution at the times of required illumination.

   g. Shielding of unwanted or distracting light, i.e., the common problem of security parking lot and street lights disturbing dormitory or house residents.

   h. Seasonal and climate variations.

   The following table contains recommendations for measurable minimum illumination levels for any point along the traveled way.

USER AREA CLASSIFICATION	LEVELS (FOOT CANDLES) 1/
o Vehicular Areas	
Roadway	0.5
Intersections/Crosswalks	2.0
High Turnover Parking	1.0
Low Turnover Parking	0.5

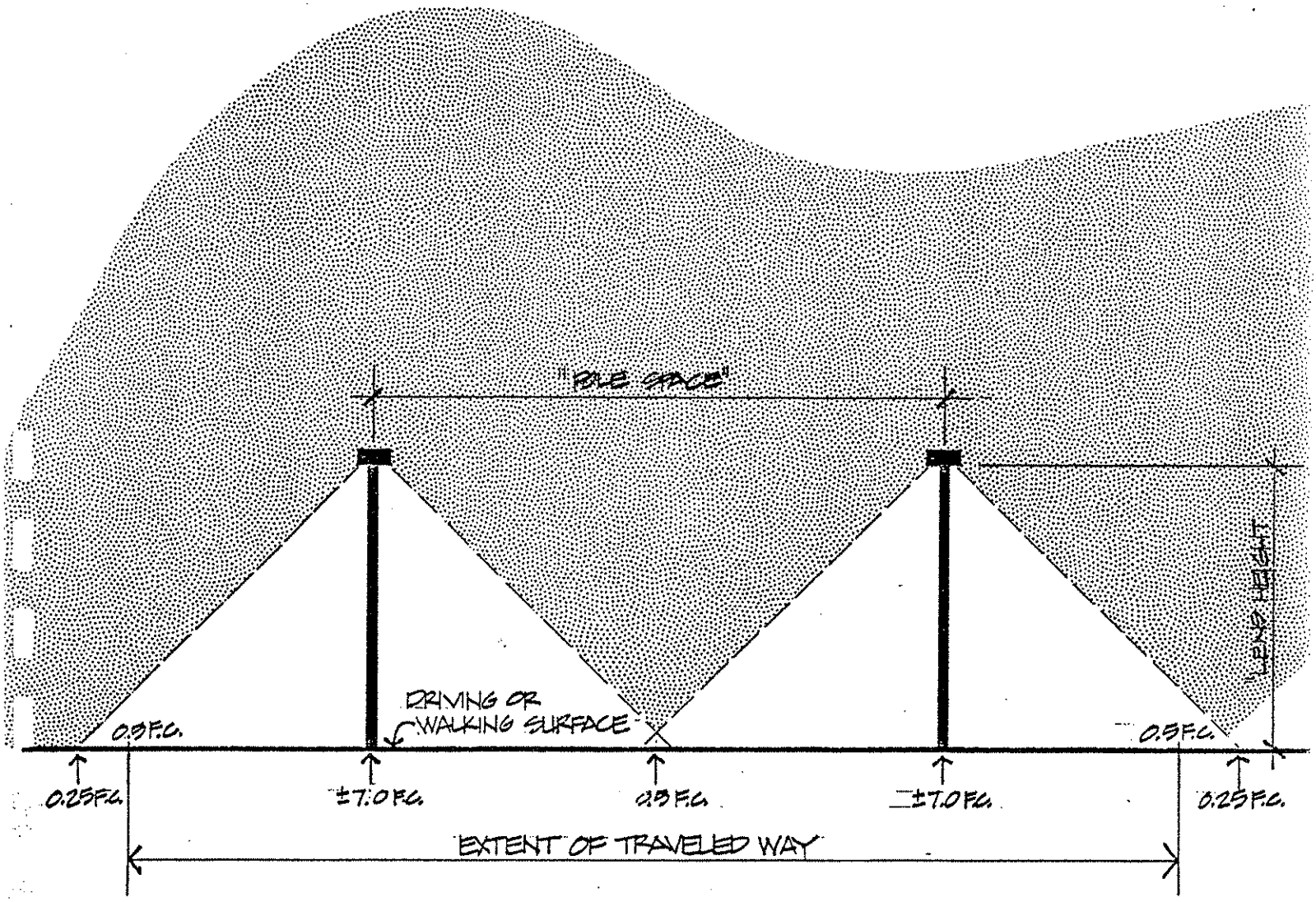
1/ Wanless & Cook, Electrical Engineers; I.E.S. Handbook 1982 Edition

o Bikeways	0.5
o Pedestrian Areas 2/	
Walkways	0.5
Stairs	2.5
Ramps	2.5

For the purpose of this master plan, five-tenths (0.5) of a foot candle is considered the absolute minimum level for a person to feel safe in the campus environment. Illustration No. 1, Page 16, illustrates the light distribution pattern on the traveled surface determined by the pole spacing pattern and size of lamp.

The "pole space", combined with the lamp size and mounting height, should always be such as to project a minimum of 0.5 of a foot candle on the walking or driving surface, keeping in mind the impact of the location and massing of adjacent vegetation, trees, buildings, structures, grade changes, etc.

2/ These values may have to be adjusted upward to meet future handicap requirements.



Pole spacing depends on illumination levels and light spread.

ILLUSTRATION NO. 1; Measurable Minimum Illumination Levels

VI. design standards

VI. DESIGN STANDARDS

GENERAL

The purpose of the design standards is to convey a detailed description of how to implement the illumination criteria previously set forth in Section V, DESIGN CRITERIA. These standards discuss the performance specifications having to do with type of fixtures, poles, mounting, lamps and placement methods, and detailing required to implement the goals and policies described in Section IV.

A. Luminaires

The style and type of luminaire selected must meet the stated goals and specific requirements of the policies as set forth in the Outdoor Lighting and Illumination Master Plan. The luminaire selection process undertaken by the architect/engineer for a particular task or project area should include reference to all the stated goals and policies. Furthermore, evaluation and selection of the appropriate type should, at a minimum, cover the following considerations:

1. Provide the best quality of illumination which will ensure the highest levels of energy conservation.

2. Provide a system of outdoor lighting and illumination which will be cost effective to maintain and service over the life of the installation.

3. Provide outdoor lighting and illumination levels which meet the needs of pedestrians and/or vehicular traffic while enhancing the character of the surrounding buildings and landscape.

4. Provide outdoor lighting and illumination levels which meet or exceed the minimum levels previously described in Section V, DESIGN CRITERIA.

The final selection of any luminaire should be determined only after careful and thorough study of the following luminaire construction specifications.

General

- Select a manufacturer with a good "track record".
- Select only outdoor luminaires that are "UL" listed and labeled "suitable for use in wet locations".
- Obtain a sample luminaire before approval is given.
- Ask the "all important question": Are spare parts readily available?

Construction

- o Ascertain whether or not the housing is weatherproof.
- o Be certain that the luminaire can withstand physical abuse.
- o Make sure that the lens are unbreakable or vandal-resistant.
- o See to it that the plastic lens is color stable.
- o See if the lens is installed in a hinged rigid frame assembly with a captive latch, and find out if it is gasketed.
- o Check to see if the color matches the established standards.
- o Determine if the internal reflector is a full one-piece unit.
- o Select the reflector photometric performance to suit the light distribution needed for the task.
- o Make sure that the luminaire arms or brackets are rigidly secured to withstand heavy physical abuse.
- o See to it that housings intended for installation in concrete walls, etc. have factory-applied protective coating.

Electrical

- o Ascertain if the ballast is rated for long life.
- o Make sure that the ballast and associated electrical components are mounted on a unitized plug-in assembly for ease of maintenance and replacement.
- o All ballasted luminaires should be fused.
- o All ballasts must be rated for at least -20° F. starting.
- o Determine if the socket(s) are rigidly secured.

Descriptions for the type of luminaire that has been established as the standard for various lighting tasks or project areas are as follows:

1. Roadways and Drives: Pole-mounted cutoff style luminaire utilizing a 150W high pressure sodium light source at a 25 foot mounting height. (Illustration No. 2, Page 21, and Illustration No. 4, Page 23, show typical examples of this condition.)

2. Parking Lots and Service Areas: Pole-mounted cutoff style luminaire utilizing a 250W high pressure sodium light source at 30 foot mounting height. Multiple luminaires on a single pole should be utilized when possible. (Illustration No. 2, Page 21, and Illustration No. 3,

Page 22 , show typical examples of this condition.) The luminaire location should be established to provide the minimum foot candle levels as recommended in the discussion on "Lighting Levels" in Section V,DESIGN CRITERIA of this Master Plan document.

3. Walkways: Pole-mounted cutoff style luminaire utilizing a 70W high pressure sodium light source at a 16 foot mounting height. (Illustration No. 2, Page 21, shows a typical condition.) The luminaire spacing should be established to provide the minimum maintained foot candle levels as recommended in the "Lighting Levels" in Section V, DESIGN CRITERIA.

4. Nontypical Areas: The luminaire selection for these areas of the campus should be in accordance with the earlier-stated Goals and Policies described in Section IV. Existing fixtures should only be reused if they are refurbished to conform to current standards of construction and energy conservation.

5. Lighting Control: The type of lighting control for a particular task or project area should be selected to meet the stated Goals and Policies described in Section V of this Master Plan. Each outdoor lighting task should be analyzed to determine the possibilities of two levels of light: 1) a "normal" use level with all lights operating, and 2) a "security" level where only a percentage of lights remain on to provide that amount of illumination required for security. The lighting control should only be by lighting contactors that are operated by a photo switch or a time clock. The security lights should be operated PHOTO SWITCH ON - PHOTO SWITCH OFF. There is a lighting control system run located in the utility tunnels of the central campus core that could be utilized where applicable.

B. Poles

The style and type of poles shall be selected to meet the stated Goals and Policies in Section V of this Master Plan. The pole selection process for a particular task or project should evaluate the physical area and user requirements to determine whether a special pole style should be introduced, or if the standard pole style is applicable. The pole style that has been established as the standard is an exposed aggregate concrete pole with a light brown finish. The pole is manufactured by Centrecon, Inc. The pole height and base style of this standard pole are as determined in the following discussion under Heading "A", Luminaire, and Heading "C", "Pole Bases."

In selecting nonstandard poles, the following items should be considered.

1. Natural finished aluminum poles should not be considered because they are not in harmony with the campus environment. Aluminum poles, if used, should have a colored permanent finish, such as anodized.

2. Steel poles should be avoided if possible. However, if they are used, they should have a primer undercoat and properly applied finish coat.

3. Wood poles should also be avoided due to maintenance problems and the instability characteristics of wood.

4. Fiberglass poles should be carefully examined before using.

5. All poles should have a handhole for ease of wiring.

6. All anchor base poles should have a factory-made base cover with a finish matching the pole.

C. Pole Bases:

The type of pole base should be selected to be compatible with the immediate landscape and also provide necessary protection from physical damage. The pole bases should have a flush-mounted cast junction box to facilitate pole wiring and future additions.

The following are descriptions of the type of pole base that have been established as the standard for task areas:

1. Roadways and Drives: Direct embedding of the concrete pole and a concrete mowing pad with flush-mounted cast junction box, as shown in Illustration No. 4 on Page 23. The mowing pad should be incorporated with the adjacent sidewalk where applicable.

2. Parking Lots and Serviceways: Concrete anchor base should be 24 inches high at a minimum and placed to coincide with parking lot striping, as shown in Illustration No. 3 on Page 22. Poles, bases and base covers should all be of same geometric shape, i.e., round pole, round base, round base cover.

3. Walkways: Flush anchor base or direct embedded pole with concrete mowing pad, flush-mounted cast junction box incorporated into walkways where applicable. (Illustration No. 4 on Page 23, shows a typical condition.)

   Note: All concrete should have a minimum rating of 3,000 psi. and be finished, i.e., sandblasted, sand, exposed aggregate. Sharp edges should be eased.

4. Conduiting: Extend (stub out) conduit at every pole to ensure expansion for future needs.

4. Fiberglass poles should be carefully examined before using.

5. All poles should have a handhole for ease of wiring.

6. All anchor base poles should have a factory-made base cover with a finish matching the pole.

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ILLUSTRATION NO. 2; Typical Pole Height and Location Conditions

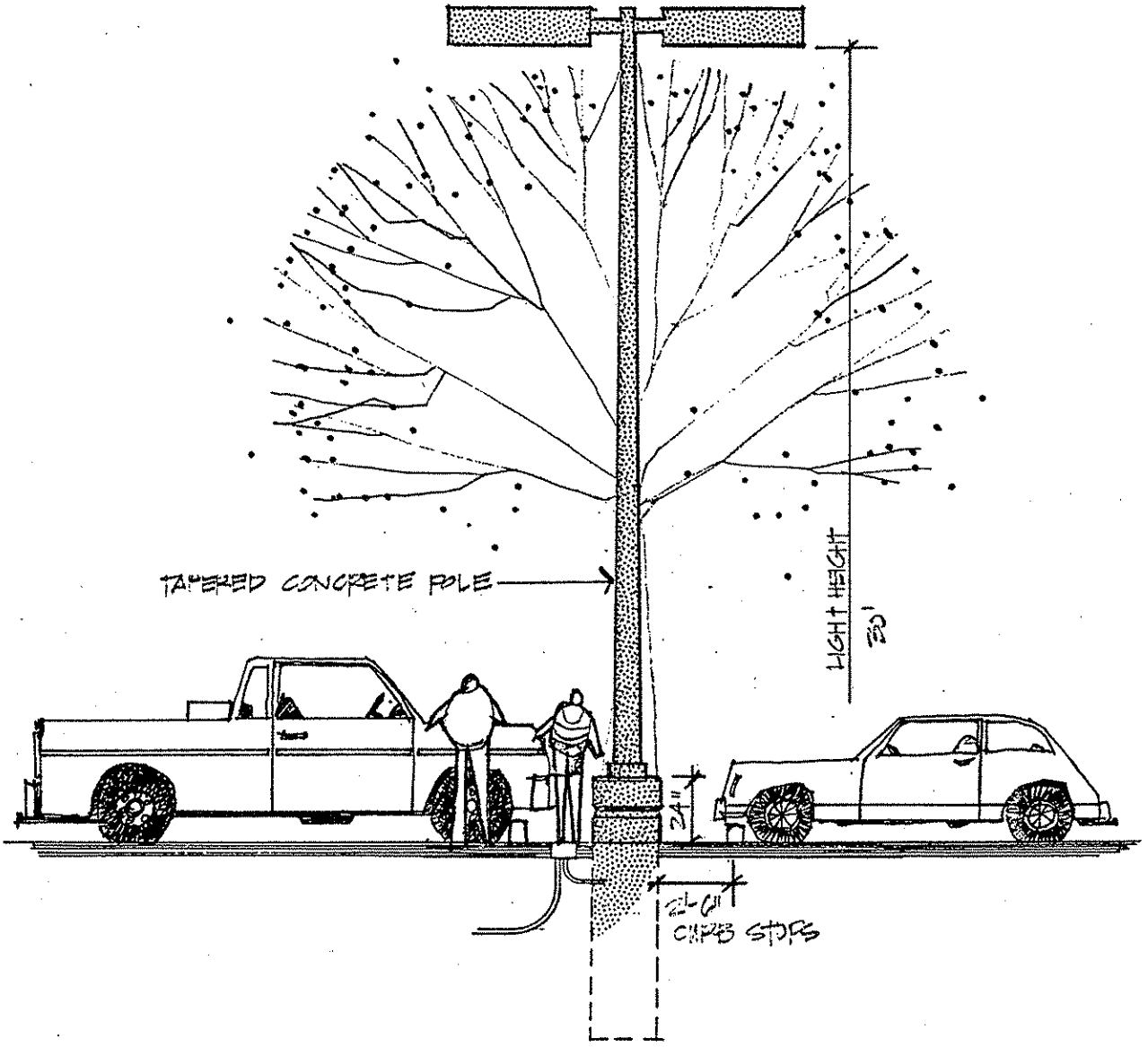


ILLUSTRATION NO. 3; Typical Parking Lot Pole Mounting Detail

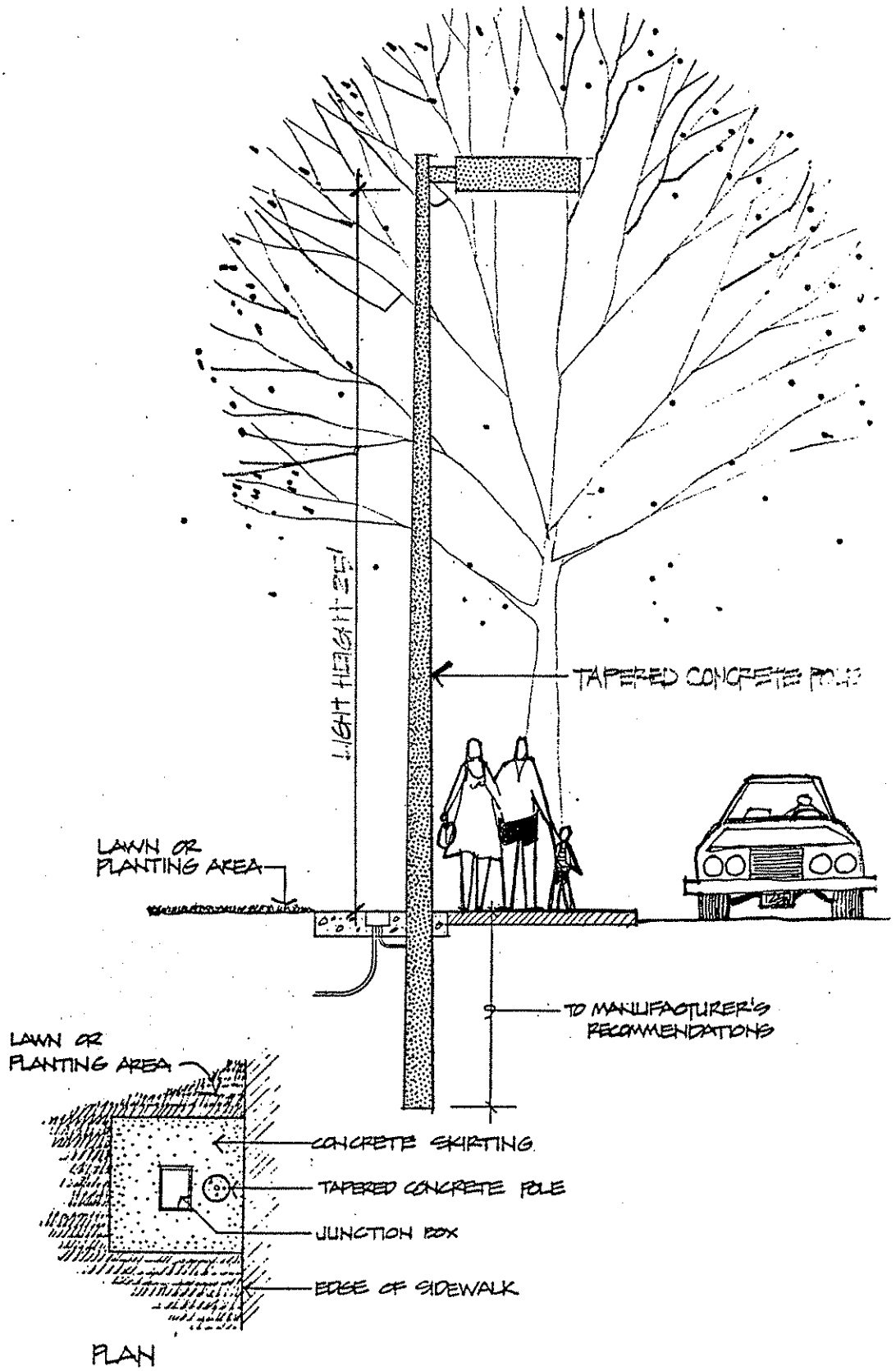


ILLUSTRATION NO 4; Typical Street Light Pole Mounting Detail

VII. implementation

VII. IMPLEMENTATION

This section describes the implementation program for components of the Outdoor Lighting and Illumination Master Policy Plan. The implementation schedule is for a ten year period beginning fiscal year 1984. A ten year implementation period was chosen because it seemed like a reasonable amount of time to complete an array of projects of this magnitude considering the various competing demands on fiscal resources within the University system.

Analysis of the short and long-range lighting needs took into account the needs of the entire campus area. This, in turn, is subdivided into definable "projects" each having specific physical limits. An example is the Administration Building lawn area which is one of thirty-nine (39) project areas. At the time of implementation, some of these project areas may be further subdivided, depending upon the availability of funds.

Once the project identification was completed, evaluation criteria were used to determine when each of the identified projects should be constructed. Seven (7) broadly stated issues formed the basis of the evaluation criteria:

- o Level or intensity of use of the outdoor area by pedestrian activity.
- o Acknowledgement that from a philosophical standpoint, lighting of major/primary off-street pedestrian corridors takes precedence over vehicular travel routes.
- o An area being identified as a trouble or hot spot, i.e., frequency of user complaints.
- o An area receiving high public use, especially by persons unfamiliar with the campus.
- o Whether or not the lighting improvements can be integrated with other funded projects.
- o Whether or not the area represents an inexpensive and easily implemented project.
- o The degree of inadequacy of the existing illumination system.

All project areas were examined for level of criticality against these criteria. They were then grouped into one of the implementation periods according to degree of perceived priority.

- o PROJECTS FOR FY 1984 THRU 1986 (1 to 3 years).
  Into this time period were grouped those projects perceived as having the highest priority for implementation -- those which include temporary conversion of lamps to high pressure sodium (HPS) and those direly-needed temporary "fix-up" projects and "special" projects.

- PROJECTS FOR FY 1987 THRU 1989 (4 to 6 years).
  Into this time period were grouped those projects perceived as having somewhat lesser urgency for implementation. These are identified as the mid-term projects.

- PROJECTS FOR FY 1990 TO 1994 (7 to 10 years).
  Into this time period were grouped all other projects. These are identified as the long-term projects, meaning that their level of implementation urgency is lower than others.

IDENTIFIED PROJECTS, AREAS AND COSTS:

PROJECTS FOR FY 1984-86 (1 to 3 Years)

Highest Priority Project Area

Location & Name	Area Description 1/	Estimate
Area A-1, Admin. Lawn	Lawn area including area of the Life Science Complex, Campus Drive, Blake Ave. to Nez Perce Dr., parking lot between Home Economics Bldg. & Music Annex, walkway from Admin. Bldg. & Nez Perce Dr., parking lot next to Ethel Steel.	$207,300
	The detail description of its components is as follows:	
	A1.1 Admin. Lawn Area	85,000
	A1.2 Campus Drive	48,000
	A1.3 Campus Drive Pedestrian Way	14,600
	A1.4 Pathway from Admin. to Nez Perce	10,600
	A1.5 Blake St.-Nez Perce to University	11,000
	A1.6 Parking Lot - Ethel Steel	4,000
	A1.7 Life Science Complex	29,900
	A1.8 Parking Lot - Music Annex	4,200
	Total:	$207,300

Other High Priority Projects for FY 1984-86

Location & Name	Area Description 2/	Estimate
Area A-2, West End Kibbie	Pedestrian	$ 45,400
Area A-3, Law School	Parking lots on north & west side of Law Building	84,000
Area A-4, Law School	East side of Law Bldg., including Rayburn from Sixth to Idaho & Lot #23 south of the Agriculture Science Building	7,000
Area A-5, Wallace-Gault	Walkway between Wallace & Gault Residence Halls	25,200

1/ See Illustration #5, Page 29, & Illustration No. 6, Page 30.
2/ See Illustration #6, Page 30, & Illustration No. 7, Page 31.

Area A-6, Idaho Ave.	Idaho Ave. Line St. to Rayburn across mall	25,700
Area A-7, Alumni Center	Area around center including Steel House & parking lot south of center	12,600
Area A-8, Deakin St.	North SUB parking lot & Sixth/Deakin intersection (dependent on intersection work, scheduled summer 1985)	7,500
Area A-9, Wallace Extension	Pathway from Idaho Ave. to Wallace Residence Hall (through Lot 17)	17,500
	Total FY 1984-85 Projects:	$432,200

Temporary "Fix-Up" Projects - FY 1984 (See Illus. #6, Page 30)

Area X-1	Park Village Area Lighting	
Area X-2	Heating Plant Parking Lot	
Area X-3	Vet. Science (Bldg. Only)	
Area X-4	VIP Parking at Dome	
Area X-5	Entry to West Dome Parking	
	Lump Sum Allocation Total:	$ 10,000

Temporary Conversion of Existing Luminairs to High Pressure Sodium (HPS) Projects -FY 1984 (See Illus. #8, Page 32)

Sixth St. from Deakin to Line & from Greenhouse Rd. to Perimeter Drive; Greenhouse Rd. and Paradise Creek St.; Line St. from Sixth to State Highway 8; Third St. from Line St. to the railroad tracks		
	Lump Sum Allocation Total:	$ 10,000

Special Projects - Funded Out of User Fees - Summer 1985 (See Illus: #6, Page 30)

Area S-1	Golf Course Parking Lot & Area	$ 20,000
	Total Projects Funded Out of User Fees:	$ 20,000

MID-TERM PROJECTS - FY 1987 THRU 1989 (4 to 6 Years)

Location & Name	Area Description 1/	Estimate
Area B-1, Vet. Science	From intersection of Perimeter Drive to Sixth St. to Vet. Research Lab	$ 25,300
Area B-2, West End Kibbie	Parking Lot #31	57,400
Area B-3, Rayburn Street	From intersection of Nez Perce Drive & Perimeter Drive to intersection with Idaho Ave.	17,600

1/ See Illustration No. 6, Page 30, and Illustration No. 7, Page 31.

Area B-4, East End Kibbie	Kibbie Dome to Idaho St.	10,000
Area B-5, Idaho Ave.	Deakin to Line	22,300
Area B-6, Line St.	From University Ave. to Sixth St.	11,600
Area B-7, PEB	Driveway & parking lot	11,900
Area B-8, Nez Perce Drive	From Blake Ave. to golf course	22,000
Area B-9, Seventh St.	From mall to SUB incl. area next to Gamma Phi Beta, area around Janssen Eng. Bldg., area around residences #630 & #631, mall between Navy Bldg. & Faculty Office Complex	49,800
Area B-10, University Ave.	From Deakin Ave. to Ash St.	8,800
Area B-11, University Mall	From Pine St. to Rayburn	22,000
Area B-12, Blake Ave.	From Taylor Ave. to Nez Perce Dr.	7,700
Area B-13, Education/Art Bldgs.	Walkways	12,600
Area B-14, Perimeter Road	From intersection of Rayburn St. & Nez Perce Dr. to State Highway #8	36,300
	Total FY 1986-89 Projects:	$315,300

LONG-TERM PROJECTS - FY 1990 to 1994 (6 to 10 Years)

Location & Name	Area Description 1/	Estimate
Area C-1, Sixth St. Agricultural/Eng.	From intersection of Perimeter Dr. to intersection with Greenhouse St.	12,100
Area C-2, Paradise Creek St.	Street from Line St. to Sixth St. & McConnel Hall parking lot	32,000
Area C-3, North Campus Mall	From Sixth St. to Idaho St.	110,000
Area C-4, Sixth St.	From Deakin to Line St.	12,000
Area C-5, Sixth St.	From Line to Greenhouse Rd.	14,000
Area C-6, Line St.	From Sixth St. to Idaho State Highway #8	14,300
Area C-7, South Campus Mall	From Idaho St. south	49,000
Area C-8, Sweet Ave.	Area around Music Bldg. incl. parking lot & Sweet Ave. East SUB to parking lot	40,600

1/ See Illustration No. 6, Page 30, and Illustration No. 7, Page 31.

Area C-9, Deakin St.	East SUB to parking lot	7,500
Area C-10, Deakin St.	Sweet Ave. to north line of SUB incl. area along College Way	17,000
Area C-11, Greenhouse Rd.	Future extension from Paradise Creek Ave. to State Highway #8	6,300
Area C-12, Sixth St./ Paradise Crk. St. Connection	Future extension of Sixth & Deakin to intersection of Line St. & Paradise Crk. St.	17,600
Area C-13, Elm St.	Sixth St. to University Ave.	11,000
	Total FY 1990 to 1994 Projects:	$343,400

TOTAL ESTIMATED COST, IN 1984 DOLLARS, FOR ALL LIGHTING IMPROVEMENT PROJECTS IS 1.12 MILLION DOLLARS.

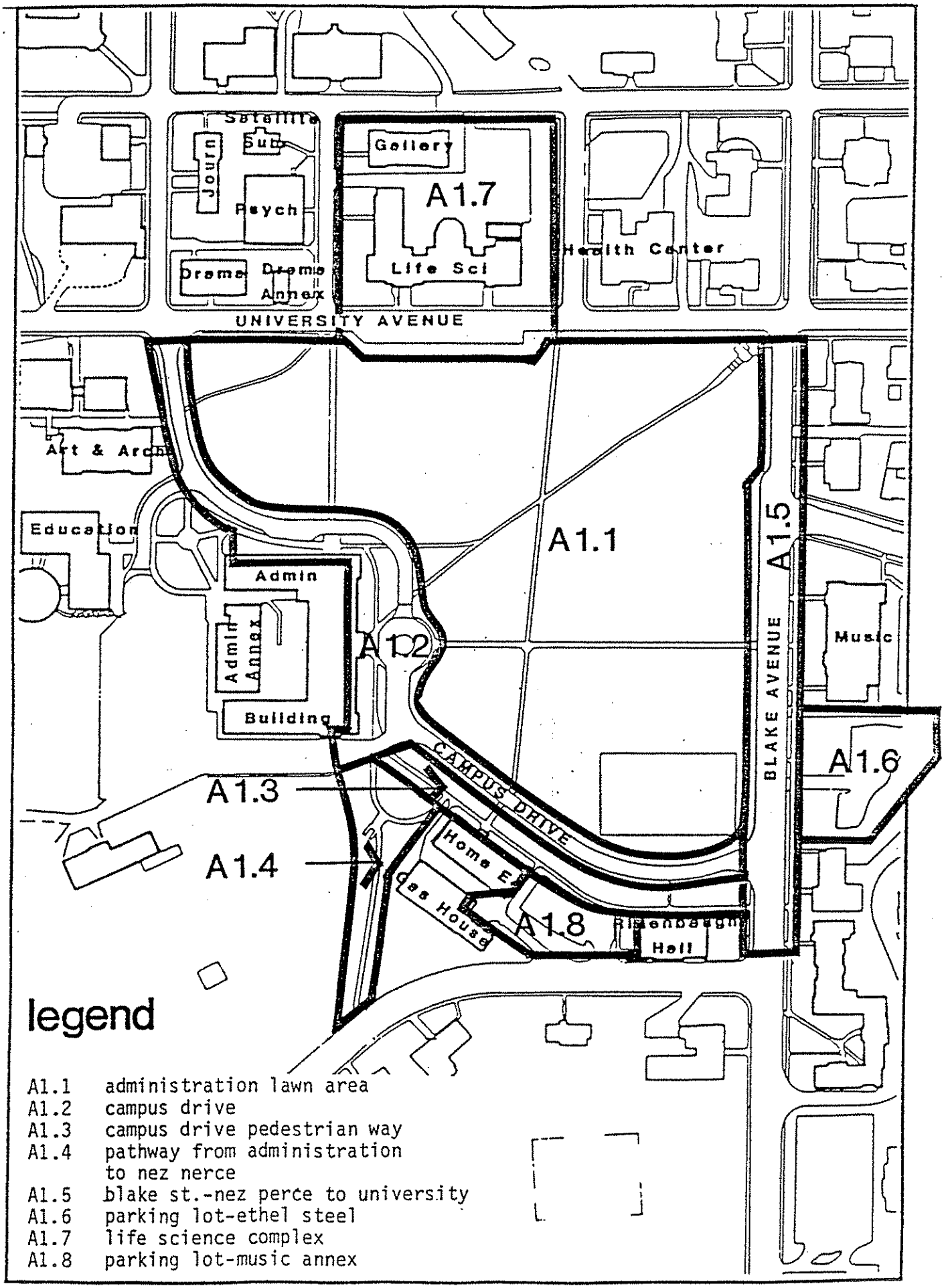
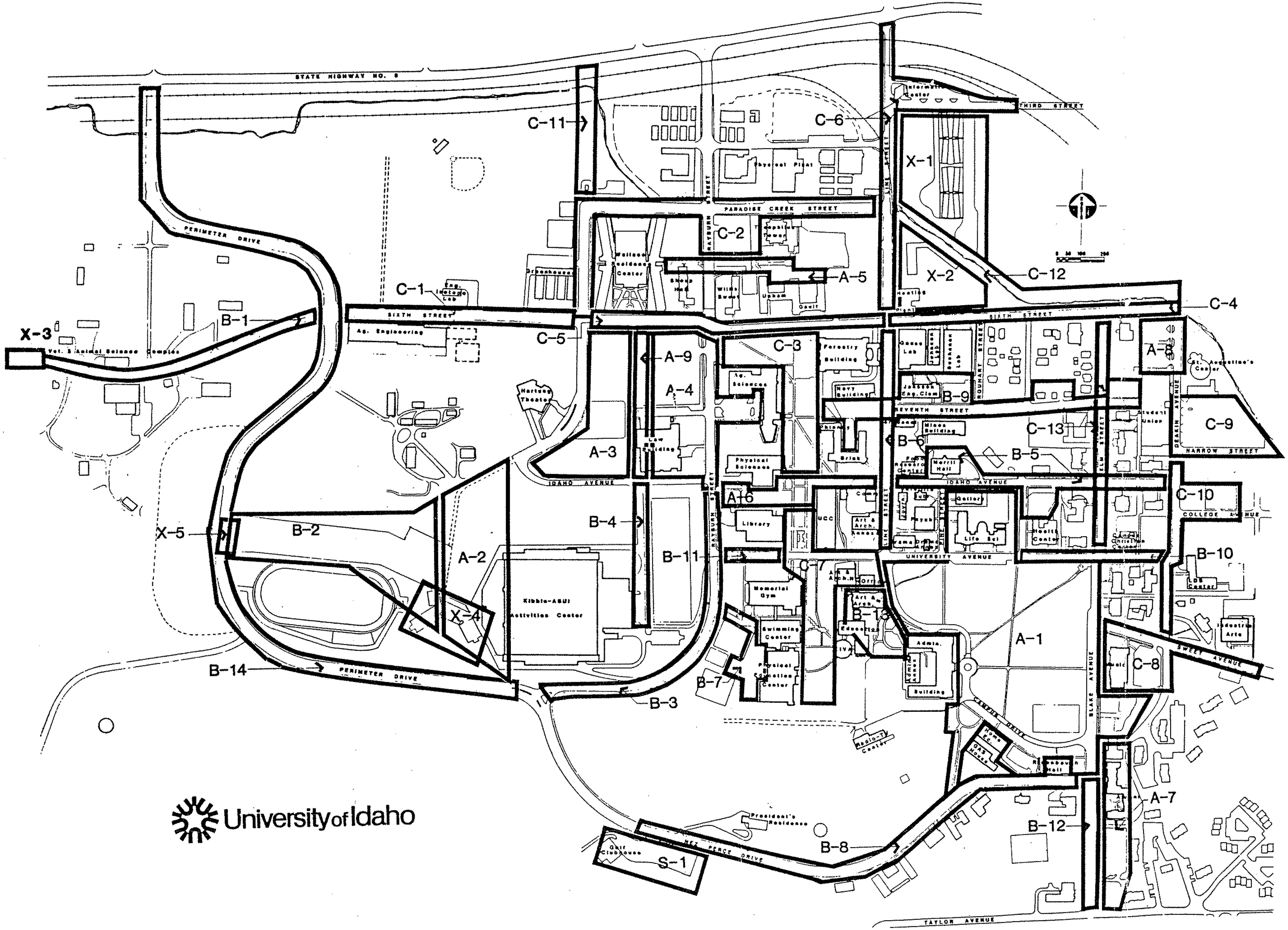


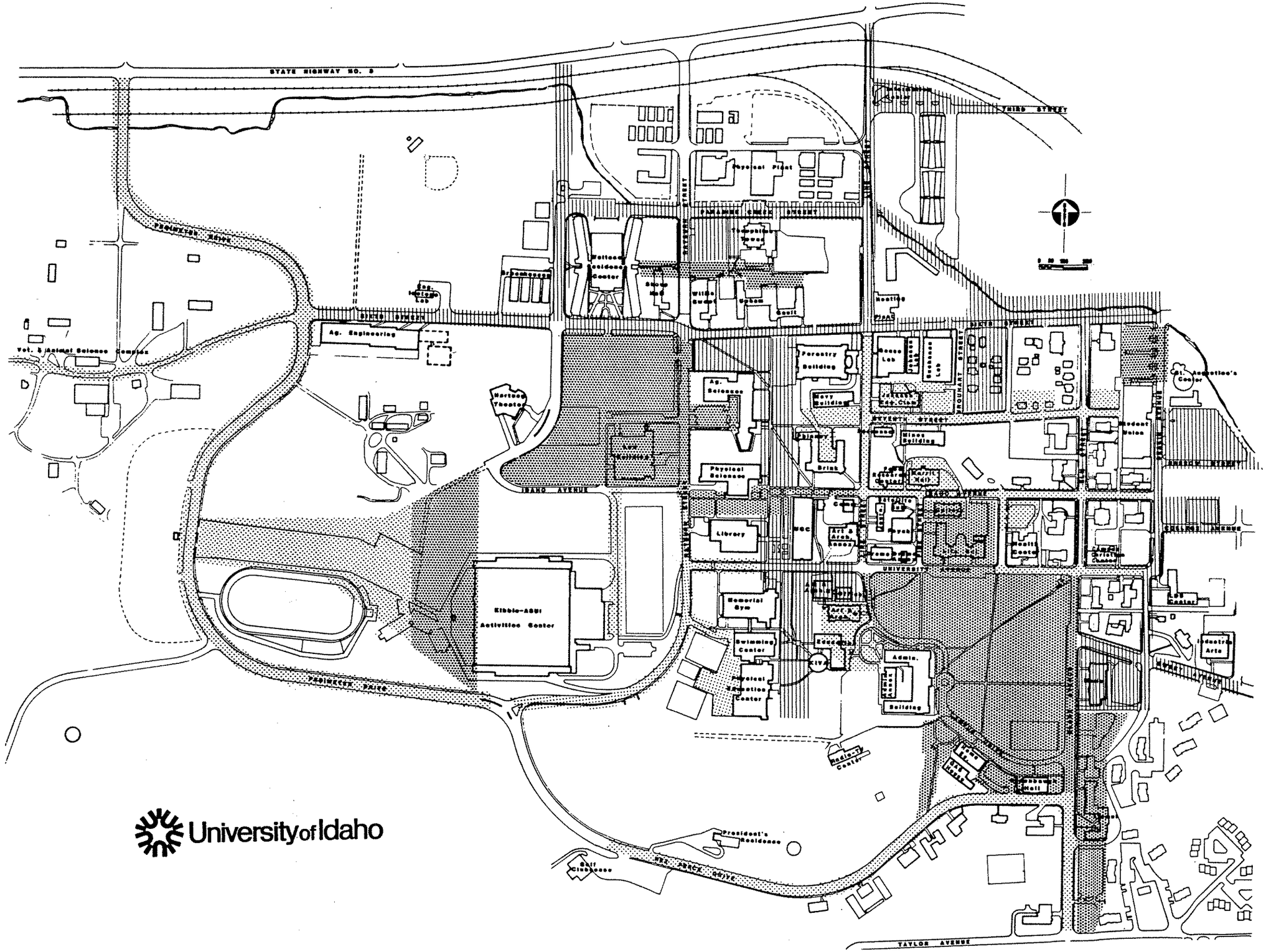
ILLUSTRATION NO 5; Highest Priority Projects for FY 1984-86



Legend

A-1	administration lawn
A-2	west end kibbie-ped.
A-3	law school-north/west
A-4	law school-east
A-5	wallace-gault walkway
A-6	idaho ave-line to rayburn
A-7	alumni center area
A-8	deakin street-north
A-9	wallace extension
X-1	park village
X-2	heating plant lot
X-3	vet. science bldg.
X-4	vip parking at dome
X-5	entry to west dome parking
S-1	golf course
B-1	vet. science drive
B-2	west end kibbie-parking
B-3	rayburn street
B-4	east end kibbie-ped.
B-5	idaho ave.-deakin to line
B-6	line st.-university to 6th
B-7	ped parking
B-8	nez perce drive
B-9	seventh st.
B-10	university ave.
B-11	university mall
B-12	blake ave-taylor to nez perce
B-13	educ./art buildings
B-14	perimeter road
C-1	6th st-perimeter to greenhse
C-2	paradise creek street
C-3	north campus mall
C-4	6th st-deakin to line
C-5	6th st-line to greenhouse
C-6	line st-6th to hwy #8
C-7	south campus mall
C-8	sweet avenue
C-9	deakin st-east side
C-10	deakin st-sub to sweet
C-11	greenhouse rd
C-12	6th st/paradise creek street connection
C-13	elm street

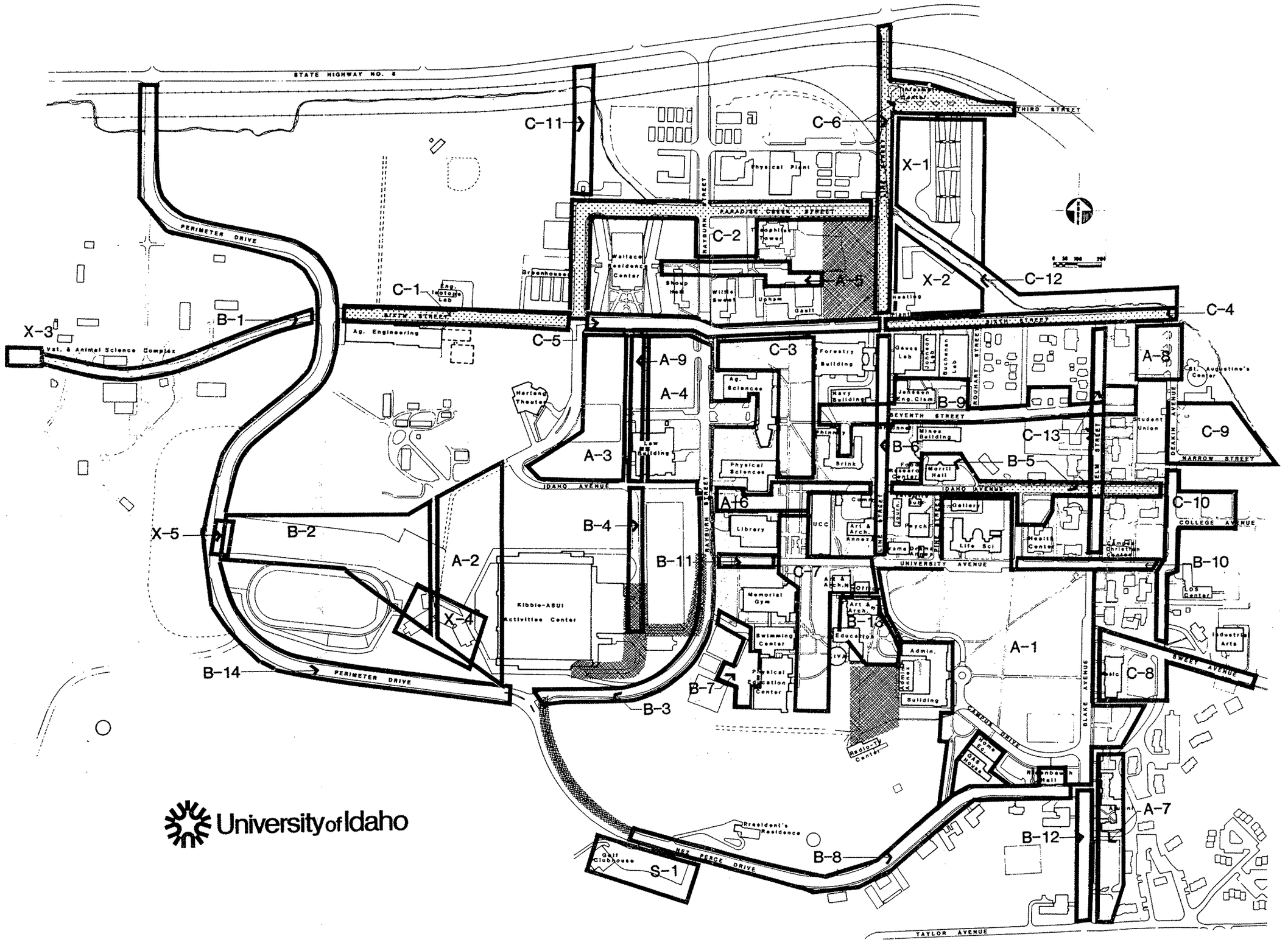
ILLUSTRATION No. 6
Ten Year Capital
Improvement Program



Legend

- high priority projects
  FY 84-86 "A" Areas
- mid-term projects
  FY 87-89 "B" Areas
- long term projects
  FY 90-94 "C" Areas

ILLUSTRATION No.7
Project Priority Areas



University of Idaho

Legend

temporary improvements

permanent improvements

ILLUSTRATION No. 8
Constructed Fiscal Year 1983-84 Improvements

VIII. recommendations

VIII. RECOMMENDATIONS

Successful and efficient implementation of this master plan requires timely and closely coordinated decision making by University personnel at four (4) important levels:

A. At the POLICY LEVEL the University should:

1. Commit sufficient resources towards providing a safe and secure well-lit pedestrian, vehicular and bicycle circulation environment.

2. Rigorously continue to modify and upgrade the existing inadequate outdoor lighting and illumination system that was begun during fiscal year 1983. (See Illustration No. 8, Page 32)

3. Plan on budgeting 1.12 million dollars in 1984 for campus outdoor lighting improvements between fiscal years 1984 thru 1994.

4. Budget 207 thousand dollars to begin immediate implementation of those highest priority projects identified in the 1984-1986 period. (See Illustration No. 5, Page 29)

B. At the PLANNING LEVEL the University should:

1. Periodically update the master plan for outdoor lighting and illumination so that it reflects current user needs and concerns and technological trends.

2. Initiate, as soon as possible, the preparation of detail design and contract documents and the construction of the highest priority projects.

3. Concurrently, initiate the preparation of a master plan and conceptual design of the campus circulation infrastructure and specifically identify those highest priority projects which need implementation simultaneously with the 1984-86 lighting projects.

4. Coordinate the detail design and construction of both the highest priority lighting and circulation system improvements to achieve the greatest combined cost savings.

5. Implement a system of outdoor lighting and illumination which will be energy cost effective as well as efficient and economical to maintain and service.

6. Initiate discussions with the Washington Water Power Company towards the eventual purchase of those portions of their existing street lighting system which overlap into the campus environs.

C. At the DESIGN LEVEL the University should:

1. Use high pressure sodium lamps on all outdoor lighting conditions except at special use areas and features.

2. Develop an outdoor lighting system which is standardized, simple and cost effective to implement.

3. Purposely design the outdoor lighting and illumination system so that it is of a unified type of quality for all pedestrian and vehicular circulation demands.

4. Purposely design the lighting so that it acknowledges those unique areas of the campus which serve special needs.

5. Purposely design the lighting so that it enhances those portions of the campus having unique historical features and cultural, educational and ceremonial traditions.

D. At the MANAGEMENT AND OPERATIONS LEVEL the University should:

1. Refer all campus lighting questions and inquiries to one central authority who has the knowledge and sensitivity to make appropriate decisions regarding required action. An alternative approach is to direct questions and inquiries to the campus lighting consultant for an appropriate response.

2. Avoid temporary solutions to any problem area as they tend to be "permanent" and are misleading in both character, design intent and quality.

3. Avoid use and installation of fixtures and poles which violate the design principles, criteria and standards set forth in this document and especially those which plainly do not satisfy all requirements.

4. Avoid the expediency of "plunking" a light on a building wall or into the ground just to provide light in a badly needed area. Such solutions are always ugly, distract from the aesthetics of the buildings and grounds, result in crude and clumsy detailing, and nearly always blind the approaching pedestrian.

5. Avoid direct burial because it is difficult to maintain and nearly impossible to protect from vandalism.

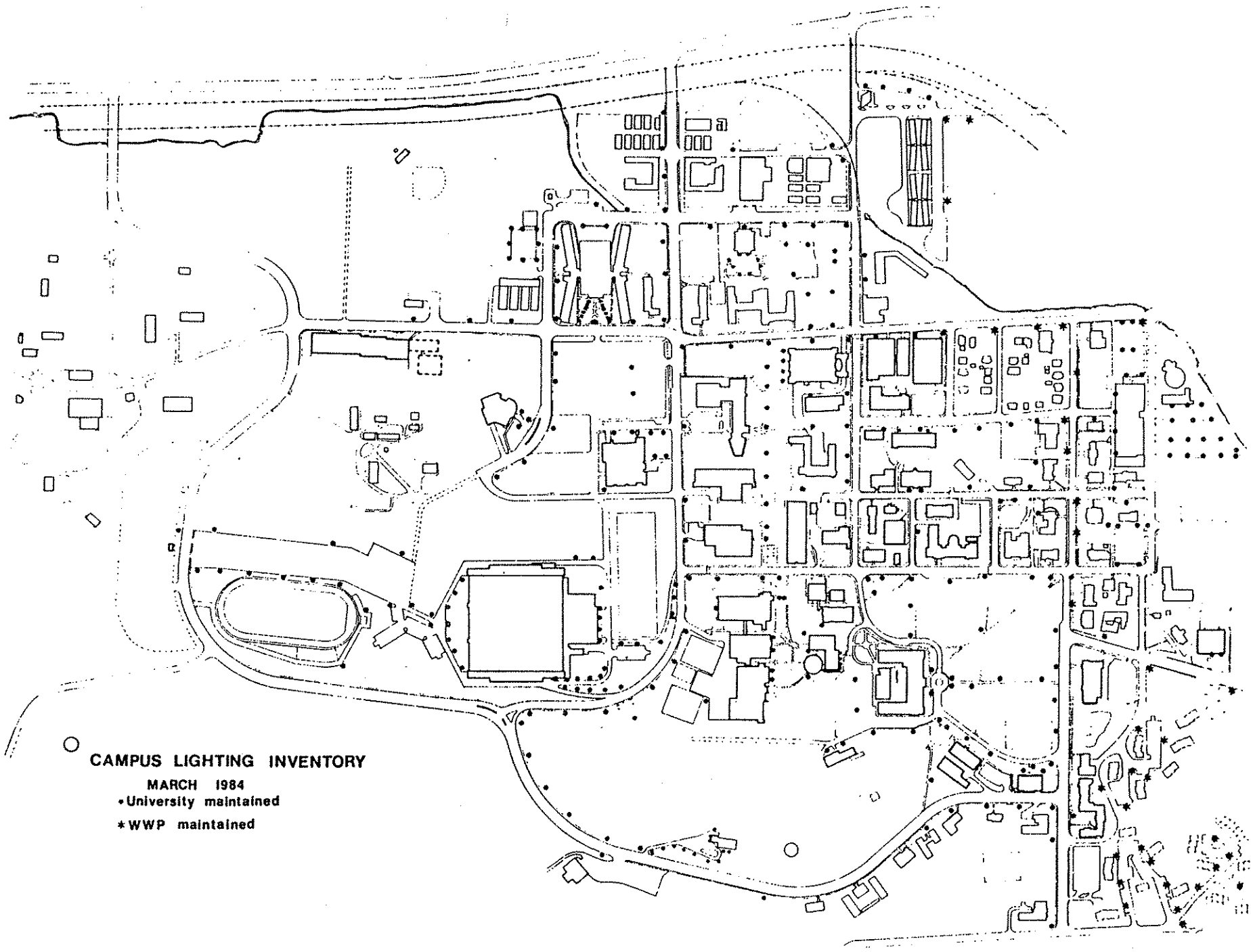
6. Continue with its existing program of changing over all mercury vapor street lamps to high pressure sodium wherever it is economically feasible.

IX. appendix

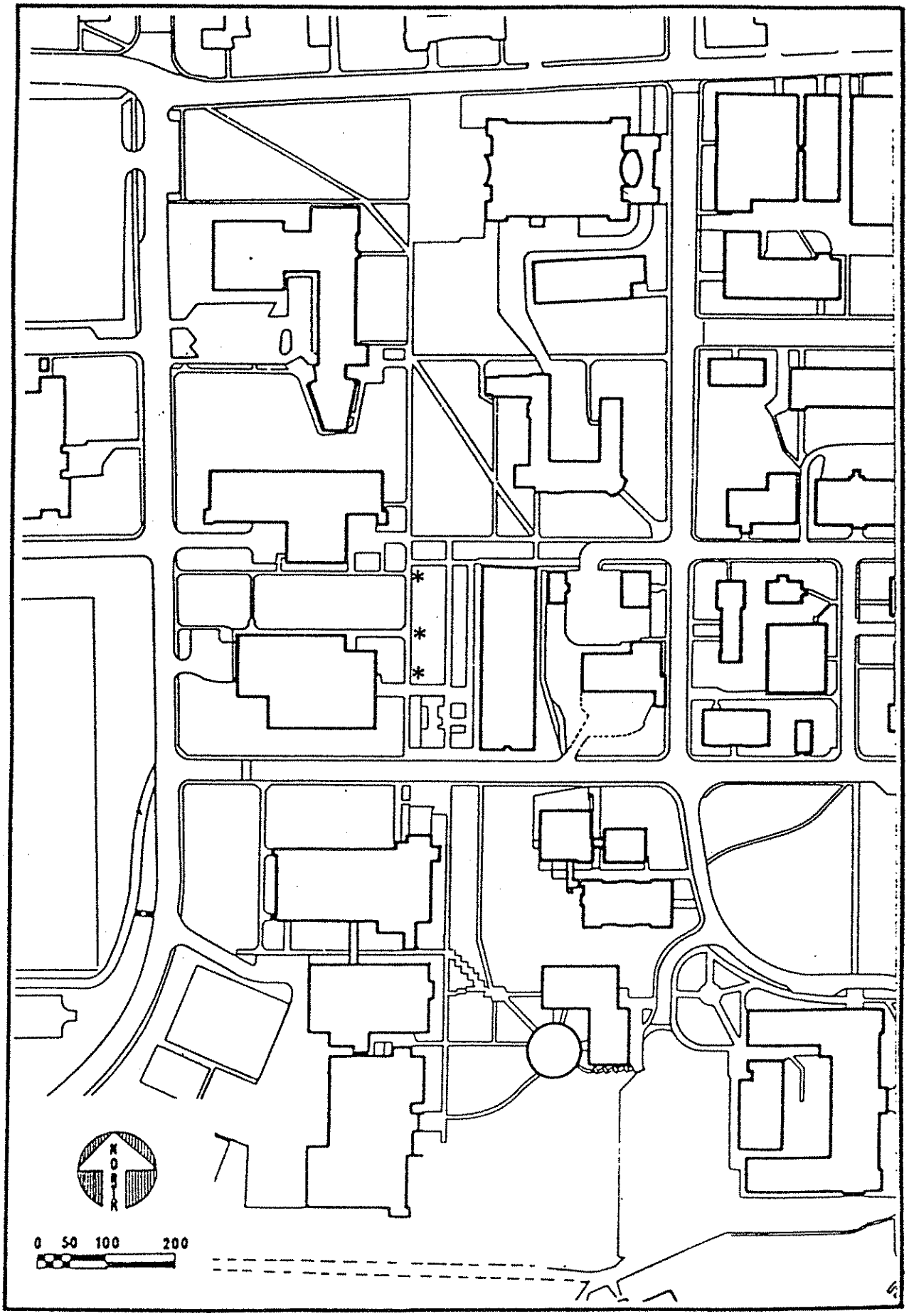
IX. APPENDIX

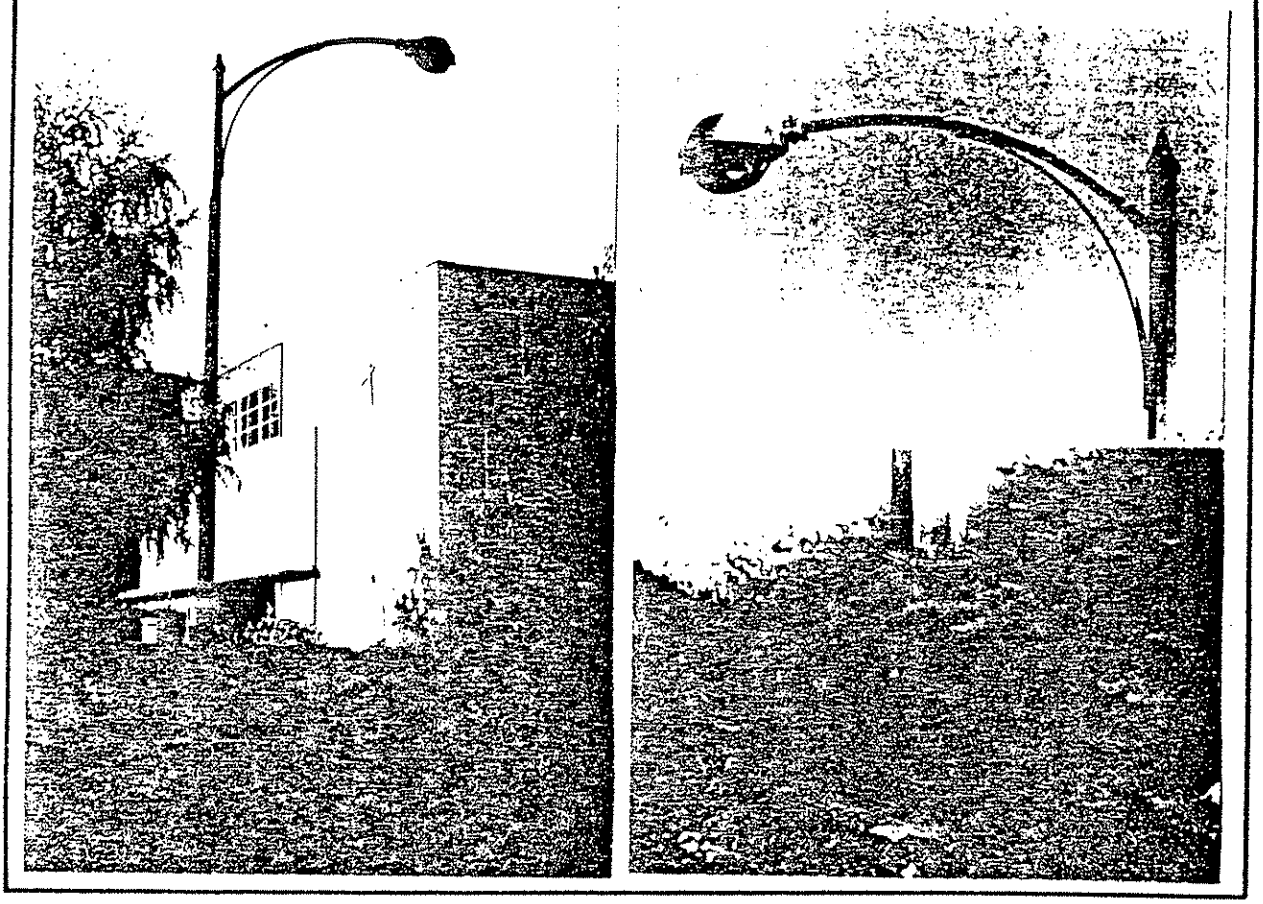
A. Campus Outdoor Lighting Inventory

The following maps and illustrations show: 1) the existing campus lighting inventory of poles and fixtures as of March 1984, and 2) a sample page from the newly developed "Campus Outdoor Lighting Inventory" looseleaf notebook which describes in detail the location of each fixture and its technical specification.


CAMPUS LIGHTING INVENTORY
MARCH 1984
•University maintained
*WWP maintained

Map Section





Fixture Description:

MANUFACTURER: Unknown

MODEL NO: -

FINISH: Aluminum

COLOR: Natural

VOLTAGE: 208

LAMP/WATTAGE: MN 400

OTHER:

Pole Description:

MANUFACTURER: Unknown

MODEL NO: -

FINISH: Painted (Green)

BASE: Cast Iron (?)

HEIGHT: 30'

ARM LENGTH: 6'

OTHER:

Other Locations: North Residences

Comments: