Hawaii Coastal Zone Management Program

technical supplement 8

Technical Considerations in Developing a Coastal Zone Management Program for Hawaii

HAWAII COASTAL ZONE MANAGEMENT PROGRAM

Technical Supplement No. 8

Identifying and Managing the Scenic Resources In Hawaii's Coastal Zone

by

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PREFACE

This paper is part of the research effort undertaken by the Pacific Urban Studies and Planning Program at the University of Hawaii on coastal zone management in Hawaii. The scope of the paper has been defined to include the following topics:

a) Designation of coastal features that characterize this management purpose.

b) Designation of criteria potentially useful in establishing an inland boundary consistent with the purpose.

c) Identification of land and water uses or other factors that threaten or impede the achievement of this management purpose.

d) Survey of existing research relating to this management purpose.

e) Determination of the information which would be required for implementation of a management program to achieve this purpose including an indication of information not presently available.

f) Analysis of current agency responsibility for the achievement of the management purpose.

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I. PROTECTION OF SCENIC RESOURCES IN THE STATE OF HAWAII

A major purpose of the Coastal Zone Management Act (Public Law 92-583, 1972) is the preservation of scenic and aesthetic resources. This objective is particularly important for the State of Hawaii, known world-wide for its natural scenic beauty and unique landscape.

The Scenic Resources

The Hawaiian islands offer a variety of landforms: rain forests and barren lava; majestic pali and gently sloping plains; tranquil bays and rocky shorelines.

Each landform creates a unique setting and paints its own vivid story: crater rims emerging from the ocean, such as Koko Head and Ulupau; birds' refuge islands, peninsulas, points, such as Manana, Makapuu, and Kaena; unique enclosures, such as Hanauma Bay and Waipio Valley; and open shores, such as Kaneohe and Kihei-Maalea.

Each setting has distinctive features like the fresh water streams flowing down to a white sand beach, such as Kalalau or the transparent aquatic parks, such as Hanauma Bay.

A variety of man-made resources are located near the shore: the taro patches of Hanapepe and Halawa; the ancient Hawaiian villages, such as Kealakekua; Hawaiian fishponds, such as Mililii; Hawaiian petroglyphs at Koko Head and on the Kona Coast; historic sites, such as KaLae and Kealekekua; tourist harbors such as Lahaina and parksites such as Magic Island.

This diversity in shoreline features provides for a variety of aesthetic experiences in coastal areas. These places need to be identified, inventoried, made accessible, improved, designed, developed, and above all,

protected. All these complex and diverse endeavors constitute a precise management task regarding scenic and aesthetic resources in coastal zones.

Objectives and Program Requirements

A number of conditions must be reached in order to establish a satisfactory level of natural and scenic resources' protection. These conditions represent objective and program requirements that may be used as general performance guidelines and indicators for the management of the coastal zone. These conditions will be accomplished when scenic coastal areas are:

- surveyed and inventoried;
- known to tourists and residents alike;
- understood in their natural meaning, environmental role and ecological processes;
- part of people's life styles providing opportunity for a variety of outdoor, recreational and productive water-oriented activities;
- visible, with unobstructed view corridors from vantage points and roads;
- accessible to all people and not restricted to private ownership;
- unspoiled in their natural, wild beauty in regard to vegetation, animal and aquatic life and natural ecological processes;
- uncongested so that overcrowding will not decrease the overall beauty of the site;
- maintained and improved, so that the access to and use of the areas do not deteriorate or trigger degenerative ecological processes (impairing the resilience of the system), such as endangering animal, aquatic species and plants, or eroding, silting, stripping and mining the land;
- developed, according to landscape and urban design values, criteria and design solutions consistent with ecological principles, in order to avoid man-made structures from impeding or diminishing scenic and aesthetic site qualities; and
- restored and renewd to minimize, relocate, demolish, or

eliminate present uses and structures incompatible with scenic purposes.

Management Endeavor

The preservation of scenic and aesthetic resources, carried out within an established management framework, requires a number of tasks. It involves:

- identification of values for the preservation of scenic and aesthetic resources that are the basis for policy clarification and criteria for management and guidance;

- establishment of a procedure and a process for assessing:
  - the changing patterns of values
  - the formation of new values
  - the obsolescence of values and

  for providing citizen inputs;

- assessment, acquisition and use of environmental design methods and procedures for CZM;

- establishment of useful and binding criteria in CZM protection of scenic resources;

- identification of zones and sites of high scenic quality;

- identification of coastal features that characterize this management purpose;

- identification of factors, elements, man-made structures, and uses affecting this management purpose;

- definition of boundaries appropriate for the management of visual resources in the coastal zone, such as shoreline setback parallel to the shorelines and mauka-makai view channels.

- experimentation with environmental, landscape, and urban design methodologies in pilot projects to create and establish a common statewide procedure to be used by all agencies concerned with the management purpose;

- determination of the information which would be required for the implementation of this management purpose by reviewing present agencies inventory and survey efforts, and by defining additional information and proposing a statewide and county-wide integrated scenic information system;

- evaluation of current agencies responsibility and indication of possible lines of interagency and intergovernmental collaboration for the achievement of this management purpose;

- analysis of present legislative measures and conservation tools for the protection of coastal area scenic resources and proposal of new ones as required;

- monitoring agencies and private groups performance in their attainment of the management purpose.

Projects for the Protection of Scenic Resources

There are a number of projects that should be immediately undertaken for the protection of coastal scenic resources. Scenic coastal areas should be inventoried, surveyed, and listed in two registers--a register of scenic districts and a register of scenic sites. A number of existing reports could be utilized for the preparation of these registers. Aerial photos of the islands should be used as base maps. The SCORP revised inventory and evaluation of recreation resources would be the starting point in the preparation of these registers and scenic districts should be separated from scenic sites. Other reference material is provided by district or site inventories available in the County general plans, for instance: the Hawaii County and the Kauai County General Plans, the Register of Historic and Archaeologic sites, and the Hawaii Inventory of Natural Scenic Resources, called Hawaii's Treasures, which contains maps and 500 photos of scenic sites.

1. Register of Scenic Districts

The register of scenic districts should identify scenic districts of all the islands. This study and the Overview Open Space Study propose the "overlay" mapping methodology to be used for delineation of districts and their boundaries. The reference index will illustrate access, governmental jurisdiction, administering agencies and public programs affecting the area. The purpose of the scenic district register is to create broad statewide coordination and guidance for quality growth. The register would provide

reference parameters for policies and programs affecting scenic resources undertaken by Federal, State and County agencies, as well as, private landowners.

2. Register of Scenic Sites

The register of scenic sites should identify within each scenic district the sites of high scenic quality. In addition it would provide detailed information concerning site uniqueness, characteristics, ownership, accessibility, landmarks, lookout points, vistas, view corridors, availability of programs and facilities. The format of the register consists of detailed site maps, site photos, location of landmarks, structures, facilities, parking, trails and site utilization.

The purpose of the register is to provide each administering agency with a precise record of the scenic resources of the sites under its jurisdiction, and a statewide monitoring system indicating where, when and how expenditures for improvements of scenic sites are undertaken.

3. Guide to Scenic Districts and Sites in the State of Hawaii

A compendium of the information contained in the above register should be coupled with an educational exposition of the nature, characteristics, utilization, natural and ecological quality of districts and sites to be made available to both tourists and residents.

This guide should be a book containing districts and site maps, and information necessary for people visiting and utilizing the site. The purpose of the guide is mainly educational.

4. Environmental Survey Manual for CZM

This manual should contain information on scenic district and site survey methodology, including a list of data and a detailed legend which

would be used by State, County and Federal agencies and by private landowners.

The basis for the preparation of the manual are the findings which are proposed in this paper.

The purpose of this manual is to assist public agencies and private firms to cope with the management of scenic coastal areas in a systematic manner in order to maintain a guidance in quality growth.

The format of the manual consists of a presentation of pilot methodology for coastal area surveys, including data to be collected and presented graphically.

Content of the manual should include districts, sites boundaries definition, methodology, ways to identify natural characteristics and features, landmarks, lookouts, and criteria for drawing view corridors and defining scenic vistas.

5. Environmental Design Manual for CZM

A large proportion of scenic coastal zones do not fall under the jurisdiction of agencies protecting open space, scenic resources, agriculture, forest reserves and watersheds. It is a fact that a large proportion of the coastal areas is in urban or rural districts. It is therefore imperative to prepare a manual for the use of private developers, County and State agencies concerning landscape and urban design criteria for neighborhood, community and town design. The preparation of this manual is a new task since there are no set Federal or State design guidelines for planning and protecting scenic resources.

II. VALUES FOR THE PROTECTION OF SCENIC AND AESTHETIC RESOURCES

Values Identification

The preservation of the coastal zone is a political matter which requires the clarification of commonly held values. These values must be made explicit to legitimize public guidance for coastal zone management.

Some values pertain to the coastal zone and are ecological and environmental, while others pertain to people's behavior. These values should provide insight in the following tasks:

- identification of the nature of the scenic resource;
- utilization of environmental desing and physical planning performance standards; and
- development of concepts and solutions of site design, organization and management.

Ecological and Environmental Values

Ecological and environmental values are inherent in the character of the natural environment. They are identified by type, intensity, and magnitude of ecological and natural environmental processes; in other words, they are values '*per se*'. These values include all natural processes.

Determination and measurement of these values are undertaken utilizing the field of ecology for the knowledge of relevant processes and systems theory for the study of the dynamics of the processes.

Ecological and environmental values are understood only if ecological principles are applied to the study of the coastal zone as an ecosystem. If this approach is used, the following concepts and definitions (Holling and Goldberg, 1971) need to be taken into consideration:

- the natural environment is not in stable balance; there are instances in which radical modification of regime may be generated.

- the natural environment has a built-in capability to respond and adapt to traumas and shocks (system resilience) which is not infinite.

- incremental changes do not generate immediate signals of their impact because of the resilience of the ecological system.

There are four relevant properties of ecosystems:

- they exhibit a system property by encompassing many components with complex feedback interaction between them.

- they show a spatial interlocking property by responding to events at more than one point in space.

- they present distinctive non-linear structural properties through the appearance of lags, thresholds and limits.

In general man-made environmental modifications tend to decrease the complexity of the environment and to generate a dramatic decline in the resilience of the system. The ecological system exists in such a highly variable physical environment that the equilibrium point itself is continually shifting and changing over time. (Ibid.) The determination of the scenic boundaries for CZM is therefore subordinate to the boundaries established by the ecosystem approach in the study of relevant phenomena of the scenic area.

Human Behavioral Values

Human behavioral values are inherent in the opportunities for man to utilize the coastal zone in various manners and intensities. They are a matter of taste, culture and economic status and may vary over time.

Human behavioral values relate to:

- what people see;

- what people appreciate;

- what people actually use;

- what people remember of their experiences

- what people associate with the site

1. Perceptual values (what people see) refer to man's ability to observe the natural features of a site. These values do not relate to people's emotional response to scenic beauty. Perceptual values refer solely to the opportunity people have to see a site apart from their inability to utilize the site as when access is not provided.

Perceptual values are measured through surveys which attempt to assess:

- what people actually see in a coastal site which is inaccessible.
- how much people actually observe and are able to describe the scenery in front of them.

Culture, education and ethnic background will cause a variety of different responses. Length of stay and frequency of visits to the site will also influence the response. Interviews of people at the site will provide identification of these values. The utilization of "mental maps" will be a useful procedure to solicit people's feedback on what they see.

2. Fruition values (what people appreciate) indicate the impact of site perception on people. These values refer to people's expressions of satisfaction and enjoyment, in the perception and/or use of coastal scenic resources.

Fruition values are identified with in-depth surveys of what people perceive as gratifying or displeasing to them in experiencing a site. There are strong similarities between perceptual and fruition values; however, they are not the same: not all what is seen is appreciated or disliked. It is dependent on people's cultural background and recreational interests. A hunter or a fisherman, or a bird watcher may appreciate a wild shoreline quite differently from someone not practicing these activities.

3. Utilization values (what people use) relate to the opportunities for people to actually use a site for given purposes, such as beachgoing,

swimming, driving, walking for pleasure, picnicking, fishing, bicycling, attending outdoor sports, cultural or educational events, and so forth.

The survey findings of SCORP (1971) indicate that the most popular activities are the ones mentioned above and the facilities needed are: beach parks, trails, paths, roadways, playgrounds, and recreational centers.

The survey of a site and its uses are ways to establish utilization values. The intent is to understand how many different ways one can use and experience a site.

Some surveys can be undertaken without even interviewing people, by monitoring their overt behavior on the site at different times and on different days. Interviews with people, however, will establish ideas for potential use.

The Household Survey of Hawaii (SCORP, 1971) is a step in this direction. The application of ecological concepts to the use of land determines a utilization value which affirms that "the highest and best use of the land is open space." The rationale for this value includes:

- the protection of natural processes;
- the provision of the largest possible number of development options (or avoidance of irreversible development); and
- the protection of the rights of the generation yet unborn (see State of Hawaii Act 139/1970, Establishing Natural Area Reserves).

4. Evocative values (what people remember) refer to people's memory of their own fruition of a site as a worthwhile experience. These values are measured by the intensity, the frequency and the clarity with which a given site is remembered by people. Interviews will provide an understanding of the strength of the evocation values of a site.

Indirect measures of these values are the efforts to recall the image or vision of the site, by means of pictures, photos, slides and other

souvenirs associated with the site itself.

5. Associative and historical values (what people associate with the site) occur when people relate the site to past events of historical or cultural significance, such as former settlements or landing places of the ancient Hawaiians.

Oral and written records of past history are the best way to establish these values and to locate new sites. Tourist guides, Hawaiian petroglyphs, historic sites, old maps, and National and State registers should provide information about them.

Design and Aesthetic Values

Design and aesthetic values are based on the prevailing aesthetic values commonly held at a given time, and they relate to the manner in which man-made structures should or should not be designed and located on a given site.

Variation of design values over time accounts for changes in site development concepts, architectural styles and landscape arrangements. In fact, as soon as new problems or opportunities are identified, new solutions are sought to replace the obsolete ones.

Design and aesthetic values affect design solutions, for example, by maintaining the natural environment dominant over the man-made one or by the congruence of form, activity and land. This fact accounts for some differences in the organization, distribution and utilization of space illustrated in Hawaii by the contrast between older, rural towns and modern subdivisions or between oriental and western cemeteries.

Tastes may change; but genuine design efforts are always appreciated, at least in a historical context. The architectural styles of the past, such as the Liberty, Spanish and Hawaiian are still enjoyed by our generation.

In addition, the natural beauty of scenic areas has always been

appreciated as demonstrated by the strategic location of heiaus at scenic sites, such as Puu O Mahuka and Keaiwa. It is in the interest of present and future generations to protect and design scenic areas.

Aesthetic experiences are difficult to explain because they entail a high level of assimilation and the presence of the following:

- knowlege of the natural environment surrounding the observer (ecological values);
- association of the scenic site with facts and events connected with it (historic values);
- recollection by the observer of previous experiences and knowledge of the site (evocative values);
- opportunity to use the site for specific activities and purposes (utilization values);
- appreciation of intense experinces in using the site with a feeling of fulfillment (fruition values);
- ability to see in depth the variety and uniqueness of the site itself (perceptual values).

Aesthetic values occur and are fulfilled when the observer has the opportunity to experience in a profound and intense manner the above values.

This inclusive definition is operationally useful because it suggests that high aesthetic values are attained when genuine efforts are made toward the proteciton of aesthetic resources, utilizing landscape and urban design solutions.

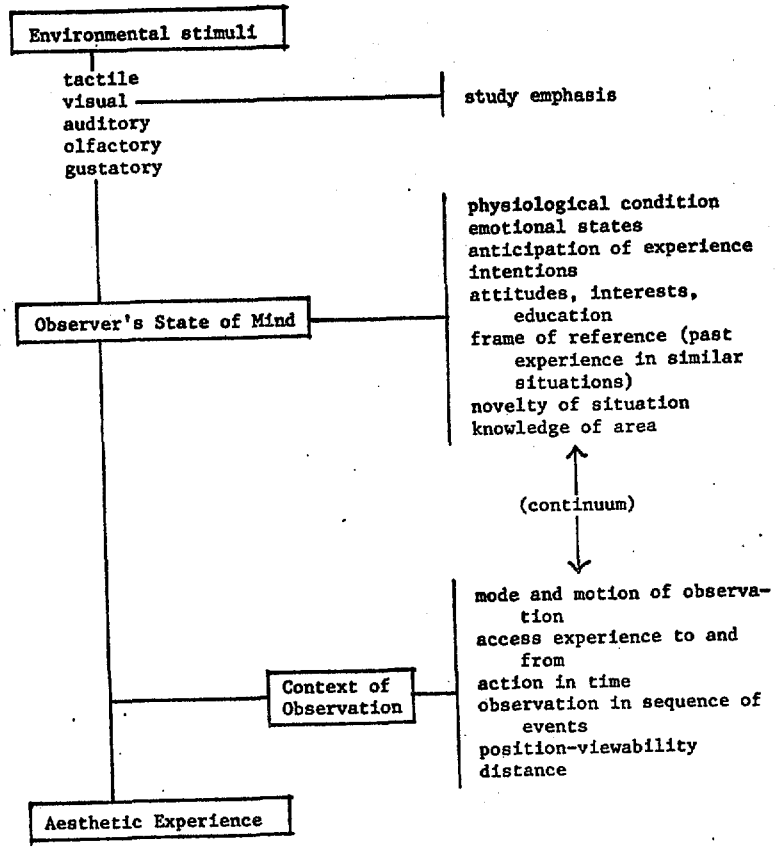
The above list of values is indicative but not necessarily exhaustive. However, it should provide a useful guideline for the identification of scenic and aesthetic sites. It still remains to be established how these values should be ranked to identify priorities in CZM policies.

Aesthetic Response

Litton and others (1971) define the complex response of the observer to a particular landscape as determined by three general variables in mutual

Figure A

A Model of Aesthetic Response



FROM: LITTON, TETLOW, SORENSEN & BEATTY (1974)

relationships. They are:

- the observer's state of mind, such as current perceptual set, past experiences, future expectations and environmental life style (Maier, 1969);
- the context of the observation, such as the activity carried on at the site (boating, swimming); and
- the environmental stimulus itself.

The observer's state of mind and the context of the observation will have an effect on his ability to perceive environmental stimuli and also an effect on which values may be more strongly felt at the time of observation. In fact, the reasons for the different ranking of values among people, and even by a single individual, can be attributed to the above stated conditions, which may vary from time to time. Therefore, the availability of scenic resources and access to them will provide people with opportunities to experience, at different times, a variety of these values. And this, in itself, is another reason for the protection of scenic coastal areas.

Discovering Values

Values are constantly changing. Therefore, it is necessary to study a mechanism to discver values for CZM in Hawaii; in particular, it is necessary to establish a process which will allow the assessment of:

- the changing pattern of values;
- the formation of new values; and
- the obsolescence of others.

An information system useful for this purpose should clarify:

- which values are presently commonly held by the community;
- what is the distribution of identified values among community groups;
- what is the distribution between residents and tourists;
- what is the hierarchy of values apparent in the overt behavior of public agencies as far as the preservation of scenic and aestheitc

resources;

- what is the distribution of values according to age, sex, occupation, education, income, and ethnic groups.

A process to discver people's attitudes toward values should consist of at least three tasks:

Survey to Establish Aesthetic Values and Preferences

This survey should provide insight into people's values and preferences and assist in establishing priorities and criteria to use in the protection and management of scenic resources. When the survey is repeated cross-temporal comparisons may provide information on the changing pattern of values over time and the intensity with which they are held.

The analysis of the Hawaii SCORP Household Survey of 1971 provides behavioral information and an account of the role of scenic resources in outdoor recreation. In this statewide survey, households expressed the following reasons for site selection for family outings: (Table 24)

- good facilities	25
- convenient	22
- scenic beach, not polluted	15
- uncrowded	11
- others	11
- family or group oriented	10
- inexpensive	6

The three major reasons for site selection were attributed to good facilities, convenience, and scenic beauty. This accounts for 62% of the total outings and applies only to park sites located in scenic areas. Since present criteria for establishing a park already include accessibility and scenic beauty, these variables can be used in defining scenic coastal resources.

This data indirectly indicates that obviously people are more concerned with access and actual use of a site and its facilities, than just with

perceiving it from a lookout. This concept is further reinforced by the data concerning facility type used for family outings (percent of total annual outings), in which beach parks account for 84%, while historical and cultural parks only 4%. This indicates that utilization values are more strongly held than associative values.

A behavioral study approach in determining what constitutes a scenic resources requires new research. However the SCORP Survey provides for some insight into this matter. Table 27 which states the three major reasons for choosing a site (percent of user families listing each reason for choosing the site) also lists what is considered to be a scenic and accessible site. These sites are:

- On Oahu:
  - Hanauma Bay and Koko Head area (55% of responses)
  - Makaha, Waianae beaches and parks (15% of responses)
  - Waialua, Haleiwa beaches and parks (15% of responses)
- On Maui:
  - Hana Bay (58% of responses)
  - Wailuku, Kahului, Iao Valley Parks (13% of responses)
- On Hawaii:
  - Volcanoes, Black Sand Beach (43% of responses)
  - Kona-Kailua beaches (18% of responses)

The survey indicates also that the households would like to see an improvement of the natural environment in the future. Table 47 concerning the attitudes on developing outdoor recreation facilities in the future ranks:

- first: the provision of more land for people to enjoy hiking, camping and nature trips (39% of total respondents);
- second: the provision of more outdoor recreation areas for specific activities, such as tennis and kite flying (33% of total respondents);
- third: the provision of more historical and cultural facilities (17% of total respondents).

Within the next ten years priority is expressed for these actions:

- combat environmental pollution (26%)

- provide more local parks and playgrounds (22%)
- improve existing facilities and areas (13%)

The purpose of the SCORP Report was not the identification of scenic and aesthetic values, but the analysis of the demand and need for present and future outdoor recreation requirements. There is no doubt that the analysis of this survey will provide additional insights on scenic resource management.

Utilization of Community Expertise

Community expertise can be used in updating values and criteria for the protection of scenic resources including:

- professional associations, such as landscape architects, historians, planners, ecologists;
- community groups (ecology-oriented) having a record of actively lobbying for the protection of scenic resources (Life of the Land, Save Our Surf, Outdoor Recreation Circle, Council of Presidents, etc.);
- users of scenic areas for different outdoor activities; and
- students who can devote themselves to projects and studies on the specific subject matter.

Protection of scenic coastal areas can not be based only on public agency initiative or on households surveys. An effective program requires mutual learning and the expertise of all the above groups, including neighborhood groups. Users, community groups, professionals provide inputs in formulating alternative conservation plans and design concepts for coastal zones. Federal grants should be made available for the formulation of plans to be developed in competition by the several groups. These grants should provide for a first and second prize, and additional pocket expenses for the development of scenic area and site plans. The initiative could be provided by the State Foundation for the Culture and the Arts in conjunction

with County agencies.

While the public agencies may provide guidelines for site survey and design, the creativity and exploration of alternative solutions can be advanced by the different community and professional groups. This process may be more economical and result in more in-depth analysis, public debate and better solutions. It may also improve cultural development and community organization.

Policies Relating to Values for the Protection of Scenic and Aesthetic Resources

1. Utilization of Values for Plan Evaluation

Evaluation of development plans, projects, and structures, should include the assessment of their adequacy with regard to:

- ecological and environmental values
- human behavioral values
  - perceptual values
  - fruition values
  - utilization values
  - evocative values
  - associative and historical values
  - design and aesthetic values.

2. Discovering Values and Periodic Surveys

The State should undertake periodic surveys to establish people's preferences, needs and demands regarding the utilization of coastal recreation and scenic resources. The surveys should be constructed to allow for crosstemporal comparisons to provide an early monitoring system on the changing patterns of values and on the intensity in which they are commonly held.

3. Utilization of Community Expertise and Design Competitions

State and County agencies should initiate design competitions for public projects, plans, and community beautification projects to restore

and enhance the visual assets of the coast. The intent of these competitions is to involve not only established professional firms and agencies, but also the university, community colleges, schools, junior professionals and community groups.

III. SURVEY OF ENVIRONMENTAL RESEARCH

General Overview

Often, in spite of the beauty of Hawaiian shorelines, the urban waterfront of Hawaiian cities and towns is unsatisfactory to aesthetic appreciation.

Lack of understanding and ignorance of basic environmental principles in town design has been responsible for the loss of portions of coastline of high aesthetic and scenic quality, as in the Honolulu waterfront.

This example must be kept in mind when assessing the Hawaiian shoreline so rich of scenic sites and aesthetic qualities.

CZM is an opportunity to protect and enhance scenic and aesthetic resources and to establish a design methodology to be applied to any man-made development in coastal areas.

Simple urban design concepts (such as human scale, pedestrian scale, integration of activities, separation of transport mode, view corridors, ratios of built to open space, etc.) if introduced years ago, would have provided a completely different physical pattern for the Honolulu waterfront.

Many waterfront cities elsewhere have been able to maintain high level of design standards. The large city of Madras has a beach waterfront for miles. Portofino (a small fishing village in Italy) has its harbor opened on a pedestrian piazza. This piazza is surrounded by shops and entertainment places on the first floor of three or four-story residences, thus residences, shops, recreation and port activities are integrated on one site.

CZM should undertake its task utilizing a body of knowledge and

methodologies which arise from environmental, urban-regional and landscape design and planning principles.

The purpose of this chapter is to identify the most significant research which could be useful to CZM in Hawaii. It is the responsibility of the public agencies involved in CZM to assure that professional work will not ignore those basic contributions.

The difficulty in categorizing those endeavors is that some works fall in more than one category. However, a broad and useful classification is as follows:

- visual and aesthetic qualities of environmental objects;
- descriptive classifications of environmental objects;
- classification systems for spatial structures and activities;
- measurement of form- activity congruence;
- classification systems of landscape units;
- environmental design, values, criteria and area analysis;
- actions which threaten or impede achievement of the management purpose.

Visual and aesthetic qualities of environmental objects are proposed and discussed in Lynch (1960) and Litton (1974). Litton's work consists of a survey of concepts and definitions developed by a number of U.S. federal agencies and other research centers interested in water-oriented environment. Lynch and Litton offer a philosophic - aesthetic contribution as a basis for practical work in planning.

Descriptive classification of environmental objects is the contribution of Lynch (1960) and has been applied and expanded in Wolfe and Shinn's (1970) study. The research provides a way to classify elements of the man-made and natural environments with scenic and aesthetic qualities.

This classification system is the basis for urban design and environmental surveys undertaken to compile a scenic resource inventory.

The works of Lynch (1960) and De Carlo (1970) are particularly oriented to the urban setting and its relationship to the surrounding natural environment. The work of Litton (1974) is oriented toward the natural environment and man-made intrusions on the landscape. The utility of these works consists of not only the provision of a methodology for visual survey, but also an environmental and urban design approach to planning practice.

Classification systems for spatial structures and activities constitute the theoretical works of Lynch, Rodwin (1958) and Webber (1963). They attempt to relate tri-dimensional city form to the urban activity system.

Measurements of form - activity congruence is the logical follow-up of the works of Lynch, Rodwin and Meyer. This study is by Steinitz (1967) and represents an effort to assess people's perception of the city of Boston.

Classification systems for landscape units are the contribution of Litton (1974) in his study of water-oriented environment. This work provides an analysis of physiographic regions, landscapes, and waterscapes of high scenic quality, while considering the effects of man-made intrusions.

Environmental design values, criteria and area analysis are identified in the research of McHarg (1969) and Alexander (1962). McHarg discusses ecological, environmental values and related regional survey methodology for the spatial association of variables by using overlay maps of physiographic and social variables. Alexander's work is an outstanding methodological contribution to the hierarchical decomposition of design problems. In the highway location problem, Alexander, in addition to the overlay maps technique later used by McHarg, establishes a "priority tree" for the anal-

ysis of the several requirements that the highway alignment must meet. Alexander applies again the hierarchical disaggregation in subproblems to another work, the design of an Indian village.

Actions which threaten or impede achievement of the management purpose are discussed in an USGS (1971) work. Environmental impact of man-made actions are analyzed and a classification and coding procedure for environmental impact studies is proposed.

Definition and illustration of terms utilizing design criteria and methods may be extrapolated from environmental, urban design and landscape discipline and applied to CZM.

Visual and aesthetic qualities of environmental objects.

Visual and aesthetic qualities of environmental objects must be identified utilizing aesthetic values. The criteria for the protection of scenic resources are based upon the presence of these qualities in coastal areas.

Litton, Tetlon (1974) and Lynch (1960) provide some insights on the way to identify the "image of the environment" and to understand its visual qualities.

Litton and others (1974) suggest the following criteria as the means to identify aesthetic quality:

> Unity: the object of the observation is seen as a continuous and as a whole, as "oneness" of moving continuity, wholeness of surface, singleness of material.
>
> There is an aesthetic or design unity, an ecological unity, an hydrological unity. To the degree that any of these kinds of unity may be recognized, they represent forms of aesthetic quality.
>
> Unity is more than the sum of the parts (Koffa, 1935) and this quality of wholeness is recognized as having an identity of its own. The concept of unity requires the understanding of the object of observation as a whole system, with dominance and subordinance of its elements and parts.

Variety: environmental objects may include a pervasive unity despite their having tremendous diversity. The variety may be expressed through movements, color, differences, in edges, forms, shapes, and textures. To the degree that the greatest amount of richness or diversity may be seen, the inference is then that also the greatest is the aesthetic quality. Richness does not merely suggest the need of many different and diverse parts, but implies that they must enjoy organization. The presence of variety insures a maximum opportunity for visual stimulus.

Vividness: the contrast of conspicuous visual combinations may depend upon interesting landscape-water linkages as well as upon time and sequence (U.S. Army Corp-USDA-USDI,1969). Vividness is a qualitative assessment of contrasts of elements within an unified whole system and is a result of variety.

Lynch (1960) proposes the following visual qualities:

Legibility: is a visual quality of natural or man-made environment and consists in the clarity or "legibility" of the city-scape or landscape. It is measured by the ease with which city-scape and landscape can be recognized and organized into a coherent pattern.

Legibility is a function of the object under observation and the scale (size) of the object (or landmark), the time lenghts of the observation, the frequency of recurrent observations of the landmark, and the complexity of the landmark affect the degree of legibility (Diamond Head has a high legibility for people who live or work on Oahu).

Identity: is a visual quality which consists of the characteristic of the object (landmark) to be defined as a separate entity from other objects, because of his "oneness". (Diamond Head is separated and isolated from the mountain range and emerges alone surrounded by gentle terrain and the flat ocean).

Structure: is a visual quality of an object which consists in its internal spatial organization and physical relation to other objects. (Diamond Head's internal structure can be described by its external and internal wall, its crater round shape, the different level of the crater rim, crater floor, and surrounding lands).

Meaning: a visual or non visual quality of evocative nature to the observer in terms of use, function, and form. (Diamond Head recalls different meanings to different people such as an opportunity for hiking, a musical festival, a recollection of prehistoric times when it was an active volcano, a majestic lookout over the ocean, an aesthetic appreciation for its conic and round form).

Summary of Proposed Visually Functional Evaluative Terms Relating To Man-made Structure and Site Design in the Water Oriented Landscape

1. Unifying. To bring together visually, a diversity of perceived elements so that each contributes positively to a unified whole. Conversely stated, there must be no significant visual disruption which can be attributed to an element of the design.
2. Focal. The visual qualities which permit the focus of attention to important or desired portions of a landscape or water view.
3. Enclosing. That quality or arrangement which permits a definite and limiting enclosure to be formed.
4. Organizing. An arrangement of elements which is structured so as to form a coherant pattern, sequence, direction, form, or quality..
5. Enhancing. Arrangements or improvements which prevent the visual isolation of disruptive elements or which, by the use of new elements, reduces the negative visual impact of existing elements or conditions. That arrangement or strategy which visually alters the elements in significant ways to relate or constructively dissociate.

FIG.A: FROM: LITTON, TETLOW, SORENSEN & BEATTY (1974)

The above qualities of an object are identified for analysis, but in reality they are perceived together. When we look for physical qualities of the natural or man-made environment, we look for physical qualities which relate to the attributes of identity and structure in the mental image (Lynch 1960). This lead to the definition of imageability.

Imageability: is the quality of a physical object which evokes a strong image in any given observer. It is also called legibility or visibility. Stern (1914) felt that one of the basic function of art was to create images which, by clarity and harmony of form, fulfill the need for vividly comprehensive appearance. Imageability is considered a composite index of identity structure and meaning. John Gulik (1963) redefined imageability as a set of qualities of, or associated with, an object, which maintains in the beholder conscious visual awareness of the object.

The aesthetic criteria and the visual qualities presented by Littlon, Tetlon, and Lynch can be applied in the identification of coastal features and visual resources for statewide surveys.

Descriptive classification of environmental objects

The elements of the landscape selected for their scenic beauty must be described and classified in terms of people's perception and use.

1. Lynch's approach

There are a number of elements proposed by Lynch (1960) which are identified in The Image Of The City and which must be taken into consideration in CZM for urban areas. They are:

- Paths: paths are channels along which the observer customarily, occasionally or potentially moves, such as walkways. streets, canals, etc.

- Edges: edges are the linear elements neither used nor considered paths by the observer. They are the boundaries between two phases, linear breaks in a continuity: shore, railroads, walls, etc. Such edges are barriers more or less penetrable, or they may be seams, lines along which two regions are related and joined together. Those edges are important organizing features, mainly with the role of holding together generalized areas, as in the outline of a middle age city by water or walls.

- Districts: districts are the sections of the city, which are recognizable as having some common identifying characters.

- Nodes: nodes are city strategic places into which an observer can enter, and which are the intensive foci, to and from which he is traveling.

- Landmarks: landmarks are another type of place reference, but in this case the observer does not enter into them; they are external.

The shoreline itself can be easily perceived as an edge (continuous separation of land and water) and as a path (a walkway for people to move along), so it should be considered of high image content and should be protected, designed and managed accordingly. Districts and nodes are elements more properly referred to in the image of a city. In the case of waterfront cities like Honolulu, Hilo, and Lahaina, the presence of the five elements of the city image indicates their high aesthetic values and the need for integrated urban environmental design concepts and solutions.

While Lynch develops this list of elements to explain the image of the urban setting, his contribution is useful in identifying natural and man-made elements.

The latter are particularly crucial since a substantial portion of the coastal area is zoned urban; the application of urban design principles for the preservation of environmental quality is particularly needed in a zone of such intensive use.

Lynch devises a very simple list of symbols to describe path, edges, nodes, districts, landmarks. These symbols are useful in establishing a visual survey in the planning agenda for CZM.

2. Wolfe and Shinn's approach

Wolfe and Shinn (1970) apply an approach similar to Lynch's in a

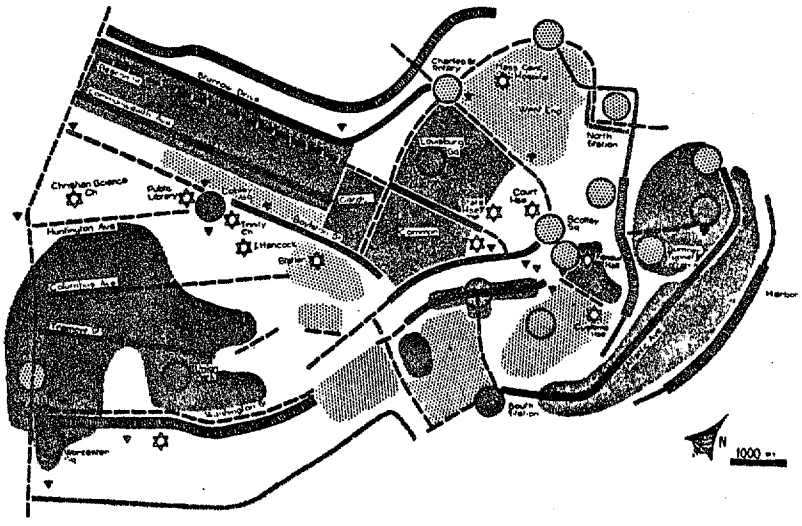


FIG. 3. *The visual form of Boston as seen in the field*

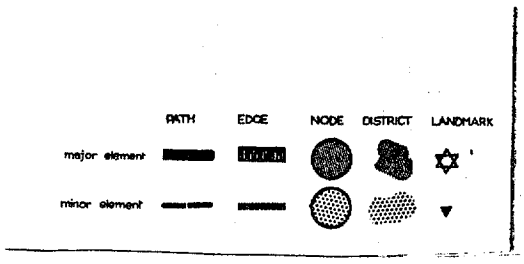
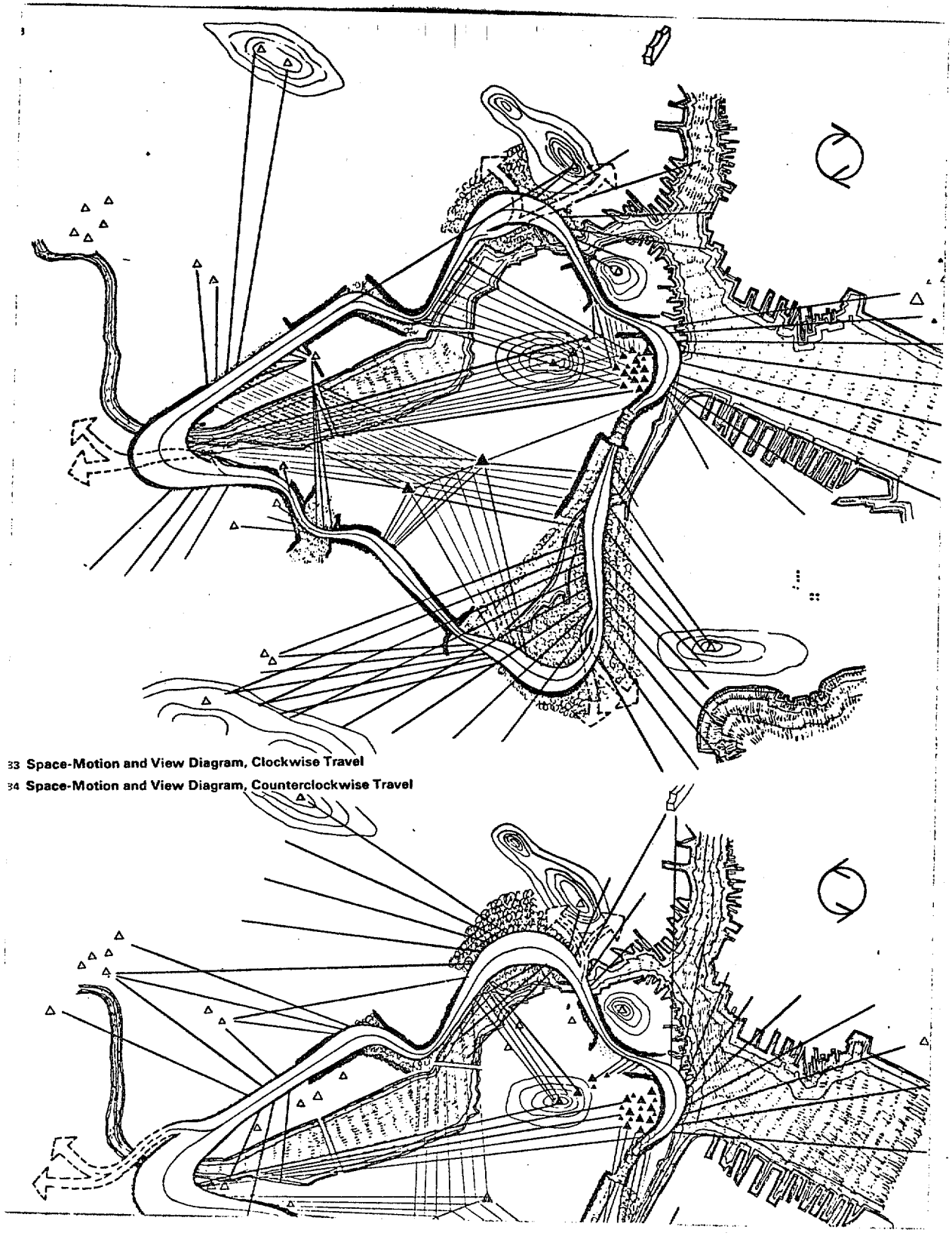


FIG.A: From: Kevin Lynch, The image of the city , The M.I.T. Press 1970



33 Space-Motion and View Diagram, Clockwise Travel

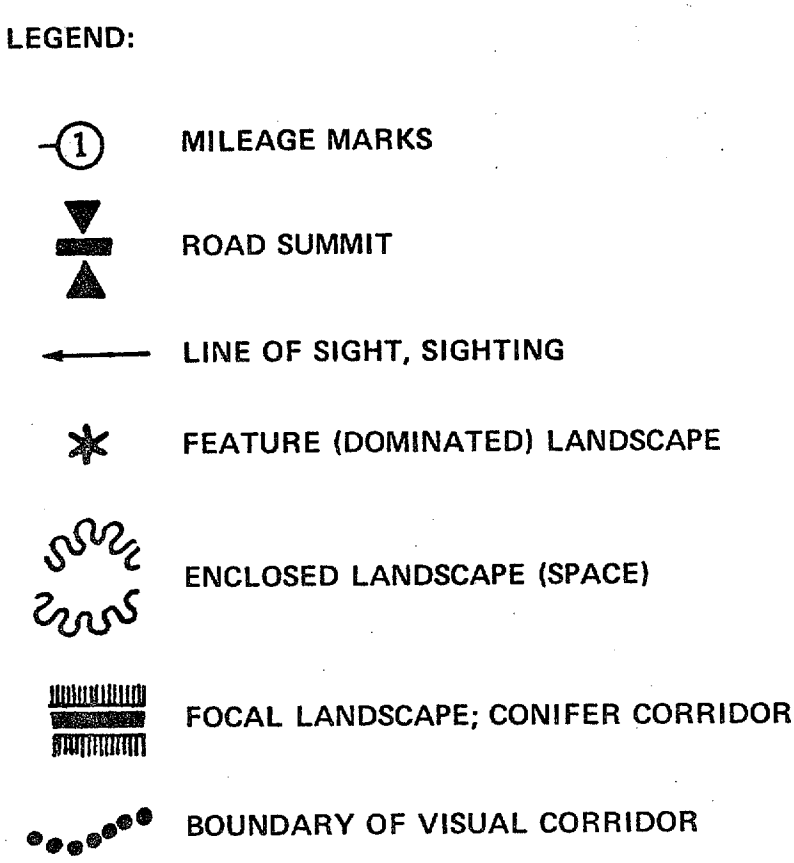
34 Space-Motion and View Diagram, Counterclockwise Travel

FIG.A From: D.Appleyard,K. Lynch, and J.R. Myer (1964)
The View From The Road

visual survey of a waterfront study. They analyze the interrelationship between design objectives (such as orientation, legibility, imageability, site uniqueness) and determinants (mountains, waterfront, wooded areas, freeways, major structures, parks, open space, street patterns). In addition, their methodology explicitly treats design objectives, design concepts, and design strategies and outcomes, including conflicts between the elements involved.

3. Litton's approach

Litton's (1972) survey of scenic areas and landscape setting has been a basic reference for the development of the classification system proposed in this report for the State of Hawaii. Litton uses the following symbols:



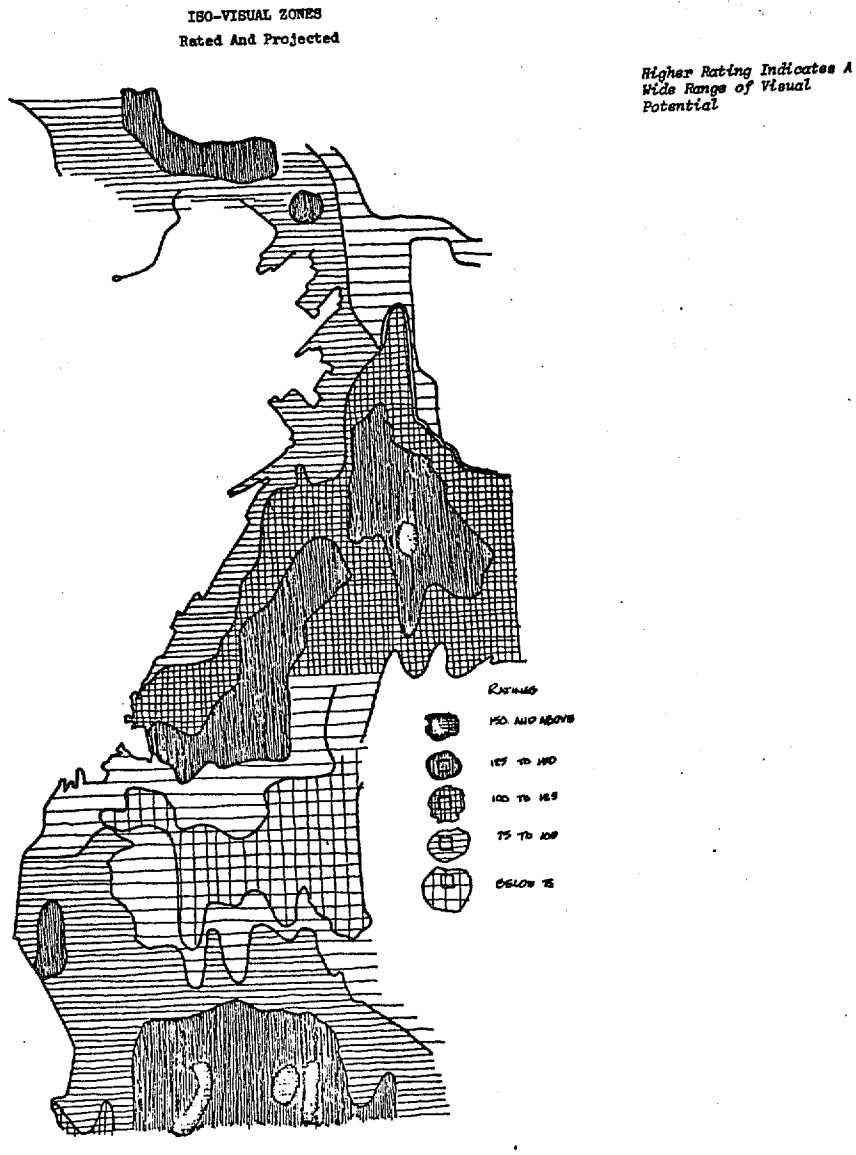


FIG.A: Source: M.R. Wolfe and R.D. Shinn (1970)

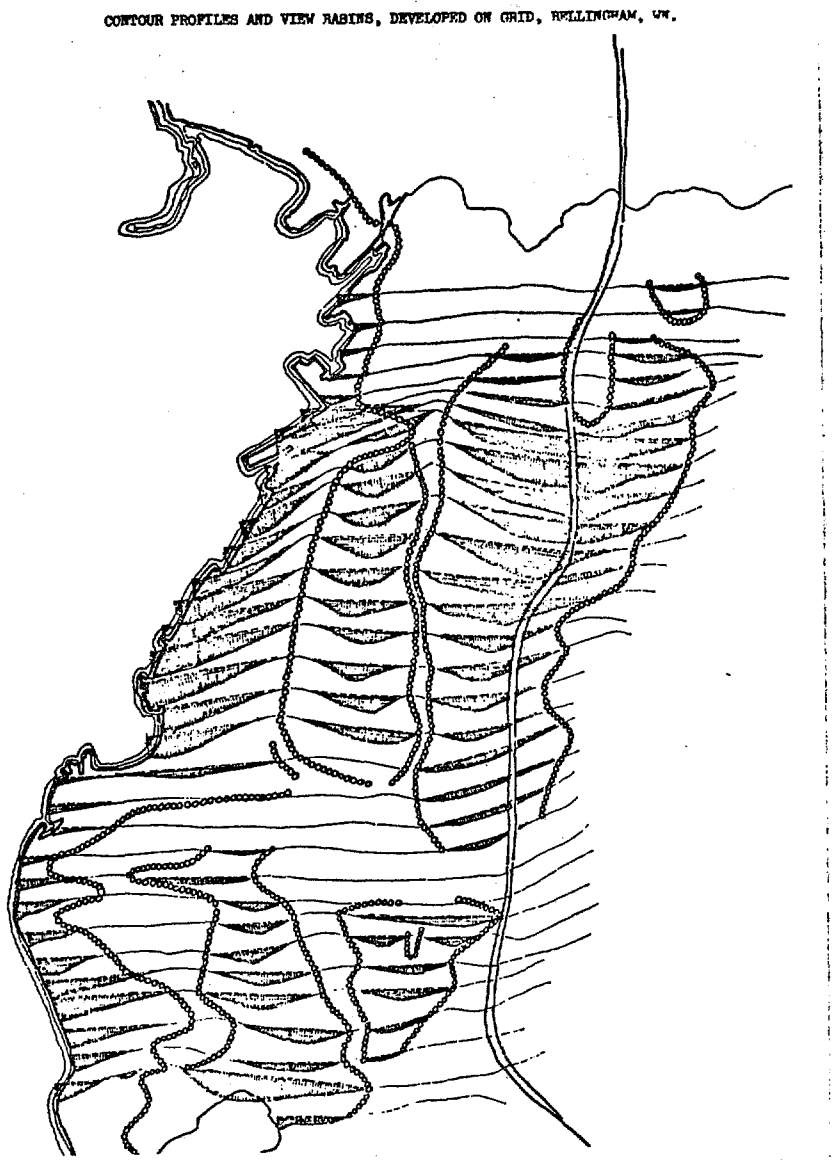


FIG.A: From: M.R. Wolfe and R.D. Shinn (1970)

FIGURE A

LANDSCAPE INVENTORY VISUAL CORRIDOR

SIERRA NATIONAL FOREST SEGMENT, HWY. 168
BETWEEN SHAVER LAKE & HUNTINGTON LAKE, CALIF.

NORTH

0 ½ 1 2 3 MILES
SCALE

LEGEND:

- MILEAGE MARKS
- FOREGROUND BOUNDARY (¼ MI. FROM ROAD)
- MIDDLEGROUND BOUNDARY (3 MI. FROM ROAD)
- VISUAL CORRIDOR BOUNDARY

AREAS:

FOREGROUND (WITHIN ¼ MILE OF ROAD)
5150 AC.

MIDDLEGROUND (BETWEEN ¼ & 3 MILES FROM ROAD)
22540 AC.

BACKGROUND (OVER 3 MILES FROM ROAD)
6520 AC.

WATER AREAS 3320 AC.
HUNTINGTON LAKE 1270 AC.
SHAVER LAKE 2050 AC.

TOTAL AREA, 37,530 ACRES

BASE MAP SOURCE: USGS, 7½ MINUTE SERIES

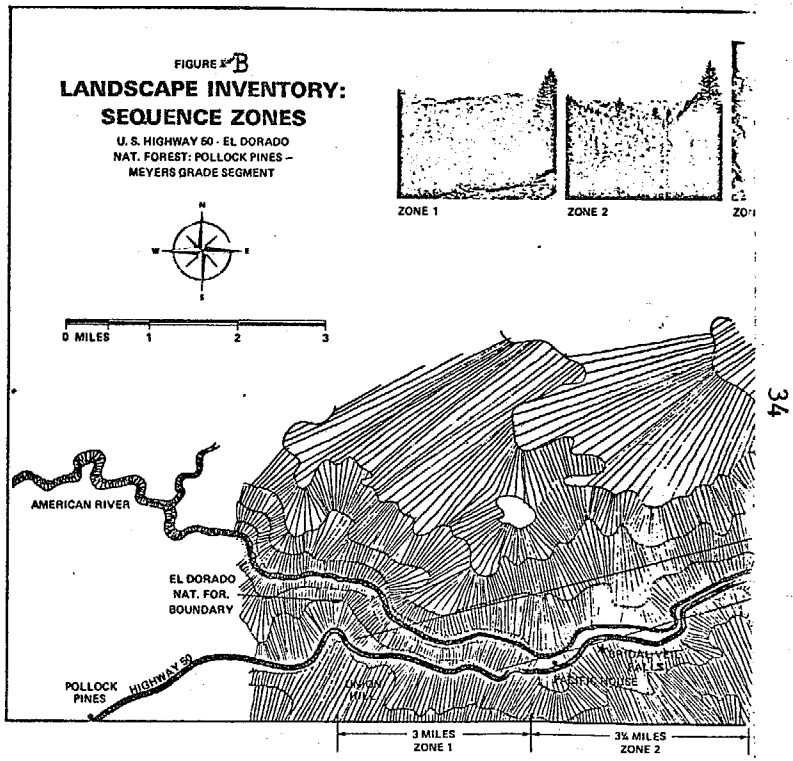
51

SOURCE: LITTON (196?)

FIGURE A

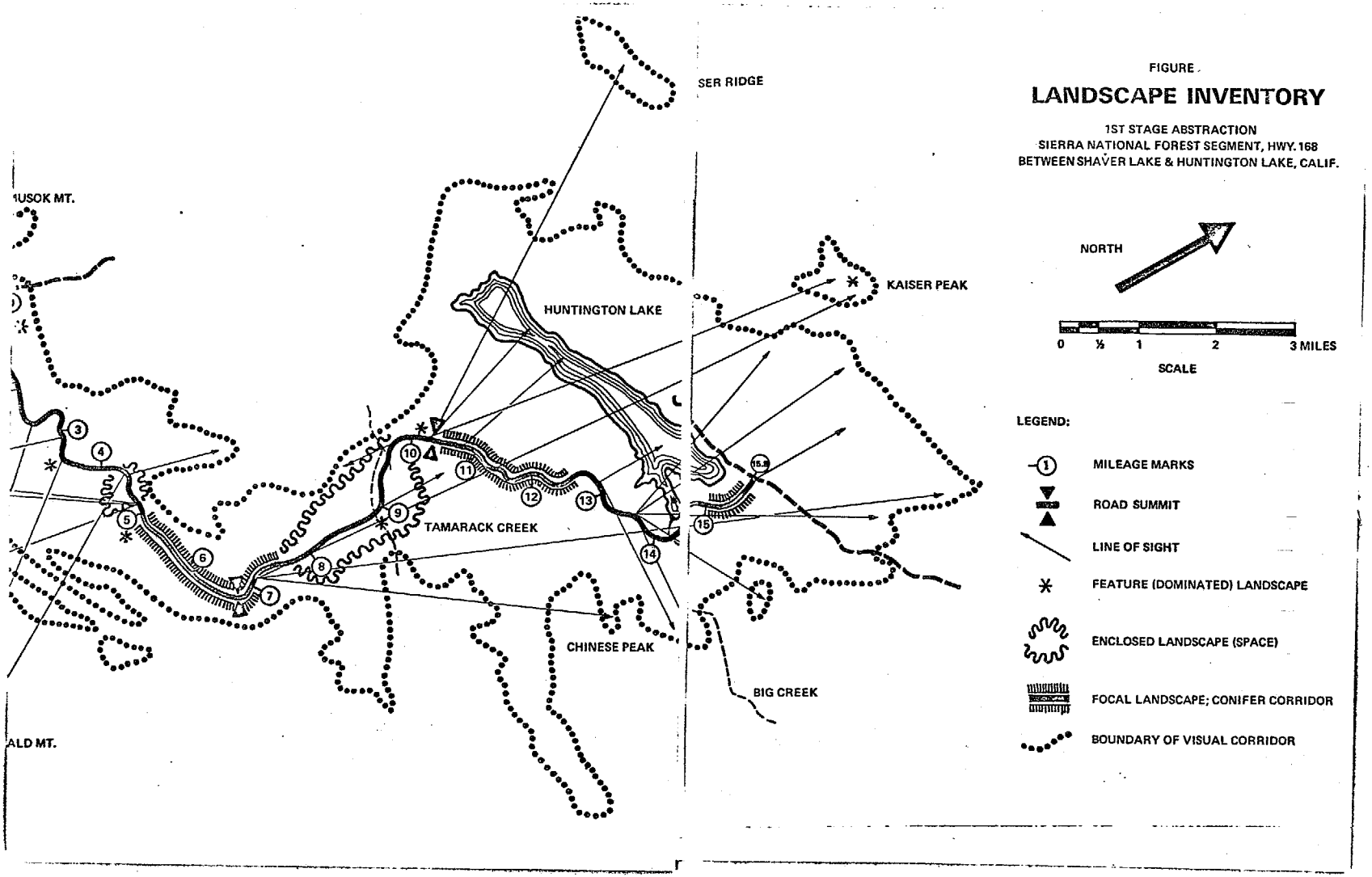
LANDSCAPE INVENTORY

U. S. HIGHWAY 50; VIEW CATEGORIES, ELDORADO NATIONAL FOREST SEGMENT

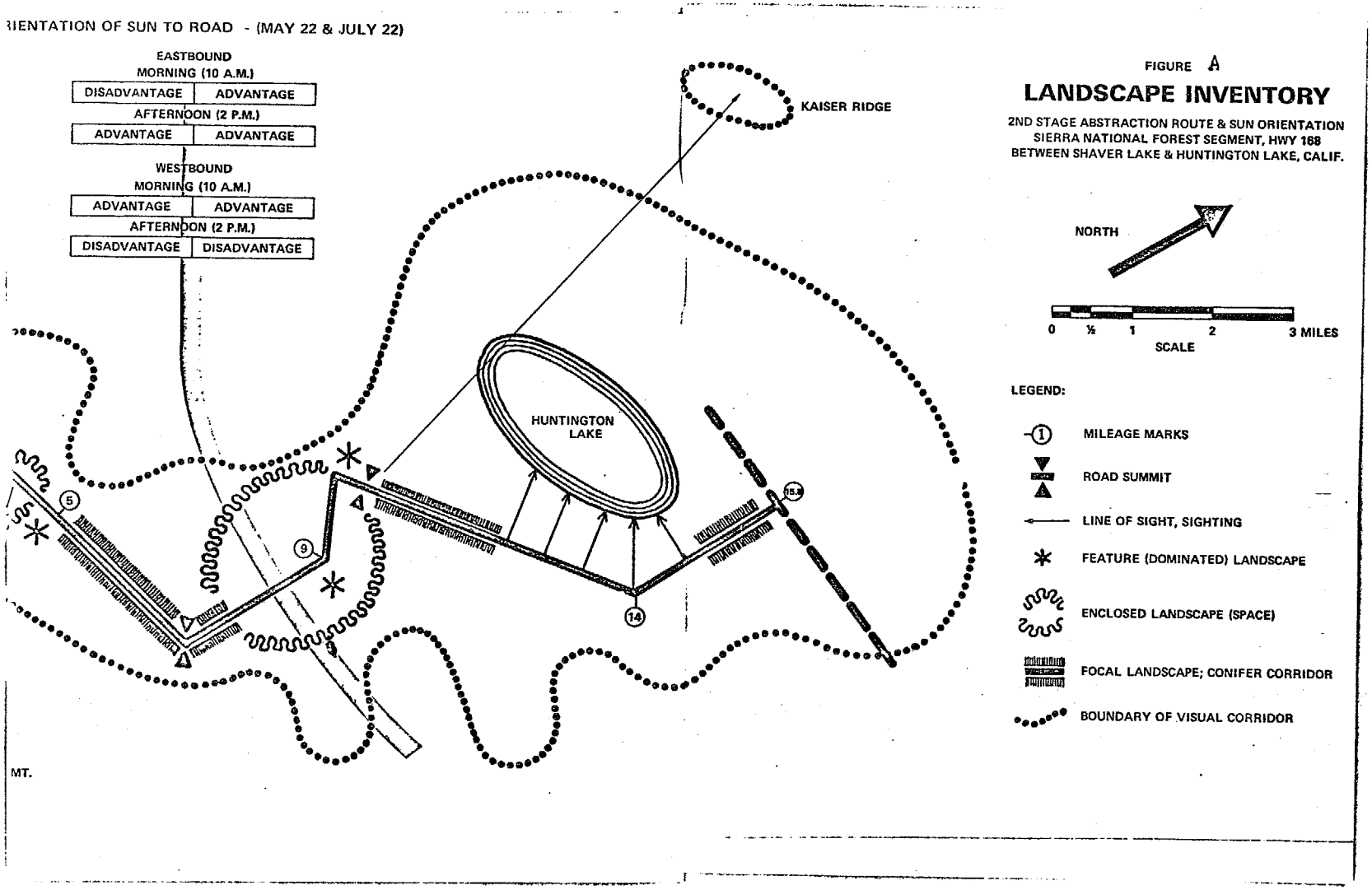


58

SOURCE: Litton (1968)



SOURCE: LITTON (1968)



SOURCE: LITTON (1968)

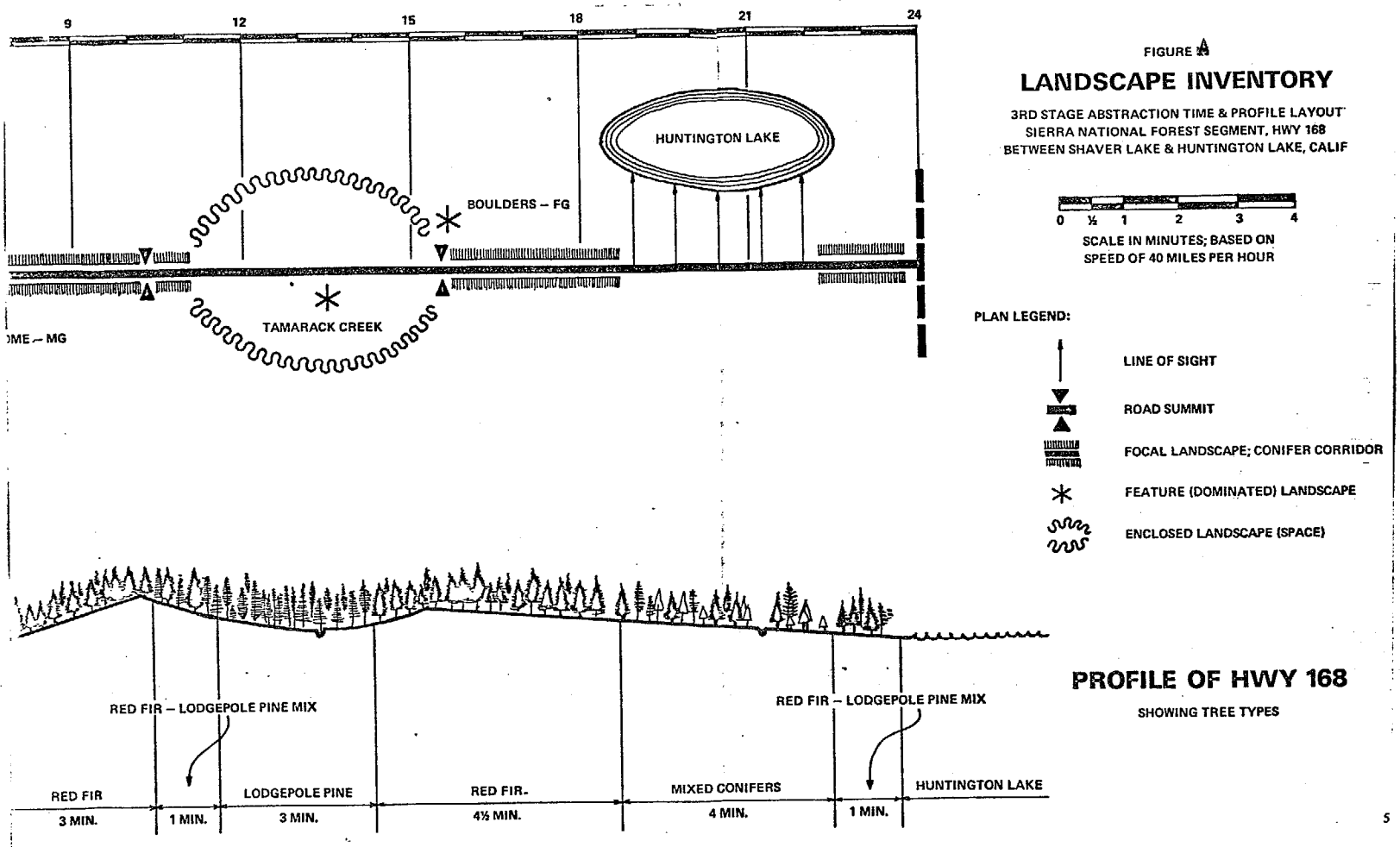


FIGURE 4

LANDSCAPE INVENTORY

3RD STAGE ABSTRACTION TIME & PROFILE LAYOUT
SIERRA NATIONAL FOREST SEGMENT, HWY 168
BETWEEN SHAVER LAKE & HUNTINGTON LAKE, CALIF

0 ½ 1 2 3 4

SCALE IN MINUTES; BASED ON
SPEED OF 40 MILES PER HOUR

PLAN LEGEND:

- LINE OF SIGHT
- ROAD SUMMIT
- FOCAL LANDSCAPE; CONIFER CORRIDOR
- FEATURE (DOMINATED) LANDSCAPE
- ENCLOSED LANDSCAPE (SPACE)

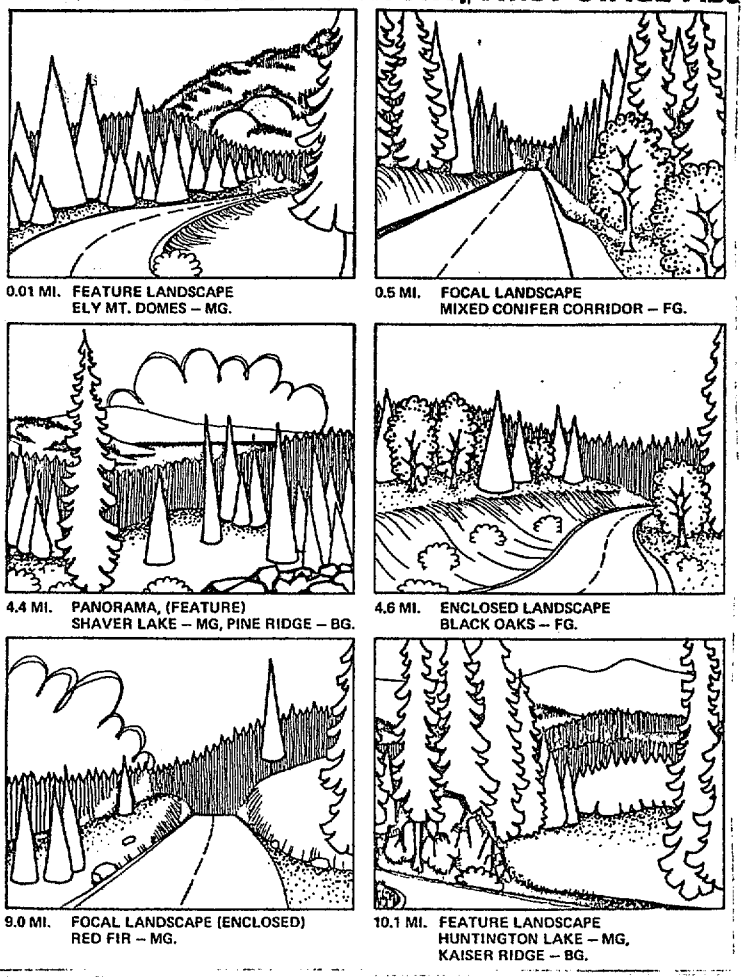
PROFILE OF HWY 168

SHOWING TREE TYPES

5

SOURCE: LITTON (1968)

FIGURE 4 LANDSCAPE INVENTORY, FIRST STAGE ABS



0.01 MI. FEATURE LANDSCAPE
ELY MT. DOMES – MG.

0.5 MI. FOCAL LANDSCAPE
MIXED CONIFER CORRIDOR – FG.

4.4 MI. PANORAMA, (FEATURE)
SHAVER LAKE – MG, PINE RIDGE – BG.

4.6 MI. ENCLOSED LANDSCAPE
BLACK OAKS – FG.

9.0 MI. FOCAL LANDSCAPE (ENCLOSED)
RED FIR – MG.

10.1 MI. FEATURE LANDSCAPE
HUNTINGTON LAKE – MG,
KAISER RIDGE – BG.

SOURCE: LITTON(1968)

Classification system for spatial structures and activities

Urban design shows how urban phenomena, activities, and space requirements should be planned. The study of urban form and structure together with principles and criteria from the landscape and natural environmental studies, should be applied to coastal areas.

Kevin Lynch and Lloyd Rodwin (1965) developed a conceptual system focusing on urban form. They view the city as being made up of adapted spaces for the accomodation of human activities and flow systems to handle movement of people and goods. The system for analyzing urban form is based on six categories:

- element types: are divided into basic types of spaces and flow systems;
- quantity: refers to amount or size of the particular type of adapted space and flow system;
- density: refers to people, facilities, vehicles per unit of space, and capacity of channels;
- grain: indicates how the various elements of urban forms are differentiated and separated;
- focal organization: is concerned with spatial disposition and interrelation among key points in the city;
- generalized spatial distribution: is the patterned organization of space as it may be seen from the air at high altitude;

Melvin Webber (1963) develops a crossclassification system to describe urban spatial structures, using three perspectives:

- the city in terms of spatial patterns of human interaction;
- the physical form of the city, or the space adapted for various human activities and the pattern of communication networks and transportation channels.
- the city as a configuration of activities location (the spatial distribution of various types of activities, by economic function, social role, etc.

Using these three definitions of the city Webber develops a cross-classification system to describe urban spatial structure and activity interaction, in which activity components are classified according to:

- size of the phenomenon;
- degree to which the phenomenon pile-up in major concentric forms around a point;
- propensity for the phenomenon to pile-up at certain points of less concentration;
- degree of pile-up per unit (pile-up of 100 contacts among people per sq. mile);
- relative togetherness of like phenomena;
- relative degree of mixture.

Measurement of form - activity congruence

On the basis of Webber's and Lynch-Rodwin's works which identify an approach to urban structure and form, Carl Steinitz (1969) establishes a methodology to measure the consistency between the activity and the form of the structure which accommodates such activity.

Steinitz investigates the city environmental meaning demonstrating the measurable correspondence and congruence between form and activity. Steinitz shows that the regularities in these relationships heavily influence the amount and type of meaning which the environment transmits and which people may acquire.

The survey questionnaire utilized the following indicators:

- form type frequency;
- activity type frequency;
- form intensity;
- activity intensity;
- form significance;
- activity significance.

The survey analyzed the following urban design aspects:

- Type congruence: (measured as the consistency with which a given form type and activity appear together at any particular site. Variables used are: construction type, transparency, form type, and activity type frequency).

- Intensity congruence: (measured utilizing the concept of spatial intensity, the relative presence of physical space, and information intensity. Information intensity is the relative potential impact of various sources of information transmitted through form. The variables used are: spatial intensity, floor area ratio, rooted sign size, visible activity, visible objects, non visual information, form stereotype, person-hour-day. Form information intensity is based upon an unweighted combination of spatial intensity and information intensity. Activity intensity is the sum of destinations persons-hours-day and persons-hours-night. Intensity congruence is the concurrence of form intensity and activity intensity).

- Significance congruence: (co-occurrence of exposed form and important activities).

- Activity significance: (importance of the activity of a place is determined by an estimate of the relative number of people affected by it and the degree of that effect. Activity significance is also measured by high level of decisions and symbolic significance in a given site).

- Form exposure: (magnitude of vehicular exposure, mass transit exposure, pedestrian exposure).

Classification systems for landscape units

Litton and Tetlow's (1974) classification of water in the landscape utilizes the aesthetic concept of "unity" and "wholeness" in order to identify the Landscape unit, the Setting unit, and the Waterscape unit in their study of rivers and lakes.

A unit is meant to suggest the strong evidence of a visually conspicuous entity limited in space.

1- The landscape unit has a large scale dimension; it suggests a regional or geographic context which for Hawaii may be equated to physiographic region, or a major portion of it.

The scale of the landscape unit makes possible the visibility of the whole unit only over a period of time and through an extended experience (Iowa Un., 1969). Generalized impressions, rather than details

characterize the landscape unit.

2- The setting unit is defined as a visual corridor or envelope of space which is set by enclosure of land forms or forest edges (Litton, 1969). Visibility of the whole setting unit will normally require several lookout points.

In general a number of smaller setting units is found within the boundaries of the larger landscape unit. (Research Planning and Design Assoc. 1967, Iowa State Un., 1969). Quality of the unit is derived from the clarity of its overall shape and from a sense of its wholeness.

3- The waterscape unit is defined by the combination of two mutually interdependent expressions: the water element and the shore element. The shore and the water depend on each other's conditions. (U.S. Dept. of Interior and the Fed. Task Force on the Potomac, 1968). The appreciation of the waterscape unit requires the observer to be close to the water edge.

1. Landscape unit boundary

Boundary definition of the landscape unit requires the application of certain components which make up the landscape unit. They consist of:

- General form: (relates to the expression of the landform: convex forms are mountains, flattened forms are plains and plateaus, concave forms are valleys and basins, composite forms are flat plains and projecting elements).

- Terrain pattern: (repetition of form-shape-color-texture variations).

- Features: (are recognized in collective structures and they are dominant scale, isolation, distinct skyline, surface contrast, variations).

- Dominant vegetative pattern: (generalized vegetation types).

- Water presence: (extent and size of water in the landscape).

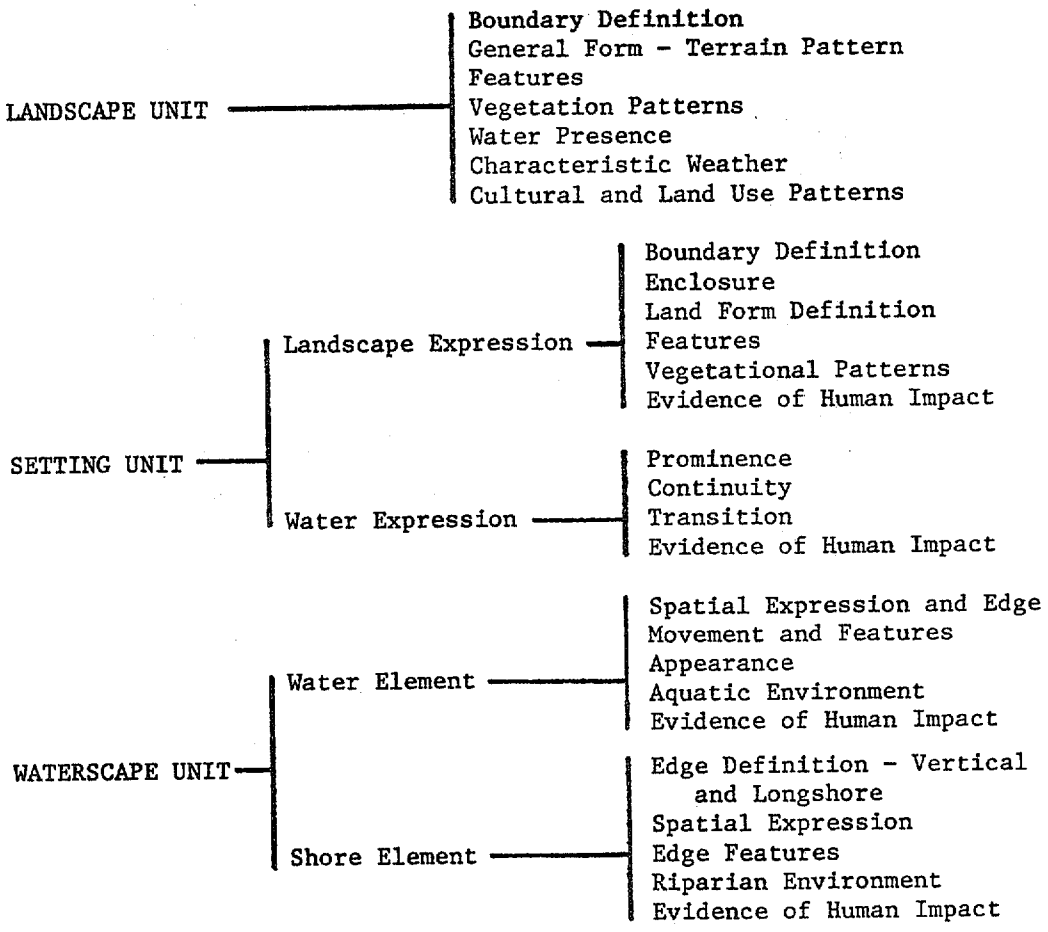
- Characteristic weather: (wheather phenomena, visual change in the landscape due to microclimatic effects on vegetation patterns).

- Cultural pattern and land use pattern: (margin between wildlands, agricultural land and urban land).

Boundary definition utilizes:

Figure A

Classification Framework:



FROM: LITTON, TETLOW, SORENSEN & BEATTY (1974)

- Determination of edges which are created between dissimilar things or contrasting elements. Sharp edges evoke strong visual images, yet some edges or margins will be transition zones of mixed areas between two elements.

- Visual juxtaposition of native elements expressed in ridges, and skylines, horizontal planes, water margins, or vegetative type edges (Iowa State Univ. 1966).

- Contrast between natural or unaltered conditions opposed to altered conditions (Lewis, 1969; Research Plan and Design Assoc., 1969).

2. Setting unit boundary

Boundary definition of the setting unit depends very largely upon enclosure edges. Some units can be expected to have distinct and sharp boundaries, others will be incomplete or indefinite in margins. In general, boundary definition is that tangible concern with the visual margins or edges of the setting unit. Skyline are the lines of maximum visual contrast within the landscape. Dark and light, solid and atmosphere and observer position give emphasis to this kind of earth-sky contrast (Whiteman, 1968). The contour edges of closer planes of land or plants seen against more distant background are not normally strong lines as sky silhouettes. Yet the overlapping planes of one surface seen against another is the fundamental way whereby distance is sensed (Gibson, 1950).

Edges of water against land, water against plants and water against sky are relationships of strong contrasts (Morre, Cullen 1953). The edges of vegetation or forest margins particularly as expressed through the junction of dissimilar and contrasting plant types, help to show the margins of a setting unit.

The components of the setting units forming a landscape expression are:

- Enclosure: (visual relationship at various scale with diverse vertical-horizontal proportion among parts (Lewis, 1968), such as basin with water and lakes, sea and stream corridors).

- Landforms: (flattened and continuous sloping surfaces, hill formations, mountain forms).

- Vegetation pattern: (tree covers, scrub cover, grassland, barren soil. Connective margins between or among dissimilar vegetation types are called butt, transitional, digitate, and diffuse).

- Features: (individual elements in the landscape which stand out from their surroundings, such as emerging from single landform, water, tree groupings, geological formations, palisades, and waterfalls. A single feature is a central element having a sphere of influence, regardless of what it may be).

- Human impact: (man-made alterations).

The components of the setting unit forming a water expression are:

- Prominence: (relative dominance or subordinance of water within the setting).

- Continuity: (relationship between waterscape and setting unit, such as uninterrupted and continuous type of water flow).

- Transition: (concerned with the way in which the shore joins the water and the nature of vegetation as it forms a link between land and water).

- Human impact: (man-made alterations exerting minimum apparent influence on the setting unit).

3. Waterscape unit boundary

The boundary definition of the waterscape unit considers the following components of the visual expression of waterscape:

a- Water elements:

- Spatial expression of the edge: (water surface in terms of size and shape, in case of the streams in terms of straight, sinuous, meander, and braid patterns).

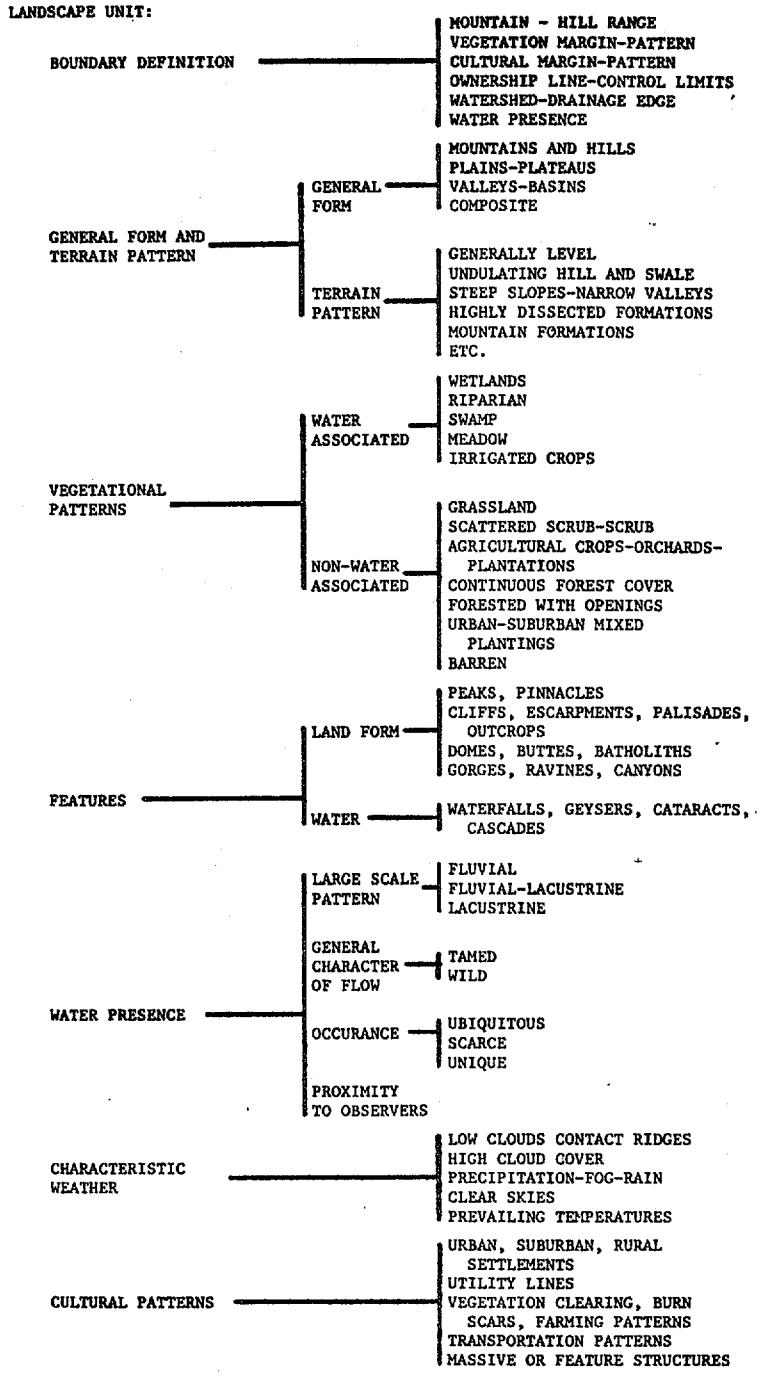
- Movement and features: (waves, maree, and type of river flow).

- Appearance: (appearance of water as a composite factor of its fluidity or its liquidness, its clarity, and color and its capability to reflect light and images).

- Human impact: (man-made alteration, such as pollution, decoloration, floating debris, and turbidity).

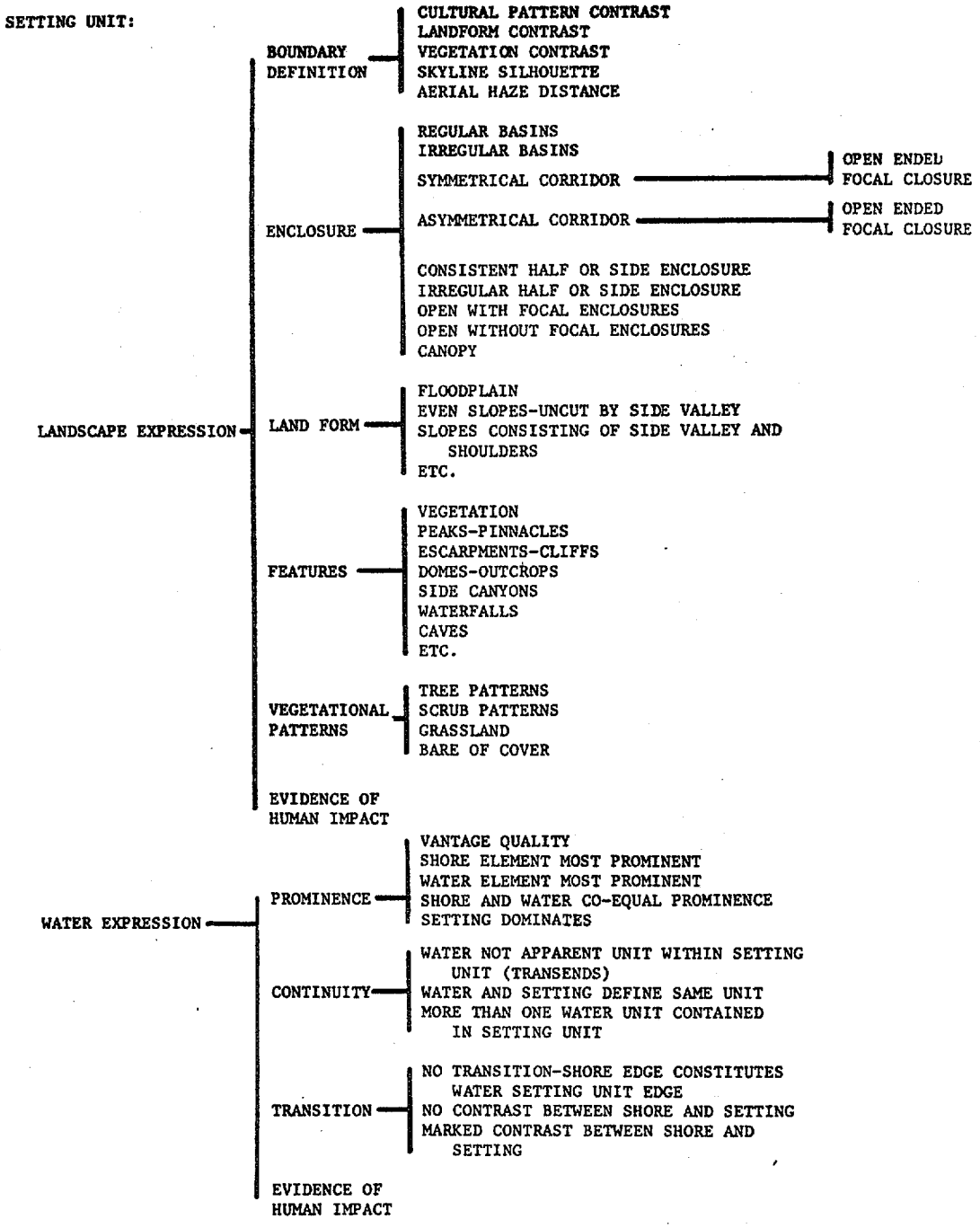
- Aquatic environment: (plants, animals, and fish).

Figure A. Inventory Review Sheet--Landscape Unit



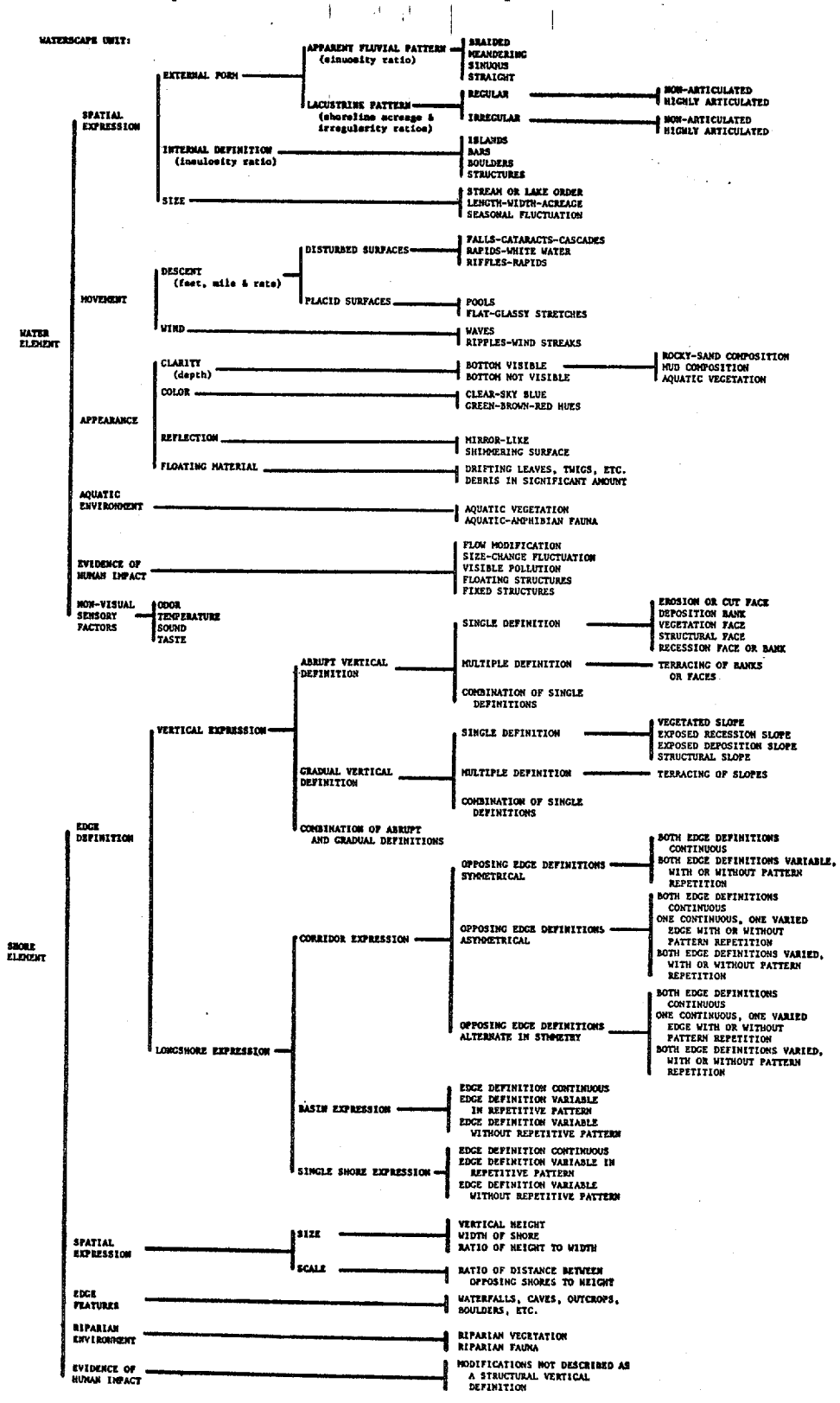
FROM: LITTON, TETLOW, SORENSEN & BEATTY (1974)

Figure A. Inventory Review Sheet--Setting Unit



FROM : LITTON, TETLOW, SORENSEN & BEATTY (1974)

Figure A. Inventory Review Sheet--Waterscape Unit



FROM: LITTON, TETLOW, SORENSEN & BEATTY (1974)

b- Shore elements:

- Edge definition: (horizontal is a long shore demarcation running parallel with the water edge, vertical is a cross shore demarcation perpendicular to the junction between land and water).

- Spatial expression: (as a function of the distance between an opposing shore and the height of the vertical shore face).

- Edge features: (highlights or discontinuities which assume importance in their relationship to commonly encountered shores (USNPS, 1968).

- Riparian environment: (linear demarcation of streams or water, especially, general assessment of the shoreline and riparian visual aspects and vegetative pattern).

- Human impact: (docks, excavations, buildings, etc.).

Environmental design values, criteria and area analysis

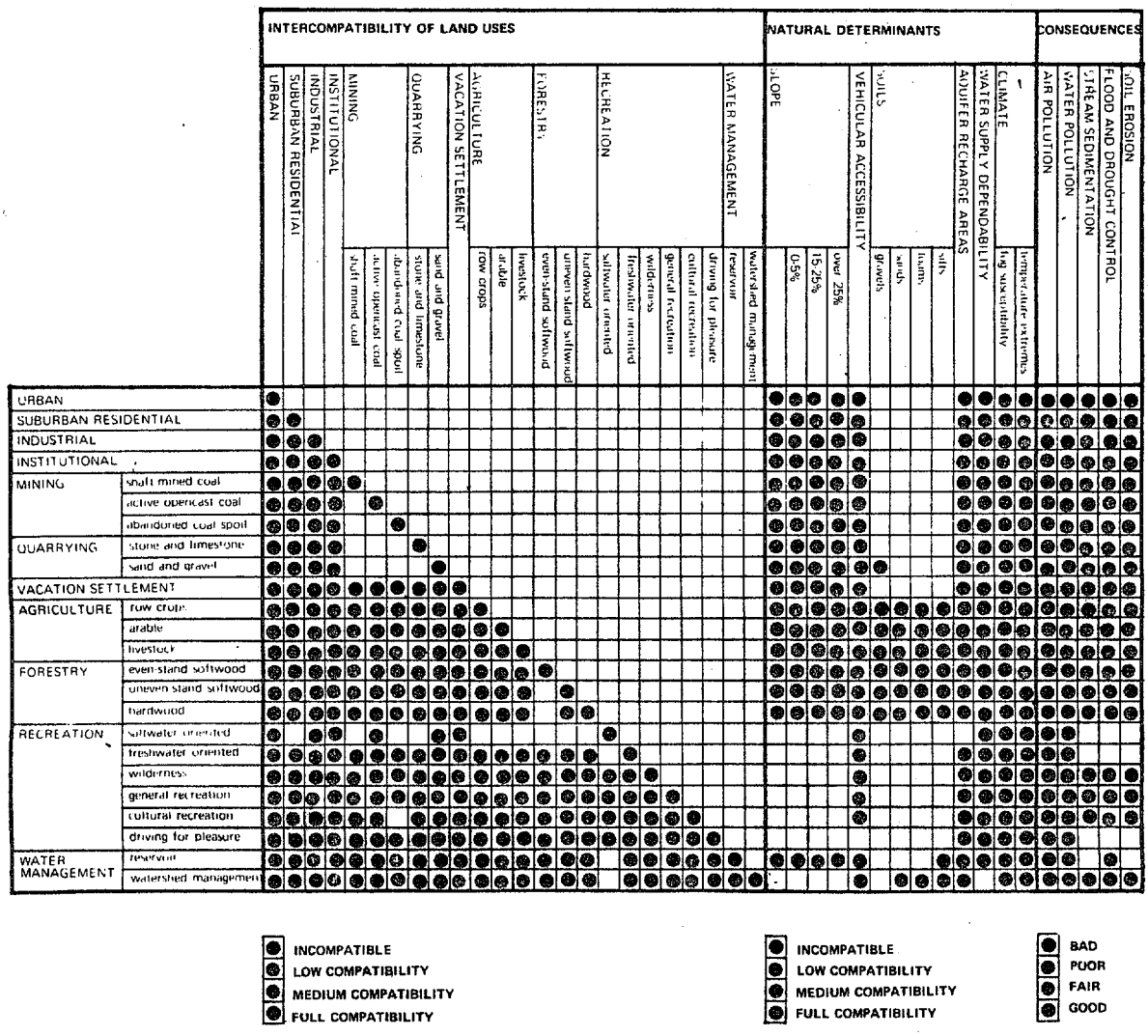
There is a body of extensive research concerning environmental design values and criteria applied to area analysis. Since coastal areas are the primary locations of a number of activities competing for space and water accessibility, the applicability of design methodologies which incorporates conflict analysis is particularly promising for CZM purposes.

1. McHarg's approach (spatial association of variables)

McHarg's approach (1969) consists of the application of environmental values to area study and the preparation of maps which spatially represent variations in intensity of given values (e.g. scenic values, recreation values, wildlife values, etc.). The series of maps depicting several variables expressing these values are overlayed to generate a composite map of all environmental values. This is a process of spatial association of phenomena and regionalization and definition of boundaries depicting areas of phenomenon intensity variations.

2. Alexander's approach (hierarchical decomposition of a design problem)

Alexander's approach (1962) is similar to McHarg's but it formalizes a



DEGREE OF COMPATIBILITY

Optimum Multiple Land Uses

FIG.A

From: Ian L. McHarg, Design with nature, The Natural History Press, Garden City, New York 1969

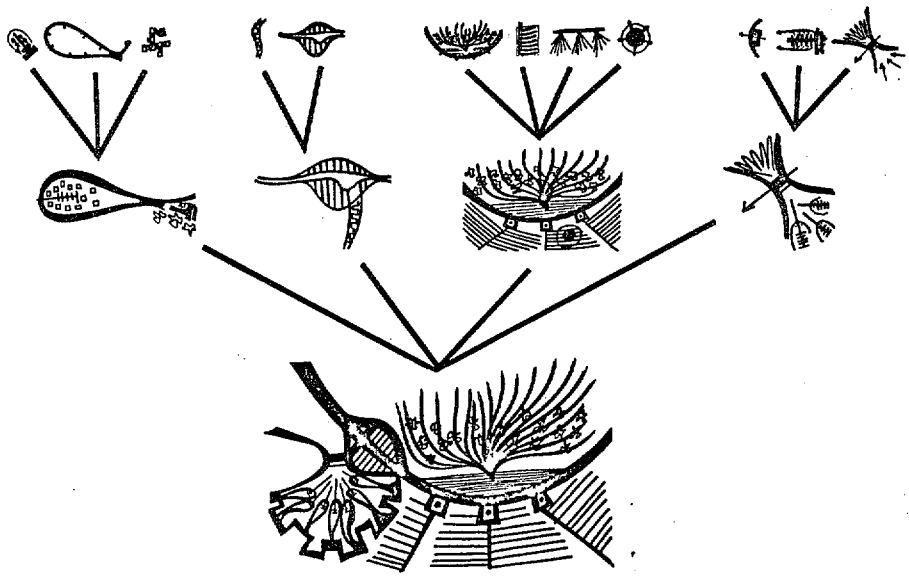


FIG.A

"The tree of diagrams" for "the determination of components for an Indian Village"

From: Christopher Alexander, Notes on the synthesis of form, Harvard University Press, Cambridge, Massachusetts 1968

process which utilizes a computer program to establish a hierarchy and priority in the examination of the variables under consideration. Alexander's application is mainly concerned with:

- identification of a list of requirements that a given project must meet;
- identification of the conflicts among these requirements;
- establishment of a hierarchy for the examination of the conflicts called a "tree";
- application of the McHarg overlays mapping technique to generate composite maps at each branching out of the "tree";
- establishment of the criteria that requirements with high conflicts should be tackled first;
- decomposition of the systems of requirements in subsystems to be accomplished so that the information transfer between subsystem is at a minimum.

Actions which threaten or impede achievement of this management purpose

A procedure for evaluating environmental impacts has been developed by Luna and others (1971) for the U.S. Geological Survey. It consists basically of a condensation of several considerations utilized in Environmental Impact Statements (EIS). The purpose of this work is to "identify and develop methods and procedures which will ensure that presently unquantified environmental amenities and values are given appropriate considerations". In a tabulation matrix, the columns represent "proposed actions which may cause environmental impacts" and the rows represent "existing characteristics and conditions of the environment". The user of the matrix should attempt the following tasks:

1. Identify all actions that are part of the proposed project.
2. Relate identified actions to the existing characteristics or conditions of the environment.

3. Indicate the numerical scale of the magnitude of the possible impact (scale from 1 to 10 in the upper leftcorner of each cell).

4. Place a + when the impact would be beneficial.

5. Indicate the importance of the possible impact (e.g. regional versus local in the lower right end corner of each cell).

The proposed actions which may cause environmental impacts are:

- modification of regime;
- land transformation and alteration;
- resource extraction;
- processing;
- land alteration;
- resource renewal;
- change in traffic;
- waste emplacement and treatment;
- chemical treatment;
- accidents;
- others.

Existing characteristics and conditions of the environment include:

- physical and chemical characteristics: (earth, water, atmosphere, and processes);

- biological conditions: (flora and fauna);

- cultural factors: (land use, recreation, aesthetic and human interest);

- cultural status and man-made facilities and activities;

- ecological relationships.

Aesthetic and human interests include:

- scenic and vistas;
- wilderness qualities;
- open space qualities;
- landscape design;
- unique physical features;
- parks and reserves;
- monuments;
- rare and unique species or ecosystems;
- historical and archaeological sites and objects;
- presence of misfits.

The use of this matrix assures the analysis of any action in terms of its impact on scenic and aesthetic resources. The process by which actual actions which are more prone to the disruption of scenic quality are identified will entail the use of the criteria emerging from the other environmental studies.

Policies relating to environmental design methodology

1. Visual and aesthetic qualities of environmental objects

The State should prepare a guideline manual to be made available to agencies in charge of plan and project reviews and approvals in coastal areas. Included would be a detailed list of qualities of the environmental objects to be protected and enhanced. The manual should be based on the environmental design research analyzed in this report and on the findings of the County general plans.

Developers should be encouraged to utilize the manual in the preparation of their plans.

2. Establishing a classification system of environmental and landscape elements

The State should establish a unified claissification system of natural, environmental and landscape elements and characteristics relating to scenic beauty. This classification system should be utilized in statewide and countywide analysis of coastal areas and it should be a component of County general plans and private developer plans.

3. Establishing a classification system of urban structure and form

The Counties in the preparation of general plans and development plans in urban districts should explicitly utilize a unified urban design description and classification of man-made structures, including indicators of bulk, height, density, envelopes, density, activity and form congruence and the like.

4. Adoption of urban design methodology in coastal planning

The State should fund a prject to explain how the hierarchical decomposition of a design problem in subproblems should be undertaken. The General Plan should include the "tree diagram" for the determination of design component of the development plan.

5. Utilization of urban design in Environmental Impact Statements

Environmental Impact Statements (EIS) should include urban design considerations so that the effect of a project or structure is analyzed against the descriptive classification of environmental and landscape elements, the classification of urban structure and form elements, and urban design methodology.

IV - SURVEY OF ENVIRONMENTAL DESIGN RESEARCH IN THE STATE OF HAWAII

Introduction

A number of State and County reports provide useful methodologies and inventories for scenic resource management and preservation.

This survey acknowledges the past works done in Hawaii and identifies the specific aspects which may be used in CZM protection of scenic resources in terms of the following points:

- inventory of sites and locations;
- survey methodology of the sites;
- design methodology for the location of man-made structures and alterations on the sites;
- suggestions on legislative measures and management mechanisms;
- people and scenic beauty;
- analysis of development impacts;
- master plan goals and objectives.

Inventory of Sites and Locations

The State of Hawaii Comprehensive Recreation Plan (SCORP) contains a Revised Inventory and Evaluation of Recreation Resources which, coupled with the Hawaii's Treasures' 500 photos and site location maps, provides much of what is needed at the state level for identification of locations and sites. An updating of the survey would establish whether man-made alterations have been undertaken utilizing environmental design guidelines.

The State of Hawaii Open Space Plan provides a Molokai map with the location of scenic districts. Several other reports describe scenic sites and locate them on maps. An updated inventory of scenic sites would com-

pare the available reports and cross-check scenic sites.

The survey should contain the site's photographs, maps and a description as to accessibility, ownership, vistas, lookouts, observation points and scenic corridors. Particular attention should be paid to the difference between scenic sites already in recreation and conservation zones and other scenic sites which need to be protected from development or made available to the public.

Each site and location should be analyzed in terms of legislation and other measures needed to make it available to the public. In this manner, a systematic picture can be constructed of available and/or needed sites, and the requirements for their protection.

Survey Methodology of the Site

The reports reviewed in our study present different approaches to site surveys. A distinction must be made between state-wide reports and county-wide reports and, between the identification of scenic districts and their boundaries and identification of site characteristics. Useful reports for this purpose are Overview, SCORP, and the Kauai and Hawaii County General Plans. A second distinction concerns the several subcounty "planning area" studies and the differences in survey methodology and information provided.

The Open Space Study (Overview Report) appears the most useful for the identification of districts. The SCORP report is the most valuable for the identification of sites characteristics, plan solutions, and program recommendations. The Kauai General Plan explicitly locates scenic sites on the general plan maps. This task is consistently undertaken in the Kauai North Shore Planning Area where detailed symbols including "view points" describe the historic scenic and recreation resources of the site. The Maui Wailuku-Kahului General Plan adopts a similar detailed description and identification

of sites on maps which include 'vista and scenic observations.' The Maui Beautification Study, Island of Maui and Molokai, provides a mapping of the visual environment characteristics. The Koloa-Poipu Urban Design Study for Kauai discusses possible design improvements for each site.

It should be advisable to make a statewide attempt to establish a unified site survey procedure to be utilized by State and County agencies when undertaking studies for the protection of scenic resources. This could be done by selecting from the available research, the best elements to create a composite site-inventory methodology. This unified methodology would ensure comparability among sites located on the different islands, facilitating priority ranking and analysis of unified management solutions.

Design Methodology for the Location of Man-Made Structures and Site Alterations

The scenic sites must be protected from man-made encroachments; not all the sites are necessarily located in conservation districts. It is crucial that environmental, landscape and design criteria be utilized in controlling and guiding development. The scenic resources survey, visual structures maps, and the development plan of the Kauai Northshore Report are an approach to this methodology. Particularly useful in the Kauai Northshore Report are the development plans and design controls plans for each town and shoreline areas. These plans identify special treatment and preserve districts, access points, public access, view lines and permanent tree and grass groves and masses, building setbacks and building limits.

The Hilo Downtown Development Plan utilizes the building envelope approach to define the maximum building height in number of stories and the view corridors from the shoreline to the city landmarks.

The West Hawaii Corridor Study and the Urban Design Study Koloa-Poipu

Area, respectively, on Hawaii and Kauai propose approaches to highway location and scenic drive implementation.

Environmental design methodology is needed for open space area protection and urban design methodology is needed for urbanized shoreline development. Both should be priority objectives of CZM. The survey methodology proposed in this report, with the above selected approaches provides a methodology to identify scenic areas, lookouts, landmarks and views corridors.

Suggestion on Legislative Measures and Management Mechanisms

Greater integration of DPED, DLNR, LUC, DOT, PUC, as proposed in recommendation two of the Overview report, would facilitate the protection of scenic resources at the State level. That recommendation provides for inter-agency coordination, plan formulation, effectuation and effectiveness. In general, all the other recommendations strengthen the attainment of quality growth and the protection of scenic resources. In fact, recommendation three provides for shoreline setback of twenty to forty feet and for the adoption of the criteria of incremental performance in granting boundary changes. Recommendation four, concerning SCORP, suggests the establishment of Special Scenic Districts and to confirm all implied easements which constitute rights-of-way to mountain and shoreline areas. Recommendation five, six and seven provide for financing the acquisition and protection of open space, and for citizen input.

SCORP recommendations on recreation planning suggests DLNR as a clearinghouse for recreation planning with authority over shorelines areas now held by DOT. The recommendation on roles and responsibilities suggests that the County should have primary responsibility on the shoreline, the State should assist in large park developments. Federal agencies with jurisdiction over land and water conservation should coordinate with local

agencies to serve recreational needs in a multiple-use context. It also suggests that the recreational use of military lands be promoted through a joint civilian-military panel. The recommendation on recreation development suggests the provision of scenic roads, trails, bikeways, and streambelts as the connecting network of the state park system. In addition, it suggests the creation of "wilderness reserves" and "shoreline reserves" to secure open space and scenic sites for future recreation needs.

All the County reports indicate the County ordinance as a measure to protect scenic resources and vistas from becoming obstructed. The Development Restriction Zones (DRZ), Open Space Zone (OZ) and the Special Treatment Zone (STZ), provided by the County of Kauai, will help in the protection of scenic resources. In particular, this is done through the utilization of tridimensional models and the master development site plan defined by the Visual Structure Map, Scenic Resource Map, Development Plan, and the Design Control Plan. The Makena, La Perouse, Wailuku, and Lahaina Areas Study on Maui suggests that for properties contiguous to public land no bonus in terms of the permitted density would be possible.

The West Hawaii Project suggests the adoption of conservation subzones and the adoption of landmarks, open space, shoreline and scenic drive legislation. The Maui Beautification Study suggests the utilization of Island Beautification Committees, and the identification of Federal programs which may assist the implementation of the beautification budgets administered by HUD, and BPW.

The Honolulu City and County Ordinance (not discussed in this section) for the protection of Diamond Head is most related to the survey procedure suggested in our study as it identifies observation points and landmarks

for establishing view corridors. These observation points are represented by the most travelled roads and the most densely populated areas.

People and Scenic Beauty

The SCORP Household Survey provides information on people's attitudes for site utilization and information on scenic beauty as a reason for outings. A detailed study on people's attitude toward beauty and the utilization of scenic site is required. In addition, there is needed a survey of open space oriented and outdoor recreation groups such as: bicycle organizations, hunting, skiing, horse riding, hiking, bird watching, surfing clubs and others, including tourists organizations, to provide an in-depth picture of the psychological needs for natural beauty, and the present and potential varieties of scenic utilization of the sites.

The Overview recommendations, which provides for individuals and/or organizations to intervene in boundary reviews, to initiate land boundary changes, and to file suits to preserve environmental values and enforce strong pollution standards, indicates a way to implement strong citizen input in the decision-making process for scenic beauty protection.

The utilization of County Beautification Committees with strong citizen input and mandatory reviews of development in Development Restriction Zones, Open Space Zones, Special Treatment Zones, and Scenic Districts would also provide citizen input at the County level.

Analysis of Development Impact

It is not possible to analyze the impact of development upon scenic areas and sites, unless a survey of the areas and sites is at hand to establish the losses of environmental beauty, ecological balance, vistas, views and access to sites. Analysis of development impact should be carried out

as the Hawaii County General Plan suggests, in terms of calculating the additional cost which must be incurred in the process of restoring natural beauty after development has occurred.

What should be mandatory in the analysis of development impact is the application of landscape and urban design principles in the preparation of Environmental Impact Statements, Development Plans, Design Control Plans, and rezoning applications.

The procedures to be adopted would include: the U.S. Geological Survey's suggestions to evaluate environmental impact, McHarg's, Lynch's, and Litton's approaches, the survey methodology suggested in our study and the procedures proposed in the Kauai, Maui Planning Districts Plans.

However, urban design is needed to provide mixed uses, activity integration, higher density, open space, views of the surrounding landscape and pedestrian access to activities and services in urban areas.

This procedure is simply master planning with a strong design component for "human scale" development.

Master Plans Initiatives

The Hawaii and Kauai General Plans are an attempt to incorporate explicit considerations concerning protection of scenic resources. The Hawaii Master Plan describes scenic criteria, scenic areas and sites. The Maui General Plan provides for each planning area, maps with location of scenic sites. Particularly important are the Maui Wailuku-Kahului General Plan and the Kauai North Shore Special Planning Area Plan for the explicit methodology adopted for visual survey, mapping, preparation of development plans, and design control plans.

What is needed is an explicit utilization of environmental and urban design procedures in the preparation of the general plan. While the Hawaii

Plan discusses criteria and guidelines for the recognition of scenic sites and provides a survey for each planning district, the Kauai and Maui Plans go further by relating that type of information to maps, to scenic and visual surveys and to design control plans.

Reviews of the Reports

It is apparent that the advisable methodology of plan-making will be the one that incorporates all three approaches of the cited plans.

1. State of Hawaii Open Space Plan (1972)

Historic, scenic and natural resource preservation is one of the goals of the State of Hawaii Open Space Plan. The identification of districts is undertaken utilizing an overlay methodology with mapping of the following elements:

- topography (selected landforms, mountains, bays, valleys, etc.);
- slope (above 20%);
- vegetation zone;
- surface water;
- ground water/geological constrains;
- shoreline (with characteristics desirable for swimming, diving, fishing, and viewing);
- agricultural suitability.

The natural elements mapped for each island are:

- forest reserves;
- highly suitable lands for agriculture production;
- grazing lands;
- 50" rainfall isohyets;
- permanent water bodies;
- wetlands;
- restricted watersheds;
- fishponds;
- permanent streams;
- selected intermittent streams;
- rivers;
- selected shorelines;
- springs;
- high level imponded water zones;
- slope over 20%;
- natural land marks;
- tsunami inundation zones;
- lava flow lands (selected).

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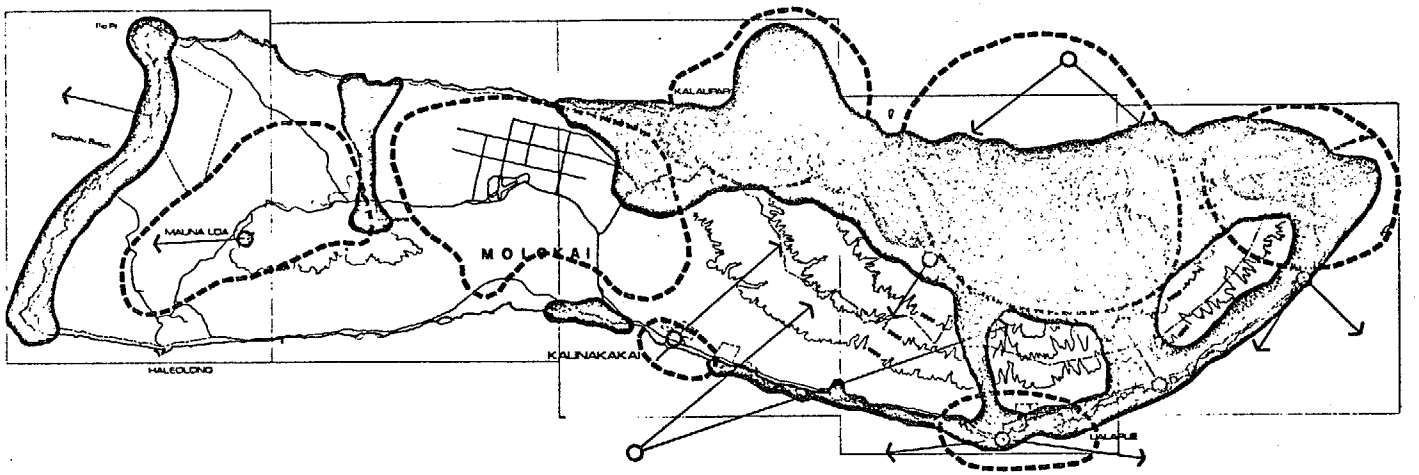
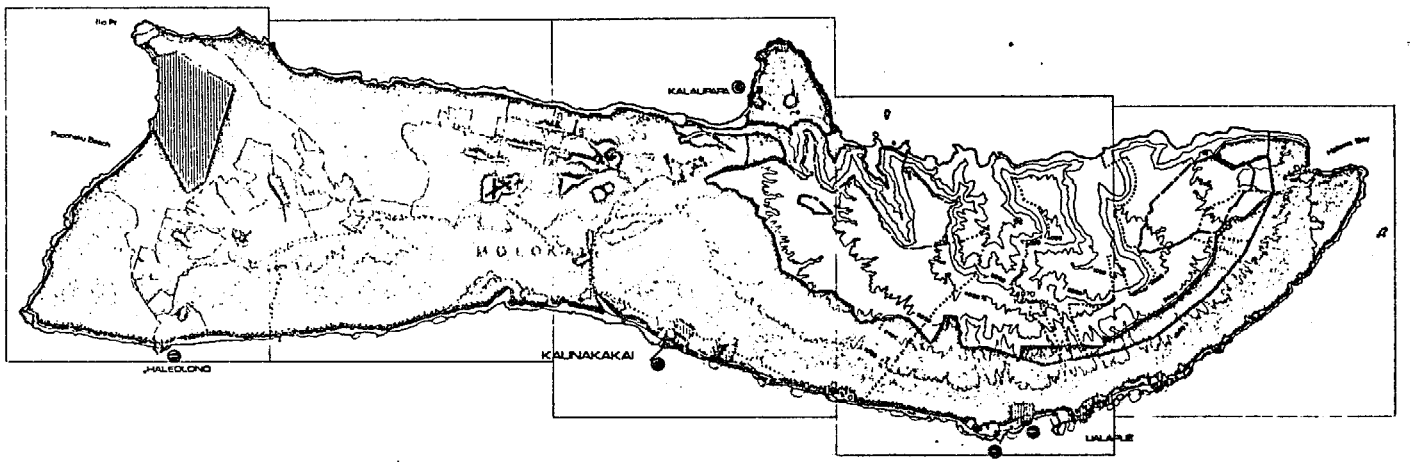
The report confirms that the overlay methodology allows the identification of districts which largely indicate that the old conservation district boundary is well drawn. The report also shows how to create a generalized statewide visual composite survey. The base documents used were DPED's Scenic and Historic Resource Study, Hawaii's Treasures, the Governor's Conference on Natural Beauty, and the Landscape We See.



(1972)

STATE OF HAWAII
COMPREHENSIVE OPEN SPACE PLAN
ISLAND OF MOLOKAI
QUALITY COMPOSITE

- OPED SCENIC AREAS
- SPECIAL EXPANDED AREAS
- EXPANDED SCENIC/QUALITY AREAS
- SELECTED VISTA
- AREA OF SPECIAL INTEREST/ACTIVITY



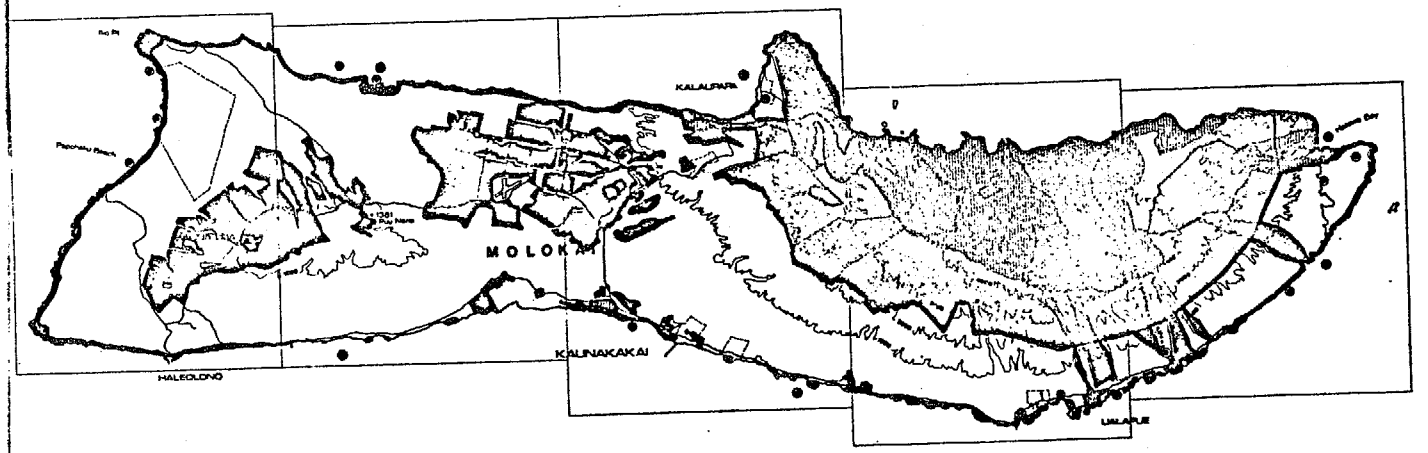
(1972)

STATE OF HAWAII
COMPREHENSIVE OPEN SPACE PLAN

ISLAND OF MOLOKAI

EXISTING LAND USE

- URBANIZED LAND
- VACANT URBAN LAND
- FOREST RESERVE
- RESTRICTED WATERSHED
- HUNTING AREAS
- PARKS & GOLF COURSES
- GRAZING LAND
- CULTIVATED LAND
- MAJOR HARBOR
- BARGE HARBOR
- SMALL BOAT HARBOR
- LAND USED BY MILITARY



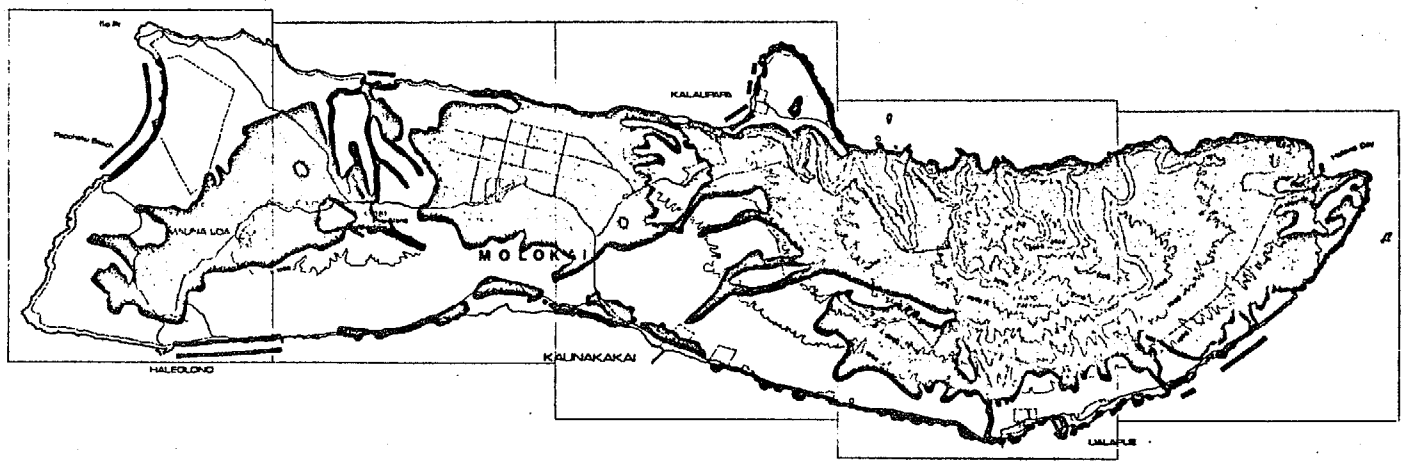
(1972)

STATE OF HAWAII
COMPREHENSIVE OPEN SPACE PLAN

ISLAND OF MOLOKAI

EXISTING & POTENTIAL OPEN SPACE

- EXISTING OPEN SPACE
- POTENTIAL OPEN SPACE
- PLANNED PARK
- PROPOSED PARK
- POTENTIAL OCEAN PARK
- FOREST RESERVE
- RESTRICTED WATERSHED
- HISTORIC & SCENIC SITE
- TRAILS



(1972)

STATE OF HAWAII
COMPREHENSIVE OPEN SPACE PLAN

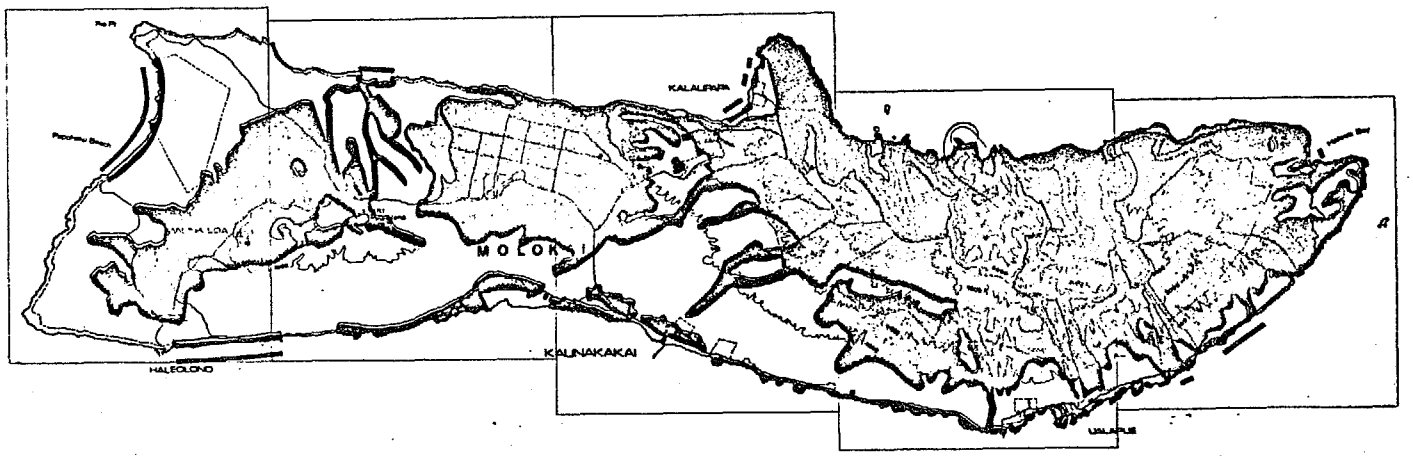
ISLAND OF MOLOKAI

NATURAL COMPOSITE **1**

TOTAL NATURAL

CONSERVATION DISTRICT

URBAN DISTRICT



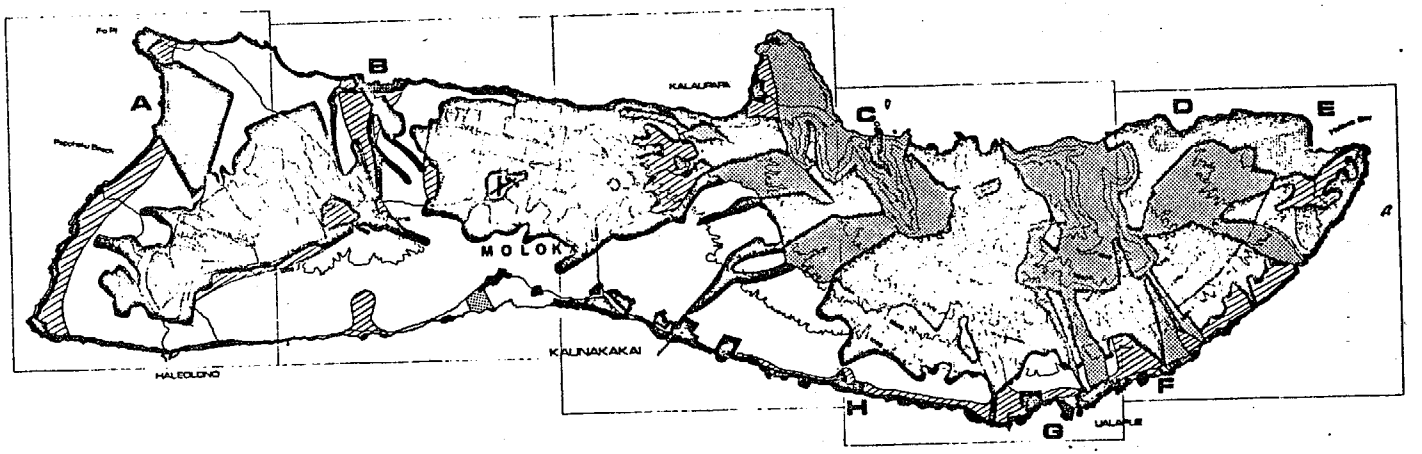
(1972)

STATE OF HAWAII
COMPREHENSIVE OPEN SPACE PLAN

ISLAND OF MOLOKAI

NATURAL COMPOSITE 2

- EXISTING OPEN SPACE
- HIGH NATURAL
- LOW NATURAL
- --- CONSERVATION DISTRICT BOUNDARY
- --- URBAN DISTRICT BOUNDARY



(1972)

STATE OF HAWAII
COMPREHENSIVE OPEN SPACE PLAN

ISLAND OF MOLOKAI
OPEN SPACE PLAN

- EXISTING OPEN SPACE
- TOP PRIORITY FUND FOR ENVIRONMENT
- TOP PRIORITY
- PRIORITY
- SOME VALUE
- ← POTENTIAL ACCESS
- * SPECIAL SCENIC DISTRICTS
- URBAN DISTRICT

2. State Comprehensive Outdoor Plan (1971)

This plan provides a base from which the suppliers of outdoor recreation can assist in providing for the recreational needs of the residents and visitors of Hawaii. It describes the present recreation delivery system, public agencies' responsibility, and jurisdictional conflicts. It indicates substantive policies and provides a statewide recreation plan with guidelines for its maintenance. It also contains an investigation of household needs and demands, suggestions on open space utilization, and a detailed inventory of recreational resources.

The report describes the shoreline resources in terms of usage, ownership, miles, in terms of competition of uses and suggests improvements. One of the improvements suggested is doubling the beach park acreage by expanding existing roads and redesigning them as a series of short scenic, coastline drives, while moving the through traffic on the inland route where feasible.

The survey of the shoreline includes maps and information concerning:

- potential ocean parks;
- existing and proposed shoreline parks;
- site evaluation indicating conditions for:
  - swimming
  - diving
  - surf
  - number of sites
  - area considerations
  - shore considerations.

Shoreline considerations include:

- type of beach;
- physical access from road;
- hazard along the beach;
- legal accessibility;
- availability of supporting facilities;
- use intensity and capacity of shore area.

General considerations discussed include;

- known projects for resort, residential or industrial use;
- existing zoning;
- accessibility to area.

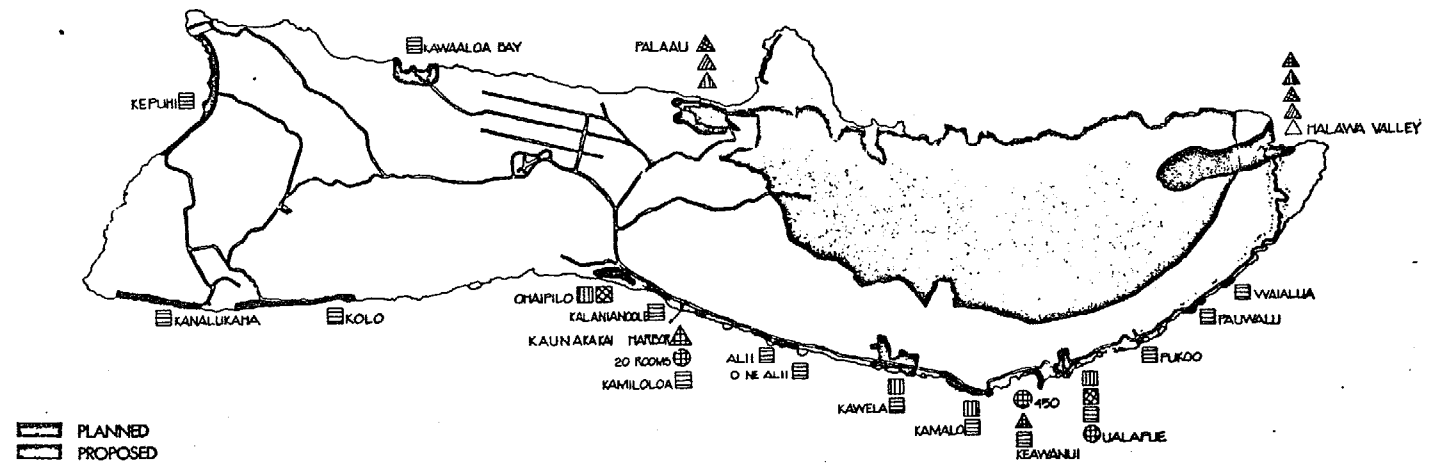
Additional maps illustrate shoreline pollution and access problems.

The report discusses scenic rivers, streams, and trails and suggests the development of streams and greenbelts to be utilized as walking and riding trails on the urban and rural shores. Maps of fish and game, proposed access, potential stream use and hunting areas are provided. The study avails itself of a statewide survey by the Division of Fish and Game.

Hawaii's Treasures constitutes the State of Hawaii Inventory of Natural Scenic Resources. It consists of 500 contact-print black and white photographs filed in three categories: conservation, preservation and recreation areas. The subcategories are as follows:

- conservation areas: wilderness, forest, shoreland, beach, vista, lookout;
- preservation areas: archaeological, historic, plantlife reserve, wildlife reserve, fishlife reserve, rock and soil formation, reefland, landmark;
- recreation areas: scenic road, trail, state park, county park, national park, military park, golf course, resort, harbor, airstrip.

A set of maps showing the location of the sites listed in the report is available for public inspection. The SCORP Revised Inventory and Evaluation of Recreation Resources provides the name of the facility and the judicial district, administering agency, acreage, B.O.R. Classification, significant features (including scenic beauty and facilities, activities, programs and evaluations).



PLANNED
PROPOSED
FOREST RESERVE
MILITARY
EXISTING SHORELINE PARK

SPONSORING AGENCY
FEDERAL
STATE
COUNTY
PRIVATE

DEVELOPMENT TYPE
BEACH PARK
BEACH RESERVE
HISTORIC
CAMPING
RESORT, HARBOR
INLAND PARK
SCENIC ROAD

CURRENT RECREATION PROPOSALS

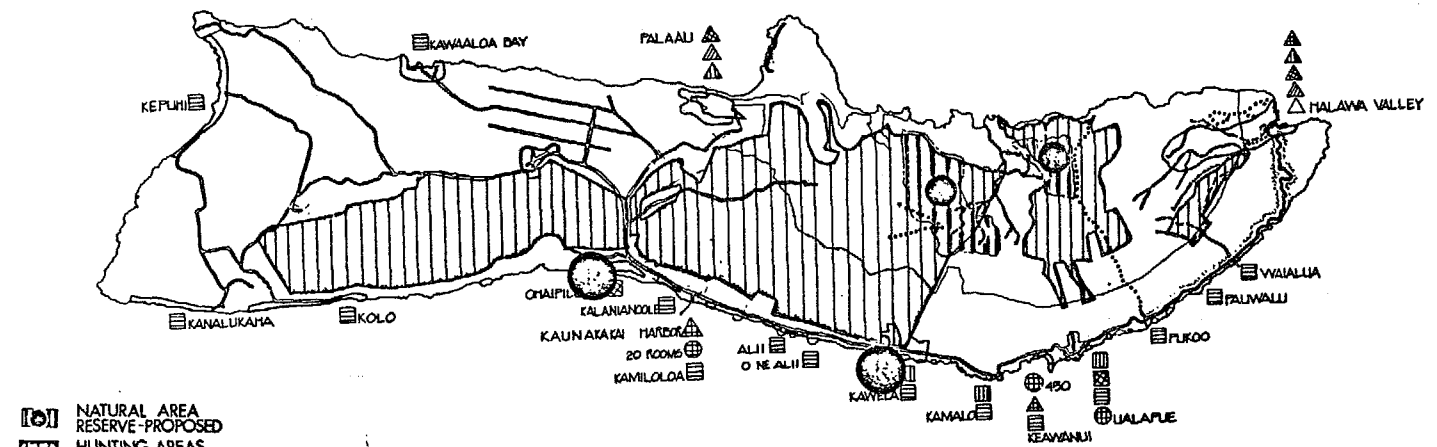
SCORP, 1971 ISLAND: **MOLOKAI & LANAI**

DEPARTMENT OF PLANNING & ECONOMIC DEVELOPMENT

PREPARED BY: MARSHALL KAPLAN, GANS, KAHN, and YAMAMOTO

0 ½ 1 2 4 6
SCALE IN MILES

SOURCE: HAWAII'S SHORELINE, 1965
STATE LAND USE REVIEW, 1969
STATE AND COUNTY CIP's, 1971-1976
STATE AND COUNTY GENERAL PLANS
STATE PARKS MASTER PLAN, 1962
NATIONAL PARK MASTER PLANS



NATURAL AREA RESERVE-PROPOSED
HUNTING AREAS
POTENTIAL STREAM USE
PROPOSED ACCESS
EXISTING TRAILS
FRESHWATER FISHING
WILDLIFE RESERVE-PROPOSED

FISH AND GAME AREAS
MOLOKAI
SCORP, 1971 ISLAND: **& LANAI**

DEPARTMENT OF PLANNING & ECONOMIC DEVELOPMENT

PREPARED BY: MARSHALL KAPLAN, GANS, KAHN, and YAMAMOTO

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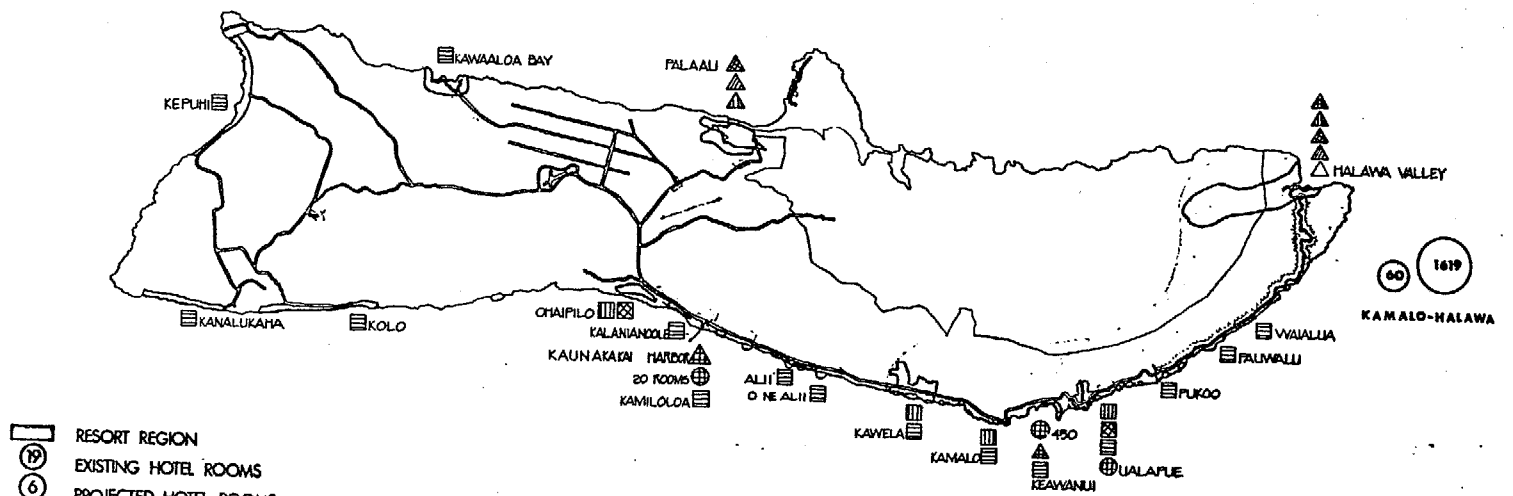
SCALE IN MILES



RESORT REGION

(19) EXISTING HOTEL ROOMS

(6) PROJECTED HOTEL ROOMS

RESORT DEVELOPMENT

SCORP, 1971 ISLAND: MOLOKAI & LANAI

DEPARTMENT OF PLANNING & ECONOMIC DEVELOPMENT

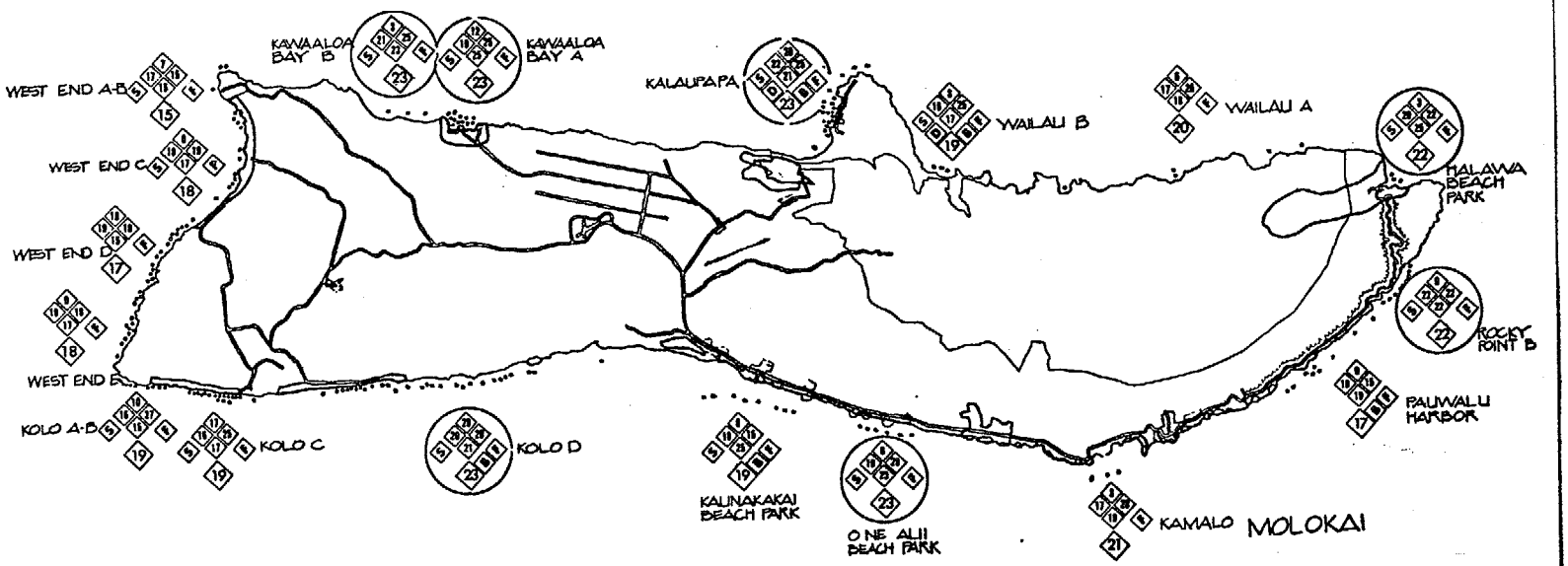
PREPARED BY: MARSHALL KAPLAN, GANS, KAHN, and YAMAMOTO

0 ½ 1 2 4 6

SCALE IN MILES

SOURCE: HAWAII VISITORS BUREAU

28



POTENTIAL OCEAN PARK

EXISTING SHORELINE PARK

PLANNED SHORELINE PARK

SURF SITE INVENTORY AND EVALUATION

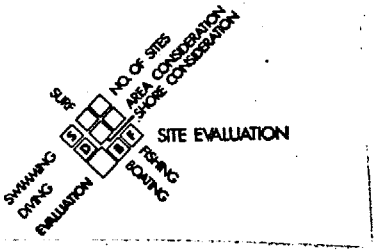
MOLOKAI

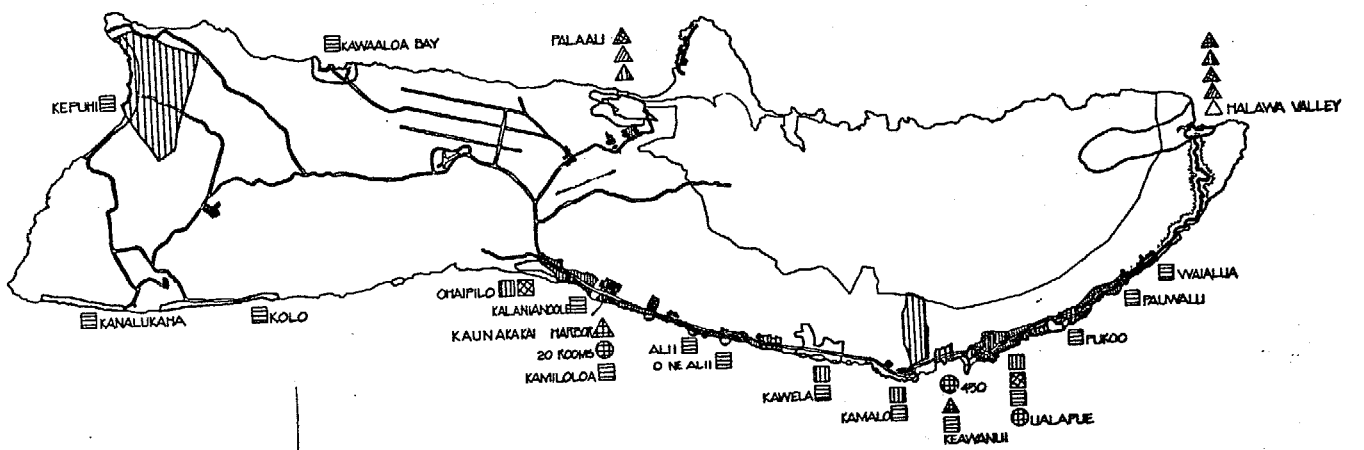
SCORP, 1971 ISLAND: **& LANAI**

DEPARTMENT OF PLANNING & ECONOMIC DEVELOPMENT

PREPARED BY: MARSHALL KAPLAN, GANS, KAHN, and YAMAMOTO

SCALE IN MILES 0 ½ 1 2 4 6





EXISTING URBAN AREA
PROPOSED PRIVATE DEVELOPMENT
STATE URBAN DISTRICT, 1969

FUTURE GROWTH AREAS
SCORP, 1971 ISLAND: MOLOKAI & LANAI

DEPARTMENT OF PLANNING & ECONOMIC DEVELOPMENT

PREPARED BY: MARSHALL KAPLAN, GANS, KAHN, and YAMAMOTO

0 ½ 1 2 4 6
SCALE IN MILES

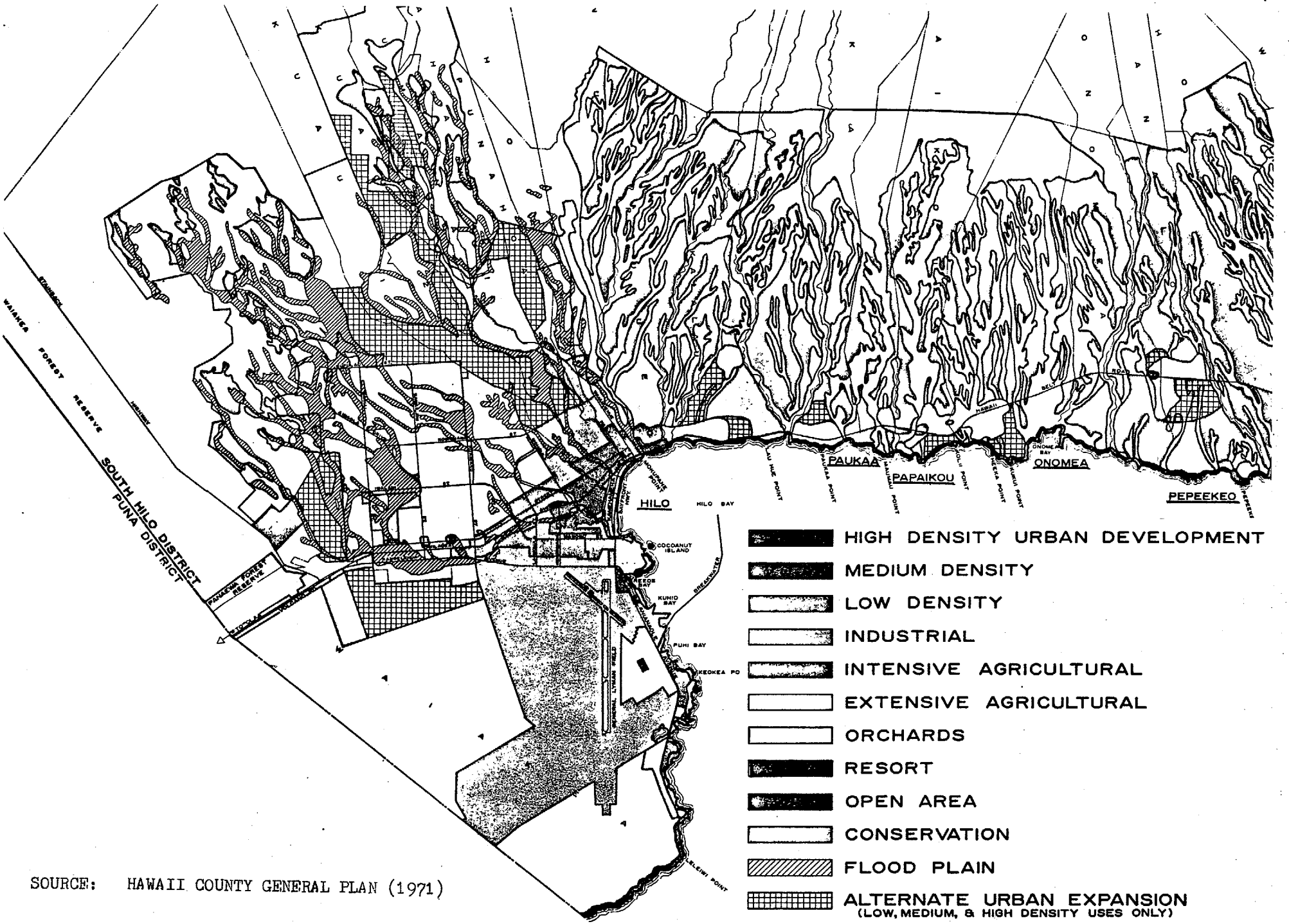
SOURCE: STATE LAND USE REVIEW, 1969
COUNTY GENERAL PLANS
COUNTY PLANNING DEPARTMENTS

3. Hawaii County General Plan (1971)

The Hawaii County General Plan explicitly analyzes natural beauty, natural resources, shoreline and historic sites and states general goals, policies and criteria to be applied in site preservation. Each district is briefly described in terms of its own resources and features. Locations of specific sites with tax key identification numbers are provided together with an indication of the natural beauty the site represents (e.g. spring, waterfall, pond, shoreline, etc.).

The Plan recognizes that Hawaii's natural beauty is a function of a variety of different environments which are determined by elevation, relative location, geologic origin and age. The methodology suggested in our report for the identification of scenic districts is based on the same concept. The Plan indicates that present regulations to protect extraordinary vistas and sites of natural beauty are inadequate, while the cost of restoring natural beauty is greater than the cost of protecting it. The Plan suggests that zoning and subdivision ordinances should protect scenic beauty. One of the Plan goals is to protect scenic areas and scenic vistas from becoming obstructed. The related policies consist of establishing view plan regulations to preserve scenic landscape vistas from specific locations, and of providing design criteria for development reviews. The standards used as guidelines for designation of sites and vistas are:

- distinctive landforms and landmarks;
- coastlines of striking contrast;
- front yard vistas of distinctive features;
- natural or native vegetation;
- areas which are harmoniously developed and enhanced by man.



SOURCE: HAWAII COUNTY GENERAL PLAN (1971)

4. Kauai General Plan (1970)

The Kauai General Plan explicitly states as goals, the protection of scenic and historic resources of the ecosystems and the need for the development of an open space plan for the recognition of the landscape beauty. The implementation program calls for the establishment of a comprehensive zoning ordinance including provisions for:

- Development Restriction Zones (DRZ) which include the shoreline, tsunami, flooding and drainage areas, watersheds, low bearing soil capacity and steep slopes.

- Open Space Zones (OSZ) for the protection of unique physical characteristics and natural and man made resources.

- Special Treatment Zones (STZ) for regulating the development within historic and cultural areas, for the redevelopment of built-up areas and for coordinating community design of large, private and multi-ownership areas.

- Rewriting special sections of the Subdivision Ordinance in order to deal with land development and parceling in the above mentioned areas.

- Establishing design control regulations by subjecting land development in the above cited areas to design reviews by appointed design commissions.

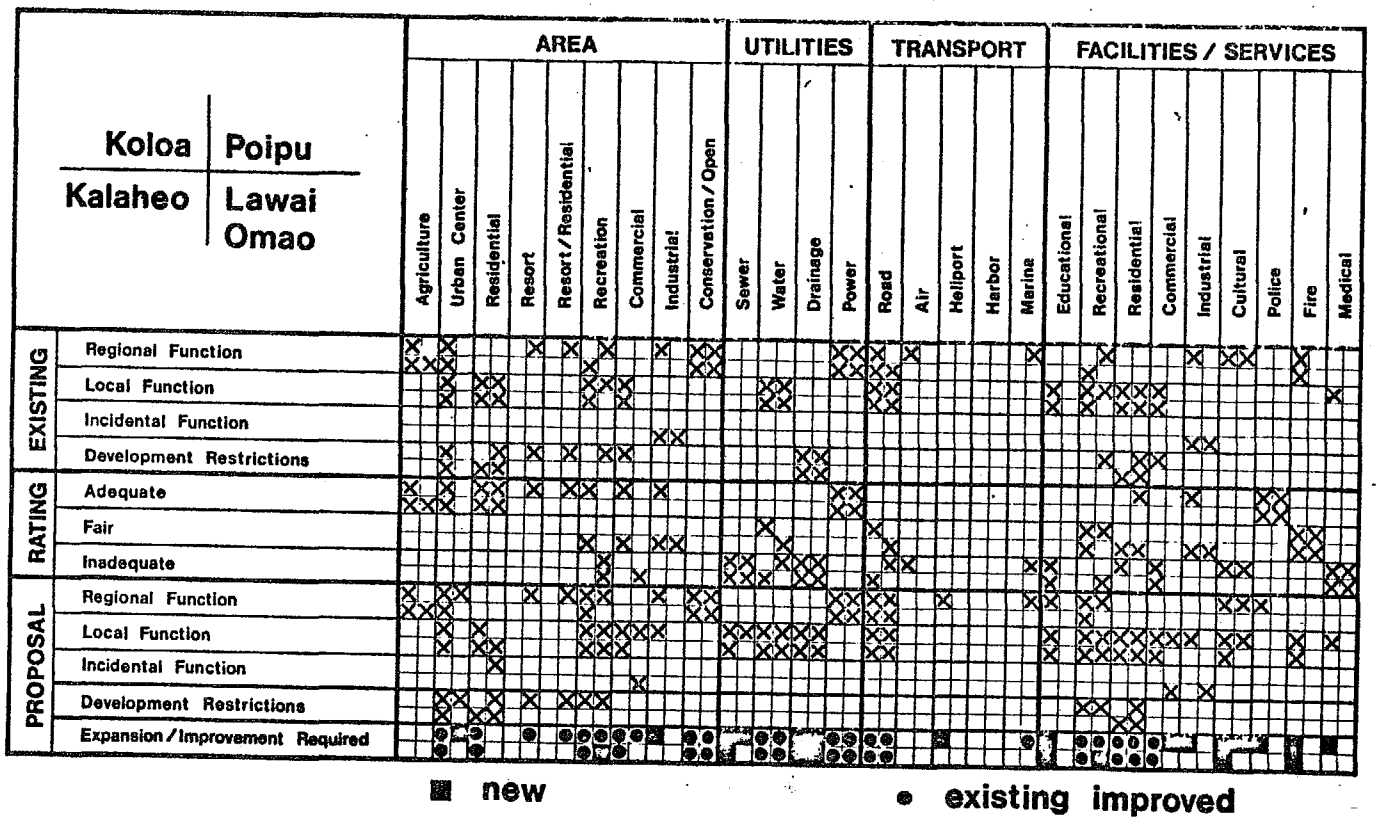
  The review would include:
  - organization and location of projects;
  - form and mass specification;
  - height, land coverage and landscaping;
  - relation to public structures and amenities.

- Establishing a system of landscape control, to be exerted by design consultations and reviews, defined in 7 points ranging from utilities, roads and parking, to lighting, signs, planting, noise and wind.

The Planning Areas and Maps identify sites of scenic, historic and cultural significance. The Public Reviews should make use of the following planning tools:

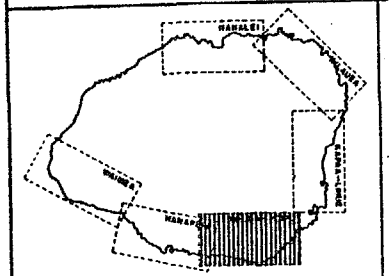
- Master Base Scale Models (tridimensional);
- Scale Models;
- Master Development Site Plans (MDSP);
- Full Textual Explanation (FTE).

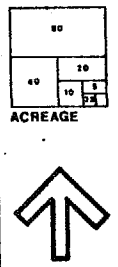
The critical design areas are constituted by the above defines zones (DRZ, OZ, STZ) and all the recreation areas, parks, publicly-owned lands, and any other zone stated by the County. Finally, detailed rules and regulations are provided for public display.



SOURCE: ECBO, DEAN, AUSTIN, & WILLIAMS AND MURODA, TANAKA & ITAGAKI, INC. (1970)

KOLOA-POIPU PLANNING AREA





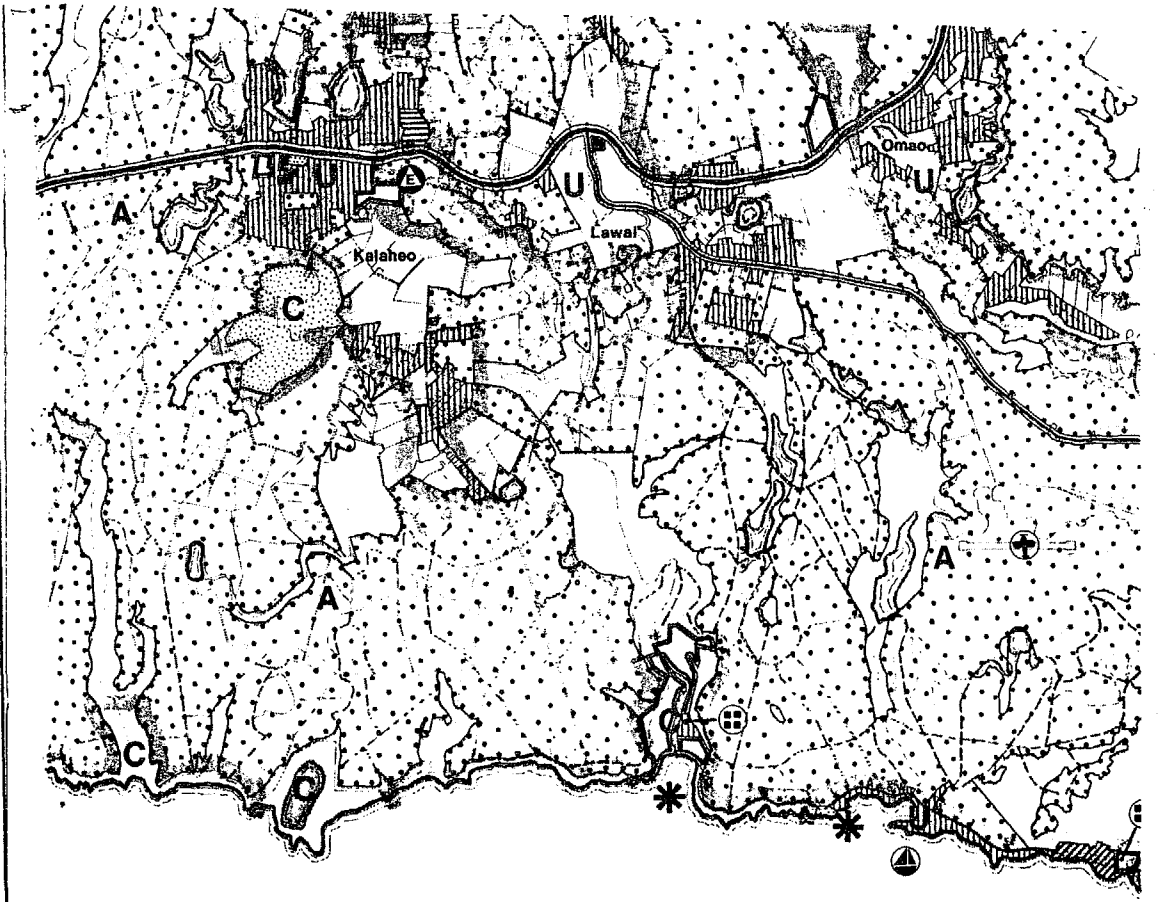
EXISTING LAND USE

- Residential
- Resort
- Commercial
- Public
- Mixed
- Arterial Road
- State Land Use District Boundary
- Industrial
- Park
- Agriculture
- Military
- Open
- Collector Road
- State Land Use District (A)

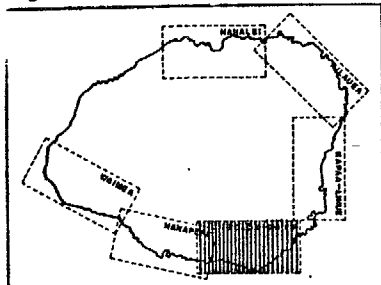
- Government Office
- Elementary School
- High School
- Community College
- Community Center
- Mill/Cannery
- Hospital/Clinic
- Fire Station
- Power Plant
- Historic/Cultural
- Scenic Site
- Sports Complex
- Major Airport
- Airstrip
- Heliport
- Deep Water Harbor
- Small Boat Harbor

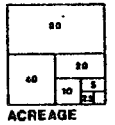
MARCH 14, 1970

SOURCE: EDAW AND MTI (1970)



KOLOA-POIPU PLANNING AREA

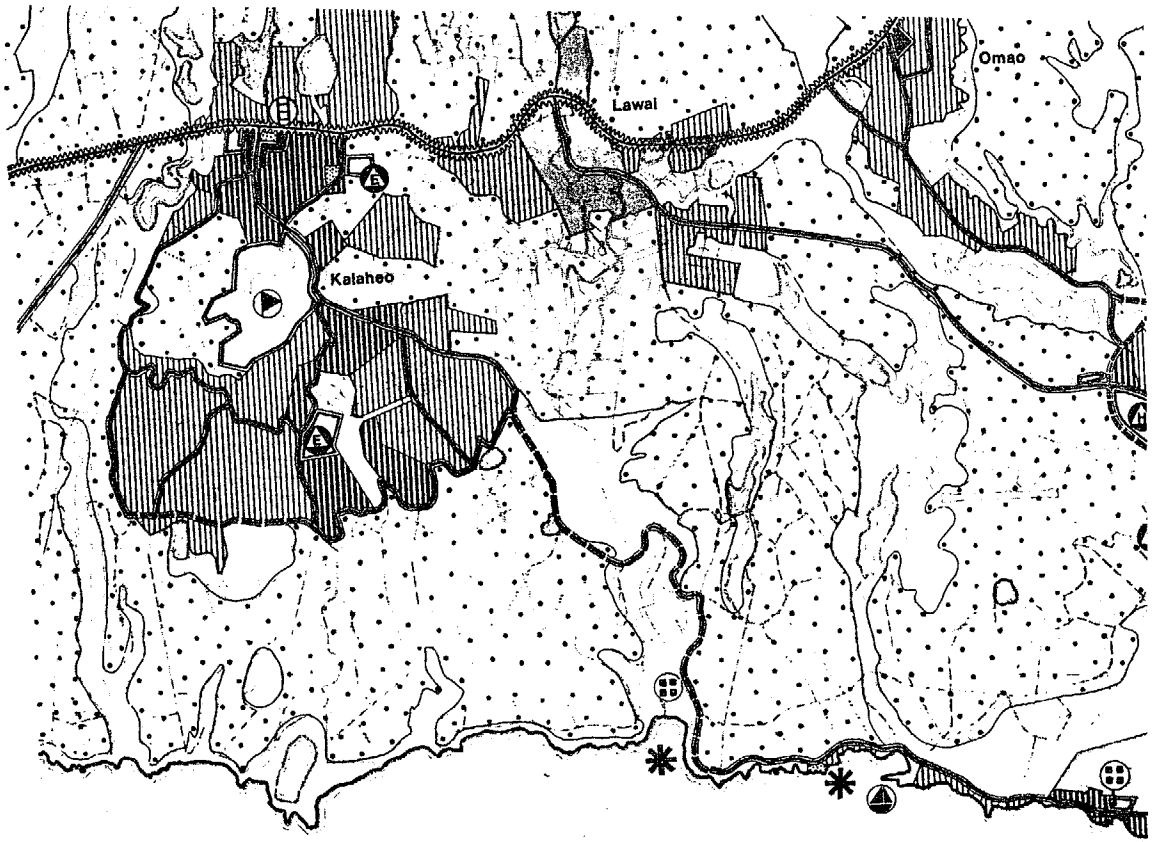




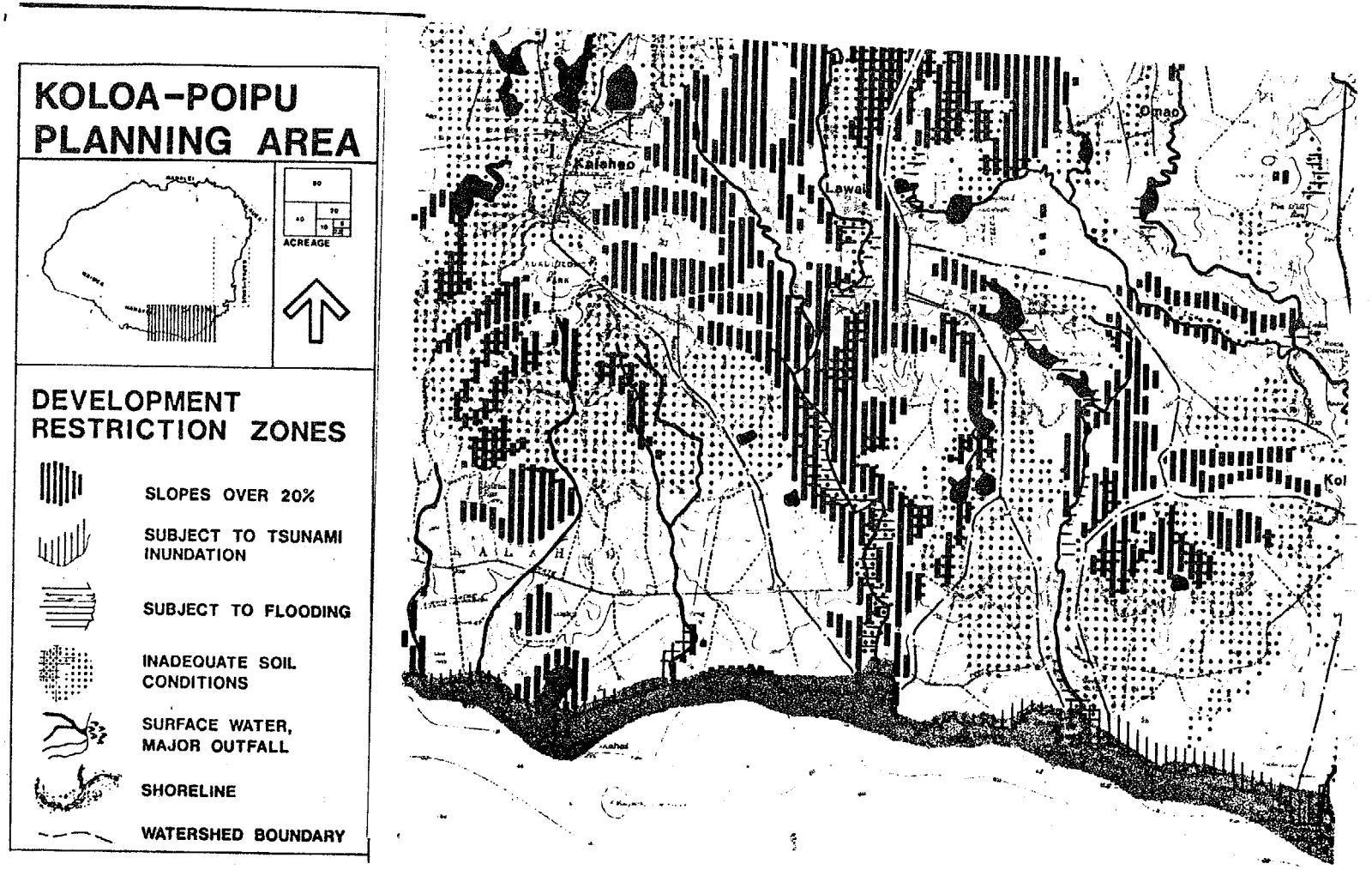
GENERAL PLAN

- Residential Sfd
- Residential Mfd
- Resort
- Park
- Commercial
- Agriculture
- Public
- Military
- Scenic Road
- Open
- Existing Road
- Proposed Road
- Project District
- Industrial
- Government Office
- Hospital/Clinic
- Major Airport
- Elementary School
- Fire Station
- Airstrip
- High School
- Power Plant
- Heliport
- Community College
- Historic/Cultural
- Deep Water Harbor
- Community Center
- Sports Complex
- Small Boat Harbor
- Mill/Cannery
- Scenic Site
- Golf Course

MARCH 14, 1970



SOURCE: EDAW AND MTI (1970)



SOURCE: EDAW AND MTI (1970)

5. Kauai North Shore Special Planning Area (1972)

This report recommends the adoption of an ordinance to make Development Plans and Design Control Plans, the official maps for regulating land development and use within the North Shore Special Planning Area. The intent of the ordinance is to define the exceptions, modifications and/or additions to the Comprehensive Zoning Ordinance and the Subdivision Ordinance that are necessary to respect the unique physical and social characteristics of the North Shore.

The elements of the ordinance include:

- The Development Plans
- The Design Criteria Plans
- Amendments to the County Zoning Maps
- Special zoning, development and use regulations
- The establishment of a North Shore Improvement Committee as a citizen review mechanism.

The major provisions are:

- Permission to increase density in return for park dedications
- Creation of:
  - a Tourist Residential District
  - a Tourist Commercial District
  - an Agricultural Preserve to maintain agricultural lands and uses of scenic and environmental importance.
- Establishment of height limit in Residential Districts (25')
- Provision for pedestrian and bicycle trails, and bus routes
- Design restrictions and regulations for structures, landscape, signs, and lighting.

The design control plan recommends:

- Building limits and required design reviews
- Building setback
- Access points
- View lines
- Trees and grass areas
- Pathways and bikeways.

6. The Wailuku-Kahului General Plan, Maui (1972)

This study identifies some problems which affect the scenic beauty of the islands:
- piecemeal planning and lack of island-wide General Plan;
- shortsighted and unimaginative community design;

SPECIAL PLANNING AREA NORTH SHORE

KAUAI COUNTY

VISUAL STRUCTURE

LEGEND

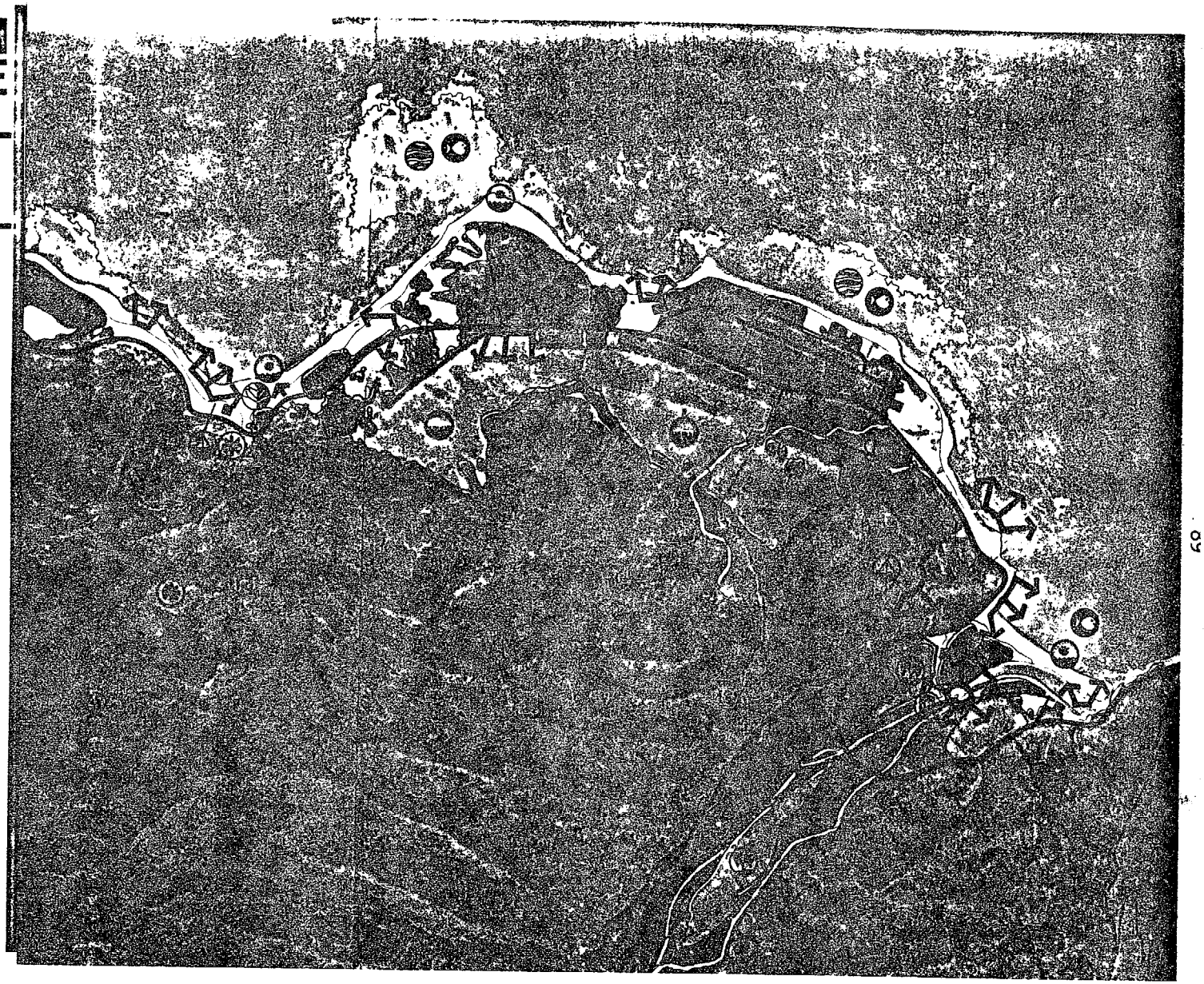
- MAJOR PATH OF TRAVEL
- MINOR PATH OF TRAVEL
- TRAIL
- MAJOR LANDMARK
- MINOR LANDMARK
- MAJOR VISUAL NODE
- MINOR VISUAL NODE
- VIEW POINT
- MAJOR EDGE
- MINOR EDGE
- ENCLOSURE
- MAJOR CHANGE IN LEVEL
- DISTRICTS
- CONTAINED VIEWS
- OPEN VIEWS

SOURCE: MURODA AND ITAGAKI, INC. AND ECKBO, DEAN, AUSTIN, AND WILLIAMS, INC. (1972)

SPECIAL PLANNING AREA — NORTH SHORE

KAUAI COUNTY

HISTORIC, SCENIC, AND RECREATION RESOURCES



SOURCE: MURODA AND ITAGAKI INC. AND ECKBO, DEAN, AUSTIN, AND WILLIAMS ,INC. (1972)

SPECIAL PLANNING AREA — NORTH SHORE

KAUAI COUNTY

LAND USE SUITABILITY

LEGEND

URBAN POTENTIAL

	FLOOD	TSUNAMI	SOIL LIMITATIONS
HIGH	NO	NO	SLIGHT
MEDIUM	NO	NO	MODERATE
	NO	YES	SLIGHT
MEDIUM TO LOW	NO	YES	MODERATE
LOW TO NONE	YES	N.A.	SLIGHT OR MODERATE
	NO	N.A.	SEVERE

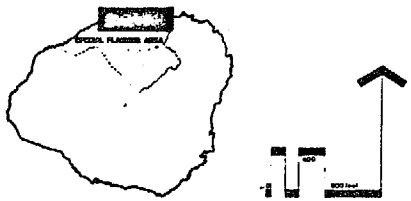
AGRICULTURE POTENTIAL

- SPECIALIZED AGRICULTURE
- SLIGHT SOILS LIMITATIONS
- MODERATE TO SEVERE SOILS LIMITATIONS

FLOOD FRINGE - 100 YEAR FLOOD

FLOOD WAY - 10 YEAR FLOOD

TSUNAMI LIMIT



SOURCE: MURODA AND ITAGAKI INC. AND ECKBO, DEAN, AUSTIN, AND WILLIAMS, INC. (1972)

SPECIAL PLANNING AREA NORTH SHORE

KAUAI COUNTY

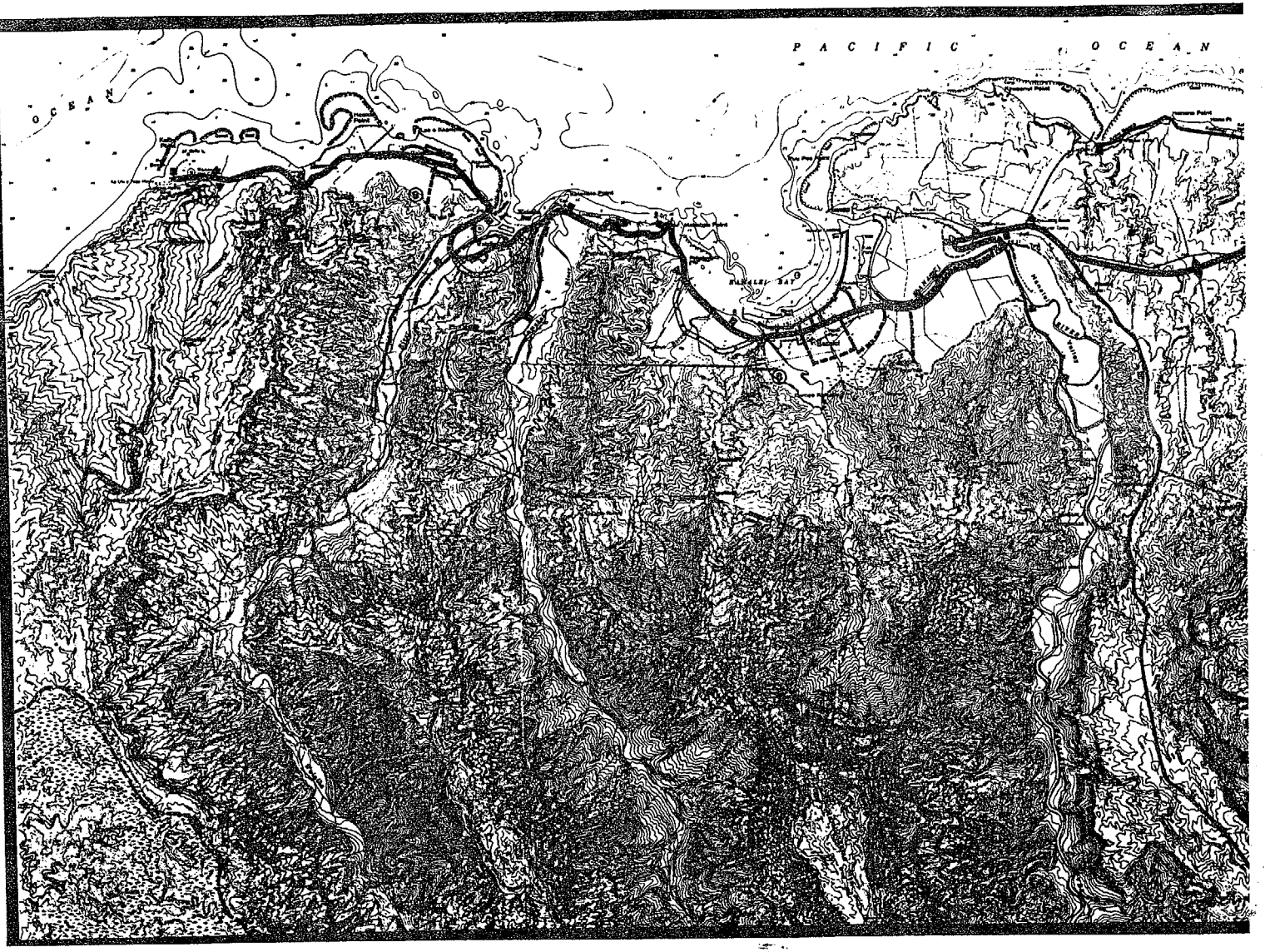
CIRCULATION

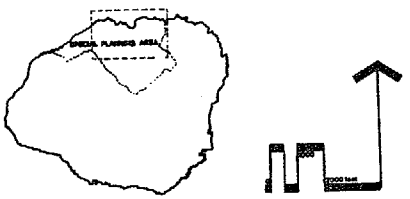
LEGEND

- KUHIO HIGHWAY
- bridge
- causeway
- alternate route

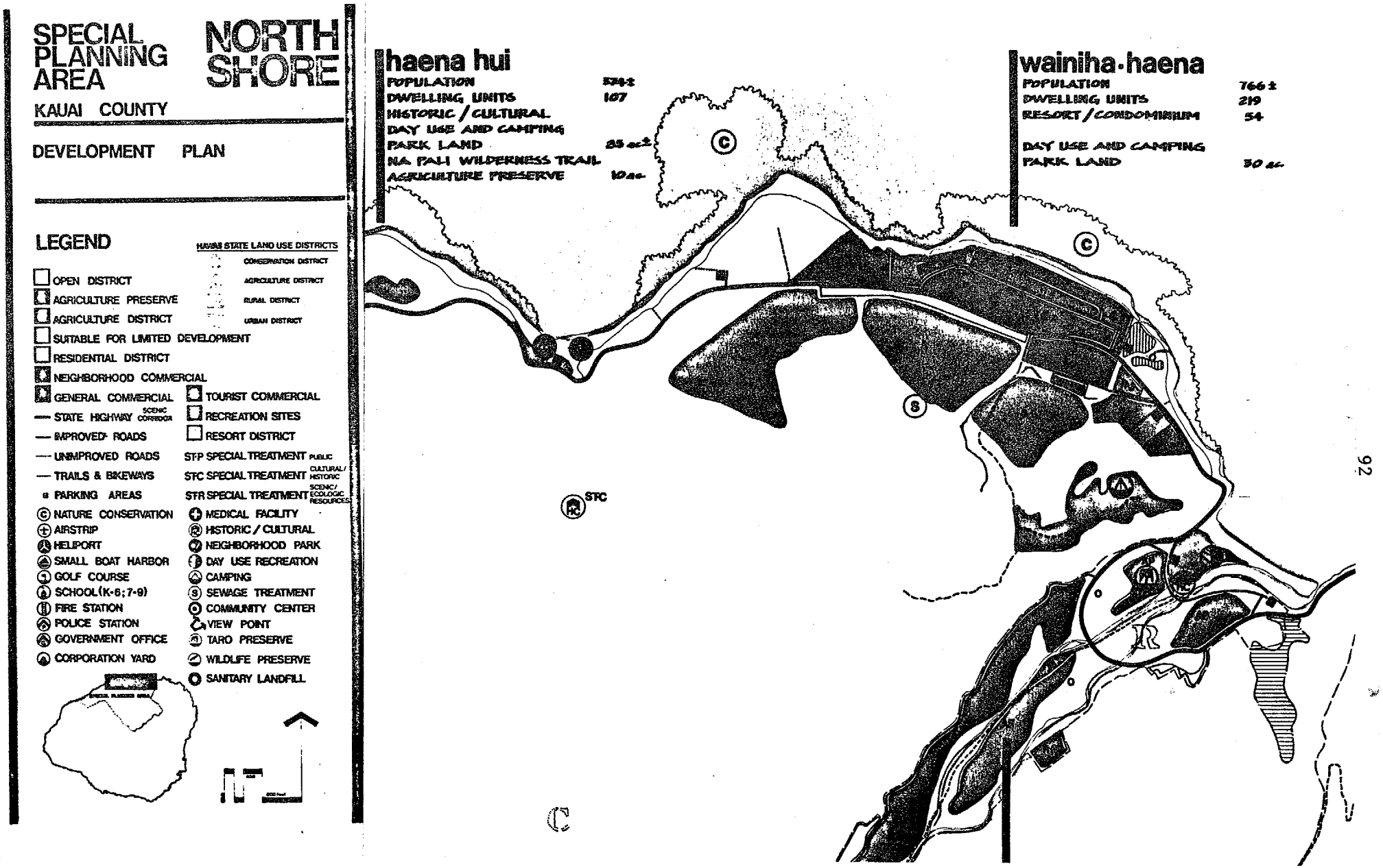
COUNTY ROADS

- bridge
- improved
- unimproved
- Access point
- Parking area





SOURCE: MURODA AND ITAGAKI INC. AND ECKBO, DEAN, AUSTIN, AND WILLIAMS, INC. (1972)



SOURCE: MURODA AND ITAGAKI INC. AND ECKBO, DEAN, AUSTIN, AND WILLIAMS, INC. (1972)

SPECIAL PLANNING AREA NORTH SHORE

KAUAI COUNTY

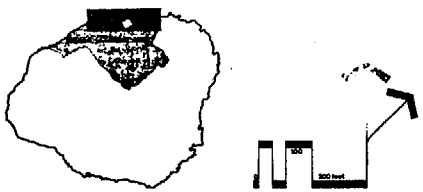
DEVELOPMENT PLAN

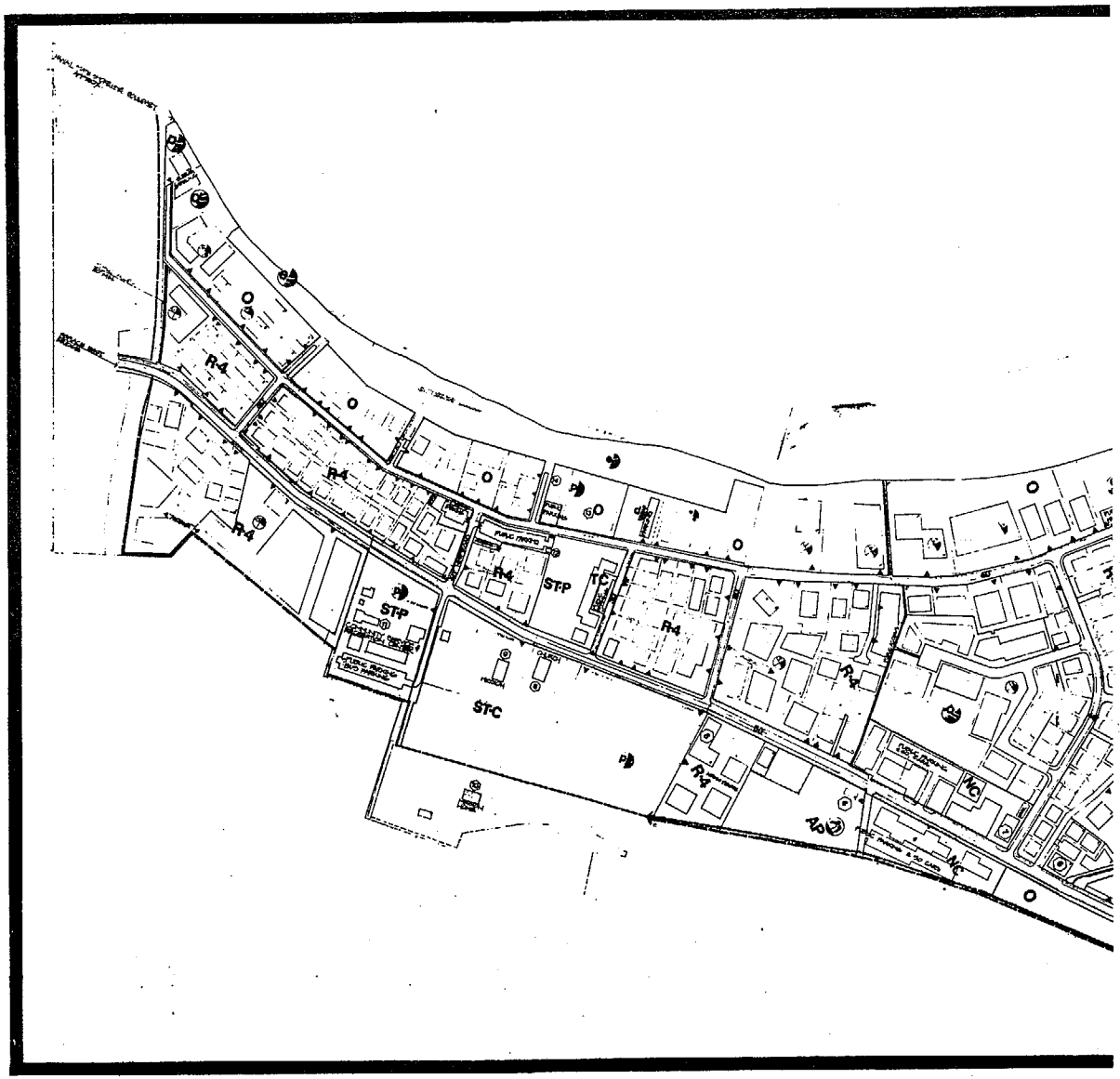
HANALEI TOWN

LEGEND

- (C) NATURE CONSERVATION
- O OPEN DISTRICT
- A AGRICULTURE DISTRICT
- AP AGRICULTURE PRESERVE
- (T) TARO PRESERVE
- (1) PRESERVATION STP/STC/STR
- (EP) EXISTING PARK
- (PP) PROPOSED RECREATION SITE
- (DP) DEDICATED PARK OPTION
- ▲ ACCESS POINTS
- (P) PLANNED DEVELOPMENT ALLOWABLE D.U. UNITS — PARK DEDICATION OPTION
- BUILDING LIMITS — PROPERTY LINE

- T-C TOURIST COMMERCIAL
- R2 RESIDENTIAL TWO UNITS PER ACRE
- R-4 RESIDENTIAL FOUR UNITS PER ACRE
- NC NEIGHBORHOOD COMMERCIAL
- RR RESORT
- STP SPECIAL TREATMENT PUBLIC
- STC SPECIAL TREATMENT CULTURAL/HISTORIC
- STR SPECIAL TREATMENT SCENIC/ECOLOGIC RESOURCES
- — STATE LAND USE BOUNDARIES
- — PUBLIC ACCESS





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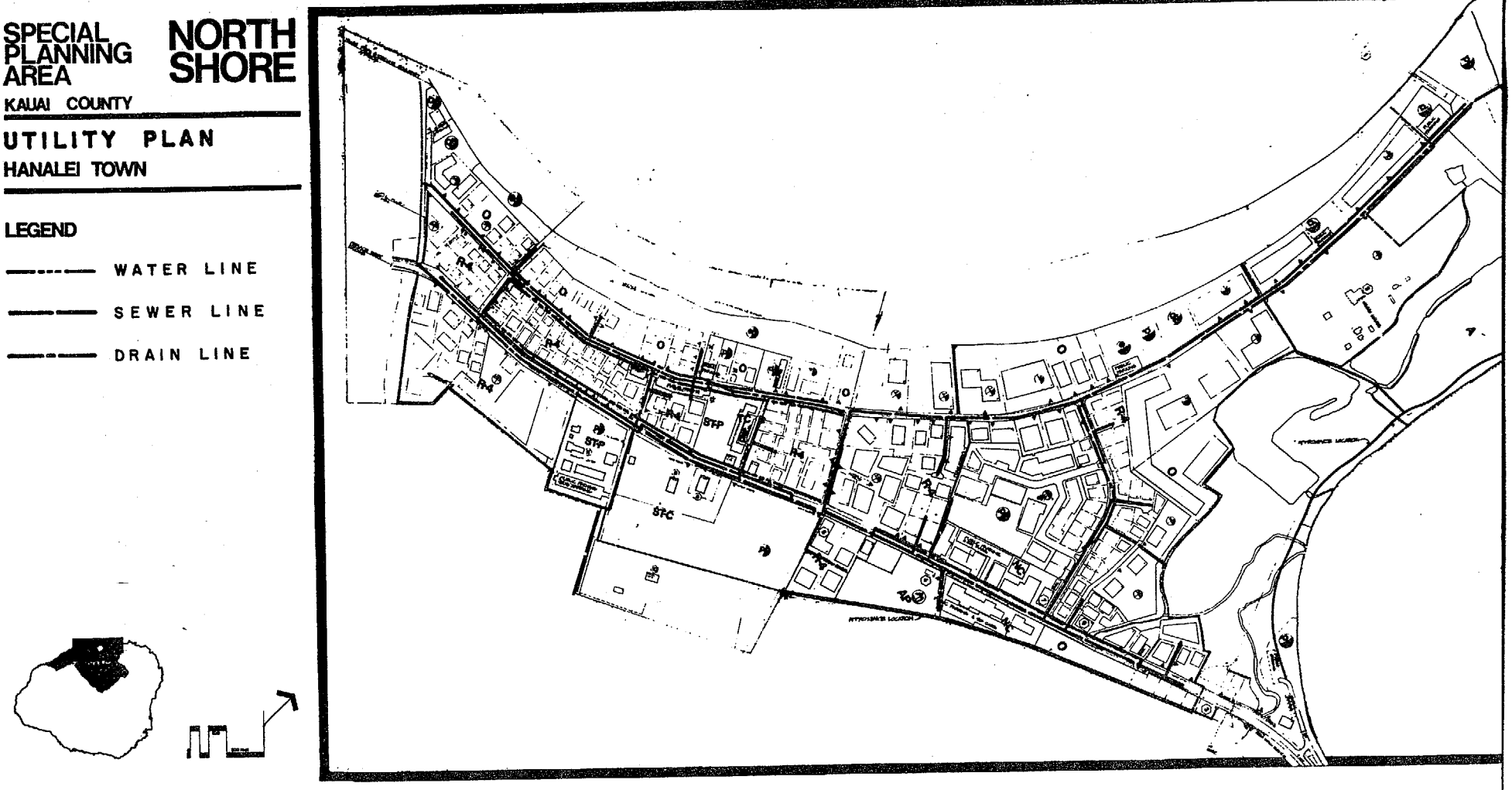


SOURCE: MURODA AND ITAGAKI INC. AND ECKBO, DEAN, AUSTIN, AND WILLIAMS, INC. (1972)

SPECIAL PLANNING AREA

NORTH SHORE

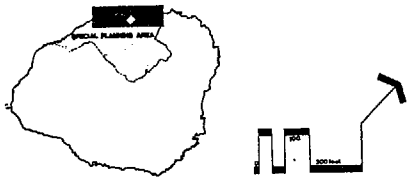
KAUAI COUNTY

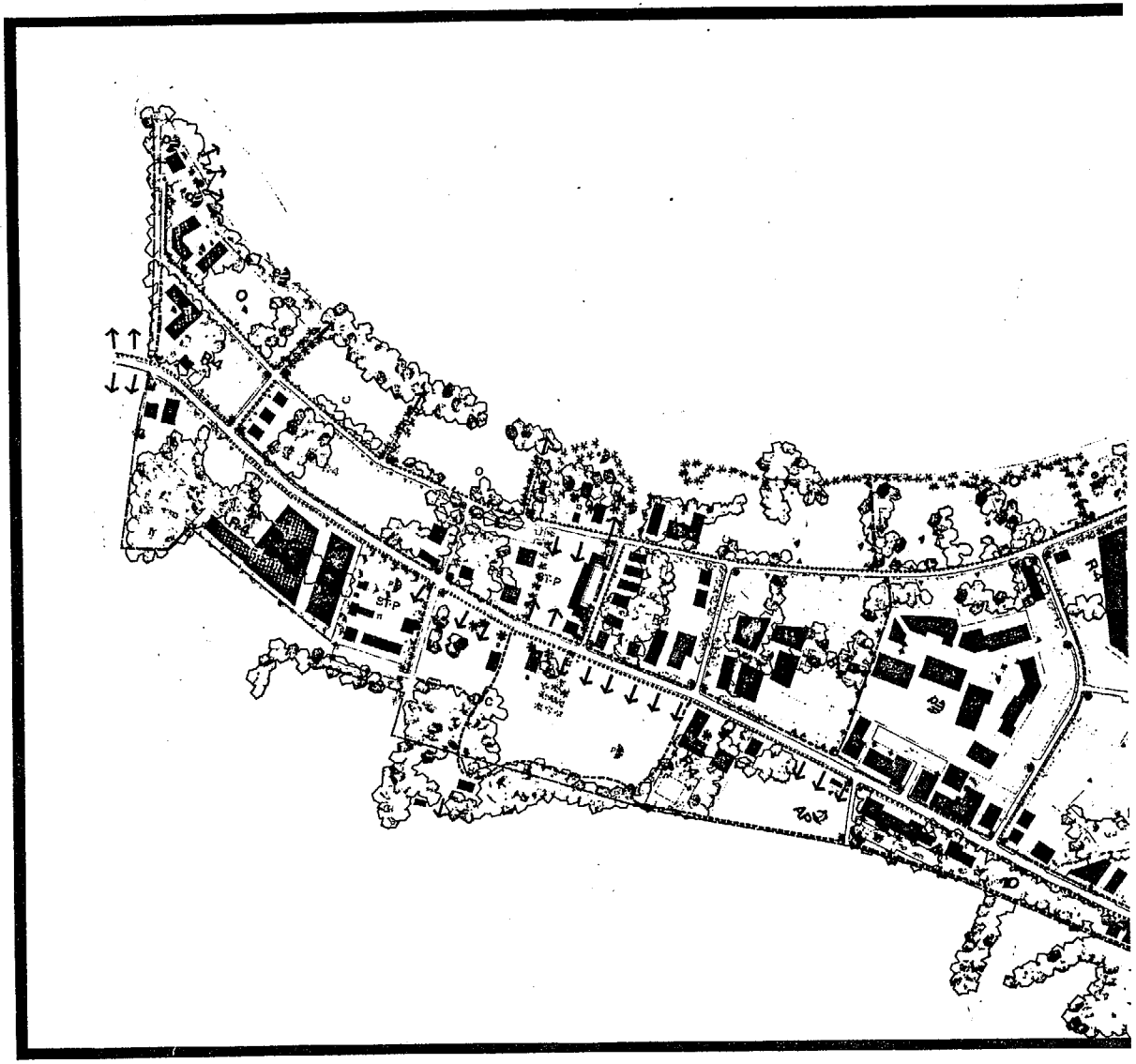
DESIGN CONTROL PLAN

HANALEI TOWN

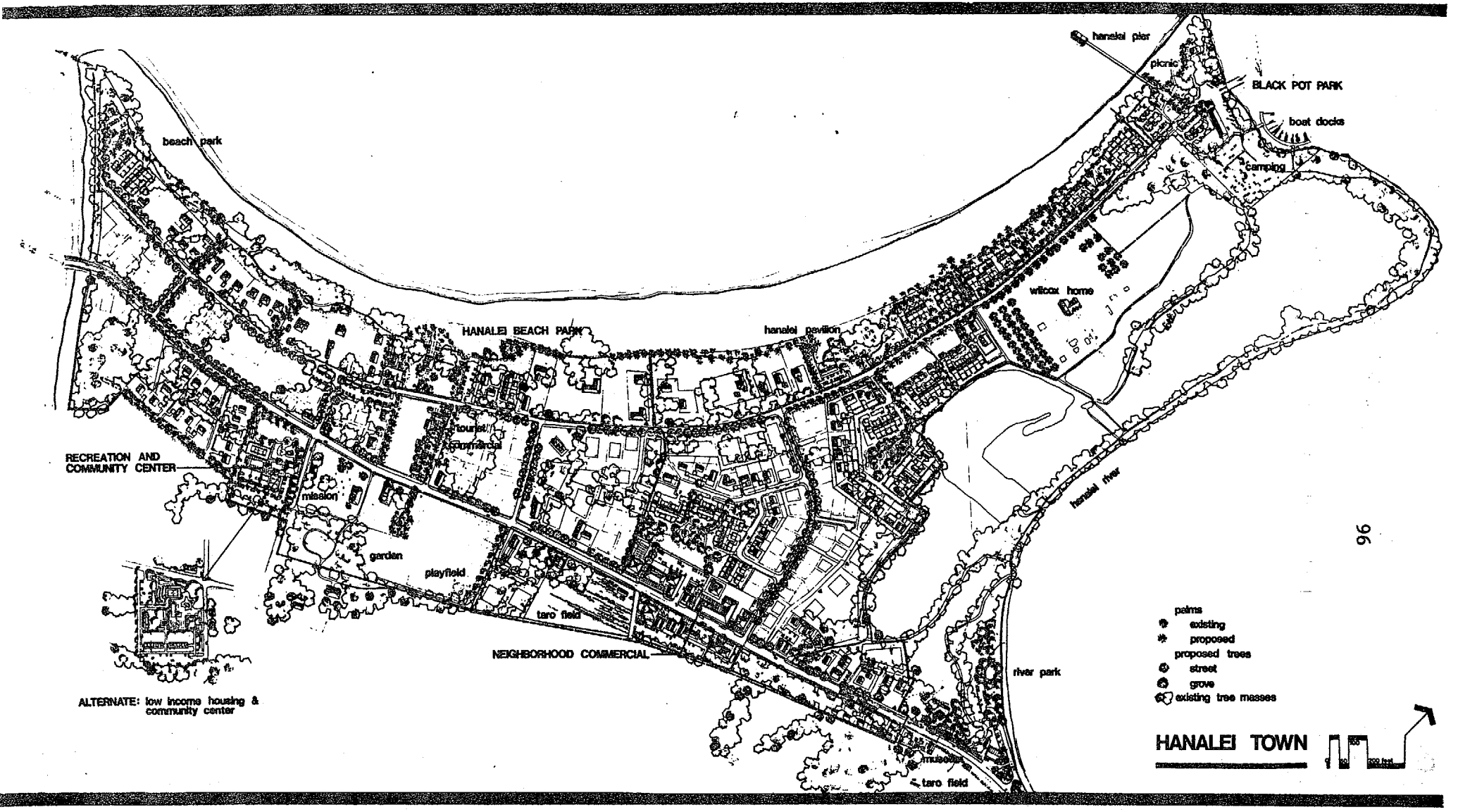
LEGEND

- BUILDING LIMITS DESIGN REVIEW REQUIRED
- BUILDING SETBACK
- ACCESS POINTS
- BIKEWAYS
- PATHWAYS
- VIEW LINES
- PERMANENT GRASS AREAS
- EXISTING PALM MASSES
- EXISTING MAJOR TREE MASSES
- STREET LIGHTING
- MAJOR SIGN
- PROPOSED TREES
  - PALM
  - STREET
  - GROVE



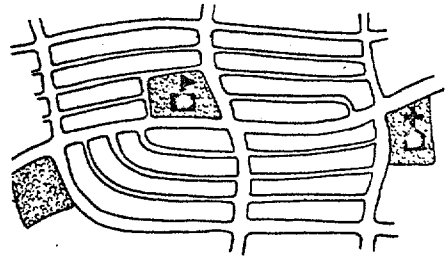


SOURCE: MURODA AND ITAGAKI INC. AND ECKBO, DEAN, AUSTIN, AND WILLIAMS, INC. (1972)

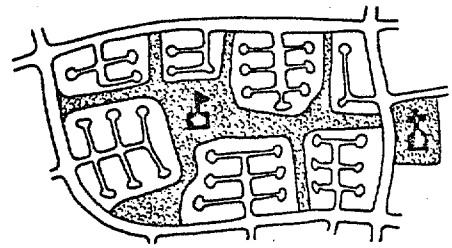


SOURCE: MURODA AND ITAGAKI INC. AND ECKBO, DEAN, AUSTIN, AND WILLIAMS, INC. (1972)

LACK OF CONNECTION



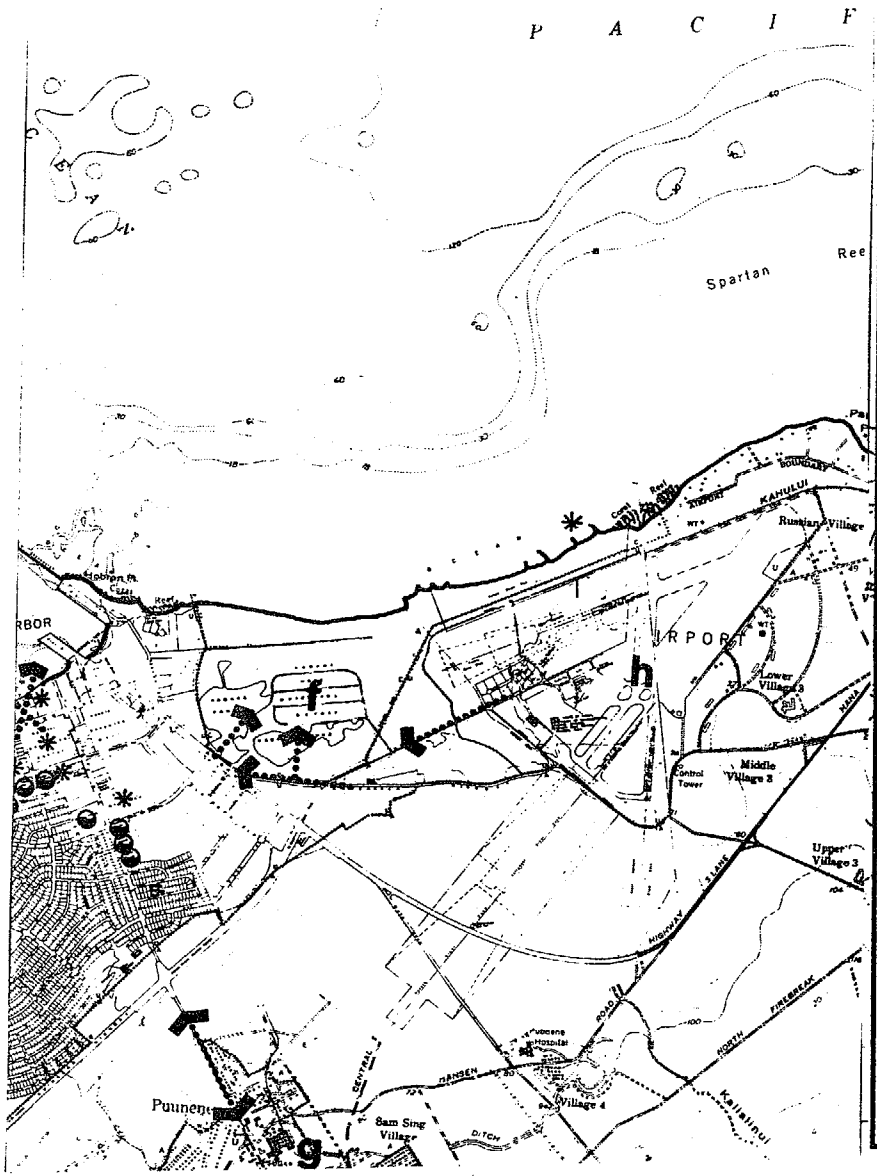
VS.



CONNECTION OF OPEN SPACE

WAILUKU KAHULUI GENERAL PLAN

SOURCE: ECKBO, DEAN, AUSTIN, & WILLIAMS (1972)



WAILUKU–KAHULUI GENERAL PLAN

AMENITIES SOCIAL–CULTURAL

- CIVIC–GOVERNMENTAL
- EDUCATIONAL
- HISTORICAL
- RECREATION NODE
- RECREATION SPACE
- RELIGIOUS

VISUAL

- SCENIC OBSERVATION
- VISTA

LANDMARKS

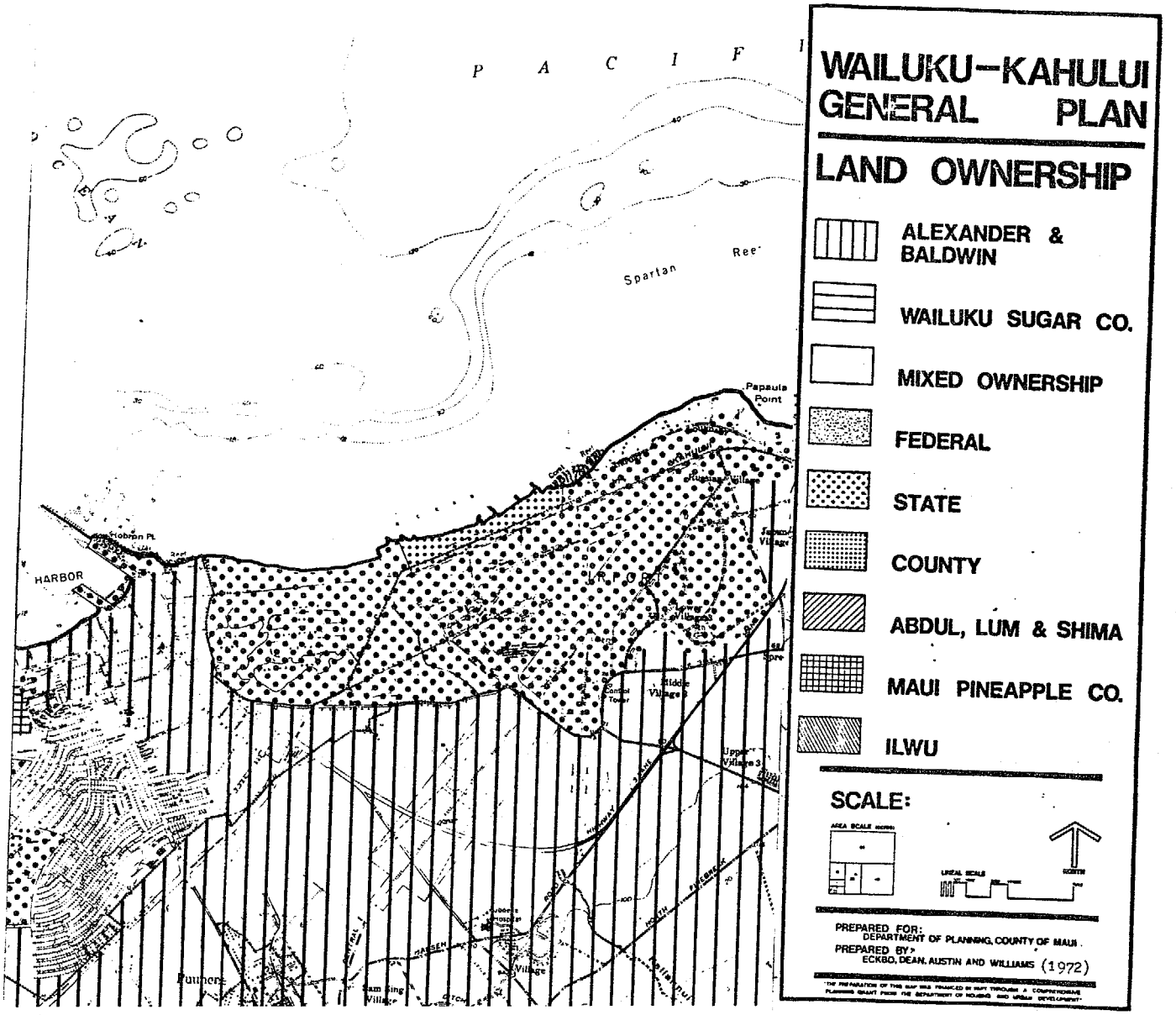
a. PUU KUKUI
b. IAO NEEDLE
c. PUU LIO
d. COUNTY BUILDING
e. KAHULUI HARBOR
f. KANAHA POND
g. SUGAR MILL
h. KAHULUI AIRPORT
i. HEIAU
j. HISTORIC DISTRICT
k. SAND HILL BRIDGE
l. WAR MEMORIAL CENTER

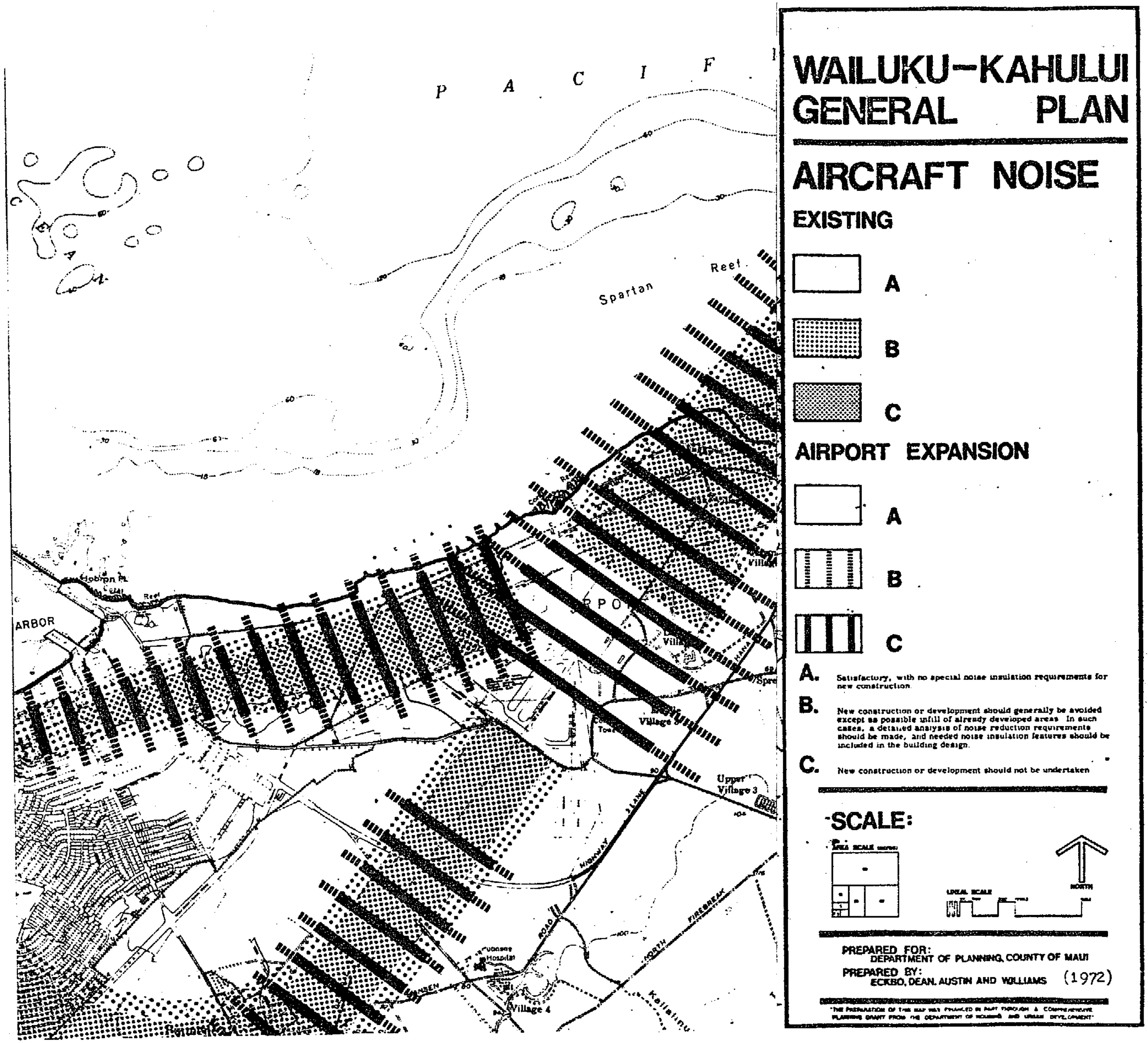
SCALE:

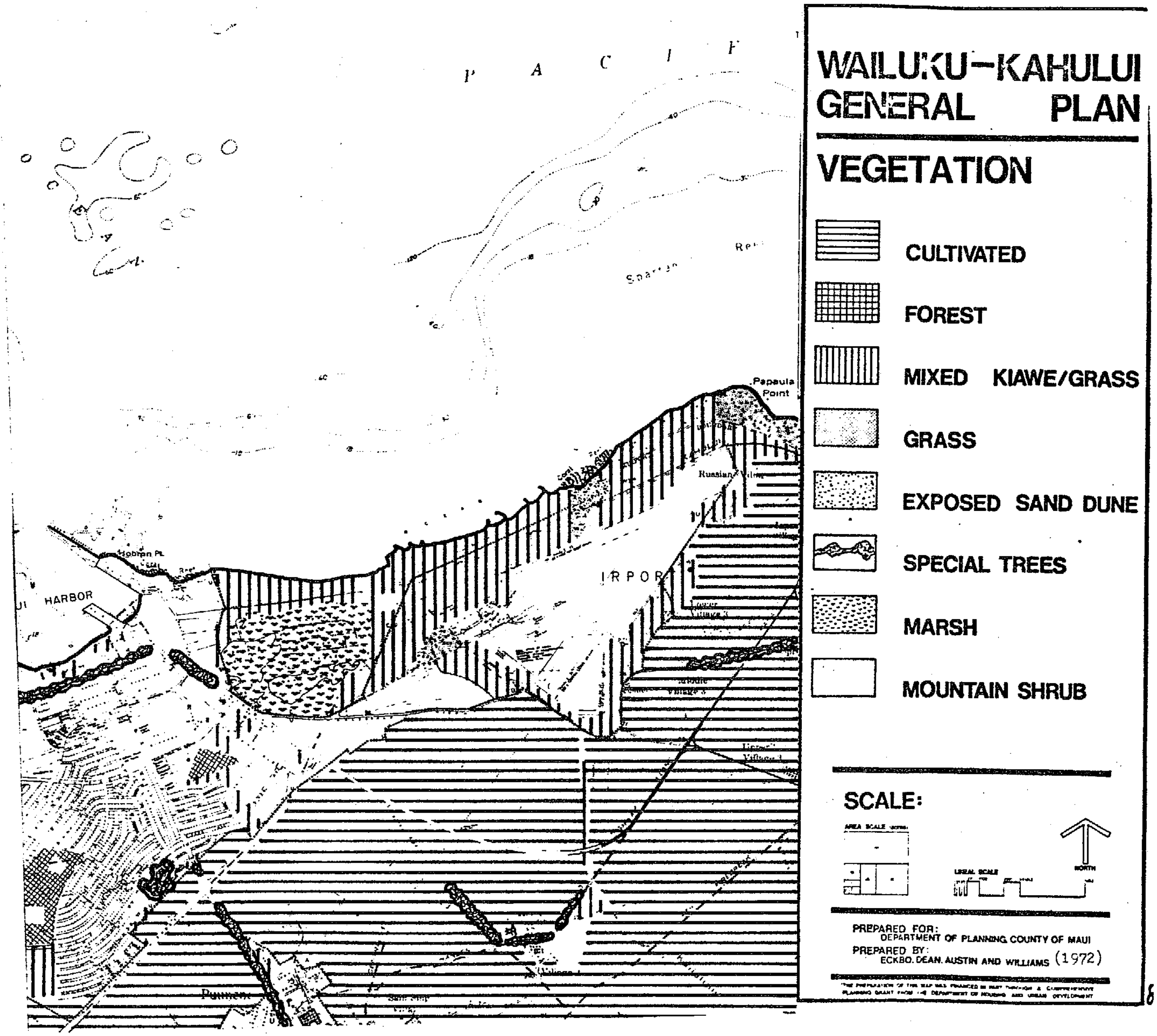
PREPARED FOR:
DEPARTMENT OF PLANNING, COUNTY OF MAUI

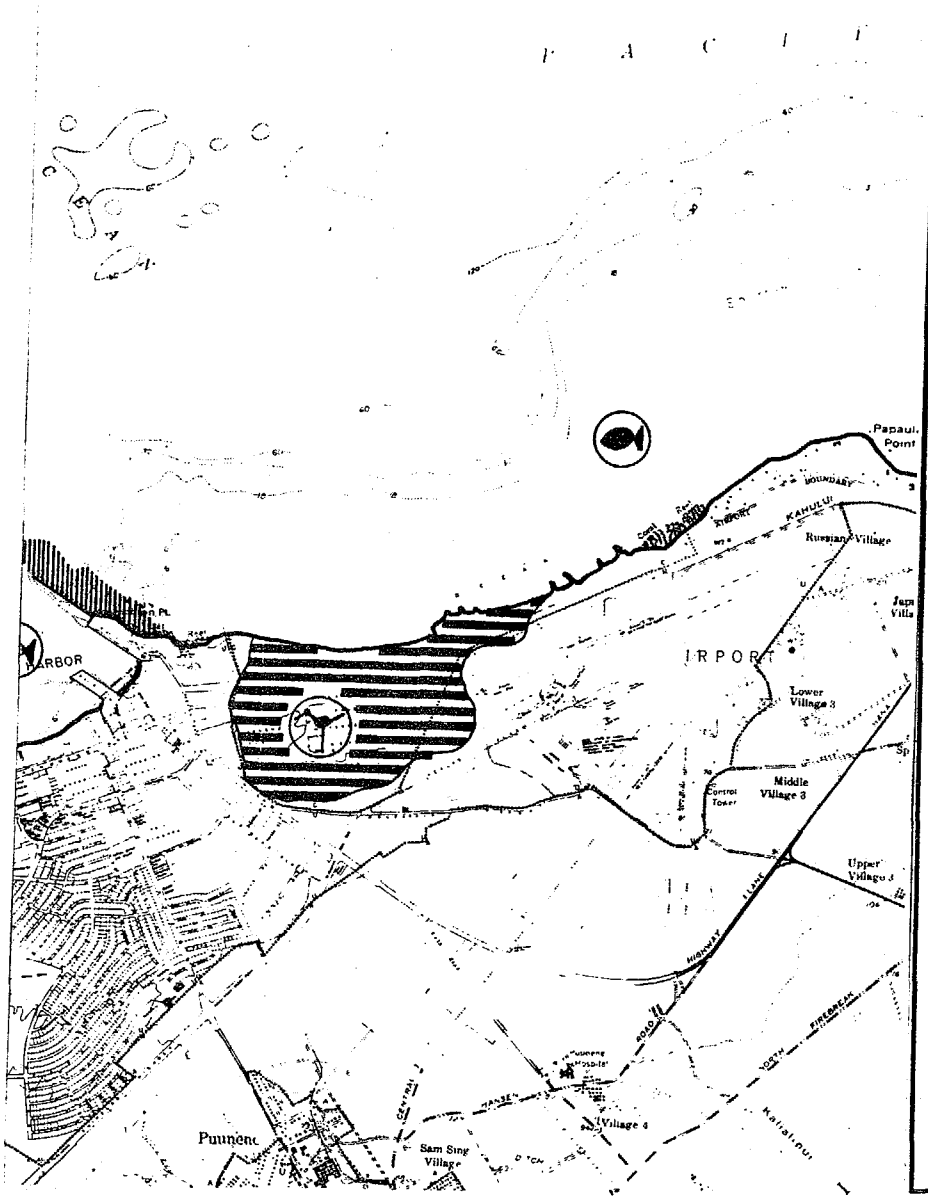
PREPARED BY:
ECKBO, DEAN, AUSTIN AND WILLIAMS (1972)

THE PREPARATION OF THIS MAP WAS FINANCED IN PART THROUGH A COMPREHENSIVE PLANNING GRANT FROM THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT.


P A C I F I
Spartan Ree
Papaula Point
HARBOR
Middle Village 5
Upper Village 3
Puunoa
Sam Sing Village
WAILUKU–KAHULUI GENERAL PLAN
LAND OWNERSHIP
ALEXANDER & BALDWIN
WAILUKU SUGAR CO.
MIXED OWNERSHIP
FEDERAL
STATE
COUNTY
ABDUL, LUM & SHIMA
MAUI PINEAPPLE CO.
ILWU
SCALE:
PREPARED FOR:
DEPARTMENT OF PLANNING, COUNTY OF MAUI
PREPARED BY:
ECKBO, DEAN, AUSTIN AND WILLIAMS (1972)


WAILUKU–KAHULUI GENERAL PLAN
AIRCRAFT NOISE
EXISTING
A
B
C
AIRPORT EXPANSION
A
B
C
A. Satisfactory, with no special noise insulation requirements for new construction.
B. New construction or development should generally be avoided except as possible infill of already developed areas. In such cases, a detailed analysis of noise reduction requirements should be made, and needed noise insulation features should be included in the building design.
C. New construction or development should not be undertaken
SCALE:
NORTH
PREPARED FOR:
DEPARTMENT OF PLANNING, COUNTY OF MAUI
PREPARED BY:
ECKBO, DEAN, AUSTIN AND WILLIAMS (1972)
P A C I F
Spartan Reef
ARBOR
Upper Village 3
Village 4


WAILUKU–KAHULUI GENERAL PLAN
VEGETATION
CULTIVATED
FOREST
MIXED KIAWE/GRASS
GRASS
EXPOSED SAND DUNE
SPECIAL TREES
MARSH
MOUNTAIN SHRUB
SCALE:
NORTH
PREPARED FOR:
DEPARTMENT OF PLANNING COUNTY OF MAUI
PREPARED BY:
ECKBO, DEAN, AUSTIN AND WILLIAMS (1972)
P A C I F
HARBOR
Papaula Point
Russian Village
I R P O R

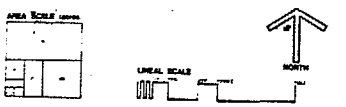


WAILUKU–KAHULUI GENERAL PLAN

WILDLIFE

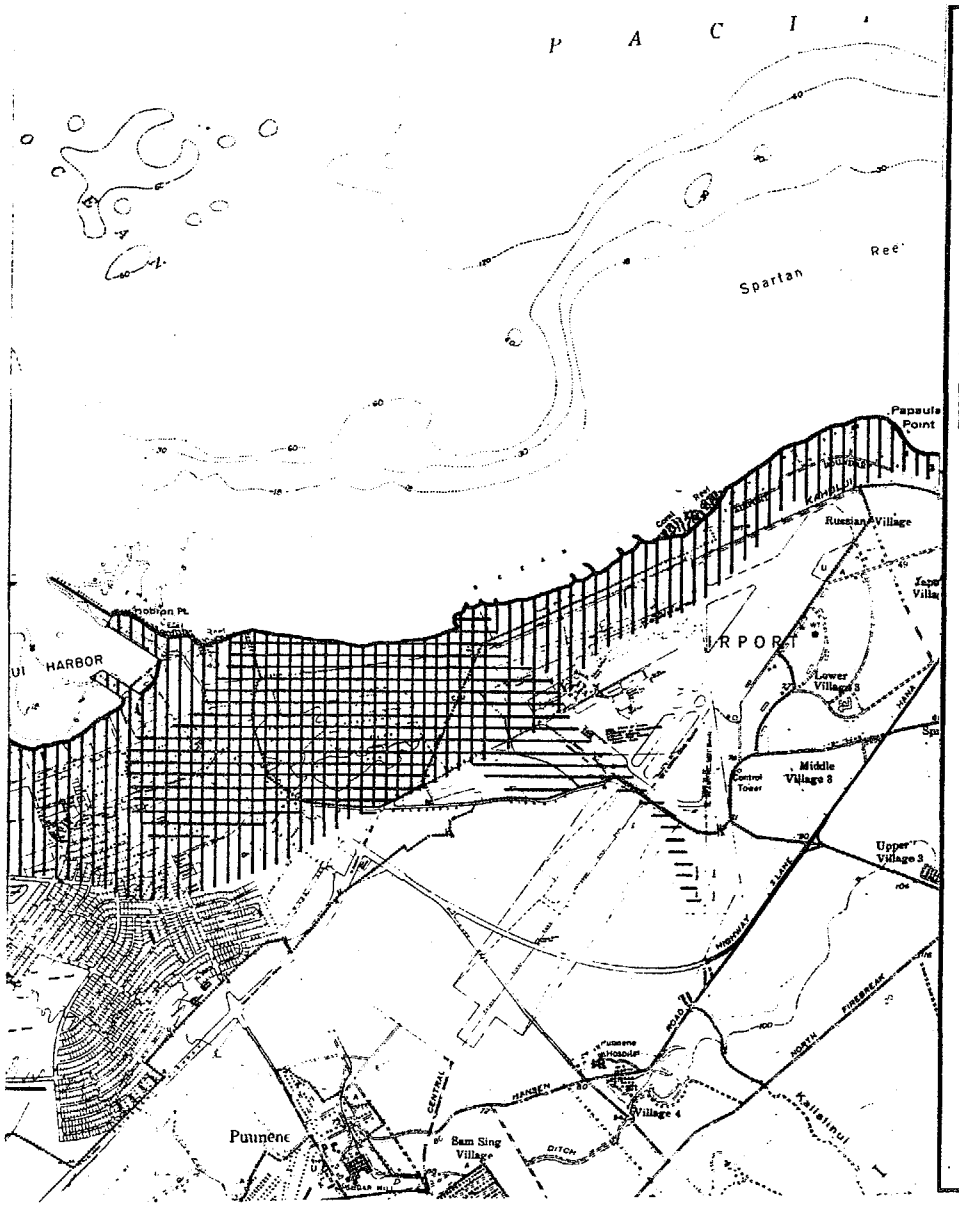
- FISH HABITAT
- WATER BIRDS
- LOWLAND BIRDS
- FOREST BIRD
- COMMON BIRDS
- ENDEMIC INSECTS
- WILDLIFE HABITAT
- CONFLICT ZONE
- SENSITIVE ENDEMIC PLANT LIFE
- ENDANGERED ENDEMIC PLANT LIFE

SCALE:



PREPARED FOR:
DEPARTMENT OF PLANNING, COUNTY OF MAUI
PREPARED BY:
ECKBO, DEAN, AUSTIN AND WILLIAMS (1972)

THE PREPARATION OF THIS MAP WAS FINANCED IN PART THROUGH A COMPREHENSIVE PLANNING GRANT FROM THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT



WAILUKU–KAHULUI GENERAL PLAN

TSUNAMI & FLOOD PLAIN

TSUNAMI ZONE

FLOOD ZONE

SCALE:

AREA SCALE

LINEAL SCALE

NORTH

PREPARED FOR:
DEPARTMENT OF PLANNING, COUNTY OF MAUI
PREPARED BY:
ECKBO, DEAN, AUSTIN AND WILLIAMS (1972)

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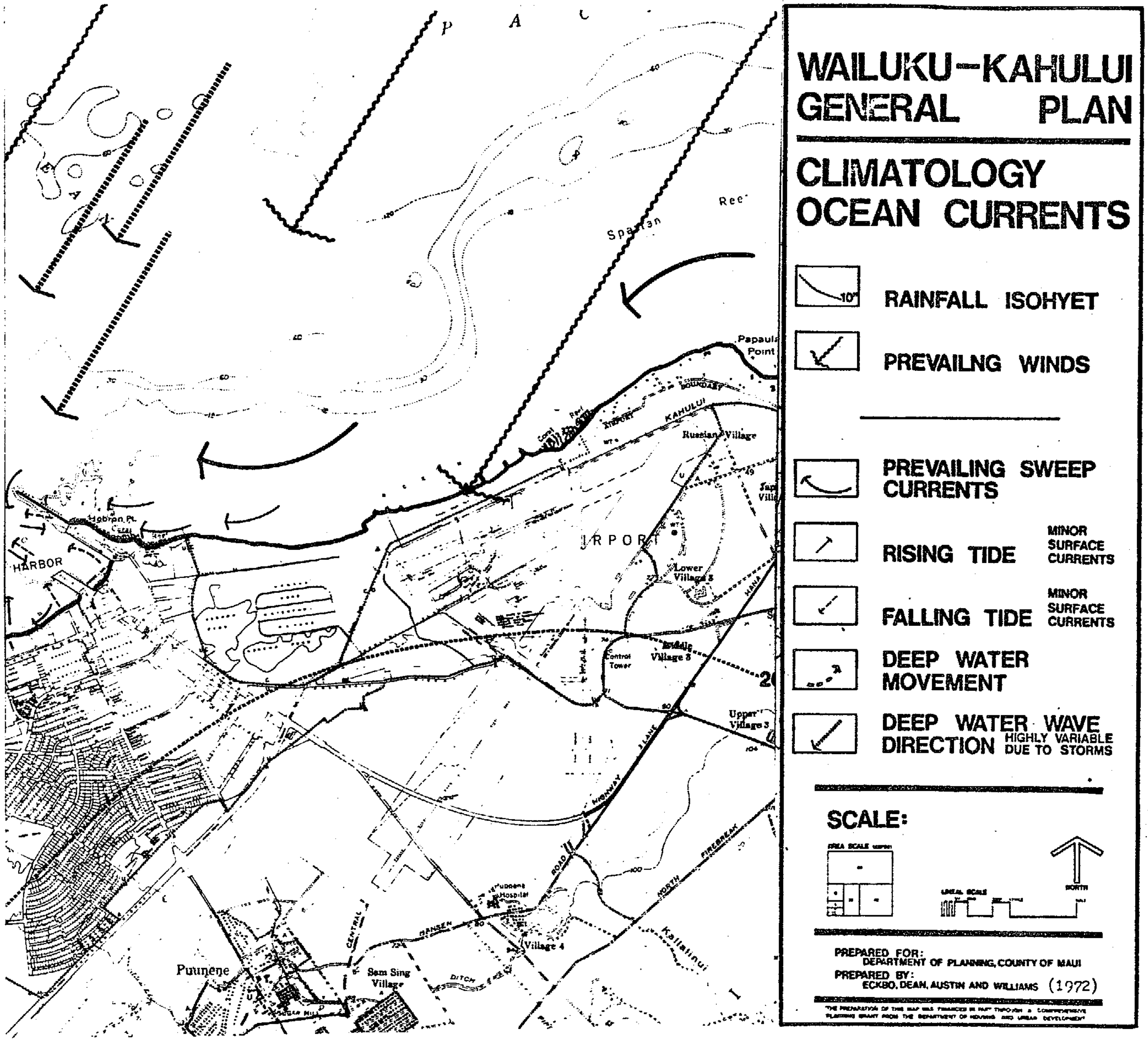
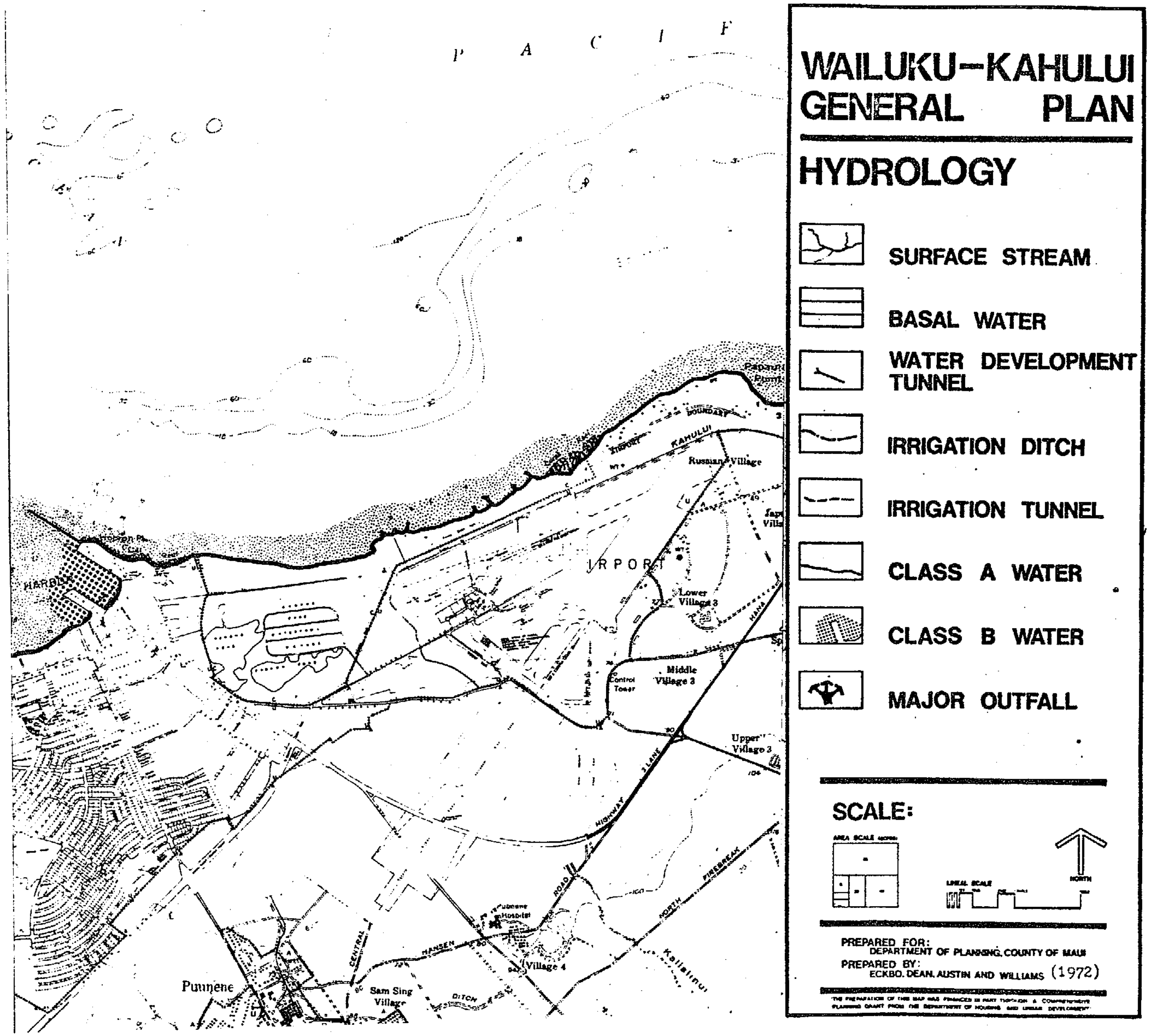
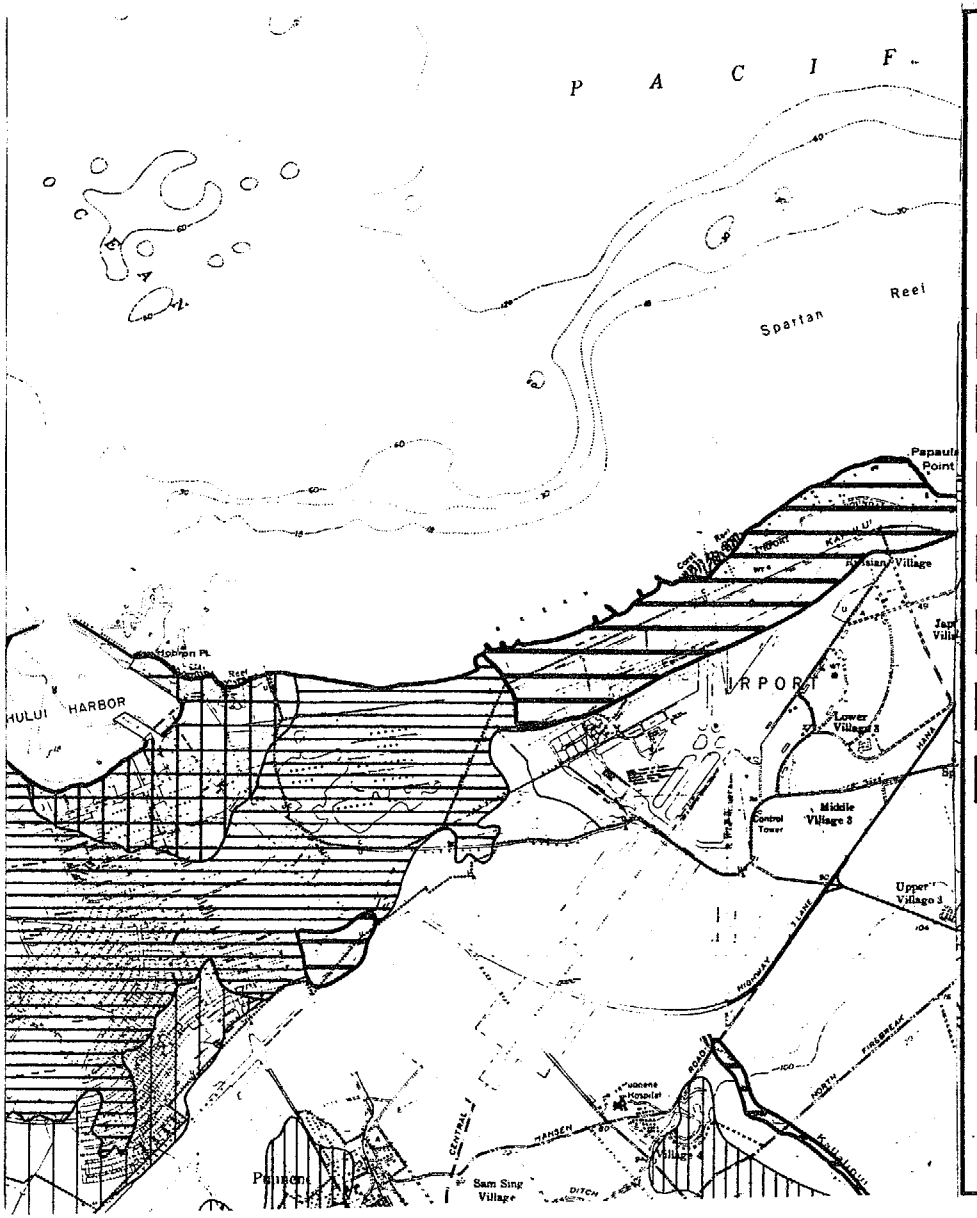

WAILUKU–KAHULUI GENERAL PLAN
CLIMATOLOGY OCEAN CURRENTS
RAINFALL ISOHYET
PREVAILNG WINDS
PREVAILING SWEEP CURRENTS
RISING TIDE
MINOR SURFACE CURRENTS
FALLING TIDE
MINOR SURFACE CURRENTS
DEEP WATER MOVEMENT
DEEP WATER WAVE DIRECTION
HIGHLY VARIABLE DUE TO STORMS
SCALE:
NORTH
PREPARED FOR:
DEPARTMENT OF PLANNING, COUNTY OF MAUI
PREPARED BY:
ECKBO, DEAN, AUSTIN AND WILLIAMS (1972)
Spartan
Reef
Papaula Point
KAHULUI
Russian Village
HARBOR
Hobron Pt.
AIRPORT
Lower Village 8
Control Tower
Middle Village 8
Upper Village 3
HIGHWAY
HANA
Puunene Hospital
Village 4
Puunene
Sam Sing Village
CENTRAL
HANSEN
DITCH
NORTH
FIREBREAK
Kailalinui


WAILUKU—KAHULUI
GENERAL PLAN
HYDROLOGY
SURFACE STREAM
BASAL WATER
WATER DEVELOPMENT TUNNEL
IRRIGATION DITCH
IRRIGATION TUNNEL
CLASS A WATER
CLASS B WATER
MAJOR OUTFALL
SCALE:
PREPARED FOR:
DEPARTMENT OF PLANNING, COUNTY OF MAUI
PREPARED BY:
ECKBO, DEAN, AUSTIN AND WILLIAMS (1972)
P A C I F
KAHULUI
Rusman Village
IRPORT
Lower Village 3
Middle Village 3
Control Tower
Upper Village 3
HARBOR
Puunene
Sam Sing Village
Village 4
HANSEN
CENTRAL
DITCH
HIGHWAY
ROAD
NORTH
FIREBREAK
HANA



WAILUKU–KAHULUI GENERAL PLAN

SOIL CAPABILITY FOR DEVELOPMENT

HOMES		SLIGHT
ROADS		"
SEPTIC TANKS		"
HOMES		SLIGHT
ROADS		"
SEPTIC TANKS		SEVERE
HOMES		MODERATE
ROADS		"
SEPTIC TANKS		"
HOMES		MODERATE
ROADS		"
SEPTIC TANKS		SEVERE
HOMES		MODERATE
ROADS		SEVERE
SEPTIC TANKS		"
HOMES		SEVERE
ROADS		"
SEPTIC TANKS		"
HOMES		VARIABLE
ROADS		"
SEPTIC TANKS		"

SCALE:

AREA SCALE

LINEAL SCALE

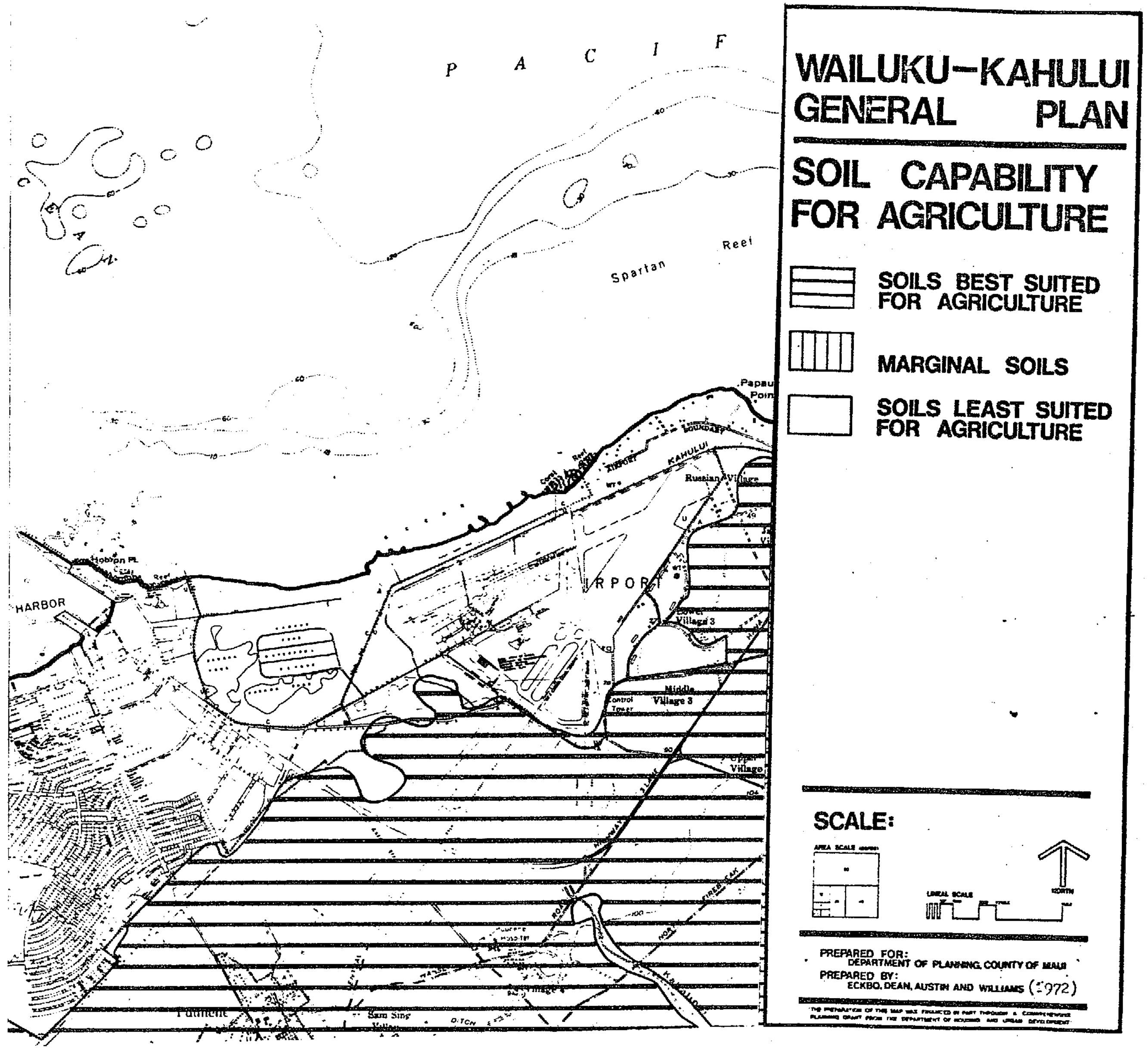
NORTH

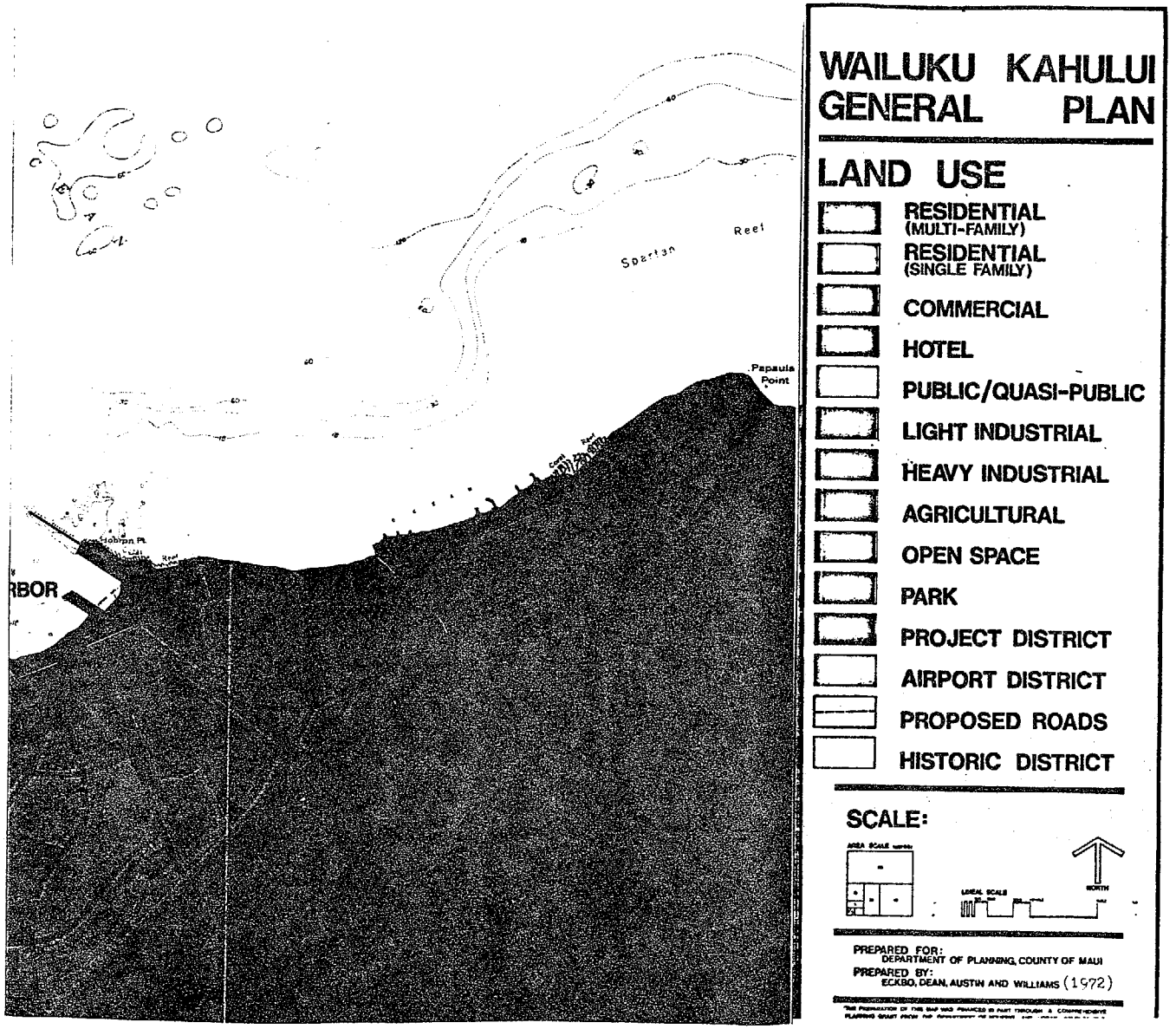
PREPARED FOR:
DEPARTMENT OF PLANNING, COUNTY OF MAUI

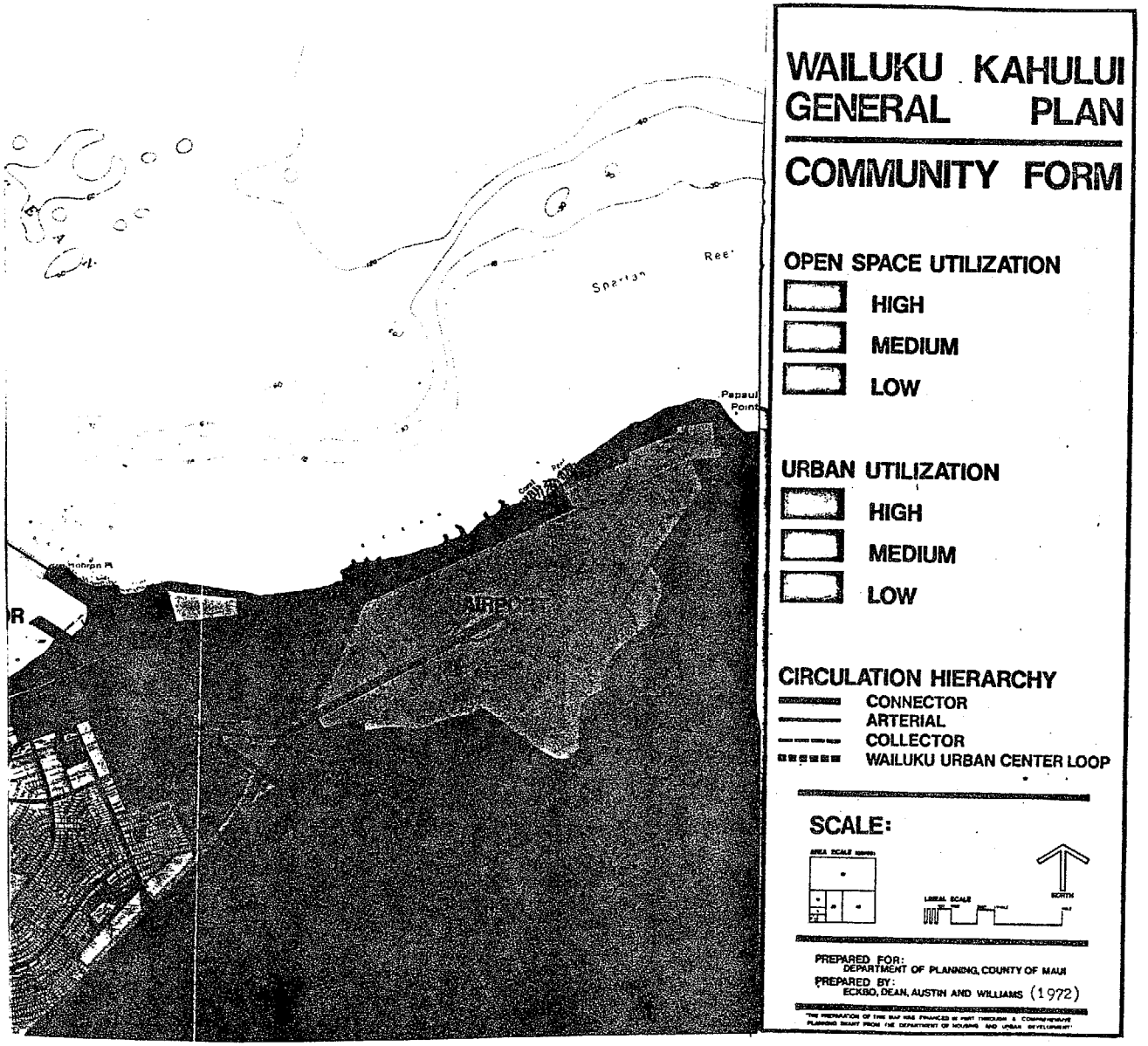
PREPARED BY:
ECKBO, DEAN, AUSTIN AND WILLIAMS (1972)

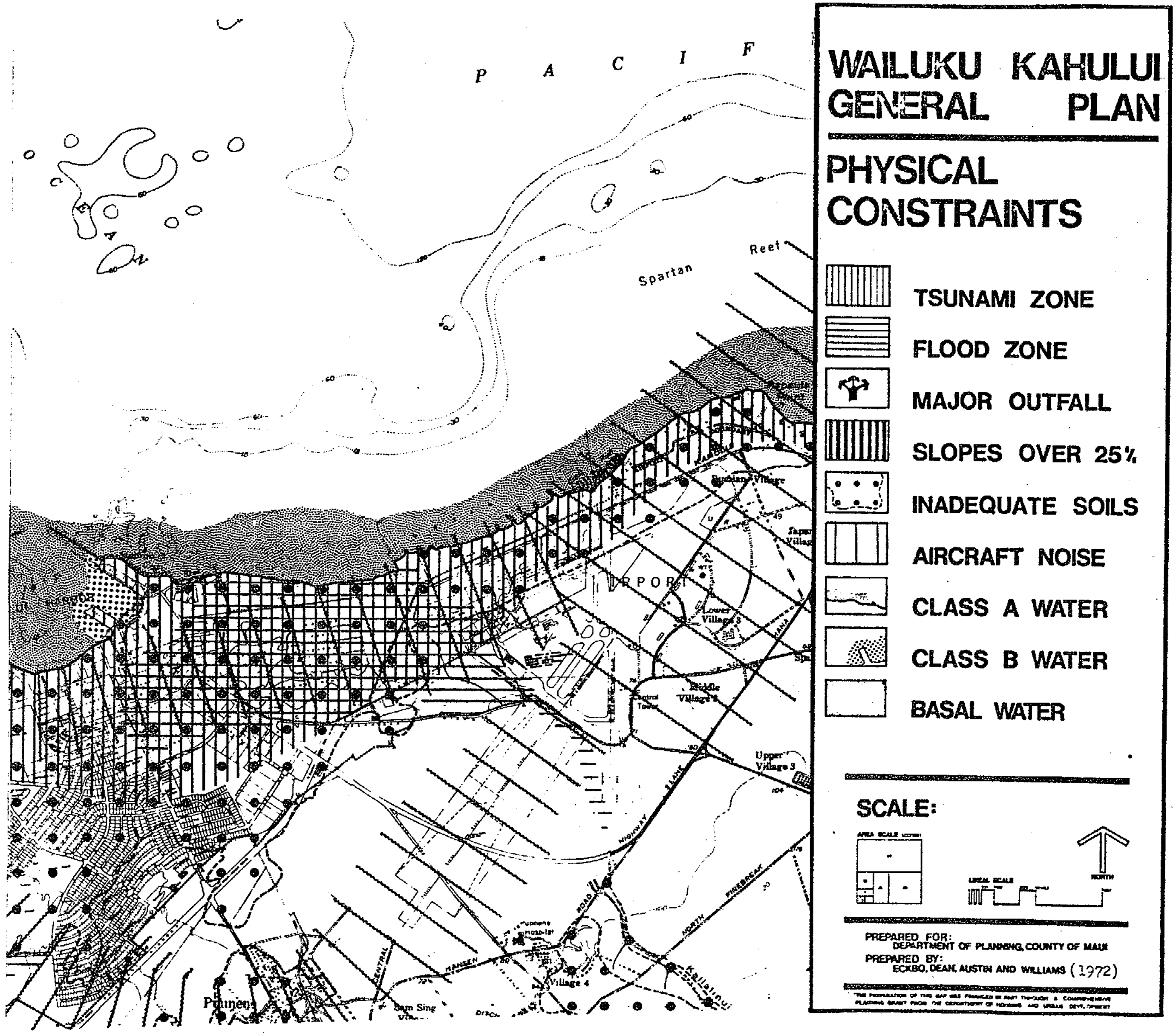
72

THE PREPARATION OF THIS MAP WAS FINANCED IN PART THROUGH A COMPREHENSIVE PLANNING GRANT FROM THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

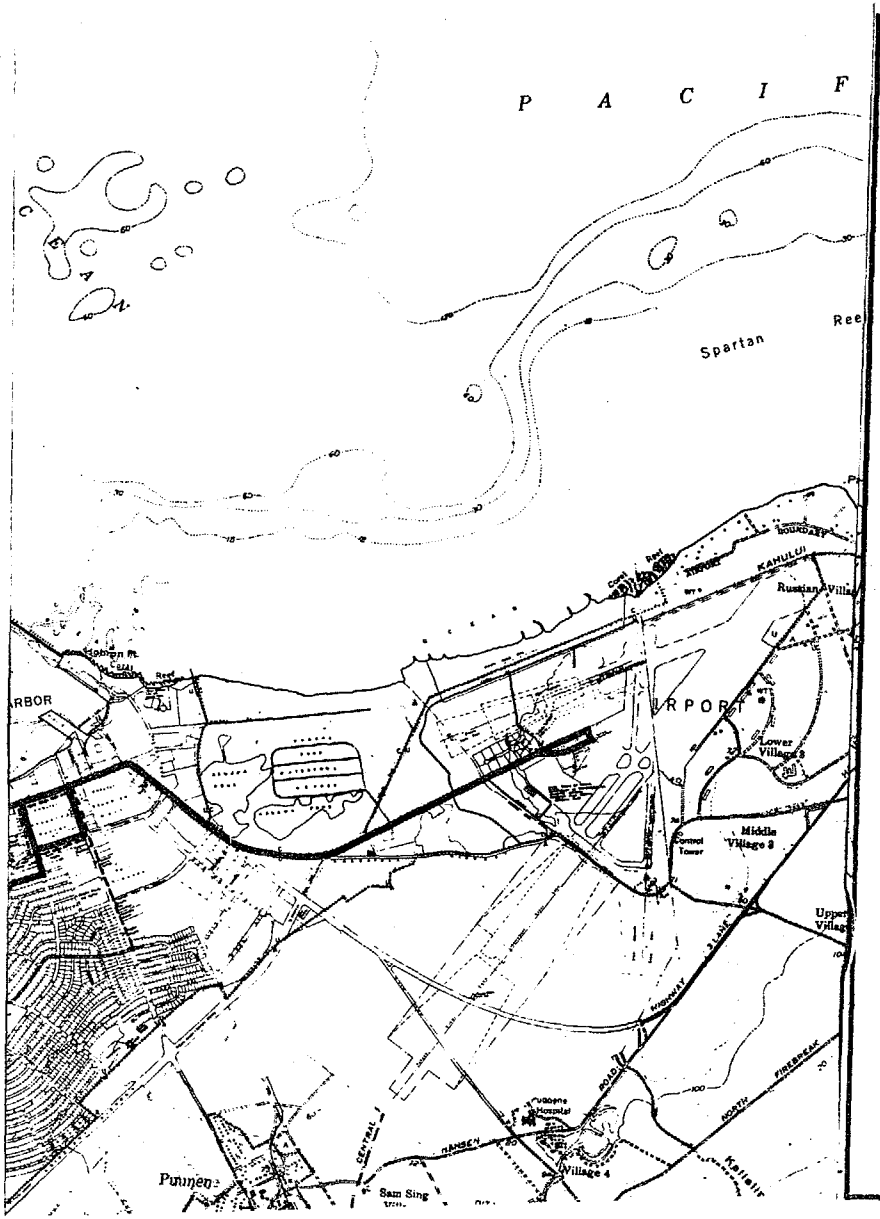

WAILUKU–KAHULUI GENERAL PLAN
SOIL CAPABILITY FOR AGRICULTURE
SOILS BEST SUITED FOR AGRICULTURE
MARGINAL SOILS
SOILS LEAST SUITED FOR AGRICULTURE
SCALE:
NORTH
PREPARED FOR: DEPARTMENT OF PLANNING, COUNTY OF MAUI
PREPARED BY: ECKBO, DEAN, AUSTIN AND WILLIAMS (1972)
P A C I F
Spartan Reef
HARBOR
Hobron Pt.
KAHULUI
Russian Village
Middle Village 3
Control Tower
Sam Sing


Spartan Reef
Papaula Point
RBOR
WAILUKU KAHULUI GENERAL PLAN
LAND USE
RESIDENTIAL (MULTI-FAMILY)
RESIDENTIAL (SINGLE FAMILY)
COMMERCIAL
HOTEL
PUBLIC/QUASI-PUBLIC
LIGHT INDUSTRIAL
HEAVY INDUSTRIAL
AGRICULTURAL
OPEN SPACE
PARK
PROJECT DISTRICT
AIRPORT DISTRICT
PROPOSED ROADS
HISTORIC DISTRICT
SCALE:
NORTH
PREPARED FOR:
DEPARTMENT OF PLANNING, COUNTY OF MAUI
PREPARED BY:
ECKBO, DEAN, AUSTIN AND WILLIAMS (1972)


WAILUKU KAHULUI
GENERAL PLAN
COMMUNITY FORM
OPEN SPACE UTILIZATION
HIGH
MEDIUM
LOW
URBAN UTILIZATION
HIGH
MEDIUM
LOW
CIRCULATION HIERARCHY
CONNECTOR
ARTERIAL
COLLECTOR
WAILUKU URBAN CENTER LOOP
SCALE:
PREPARED FOR:
DEPARTMENT OF PLANNING, COUNTY OF MAUI
PREPARED BY:
ECKBO, DEAN, AUSTIN AND WILLIAMS (1972)
Pepaui Point
AIRPORT



WAILUKU KAHULUI GENERAL PLAN
PHYSICAL CONSTRAINTS
TSUNAMI ZONE
FLOOD ZONE
MAJOR OUTFALL
SLOPES OVER 25%
INADEQUATE SOILS
AIRCRAFT NOISE
CLASS A WATER
CLASS B WATER
BASAL WATER
SCALE:
NORTH
PREPARED FOR:
DEPARTMENT OF PLANNING, COUNTY OF MAUI
PREPARED BY:
ECKBO, DEAN, AUSTIN AND WILLIAMS (1972)
P A C I F
Spartan Reef
AIRPORT
Upper Village 3
Village 4
Puunene



WAILUKU–KAHULUI GENERAL PLAN

PUBLIC TRANSIT

ROUTE A

ROUTE B

SCALE:

AREA SCALE

LOCAL SCALE

NORTH

PREPARED FOR:
DEPARTMENT OF PLANNING, COUNTY OF MAUI

PREPARED BY:
ECKBO, DEAN, AUSTIN AND WILLIAMS (1972)

"THE PREPARATION OF THIS MAP WAS FINANCED IN PART THROUGH A COMPREHENSIVE PLANNING GRANT FROM THE DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT"

- lack of transportation hierarchy in road design and utilization;
- lack of connection of open spaces.

For these problems there are related design solutions which should have broader applicability in the State of Hawaii.

The general plan recommendations concern:

- physical constraints (tsunami, flood, outfall, slopes, aircraft noise, water conditions);
- community form (three degrees of open space and urban utilization and circulation hierarchy);
- land use plans (including "project districts" location and boundary for large scale developments).

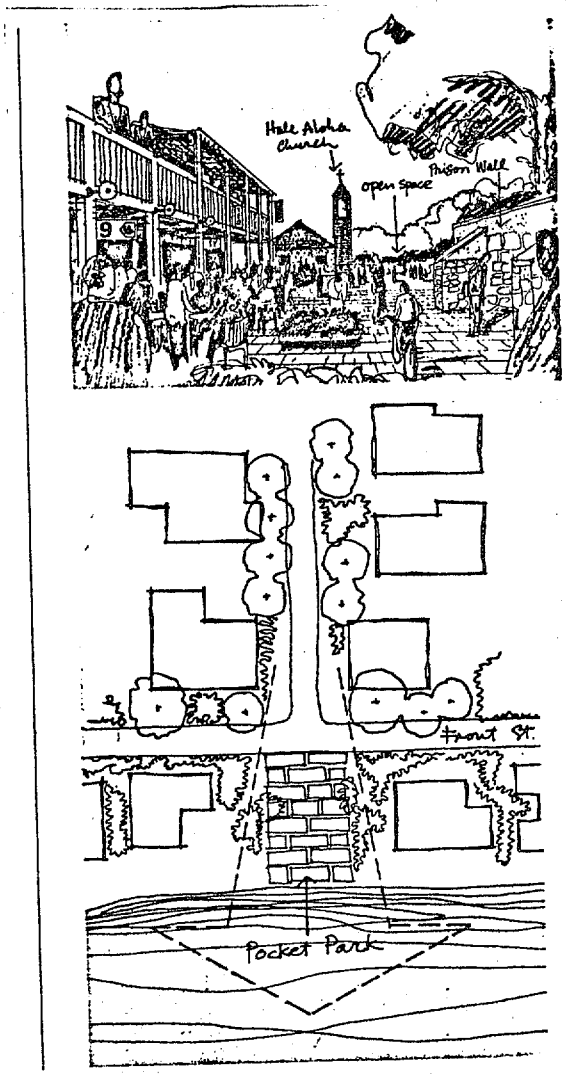
The plan proposes conservation resources management and the enaction of a Comprehensive Zoning Ordinance that includes provisions for Development Restriction Zone, Open Space Zones, Special Treatment Zones. In addition, land development within Development Restriction Zones and Open Space Treatment Zones should be subject to design reviews. For the maintenance of landscape quality, particular areas of environmental concern are to be listed in the proposed ordinance. Finally, review boards for architectural design quality are proposed to be concerned not so much with style, color, materials, and other details, as with the effects of building mass, height and proportion on the environmental qualities of the surroundings.

The General Plan maps indicate relevant survey and classification systems which include:

- soil capability for agriculture and/or development;
- hydrology, climatology, ocean currents, tsunami and flood plains;
- wildlife and vegetation;
- aircraft noise;
- land ownership;
- socio-cultural amenities, visual amenities and landmarks;
- public transit.

7. Makena, La Perouse, Wailuku and Lahaina Areas, Island of Maui (1968)

This urban and environmental design study contains a visual survey of



SOURCE: J.C. WARNECKE & ASSOC. (1968)

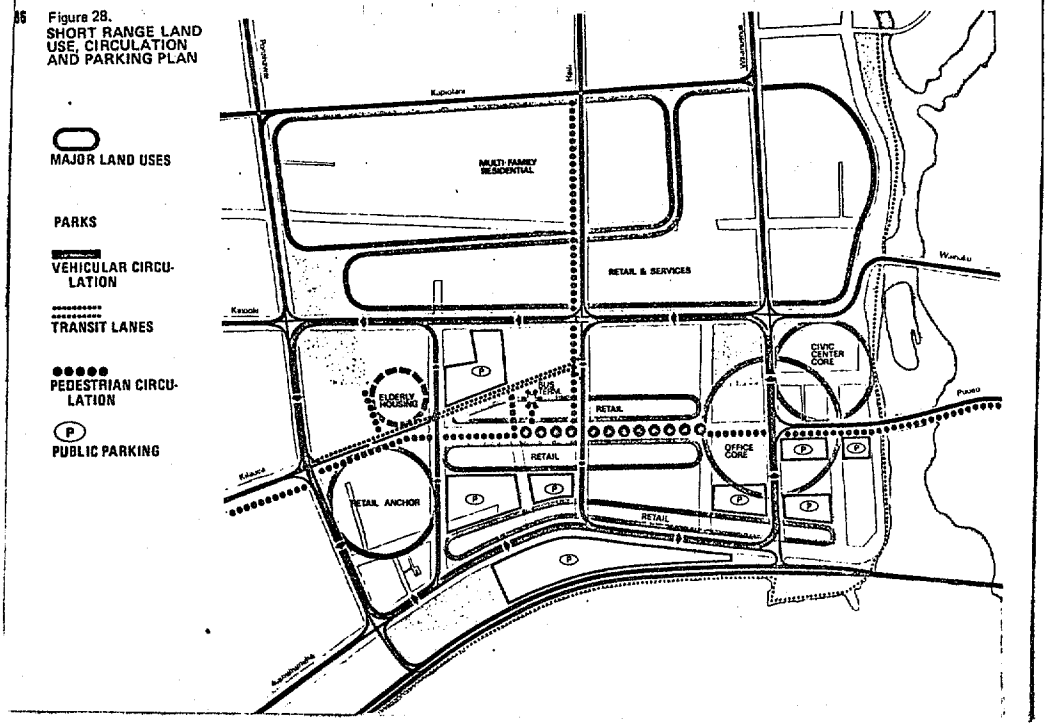
Makena Bay and La Perouse Bay coastlines, design principles and a number of recommendations including:

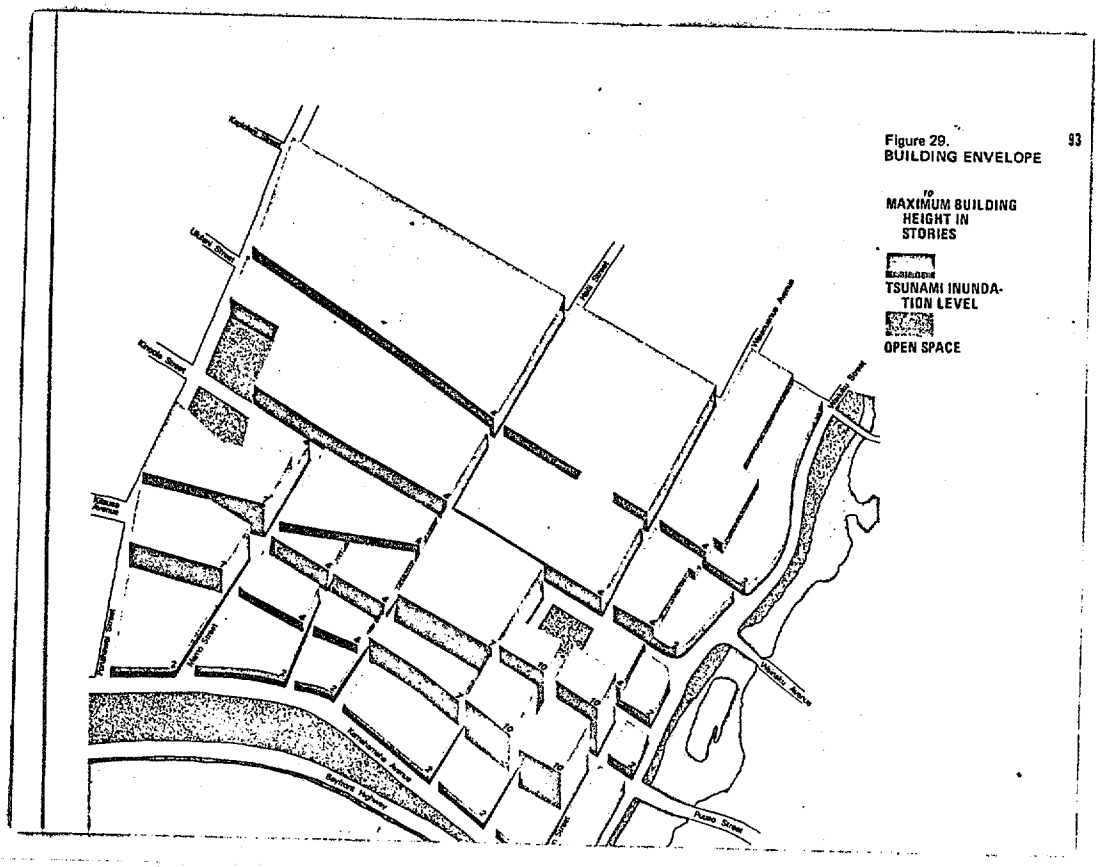
- the establishment of a new land use category: recreation reserve;
- the establishment of a system that will permit the public to share those unearned gains of private enterprise which were made possible by public investment, and use the money for recreation projects;
- the establishment of a system of shoreline setbacks (not based on a linear scale) for the whole island and the addition of a line of potential (visual) experience (L.O.P.E.) to be used in establishing the shoreline setback zone;
- the recommendation that no bonus in terms of density permitted should be allowable on property that is physically or environmentally contiguous to public lands.
  The density permitted should be somewhat lower than that allowed without a park there. The degree to which the permissible density is lowered, for property so located, should be inversally proportional to the amount of (unearned) value added to the property by the existence of the park.

8. Hilo Downtown Development Plan (1974)

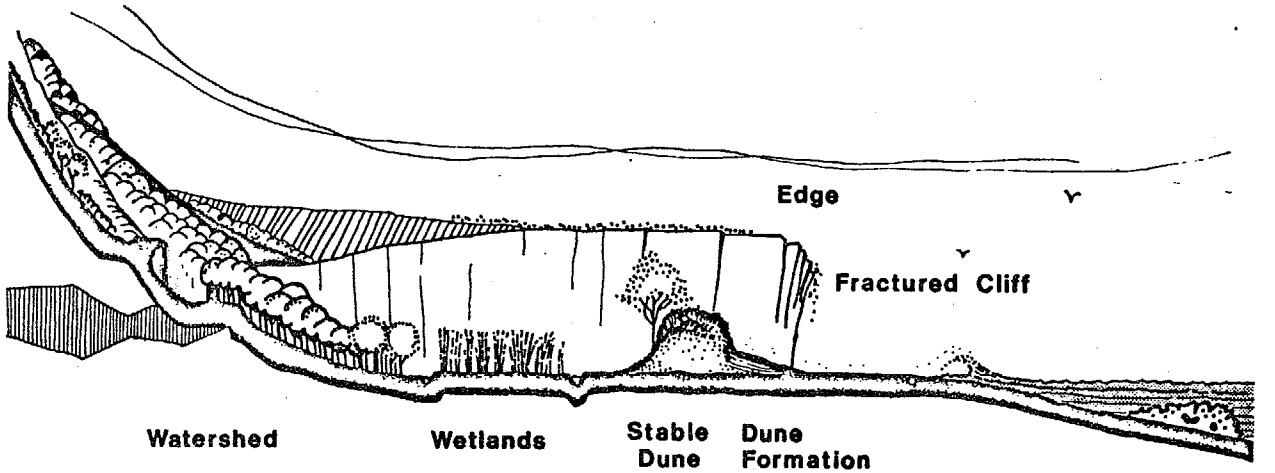
This plan, embodied in Ordinance No. 53, implements goals of the Hawaii County General Plan for the revitalization of Hilo City. It contains several relevant environmental and urban design concepts, which might have a broader application than just to Hilo City.

- The plan implicitly expresses the concept that high building structures should not be aligned paralled to the shoreline and obstructing the view of the ocean. In fact, the suggested building height is four (4) stories for the downtown area, allowing ten (10) and seven (7) stories heights in concentrated commercial and office areas. Higher buildings should be allowed only with issuance of "use permit". What is avoided in this manner is a blanket coverage of ten stories height limit on all the portions of downtown, as was stated in the old zoning ordinance.
- Construction of scattered and isolated high rises is discouraged in favor of clustering them, so that buildings should not substantially block the views of any residential unit behind the downtown core. In some cases where higher structures are demanded for residential uses, it is felt undesirable to cluster buildings and to let them block each other's view. The importance of identifing significant view channels and spacing residential structures so that major views are protected, is recognized.



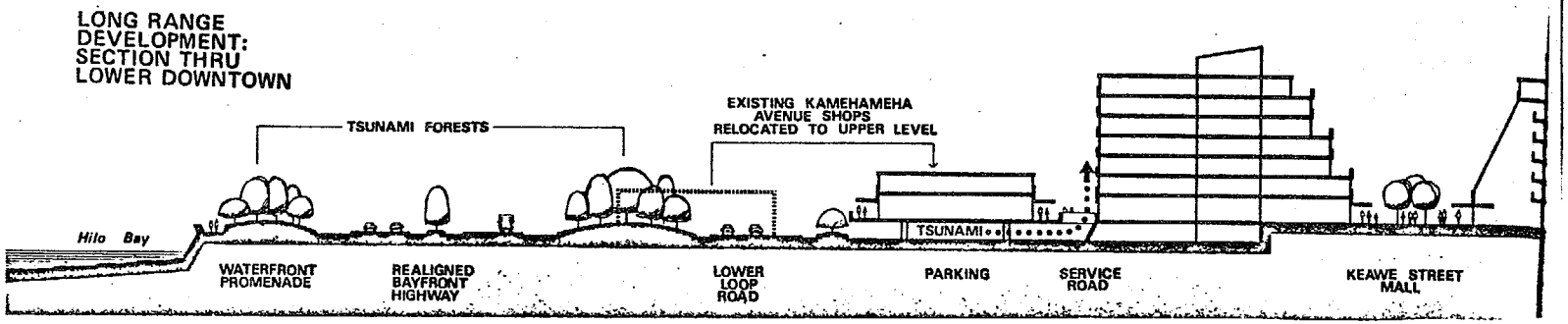


SOURCE: BELT, COLLINS, & ASSOC. (1974)

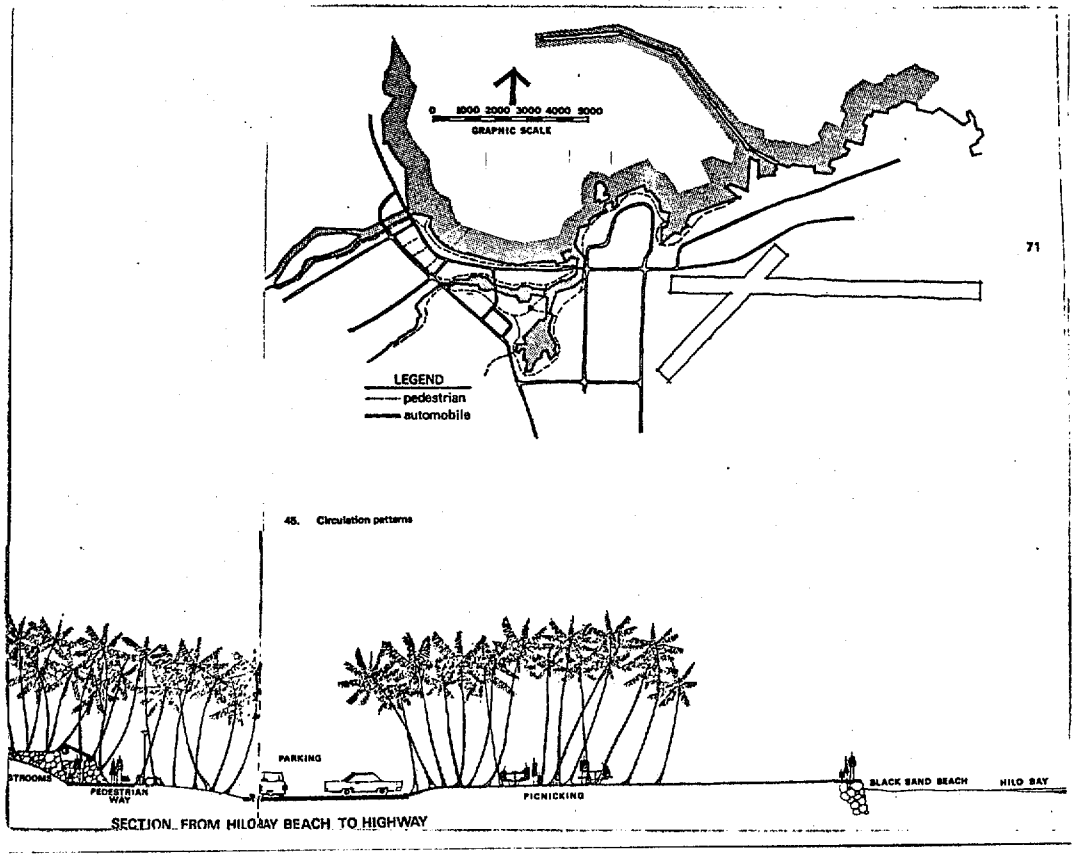


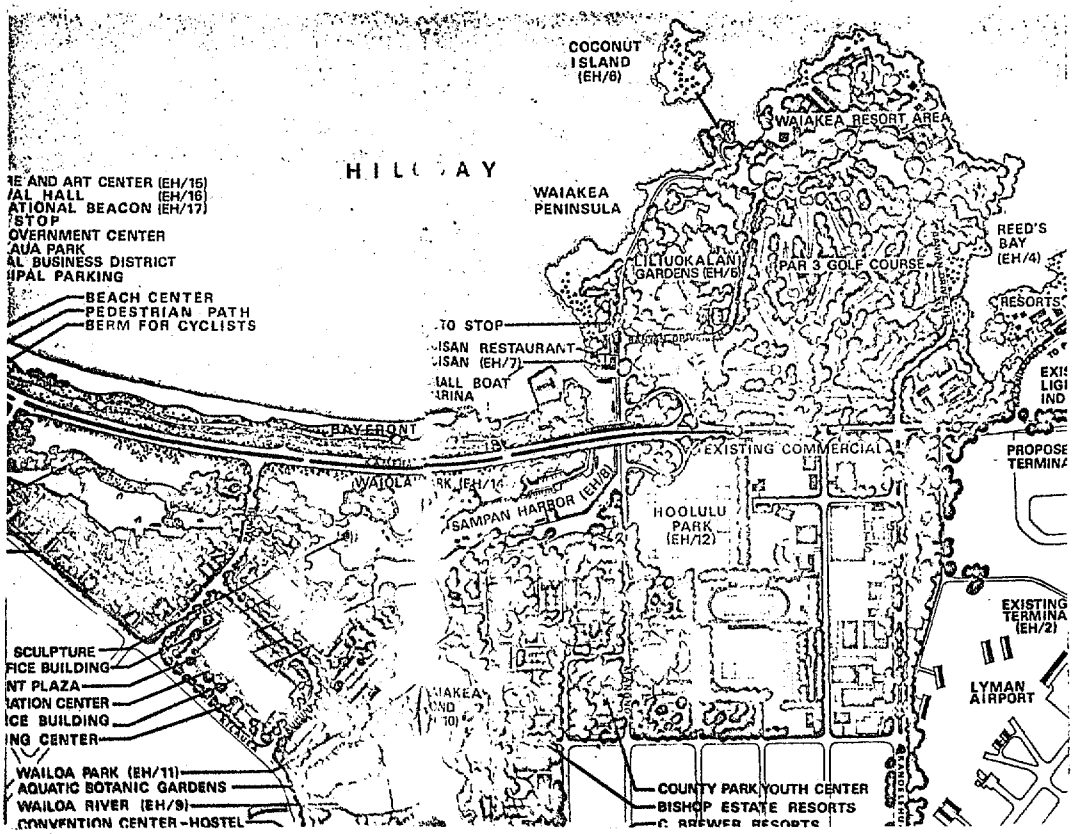
SHORELINE ZONE FACTORS

SOURCE: ECKBO, DEAN, AUSTIN & WILLIAMS and MURODA, TANAKA, & ITAGAKI, INC.(1970)



SOURCE: BELT, COLLINS, AND ASSOC. (1974)





SOURCE: G.S. WALTERS (1969)

- A realignment of the bayfront highway away from the shoreline and opening up of Mooheau park to the bay is proposed. This is consistent with the principle that urban waterfront should be open recreational space.

- Unsightly parking is however still planned along the waterfront; thus missing the opportunity to use that zone for pedestrian mall and pedestrian-oriented commercial activity such as coffeeshops.

- Tsunami forests are planted along waterfront promenades to minimize inundation damages and existing shops are relocated on upper floors along Kamehameha Avenue.

- The concept of pedestrian malls is adopted; Keawe Street is closed to traffic, which is consistent with the principle that urbanized shoreline should be designed at a pedestrian scale.

9. East Hawaii Project - The City of Hilo (1969)

In this environmental and urban design proposal for Hilo Bay a brief description of each site is provided with comments on present and possible environmental problems and recommendations concerning design solutions.

- The urban design development concept sets aside the shoreline as public beach park and the bay as a resort area.

- The port-oriented activities of the industrial area are perceived as an important visual attraction on the shoreline to be taken into account in a design scheme.

- View corridors from the shoreline to important urban landmarks such as churches are recommended in the plan.

- Relocation of the Hawaiian Homesteads situated near the industrial area is proposed.

- The design elements taken into considerations are:

  - circulation patterns (vehicular, pedestrian, bicycle, marine);

  - lighting patterns (intensive lighting of large areas, of individual points and interweaving lines);

  - tree lines and tree masses with names of plant species;

  - building mass patterns with the introduction of building envelope concepts;

- the plan recognizes the airport location as inadequate and too near to the city of Hilo and recommends the relocation of the airport beyond the Hawaiian Homestead area.

- However, the plan fails to provide malls in the direction of the view of the bay and perpendicular to the shoreline.

- The plan protects twenty-five (25) waterfront buildings from the early 1900's on the Mauka side of Kamehameha Avenue, so that the character of old downtown Hilo is maintained. The economic value of such a measure is clearly understood in terms of its contribution to the upgrading of the downtown as a pleasant commercial and shopping district, successful in attracting customers. Rather than allowing buildings to deteriorate or to be replaced by incompatible structures, the plan calls for rehabilitating, refurbishing and painting the buildings.

- The concept of protecting the open space streams, particularly in proximity of the shore, is adopted by the plan which protects Wailuku stream and even limits building heights to two stories to prevent them from dominating the river's edge.

In summary, building density, location of clustered structures, open public waterfront, pedestrian orientation of the urban core, protection of beaches and streams, revitalization of preservation of old buildings, protection of view corridors appear to be some of the concerns for the design of the urban shoreline.

10. West Hawaii Project: West Hawaii Corridor Study (1968)

The major purpose of this study is the establishment of criteria for the selection of beautification, planning and design of a highway corridor for a shoreline belt road between Kawaihae and Hookena on West Hawaii.

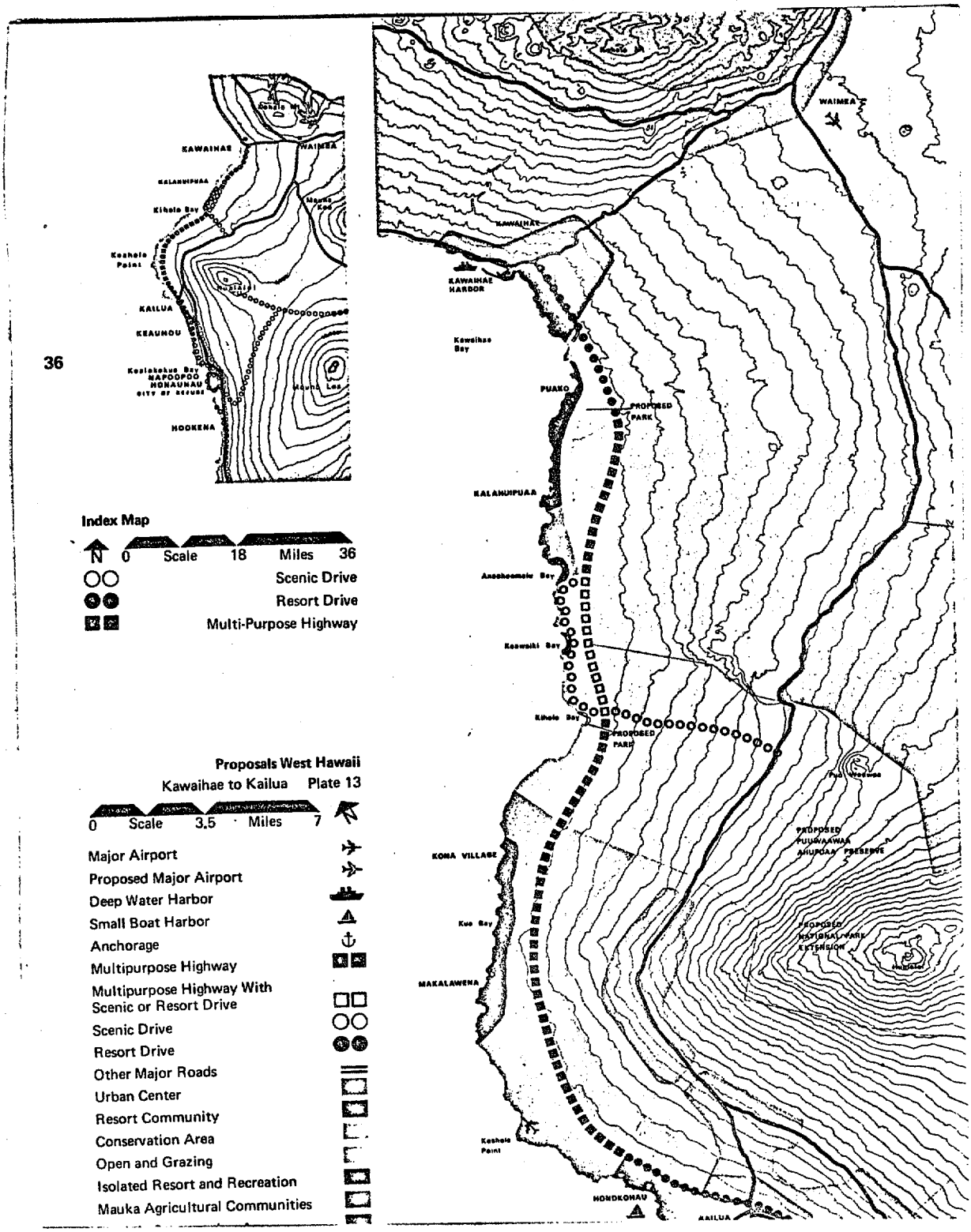
The island inventory covers:

- natural features
- existing land uses
- shoreline conditions
- scenic, recreation and historic sites.

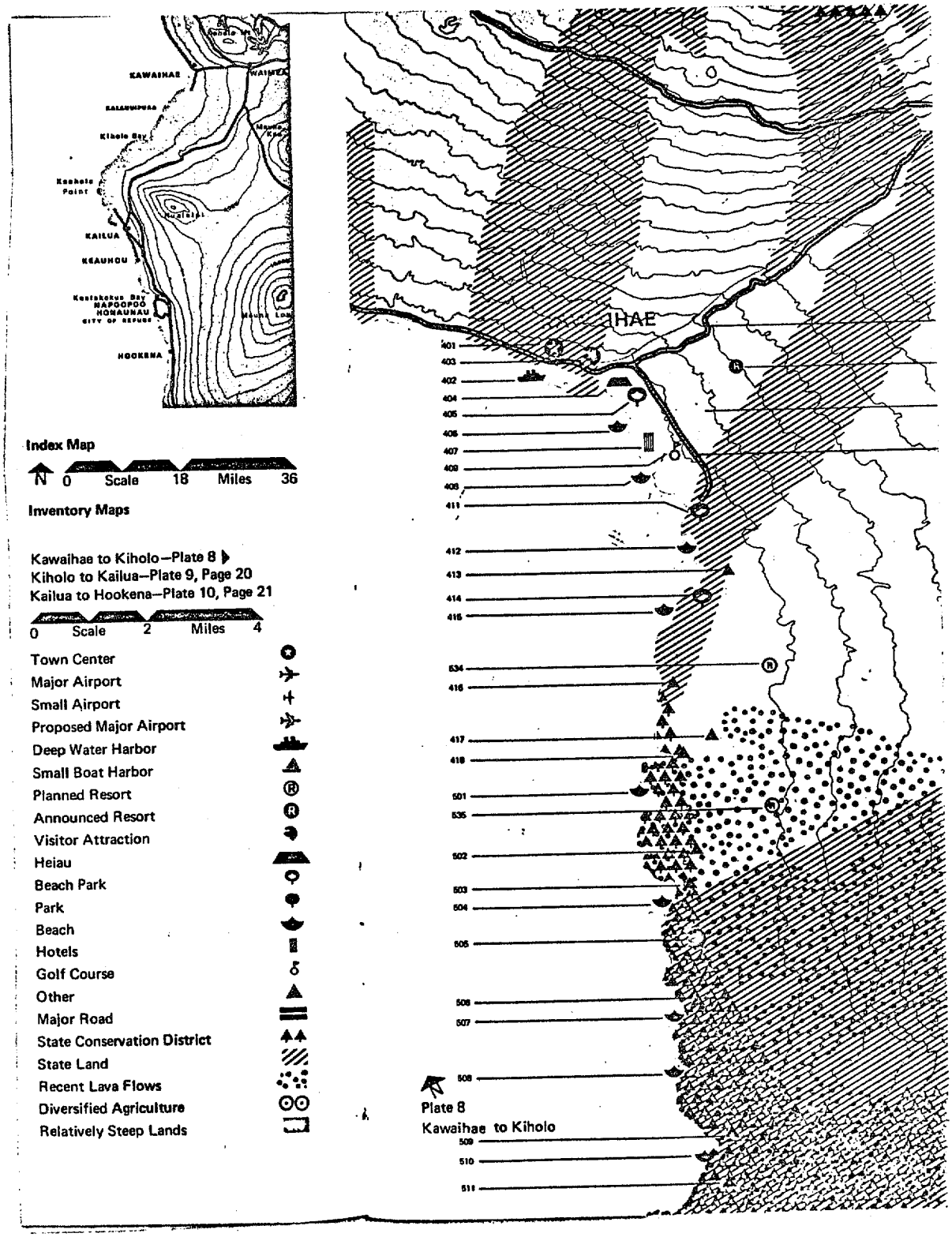
Each site along the route is briefly described. Policies and proposals indicate the adoption of design principles to be followed in the selection of the road alignment and in the study of the land use implications for nearby areas. Particularly useful are the following recommendations:

- scenic drive and highway physical aspect design principles;
- adoption of conservation subzones recommended by the Scenic Resource Conservation Committee of DPED (1966)*;
- utilization of the County Community Appearance Ordinance;
- adoptation of the guidelines of H. Bartholomew and Association, Kona Plan (1960).

*the subzone classification proposed by the Committee includes: restricted watershed (which already exists), water reserve, open land, wilderness, forest, shorelands, beach, scenic area, views and vistas, lookouts and overlooks.



SOURCE: BELT, COLLINS, & ASSOC.(1968)



SOURCE: BELT, COLLINS & ASSOC. (1968)

The following legislations are proposed;

- Landmark Bill for the State Monuments; protection of State Monuments and demarcation of State Monuments Control Zones.

- Open Space Bill: open space preservation and general plan preparation of open space.

- Shoreline Bill: regulation of uses on the shoreline and establishment of setback requirements.

- Scenic Drive Bill: expansion and improvement of scenic highways, site acquisition, leases, design selection of highway material, removal or screening of unsightly elements.

11. Urban Design Study Koloa-Poipu Area Island of Kauai (1968)

This urban design study supplies an inventory of natural and man-made features and identifies major design problems and proposals, such as:

- economic, land use, ownership considerations, past plans and zoning analysis are the first approach to the study of the area;

- an inventory of physical features is provided both with maps, indicating site locations with related sketches;

- from the analysis of both the inventory and the present pressure for change and development, design issues are identified and an effort has been made to establish a graphic visualization of these problems;

- regional design plans are proposed;

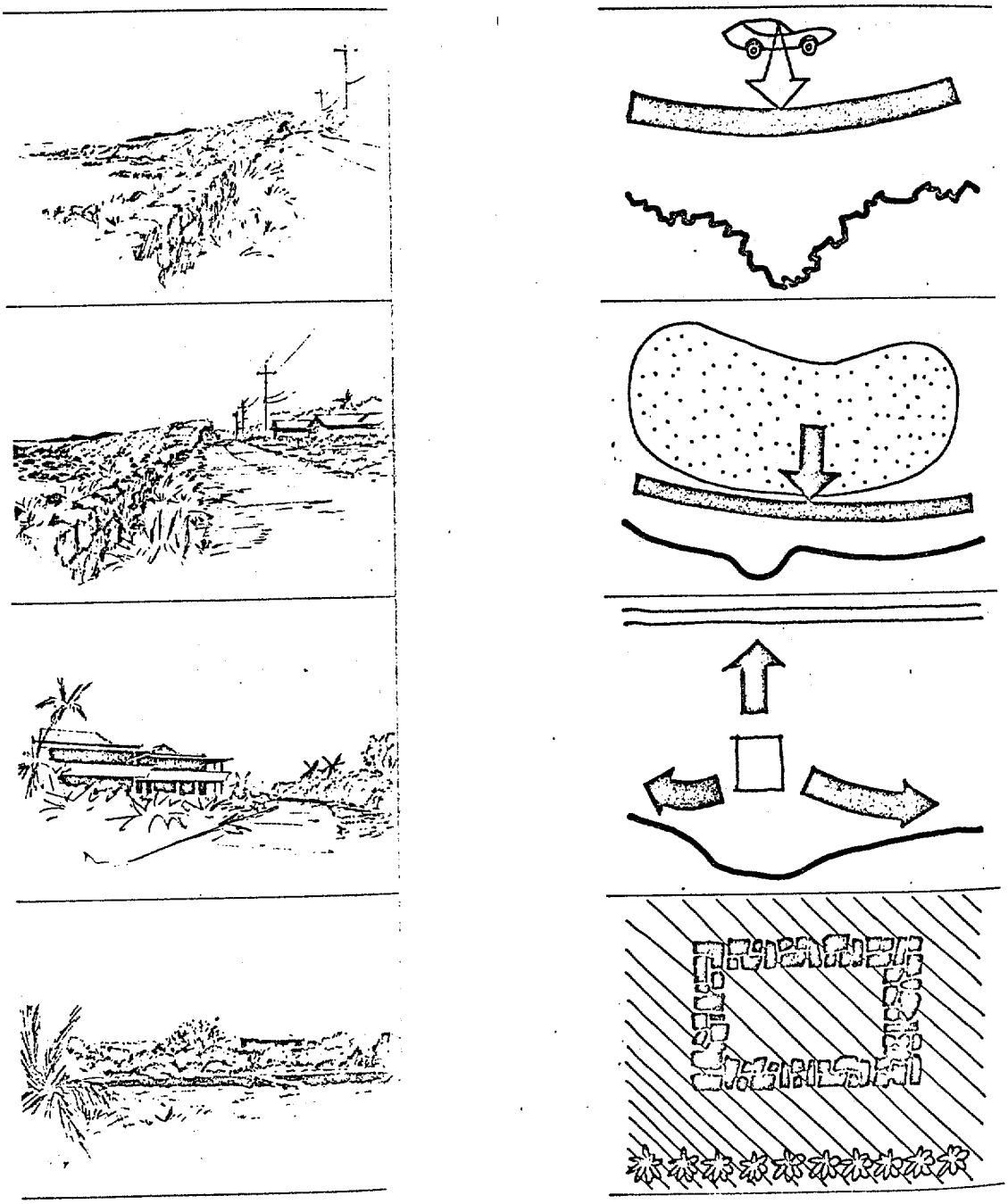
- solutions to urban design problems are proposed for each site; a diagrammatic visualization of these solutions is also provided.

In this report the planning and design processes have been made explicit. The study shows how inventory, design problems, current development trends, design potentials, identification of problems, and proposal of solutions are related to each other.

12. Maui Beautification Study: Island of Molokai (1969)

The beautification study for the Island of Molokai provides the following information:

- Maps, of scenic roads and parkways location according to the State's Department of Transportation requirements;



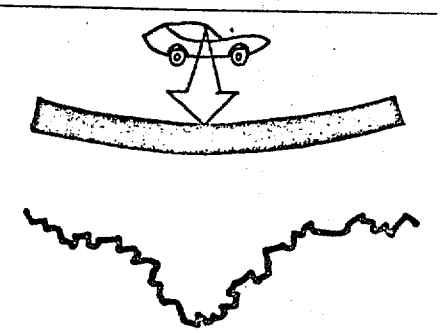
SOURCE: D. WOLBRINK & ASSOC. (1968)

50 rocky shoreline

roadway proposals for most future plans in area eliminate all through traffic on shore

this road is proposed to serve only residents in housing sector

sight of ocean will be lost for non-resident motorists



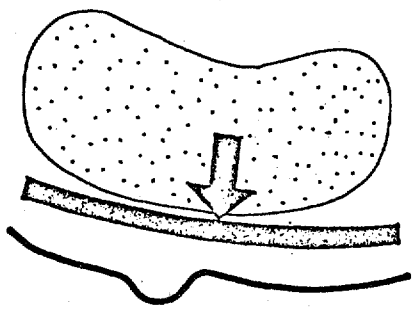
51 residential sector

only few sites have houses on them presently

layout is a typical subdivision and doesn't recognize desirability of access to sea

only homes on beach road will have an indirect association with the water

Knudsen proposal indicates this as multi-family



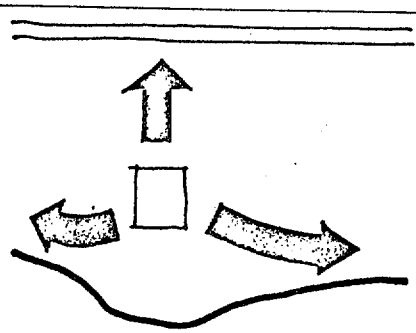
52 sheraton kauai hotel

approach road unclear

ambling plan consumes much frontage

present road pattern forced development parallel to shore

overhead utilities

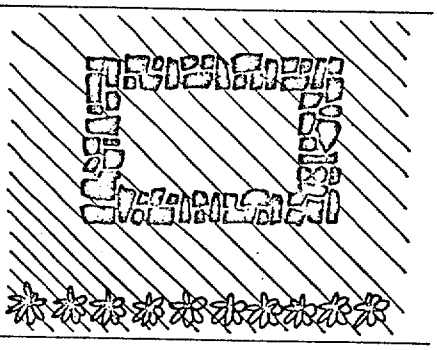


53 hawaiian archaeological site

public access available

site not identified to public

absorbed in commercial development in county plan and Knudsen plan report



149

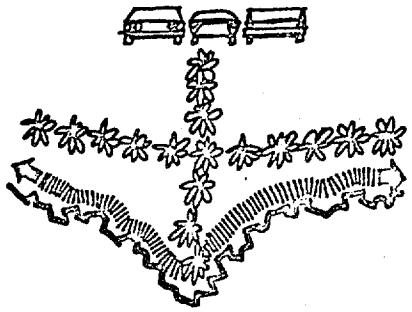
SOURCE: D. WOLBRINK & ASSOC. (1968)

50 rocky shoreline

preserve as open space

provide public approach to shoreline

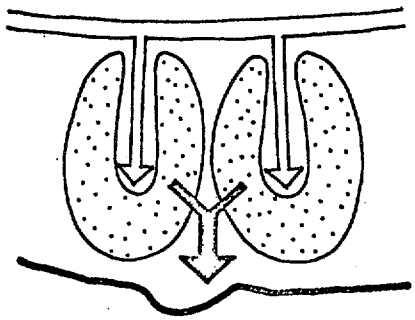
develop pedestrian pathway along shore and on right-of-way of present Poipu road



51 residential sector

enlarge Koloa landing area

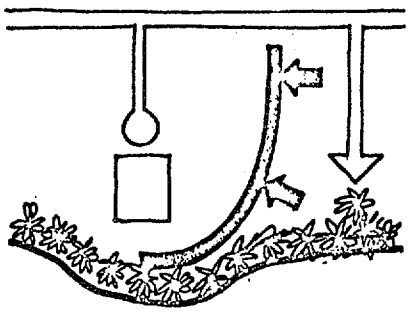
penetrate housing area with dead-end streets from county road and pedestrian penetrators from rocky shoreline—giving each residence direct connection to sea



52 sheraton kauai hotel

develop controls to limit density and ground coverage

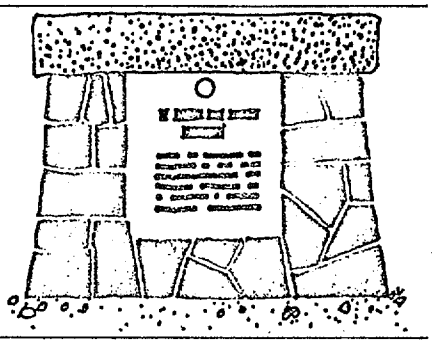
extend visual control to signs



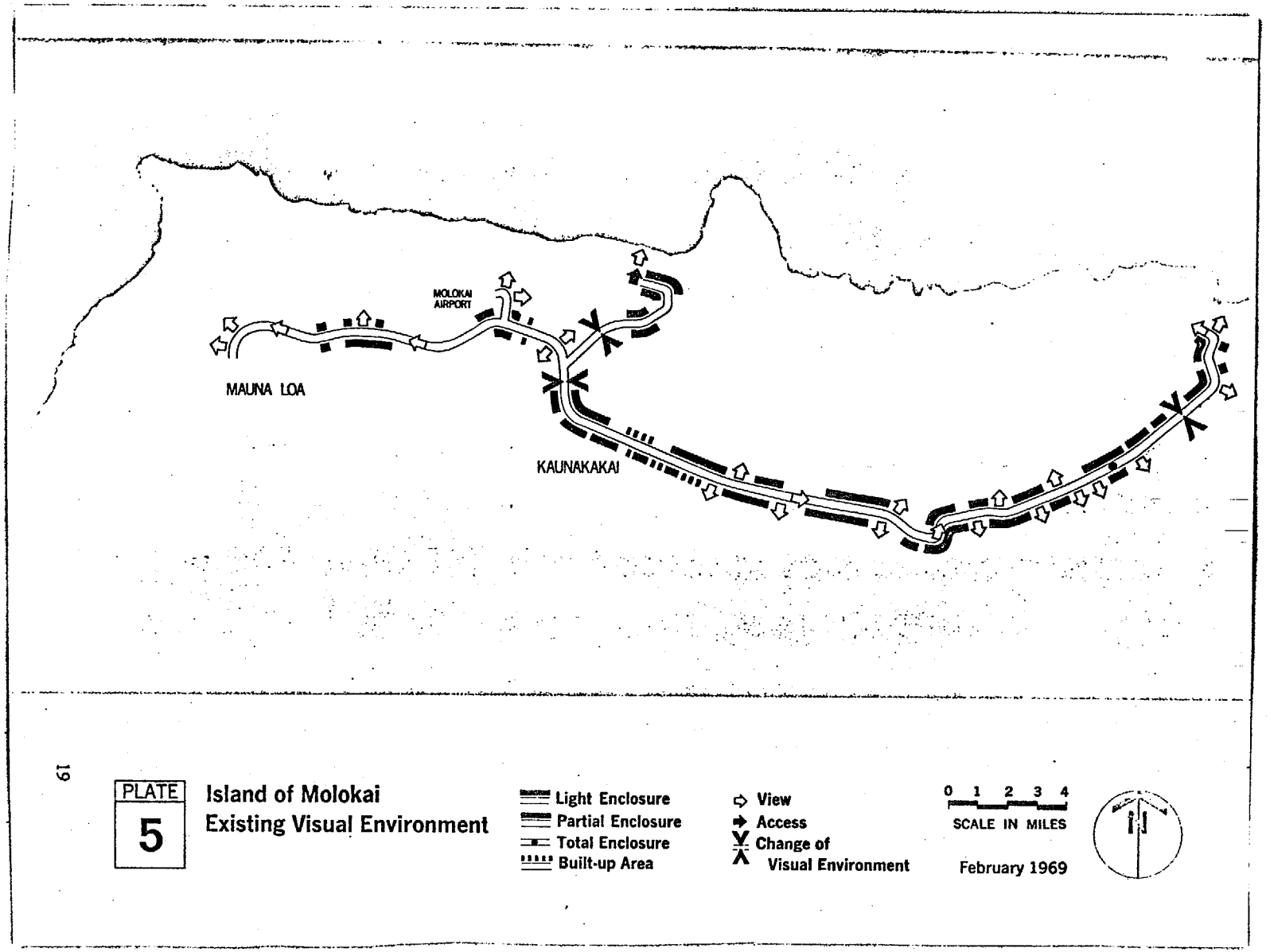
53 hawaiian archaeological site

incorporate this and other Hawaiian sites as part of public open space, making them accessible by a pedestrian network directly related to parking areas

introduce landscape design, identification sign, and information



SOURCE: D. WOLBRINK & ASSOC. (1968)



SOURCE: D. WOLBRINK & ASSOC. (1969)

- Statement of priorities for development;

- Physical inventory of sites, identification on maps of the location and of the number assigned to each of them. The sites are classified as:

  - scenic areas
  - specimen trees
  - unsightly areas

Each site is analyzed and accompanied by a brief description of landform, proposed site improvements and design criteria. Survey of the existing visual environment and the identification of the type of visual experience available to the observer along the road is provided. It includes:

- observation points with good scenic views;
- points of available access;
- points where a change in the visual environment may be experienced;
- points of obstructed view such as built up areas;
- total enclosure, partial enclosure and light enclosure points;
- sites of "specific design" or "potential for future design."

Finally, the possible role of the Molokai Beautification Committee is discussed in terms of:

- development of specific projects of beautification;
- promotion and coordination of community and civic organizations' input in the implementation of the beautification program;
- access to the Mayor to provide input on this matter;
- examples of implementation costs for beautification;
- identification of Federal programs, which may assist the beautification program such as:

  - Bureau of Public Works Beautification Program
  - Department of Housing and Urban Development Program of Urban Beautification for improvement of the community appearance
  - Federal Open Space Program administered by the Department of Housing and Urban Development.

13. Environmental Factors of the Kaneohe Bay Region (1973)

This report consists of an atlas of the existing environmental conditions affecting the study area of Kaneohe Bay. It contains an accurate application of McHarg's methodology of overlaying natural features and social value maps. The natural features include:

- Topography and bathymetry;
- Slope;
- Water supply and sedimentation;
- Rainfall;
- Floods and tsunamis;
- Erodable soils;
- Foundation soils;
- Agricultural soils;
- Woodlands;
- Vegetative cover;
- Wildlife.

The social values include:

- Existing zoning;
- Existing land use;
- Detailed land use;
- Existing utilities;
- Existing agricultural use;
- Historical significance;
- Scenic value;
- Recreational value;
- Population density;
- Institutional value;
- Shoreline access;
- Land ownership;
- Road and highways.

The selected composite maps are:

- Natural features - geological;
- Natural features - biological;
- Social values;
- Urban land use.

This report illustrates the utility of the overlapping maps procedure which should be utilized for all shoreline and coastal zone studies relating to the protection of scenic resources.

Source: Fowler, Bergman and Assoc.(1973)

COMPOSITE I
NATURAL FEATURES · GEOLOGICAL

OVERLAYS USED

SLOPE

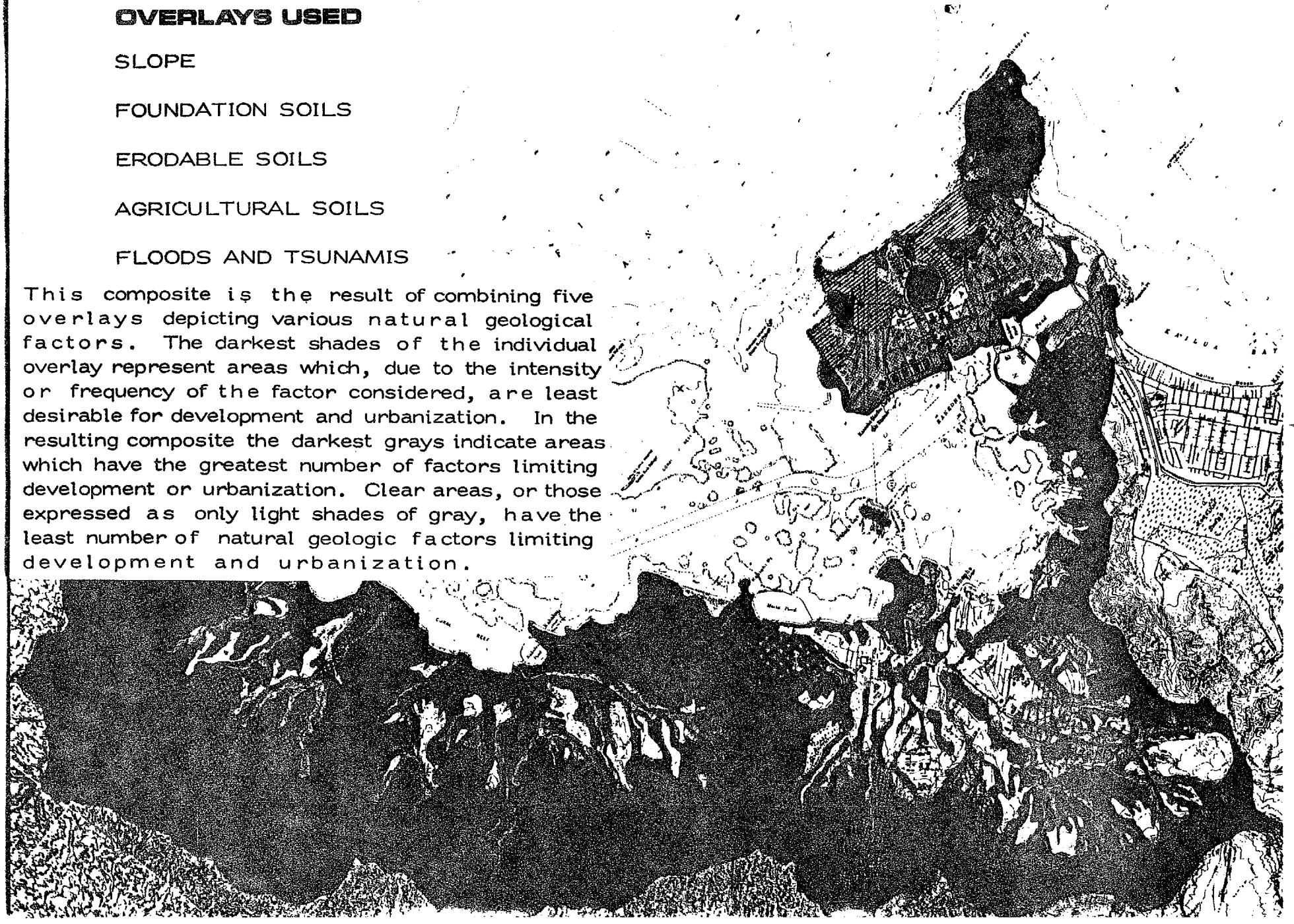
FOUNDATION SOILS

ERODABLE SOILS

AGRICULTURAL SOILS

FLOODS AND TSUNAMIS

This composite is the result of combining five overlays depicting various natural geological factors. The darkest shades of the individual overlay represent areas which, due to the intensity or frequency of the factor considered, are least desirable for development and urbanization. In the resulting composite the darkest grays indicate areas which have the greatest number of factors limiting development or urbanization. Clear areas, or those expressed as only light shades of gray, have the least number of natural geologic factors limiting development and urbanization.



Source: Fowler, Bergman and Assoc. (1973)

COMPOSITE
NATURAL FEATURES · BIOLOGICAL

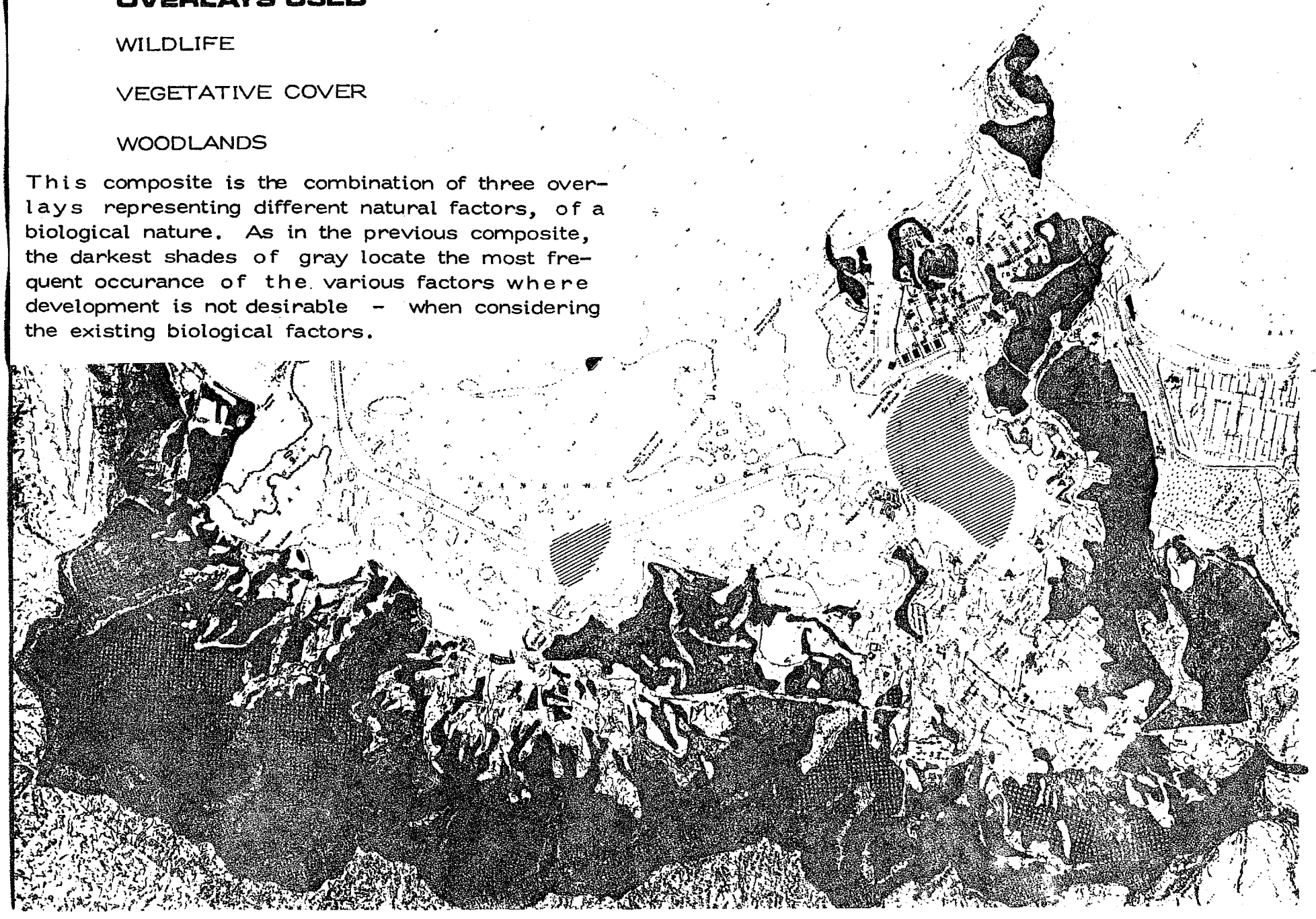
OVERLAYS USED

WILDLIFE

VEGETATIVE COVER

WOODLANDS

This composite is the combination of three overlays representing different natural factors, of a biological nature. As in the previous composite, the darkest shades of gray locate the most frequent occurance of the various factors where development is not desirable - when considering the existing biological factors.



Source: Fowler, Bergman and Assoc. (1973)

COMPOSITE IV
URBAN LAND USE

OVERLAYS USED

EXISTING ZONING

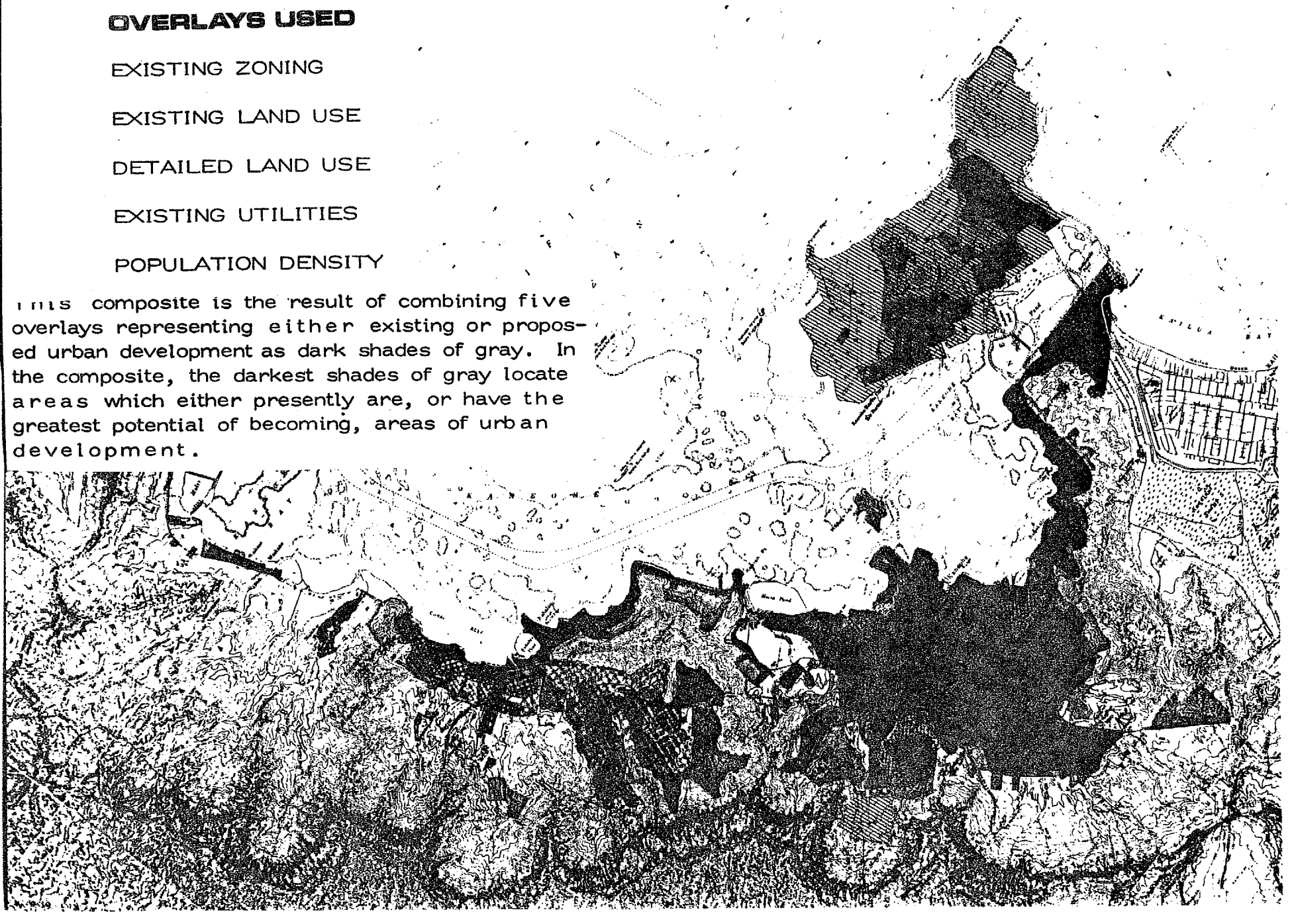
EXISTING LAND USE

DETAILED LAND USE

EXISTING UTILITIES

POPULATION DENSITY

This composite is the result of combining five overlays representing either existing or proposed urban development as dark shades of gray. In the composite, the darkest shades of gray locate areas which either presently are, or have the greatest potential of becoming, areas of urban development.



Source: Fowler, Bergman and Assoc. (1973)

COMPOSITE III
SOCIAL VALUES

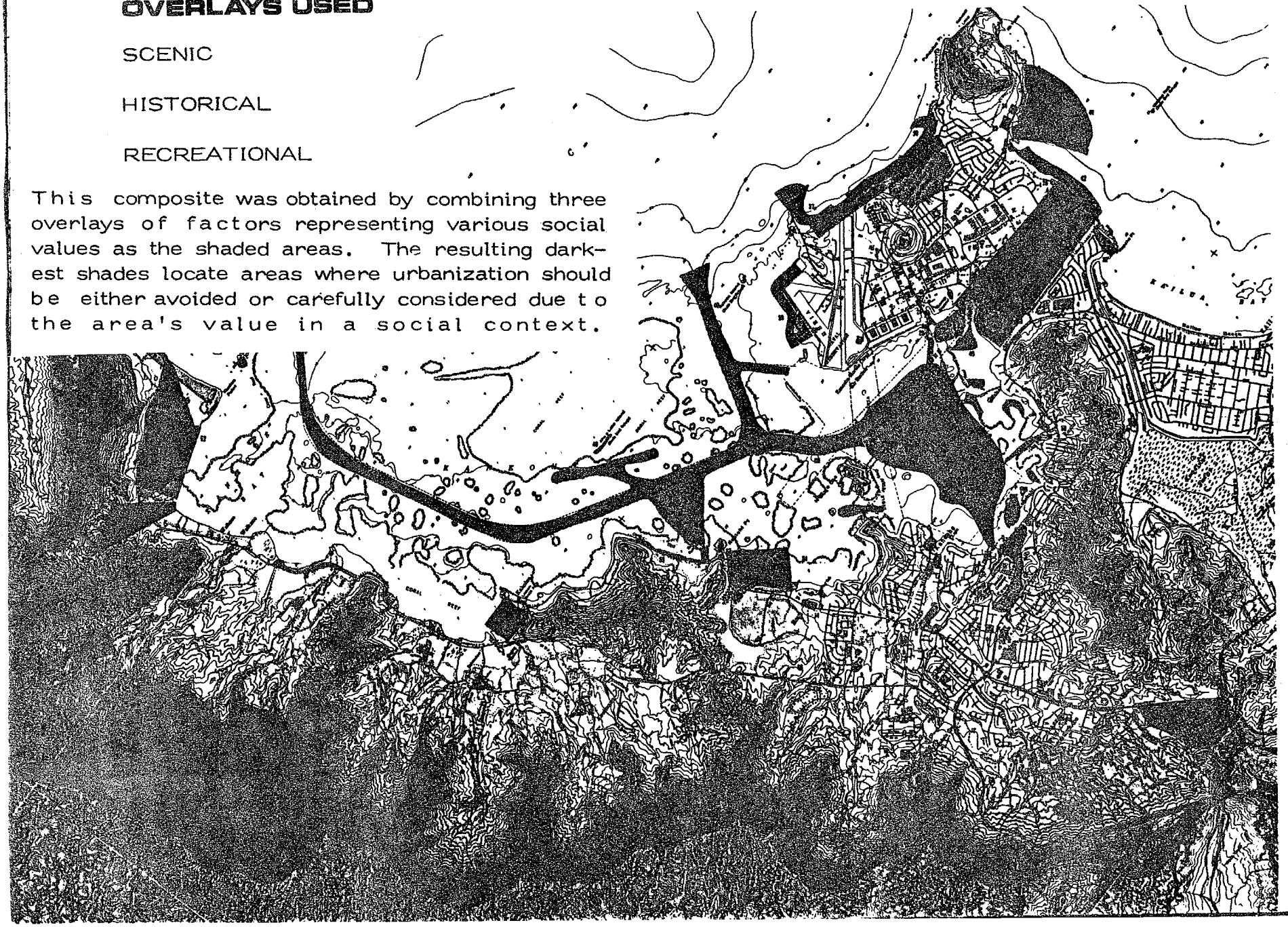
OVERLAYS USED

SCENIC

HISTORICAL

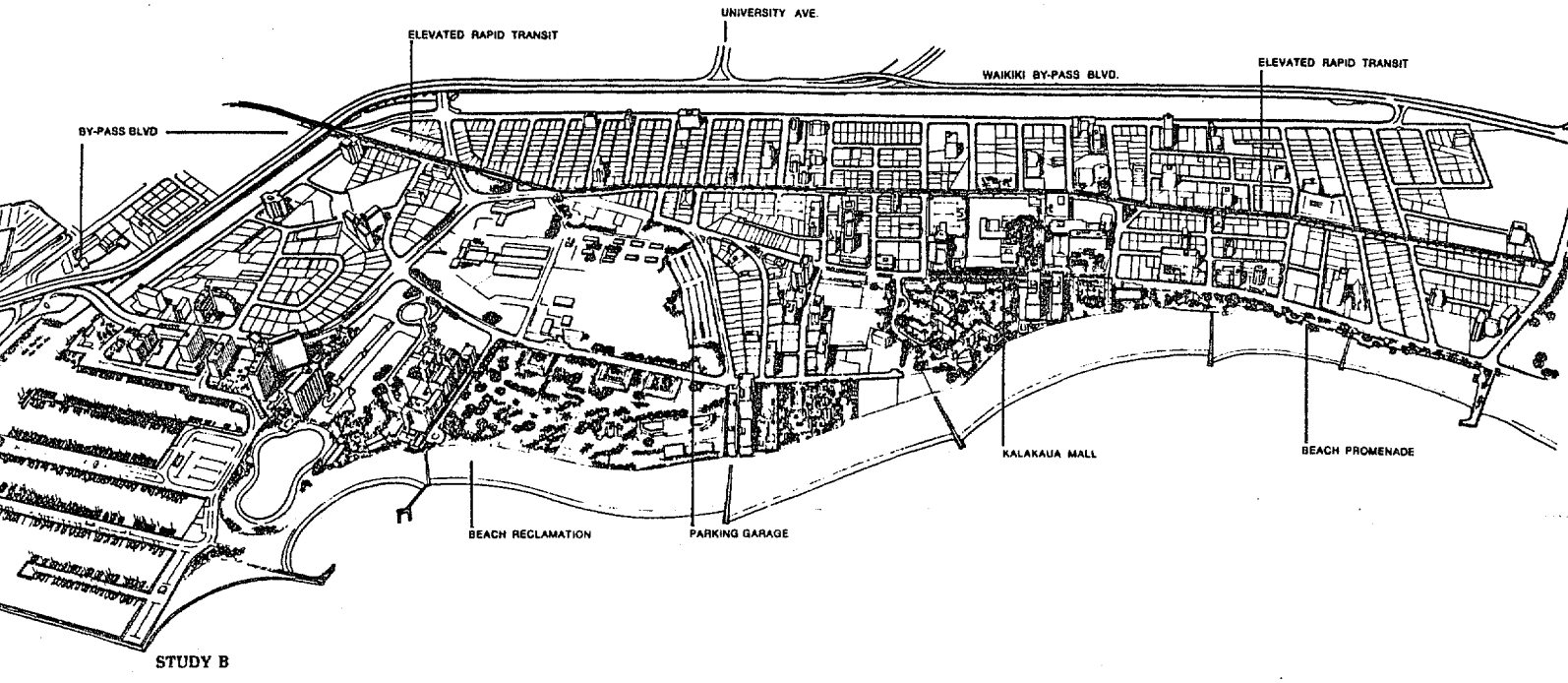
RECREATIONAL

This composite was obtained by combining three overlays of factors representing various social values as the shaded areas. The resulting darkest shades locate areas where urbanization should be either avoided or carefully considered due to the area's value in a social context.

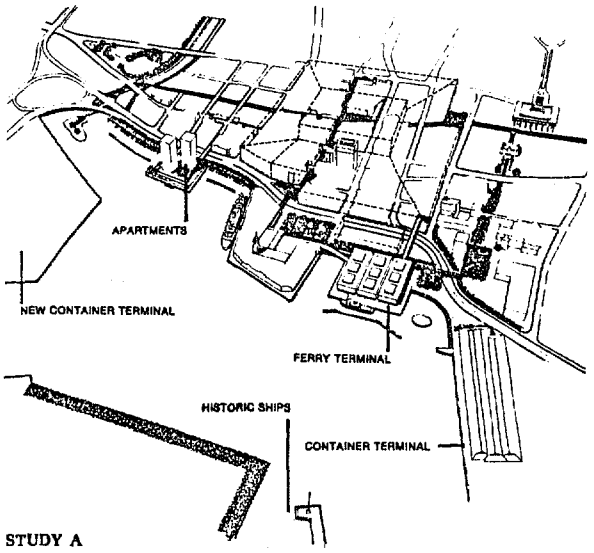


14. Urban Design Study of the Honolulu Waterfront (1968)

This study of the Oahu Development Conference demonstrates the urban design implications of public policies and development pressures. Current development proposals, trends and policies, development controls and public work programs to improve city appearance are the focus of the report. The design alternatives considered in the study are consistent with identified development policies for the Downtown, Kakaako-Ala Moana and Waikiki districts.

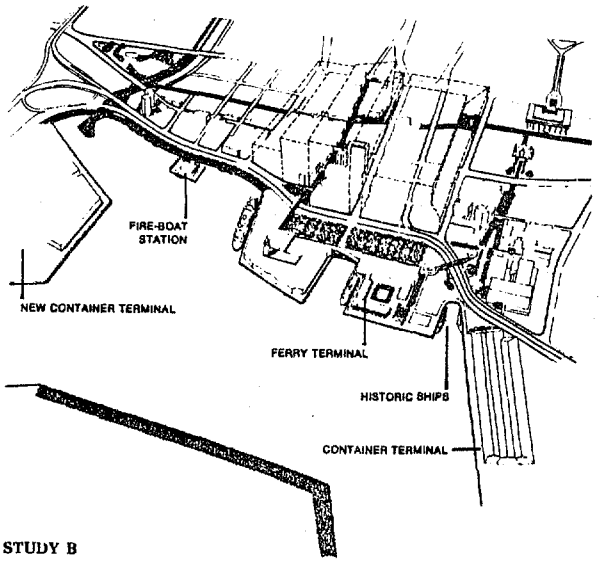


SOURCE: OAHU DEVELOPMENT CONFERENCE (1968)



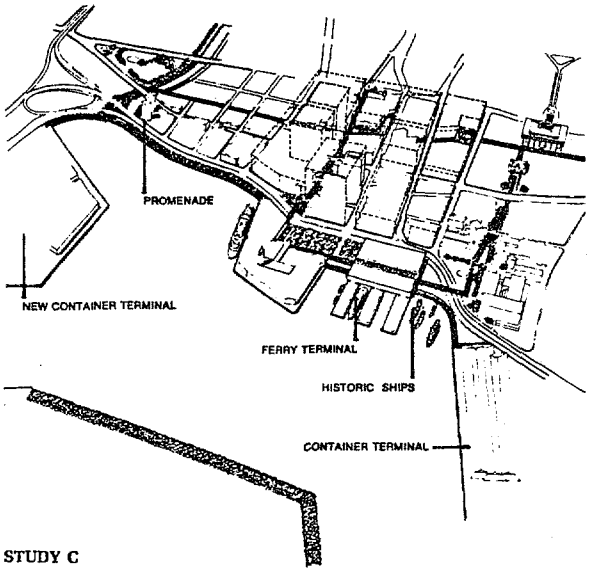
STUDY A

An apartment development makai of Chinatown, a waterfront promenade, pedestrian bridges from the waterfront to the Fort Street Mall and Civic Center Mall, and a general building envelope plan are studied above.



STUDY B

An alternate building envelope plan is shown, with an extension of Irwin Park into the site of the electric generating plant. The design of the inter-island ferry terminal is that of the civic center consultants.



STUDY C

The historic ships basin is shown adjacent to the inter-island ferry terminal. The water area makai of Chinatown is cleared of all structures and suggested as a berth for transient vessels.

SOURCE: OAHU DEVELOPMENT CONFERENCE (1968)

Policies and Recommendations Emerging From Environmental Research in Hawaii

1. Inventory of Sites and Location

Existing scenic sites surveys and inventories should be compared and discrepancies resolved to ensure that a scenic site mentioned in one report will appear in the others.

Site inventories should include: photographs, location on a map, details on site accessibility, ownership, vistas, lookouts, observation points and scenic corridors.

For each scenic site a policy statement should be formulated as far as plans and mechanisms that are needed to make the site available to the public.

2. Survey Methodology of the Sites

The State should promote a unified methodology for site surveys to be utilized by both State and County agencies. This would facilitate inter-island scenic site comparisons and establish priorties for their protection.

3. Design Methodology for Location of Man-Made Structures and Site Alterations

The State should review site survey methodologies undertaken by County and State agencies and establish a procedure to acquire any new methods utilized by any agency.

4. Reports and Suggestions on Legislative Measures and Management Mechanisms

The State should establish a more formalized procedure for adoption, rejection and/or modification of recommendations proposed by reports commissioned to consultants.

Counties' comprehensive zoning codes should not allow a density bonus for property contiguous to public lands, including the shoreline.

Citizen beautification committees and design review committees should be established on every island and integrated in the County planning process. The State should assist the Counties in securing Federal funds for beautification and protection of scenic resources.

5. People Perception of Scenic Beauty Surveys

The State should conduct periodic and systematic surveys to establish people's attitudes toward beauty and scenic resources.

Legislation should be passed to allow citizens to file suit to preserve scenic beauty and environmental standards.

6. Analysis of Development Impact and Cost of Restoring Scenic Beauty

Analysis of a development impact should be carried out by calculating the additional cost which must be incurred in the process of restoring natural beauty after development has occurred.

7. Urban Design Procedures and General Planning

Environmental and urban design procedures should be utilized uniformly by all Counties in the preparation of the general plans and planning district plans. They should include: visual survey, development plans, design control plans and design review boards.

The State should take a stand on the recommendations contained in the Overview and SCORP reports relating to:

- protection of scenic resources
- interagency coordination
- plan effectuation
- quality growth
- shoreline setback
- establishment of scenic districts
- confirmation of easements and right of ways to mountains and shoreline
- financing of open space protection
- State and County role and responsibility
- utilization of Federal land, including military, in a multiple-use context for recreational purposes

- provisions of scenic roads, trails, bikeways, and streambelts connecting the State park system
- creation of wilderness and shoreline reserves.

Every County should establish:

- development restriction zones
- open space zones
- special treatment zones.

Every County should utilize master plans provided with:

- visual structure maps
- scenic resource maps
- development plans
- design control plans.

V. SCENIC DISTRICTS AND SITES IN COASTAL ZONES

Island Scenic Districts

The management of scenic resources requires the demarcation of island scenic districts whose distinct characteristics and great visual quality would be measured in terms of the variety of vividness of the visual experience.

Island Divisions

Variety of the landscape in the Hawaiian islands is determined by land physiography and geology, climate, altitude, orientation and vegetation. The analysis of these factors leads to the identification of the following island divisions:

1. Physiographic divisions

   The Hawaiian islands are subdivided into a number of physiographic types with specific landscape features and forms determined by geological origin, age, and erosion processes. They are: dissected land, undissected land, uplands, plains, caldera complex: cones and craters, cliffs and valleys, and upper slopes.

2. Environmental divisions

   Environmental divisions are determined by the following:

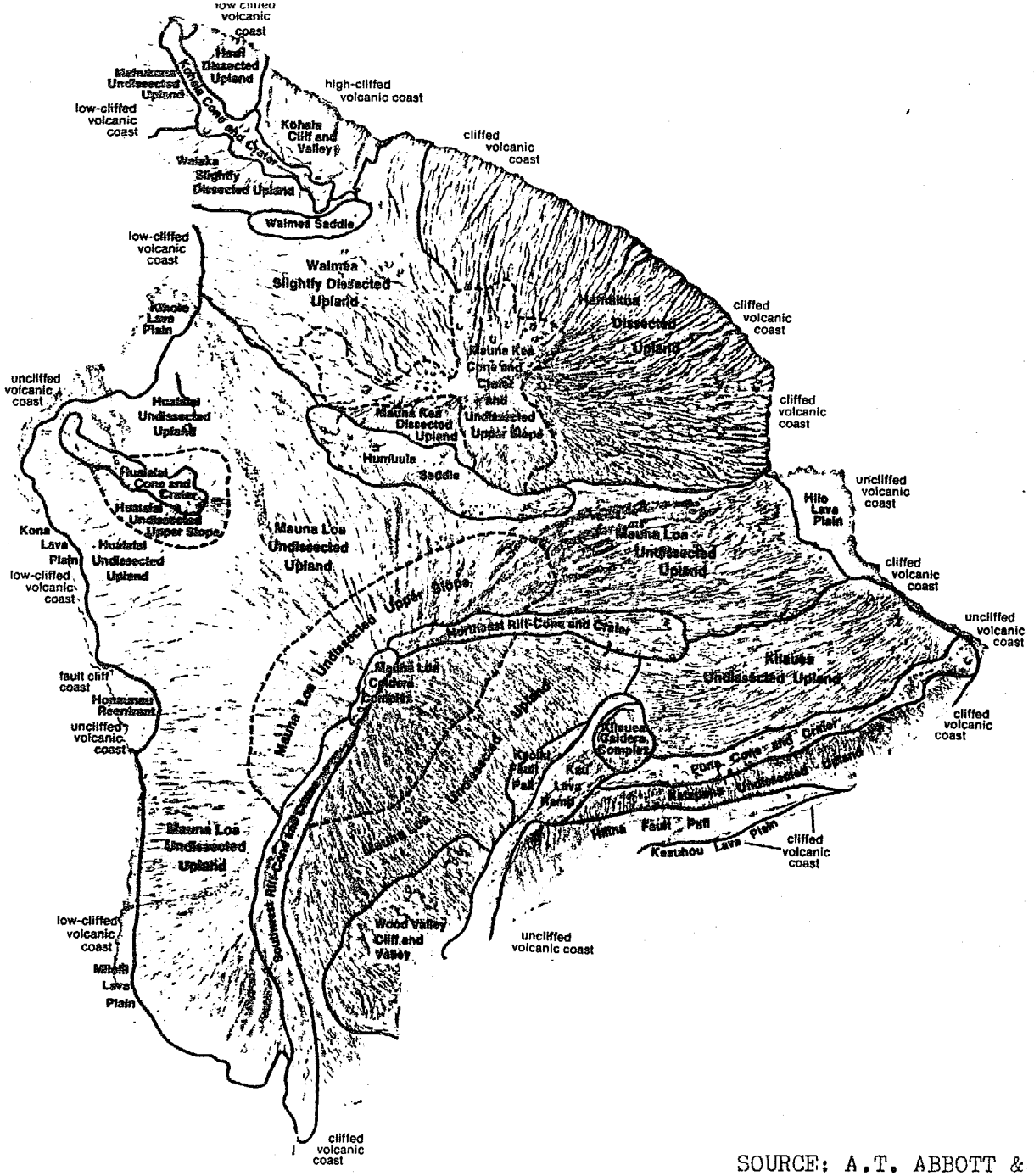
   a. climate, rainfall, temperature, solar and wind exposure;

   b. areas characterized by water-related phenomena (ground water, water runoff, drainage processes);

   c. altitude, and unique vistas from the site;

   d. site orientation, relative location and related minor climatic and physiographic conditions and plant variations;

   e. vegetation zones (Kiawe and lowland shrubs, Lantana-Koa haole shrubs, open guava forests with shrubs, closed Ohia Lehua rain-



Physiographic Types

Caldera complex. Area having features associated with calderas including craters, cones, bounding faults, fissures, slump blocks, talus heaps, caldera-filling lavas.

Cliff and valley. Area showing little evidence of former slope; with high, nearly vertical cliffs and amphitheater-headed valleys; some valley floors may be gently sloping.

Uncliffed coast. Coastline with little or no cliff along the shoreline.

Low cliffed coast. Coastline with wave-cut cliff—average height about 20 feet.

Cliffed coast. A more mature cliffed coastline—average height about 100 feet.

High cliffed coast. Coast with extreme cliff development up to 2,000 feet in height.

Cone and crater. Volcanic cones and craters of diverse origins, common along volcanic rift zones.

Fault palis. Cliffs resulting from displacement along faults.

Headland. A particularly prominent coastal cliff or promontory.

Isthmus. A low land link between islands.

Lava ramp. A distinctive linear incline formed by lava flows.

Plain. A large area of low relief.

Saddle. Subdued divide between two volcanoes formed where lavas meet or impinge.

Sand dunes. Dunes of loose and/or lithified, wind-blown sand.

Sandy beach. Strips of sand of varying widths at the water's edge.

Undissected upland. Slopes with little or no established surface drainage.

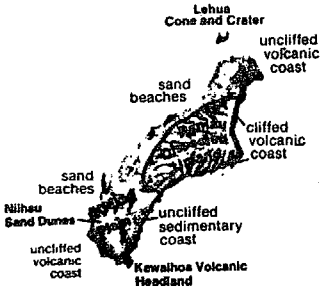
Slightly dissected upland. Slopes cut by widely spaced erosional gullies.

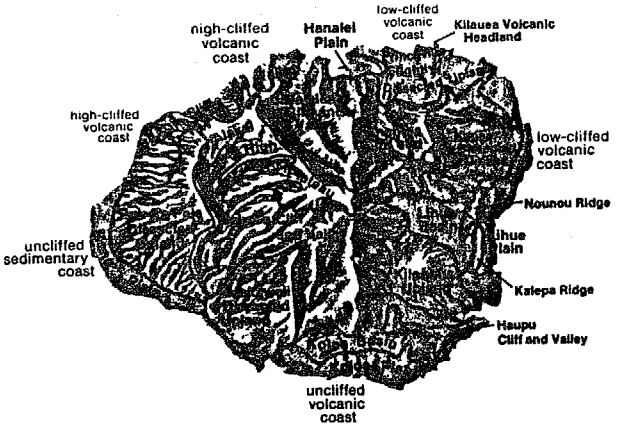
Dissected upland. Slopes cut by numerous major valleys; master drainage patterns established.

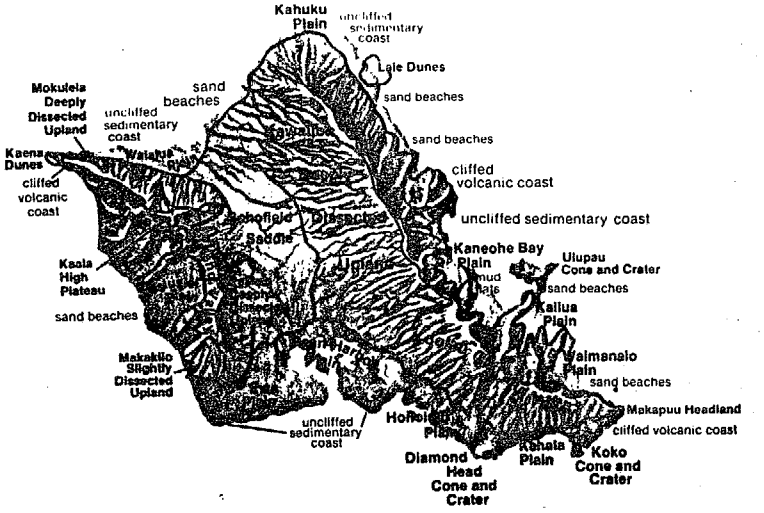
Deeply dissected upland. Slopes incised by large, deep valleys; some ridge crests may reflect former slope. Transitional toward the cliff-and-valley type.

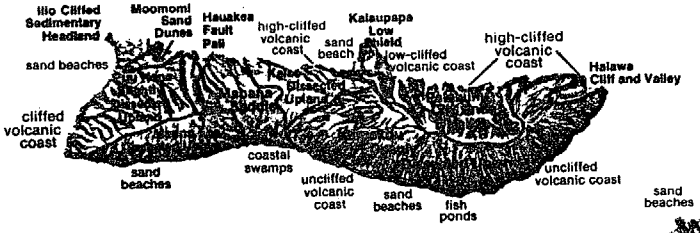
Upper slope. A zone above the uplands found only on the highest volcanic shields; characterized by little or no vegetation, late lavas, and barren, rocky terrain.

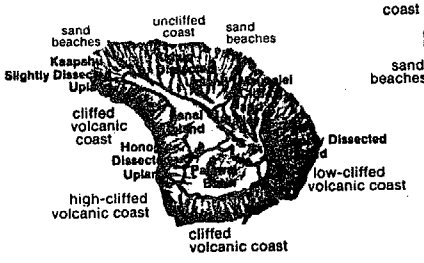
SOURCE: A.T. ABBOTT & J.A. BIER
ATLAS OF HAWAII 1973

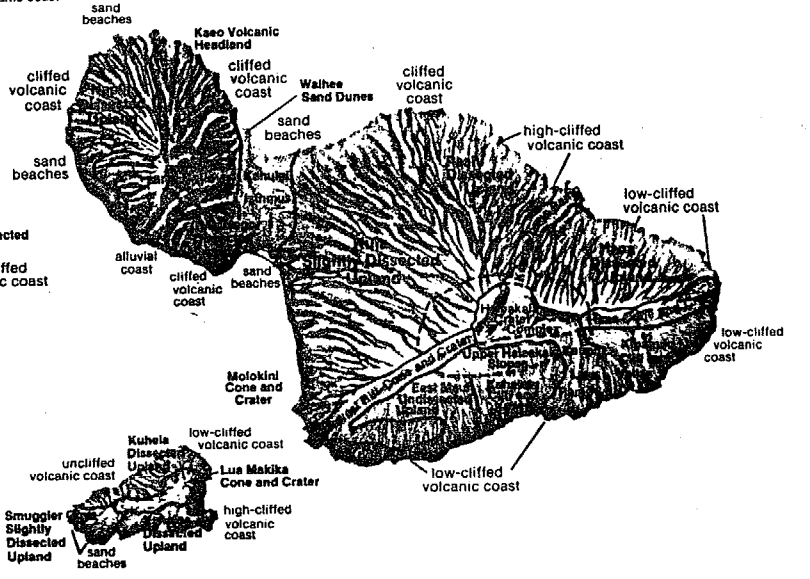












PHYSIOGRAPHIC DIVISIONS

5 0 5 10 15 20 25 miles

5 0 5 10 15 20 25 30 35 kilometers

Source Physiographic divisions—A.T. Abbott, Geology-Geophysics Dept., Univ. of Hawaii
Relief presentation—J.A. Bier, Geography Dept., Univ. of Illinois 1972

ATLAS OF HAWAII 1973

forests, open Koa forest, open Koa forest with Mamani, open Mananinaio forest with subalpine shrub, alpine stone desert, pasture and cultivated land);

f. soil types (Alfisols, Aridisols, Entisols, Histosols, Inceptisols, Mollisols, Oxisols, Spodosols, Ultisols, Vertisols).

Scenic Districts Boundary

The overlay of physiographic and environmental division maps determines a set of smaller zones which will constitute, because of the variety of natural and scenic resources, the scenic districts. They should be identified, inventoried and protected, since all of them constitute the vividness, variety and uniqueness of the scenic resource in Hawaii. The preservation and enhancement of the quality and variety of this resource provides a basis for the aesthetic experience. The protection of a scenic district must be decided on the basis of its uniqueness nationwide, statewide and islandwide.

Scenic Coastal Features

Generalized coastal features, emerging from the physiographic approach, are the following:

1. Island points or peninsulas

Peninsulas are portions of land nearly surrounded by water and connected to the mainland by an isthmus. This feature is of high scenic quality as it permits the observer and the user to: perceive water all around him in its immensity and depth (at the tip); perceive and have access to two quite different water orientations and views (on the two sides); perceive island shoreline and profile from a unique observation point.

In addition, points and peninsulas constitute landform variations of the shoreline highly visible from inland.

Peninsulas are, generally, the most unspoiled and unencroached portions of the Coastal Zone. They already are or should be recreation areas with access open to all. On Oahu they include Kaena, Mokapu, Kaneohe, Koko Head, Black Point, etc.

2. Bays

Bays have high scenic values because they are a natural moment of "unity" along the coastline. They consist of natural enclosures (amphi-theaters) created by palis or cliffs and bordered by semicircular sandy beach edges separating the valley floor from the sea. Each place along the semi-circle offers a different observation point and view. The bay usually represents the most natural access to the ocean for water-oriented activity.

3. Generalized Shoreline

The shoreline, as a continuous edge separating land and water, is an element of high "macroscale" scenic value. It offers an experience of continuous variety and vivid scenery when travelling or boating along it. The application of macroscenic criteria for the identification of great scenic coastal features, allows us to identify points, peninsulas, bays, and the shoreline.

The physiographic characteristics that give the shoreline its variety are:

- high cliffed volcanic coast;
- cliffed volcanic coast;
- uncliffed volcanic coast;
- lava plain;
- fault cliff coast;
- sand beaches;

- alluvial coast;

- sedimentary coast.

Each of these zones require the application of environmental design criteria for protecting the natural setting and guiding man's intervention and development.

Coastal Scenic Districts

Coastal scenic districts are determined by superimposing scenic district maps upon scenic coastal feature maps. The overlap generates a finer classification of coastal zones which account for and describe the variety of coastal features and settings.

The protection of coastal scenic districts is even more urgent than inland scenic districts because the former presents the unique visual quality inherent to the shoreline.

Coastal Scenic District Boundary

The boundaries of the coastal scenic districts are determined by the superimposition of scenic district maps upon scenic coastal feature maps. The seaward boundary is the shoreline or the water-land edge. The inland boundary is determined empirically by overlapping the maps for each given site.

The seaward and inland boundaries thus determined are useful for a general definition of the scenic district. The analysis of scenic views and sites presented in the next chapter allows for boundary adjustments. This methodology does not establish a shoreline setback defined by a fixed number of feet inland from the shore. However, the establishment of such shoreline setback as proposed in recent legislation in Hawaii would certainly help the protection of scenic coastal resources.

Scenic Sites

The localization of scenic districts and the definition of their boundaries can be accomplished through the utilization of the procedure explained in the previous chapter. However, the relative degree of scenic value in terms of vividness, variety, and uniqueness of the aesthetic experience within the district must be established by determining on maps the specific scenic sites which constitute the focal point of the observation from given lookouts.

This task is accomplished by undertaking an inventory of the type and variety of visual experience available to the observer within the scenic district. The end result is the preparation of isovisual maps (See Figure A, page 31 , Chapter 3).

Scenic Views

The scenic sites can be perceived from a number of lookouts which must be located on maps because the scenic view from these vantage points must be protected and remain unobstructed.

The study of the scenic view analyzes the relative combination, proportion, and location of land, water and sky within the observer's range of vision at a given lookout point.

More specifically, it is the features of the edges separating:

- water and sky;
- water and land;
- land and sky;
- flat land and sloping land;

which constitutes the basis of the scenic view.

The identification of the lookout (or observation point) of the scenic site (or the object of the observation) and the scenic site's boundaries

allow the demarcation of the "visual cone" (or view corridor) in the direction of the scenic site.

This visual cone must remain unobstructured by man-made constructions in order to maintain the quality of the scenic view. The projection of the cone on the land is called the "view plane." The latter defines the boundaries of the landscape to be protected from development.

Scenic View Inventory Definitions

The following are definitions and criteria to be used in determining scenic views:

- Observation point: place where the observer is located, lookout, vantage point, view point;
- Object of observation: place where the focus of the observation is addressed to, usually a landmark or a landform;
- Depth of field: depth of vision or length of the view line;
- Field of vision: circular solid angle zone from the center of vision determined by relative vision of two eyes (see Figure 2, 3 page 147).
- Visual intrusion: proportion of the apparent size of the observed object in the field of vision (See Figure A, page 147).
- Solid angle divisions: quadrant zones of the visual field occupied by the image of the observed object. They are:
  - left - upward,
  - right - upward,
  - left - downward,
  - right - downward.
- Naturalscape element: general object of the observation:
  - waterscape,
  - landscape,
  - skyscape.
- Naturalscape intrusion: proportion of landscape, waterscape, skyscape intruding in the visual field. It constitutes the form and content of the scenic view.

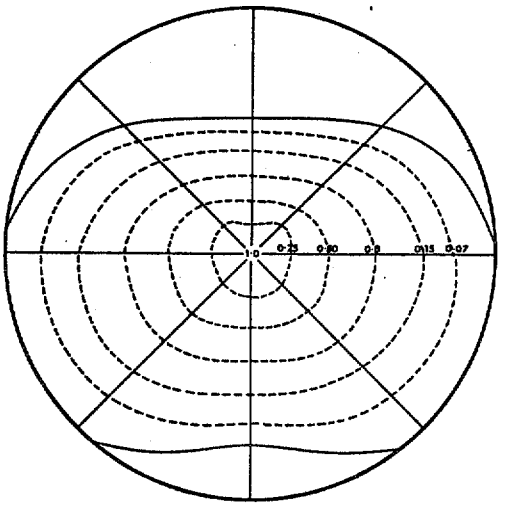


FIG. 2. *Relative sensitivity of the visual field to intrusion.*

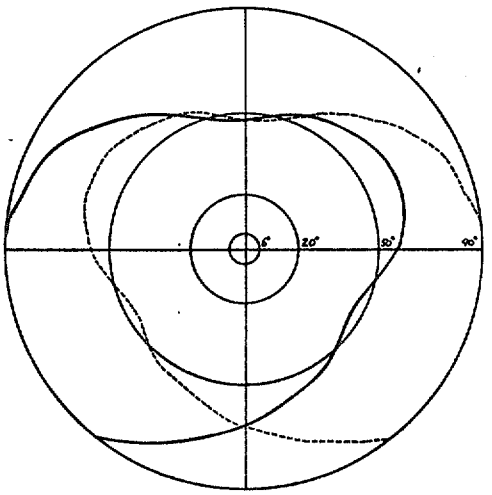


FIG. 3. *Circular zones of radius 6°, 20°, 50° and 90° from the centre of vision, together with the fields of the two individual eyes. (The 50° circle is seen to correspond approximately to the limits of the binocular limits of the field.)*

From: R.G. Hopkinson " The evaluation of visual intrusion in Transport situations ",J.T. Coppock & C.B. Wilson ed. in Environmental Quality , John Wiley & Sons, N.Y. 1974

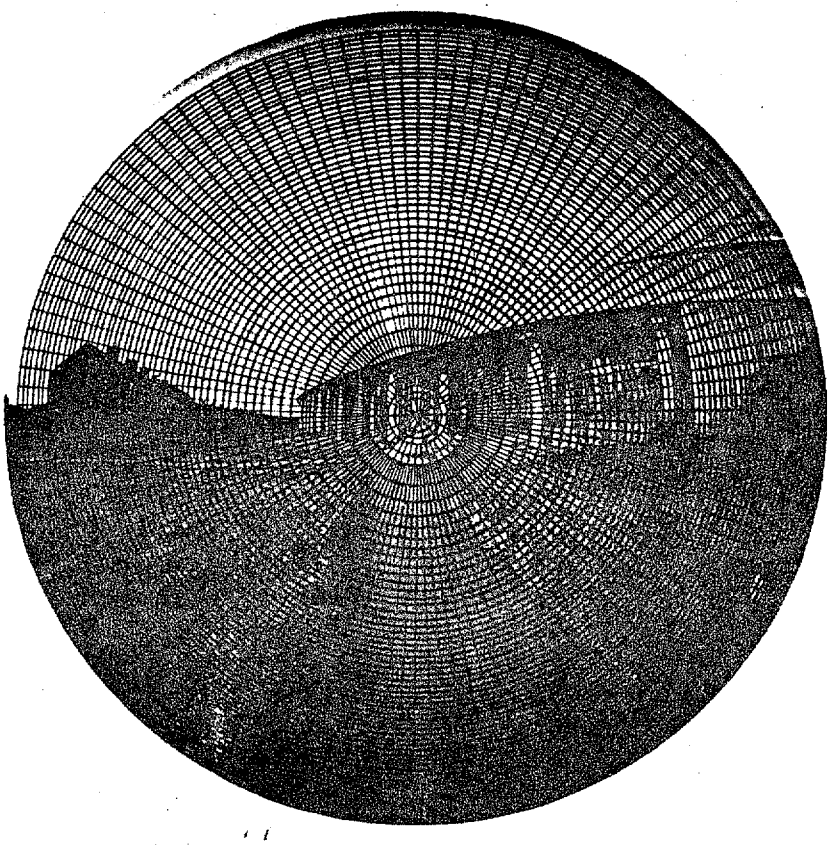


FIG. 4. *Solid angle transparent overlay laid over a full field photograph. Each division on the solid angle overlay covers one millisteradian. Procedure is to count the divisions covered by the image of the motorway. The total gives the solid angular subtense at the particular viewing position.*

From: R.G. Hopkinson " The evaluation of visual intrusion in transport situations", J.T. Coppock & C.B. Wilson ed. in Environmental Quality ,John Wiley & Sons, N.Y. 1974.

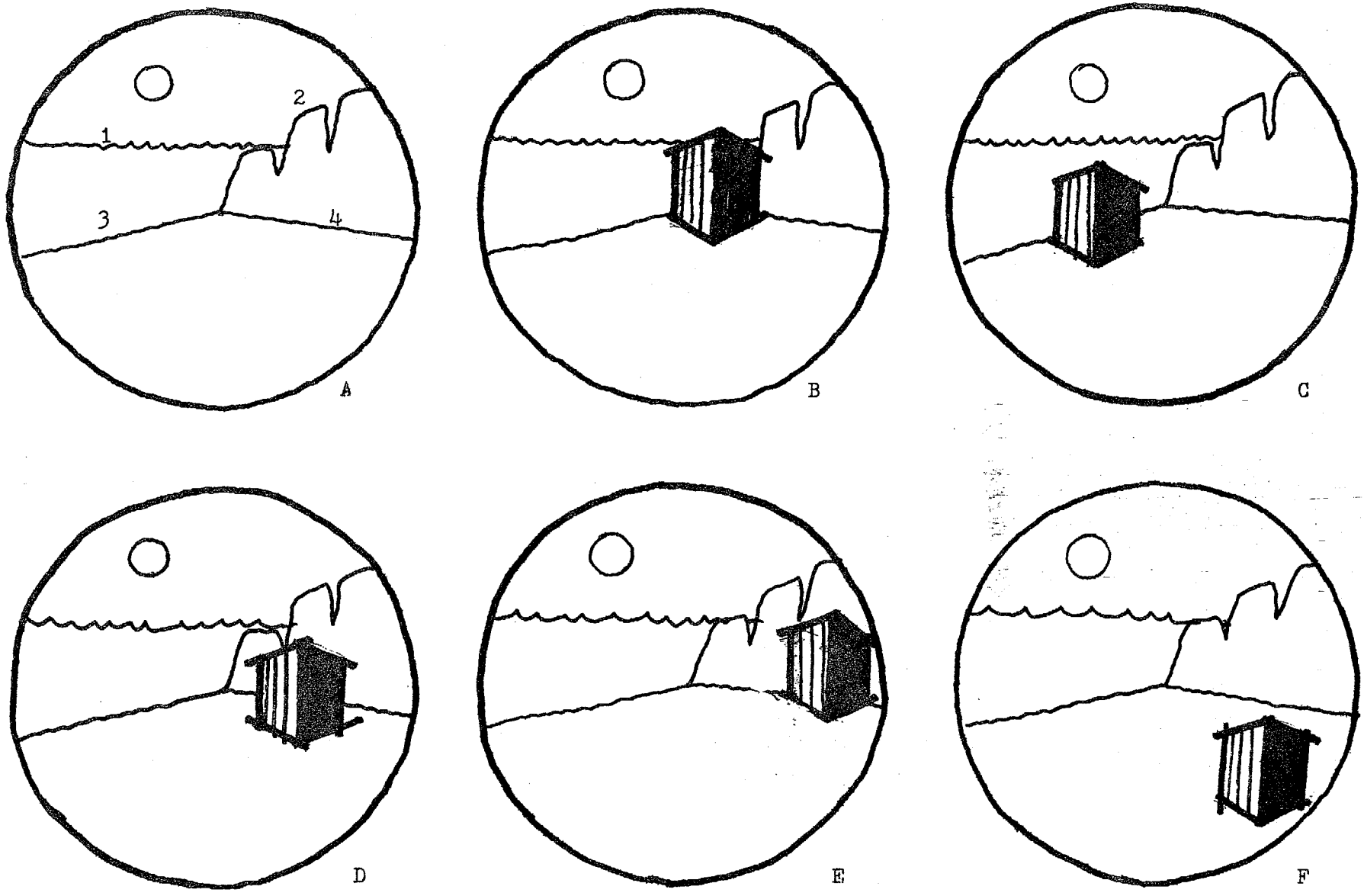


FIG.: A: 1-waterline, 2- skyline, 3- shoreline, 4- landline

FIG.: B, C, D, E, F: Instrusion of structure in the visual field

- Man-made intrusion: proportion of man-made construction and alteration intruding on the visual field. Man-made intrusions are the factors that would decrease the quality of the scenic view, (See Figures A, B, C, D, E, and F, page 149) unless built and located adopting urban design criteria.

- Naturalscape edge: demarcation line - delineating the naturalscapes silhouette:

  - skyline (sky and land edge),
  - waterli ne (sky and water edge),
  - shoreline (land and water edge),
  - landline (flat land and sloping land edge).

- View cone: visual cone with the vertex of the observer's location and the base intersecting or tangent to the boundary and envelope of the object of observation.

- View corridor: see view cone.

- View plane: projection of the view cone over land defining the boundaries on land of the scenic vista to be protected.

- View cone base: intersection of the view cone with the object of observation.

Environmental and Site Planning Principles

The scenic view inventory provides a means for implementing specific design control principles and environmental design standards that can be enacted by State legislation and County ordinances. In fact, the observation point of lookouts from prominent public places can be identified and made site specific together with the identification and location of the landmark point of observation.

The view cone will be established and its projection on the land will determine the view corridor's boundaries to be recorded on maps attached to the ordinances and bills. These procedures must be followed, especially, where private development constitutes an intrusion on the view plane. An example of this procedure given by the Honolulu City and County Ordinance for the protection of Diamond Head and Punchbowl landmarks, requires corridors to be established from heavily travelled roads and dense residential

areas. Provision of this kind will protect the scenic beauty of the area and limit heights of man-made structures and buildings so as not to obstruct the field of vision from the observation points.

A given scenic area may be observed from several lookouts or vantage points, everyone of them determining a view cone with its projection on land. When this occurs, it is possible to screen out from the overlapping of several view planes the scenic site common to all of them. Highest priority protection should be established for such a site because it is the most perceived portion of the district.

This environmental procedure is not inconsistent with private initiative goals in shoreline resort development. In fact, it is possible to evaluate tourist resort areas in coastal zones in terms of their good or poor environmental design solution following this concept. In any resort there is a number of alternative possible sites away from the shore, a number of site planning solutions, and a number of building typology alternatives, which are all options open to the developer. The sound application of these principles can only guarantee a high scenic quality and economic value to the project. The first step in this procedure is the location of the observation points in relation to the surrounding scenery and landmarks.

The second step is to search for the location of structures and buildings in a manner so as not to intrude on the naturalscape edges visible from the observation point. In other words, the building structures as much as possible should not cut across the skyline, waterline, shoreline, landline, but should be contained within these demarcation lines.

It is apparent in illustrations on page 149 that field of vision F is ideal from the standpoint of natural environmental considerations. Field

of vision E and F are not as environmental disruptive as field of vision B and C which are highly undesirable.

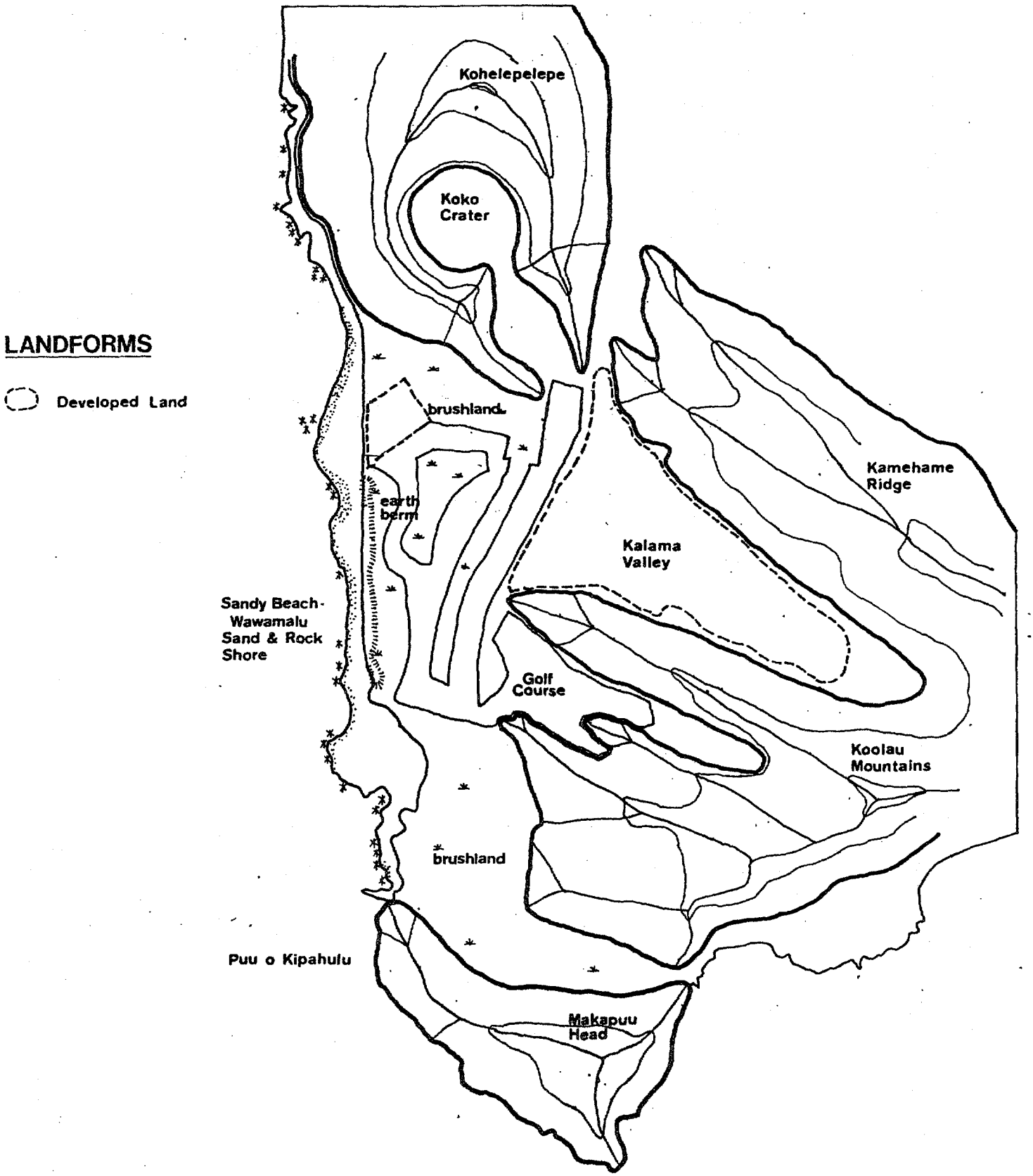
The utilization of the field of vision indicates how to locate the buildings in a less intruding fashion and, in a manner so as not to intrude on the focal points of vision when more than one naturalscape edge is visible. In this case, field of vision six represents the worst building location.

The following pages give an example of the survey methodology proposed in this report, applied to the Koko Head - Makapuu area on Oahu.

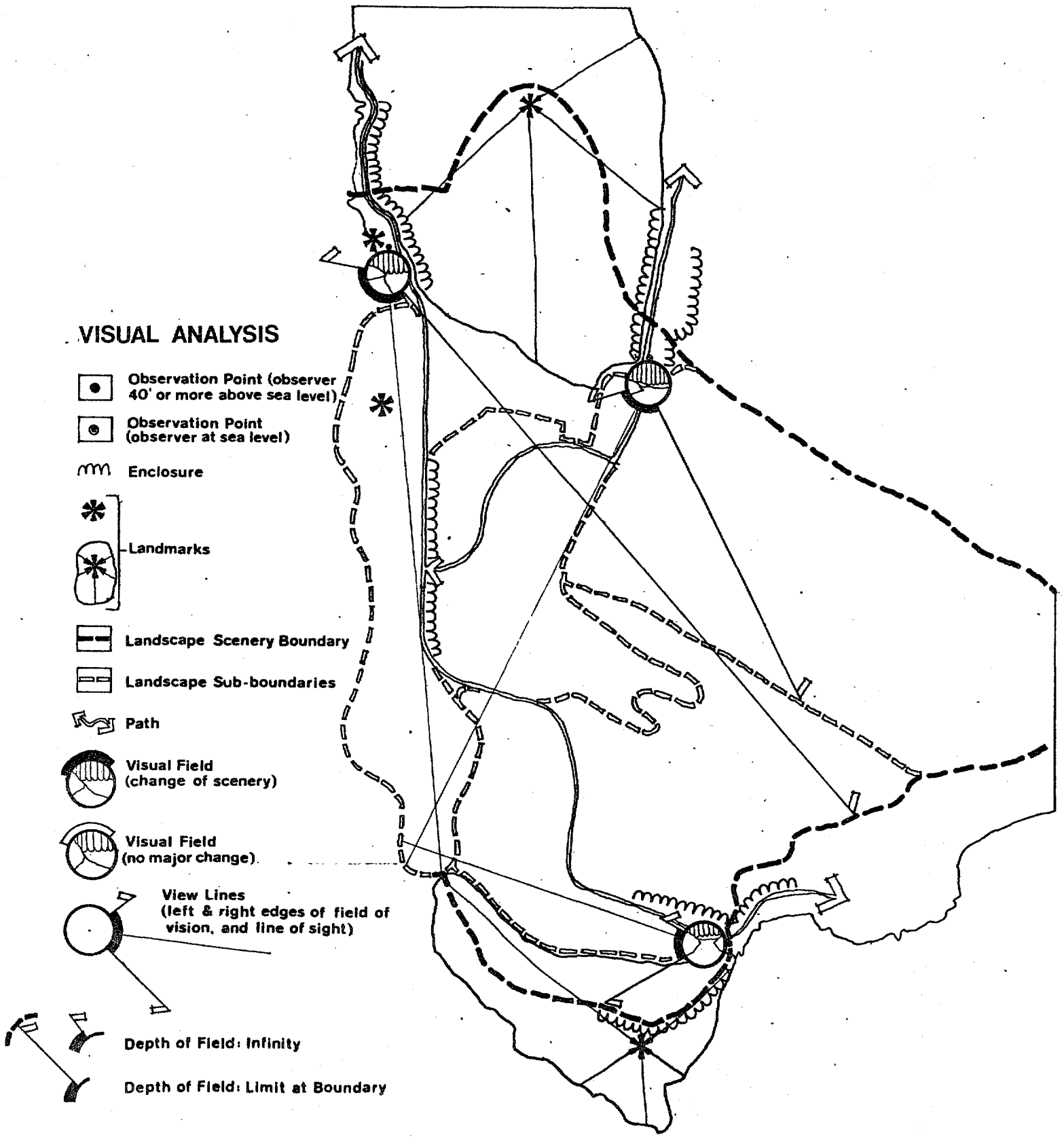
The Landform map (page 153) describes the natural features of the landscape differentiated between flat land and elevated land.

The Visual Analysis Map (page 154) identifies the observation points, visual enclosures, the landmarks, the landscape boundaries, the visual field and the view lines. The observation points are located in sites where a major change in scenery is perceived by the observer travelling in the area. Such points offer views of high scenic values in terms of variety and vividness of the visual experience. The view lines are the projection on the land of the view cone; they indicate the boundaries of the sites which are perceived from the observation points. The landscape visual boundaries are determined utilizing the landforms boundaries as they are perceived from the observation points.

The View Plane Maps shows the "isovisual zones" of the area which are the sites more often seen from the observation points. The View Plane Map establishes the relative degree of visual importance of the sites in a scenic district measured in terms of how frequently they are perceived from the observation points.

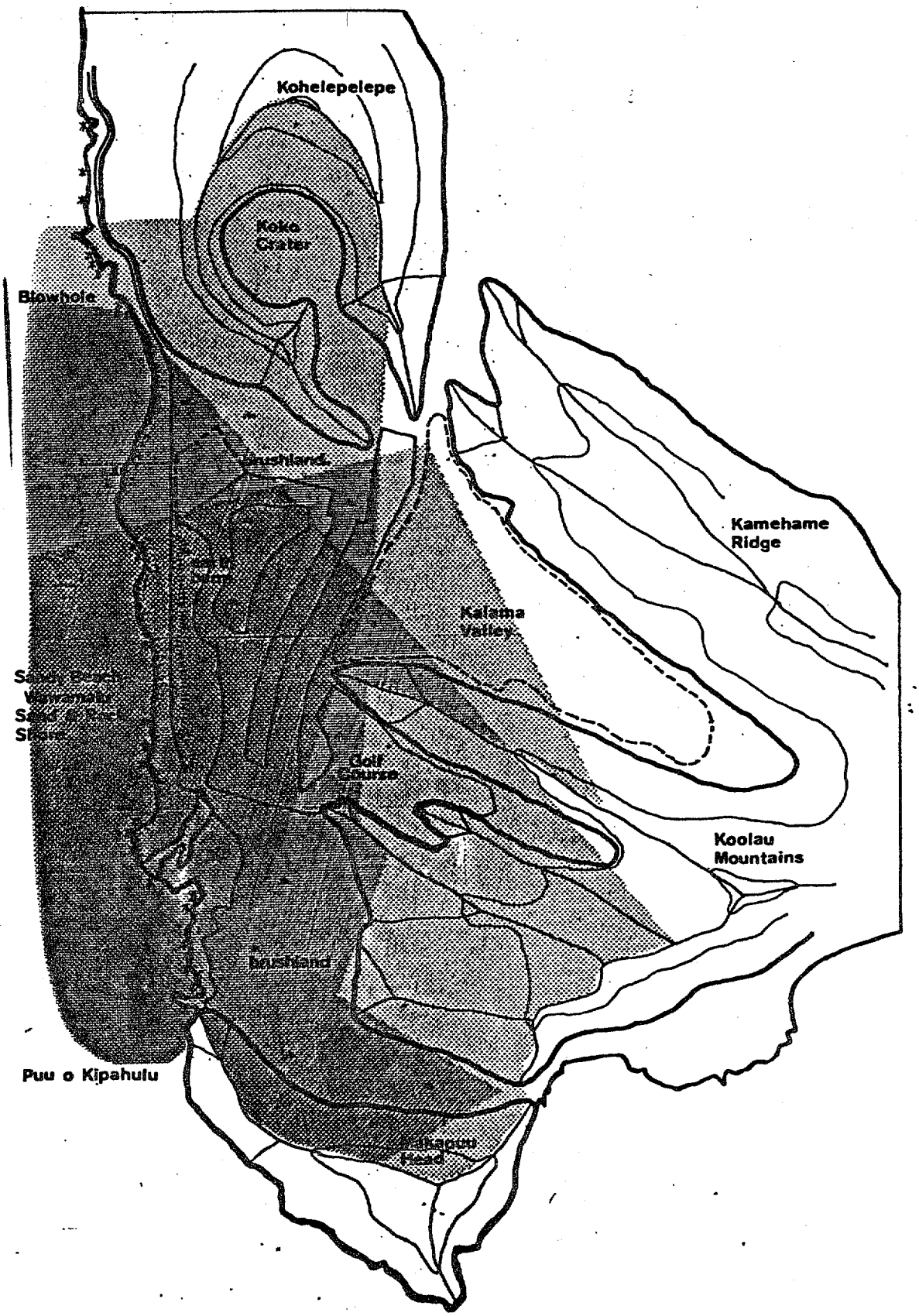


Scenic Coastal Areas



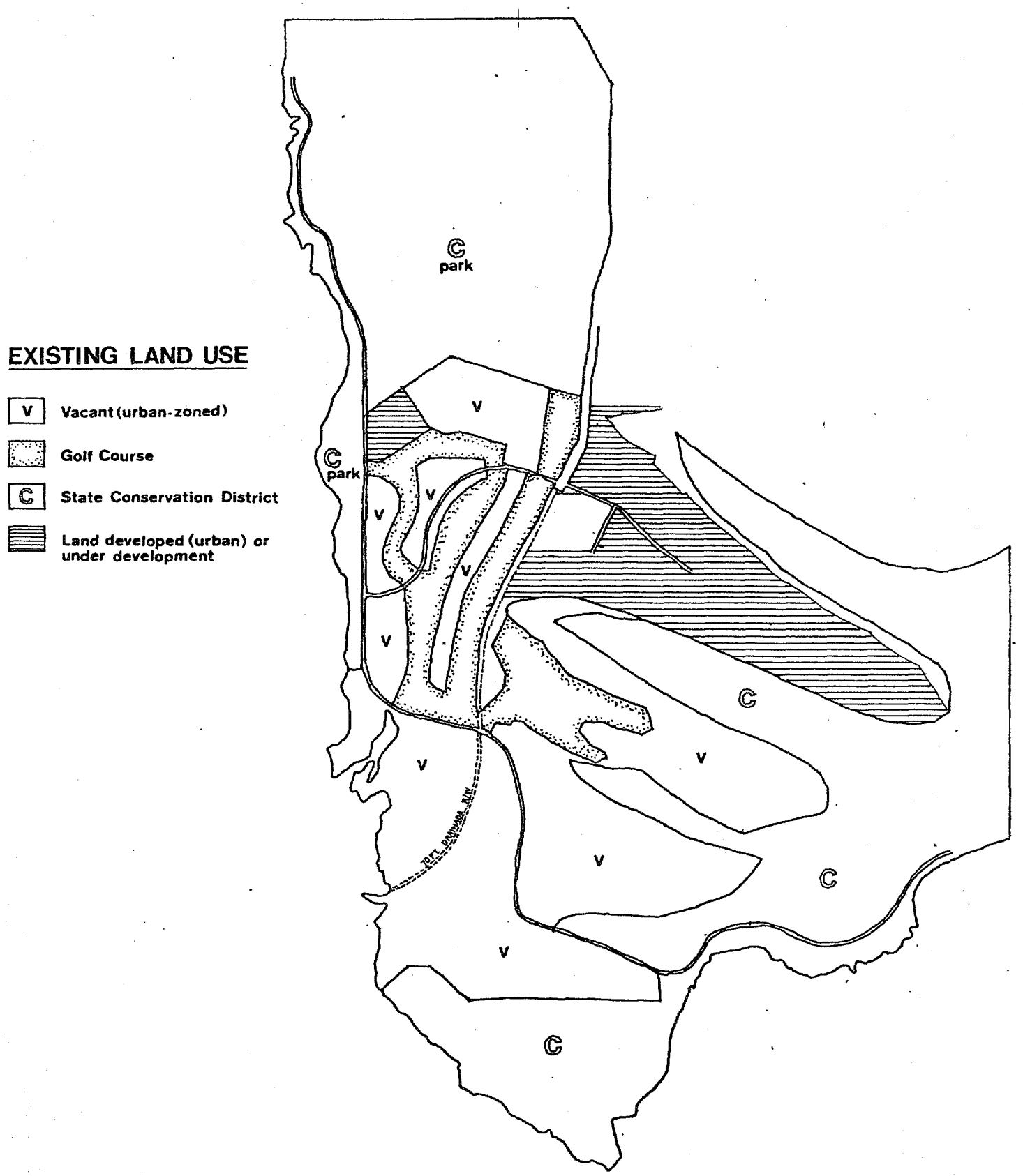
Scenic Coastal Areas

VIEW PLANES

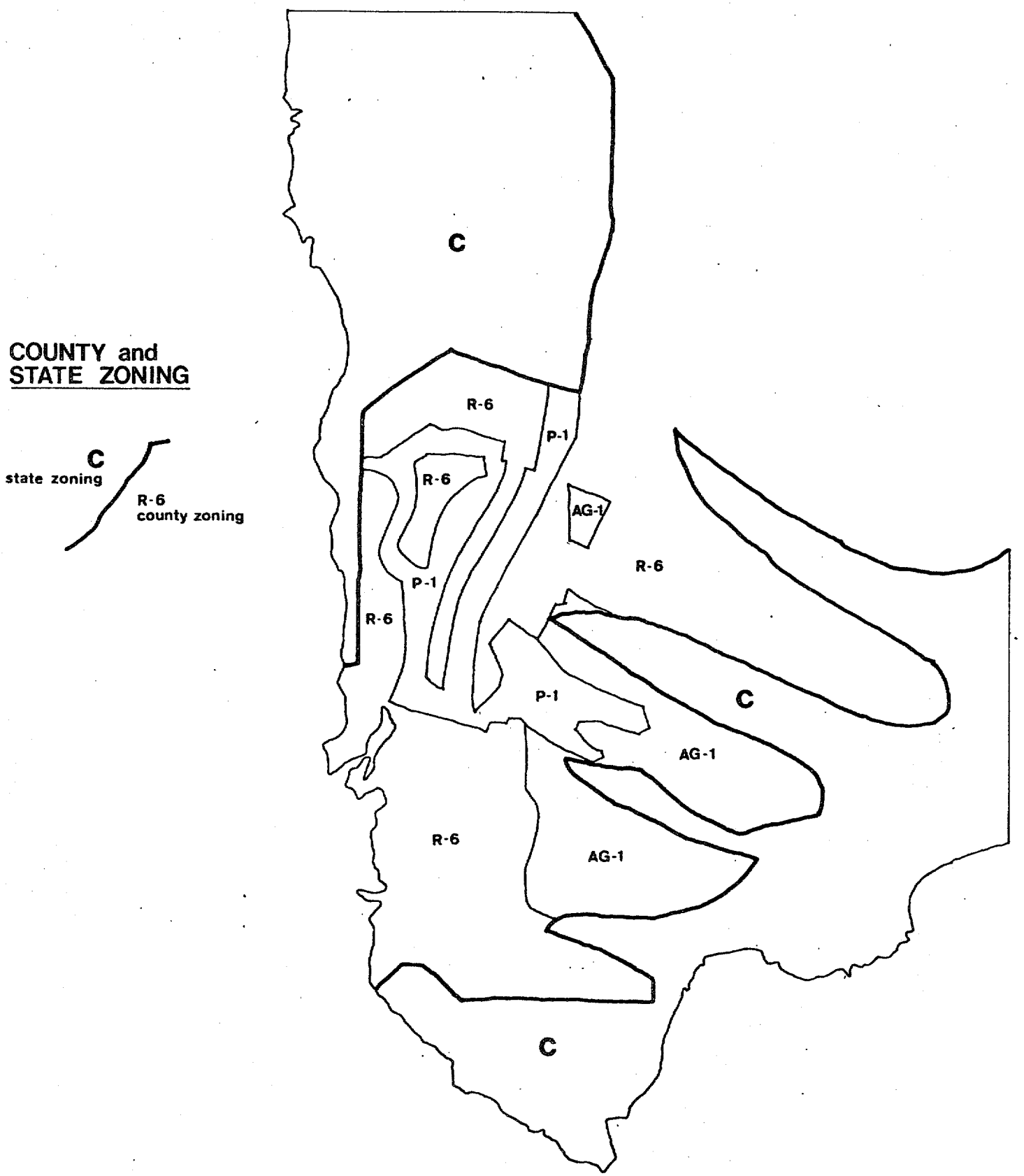


Scenic Coastal Areas

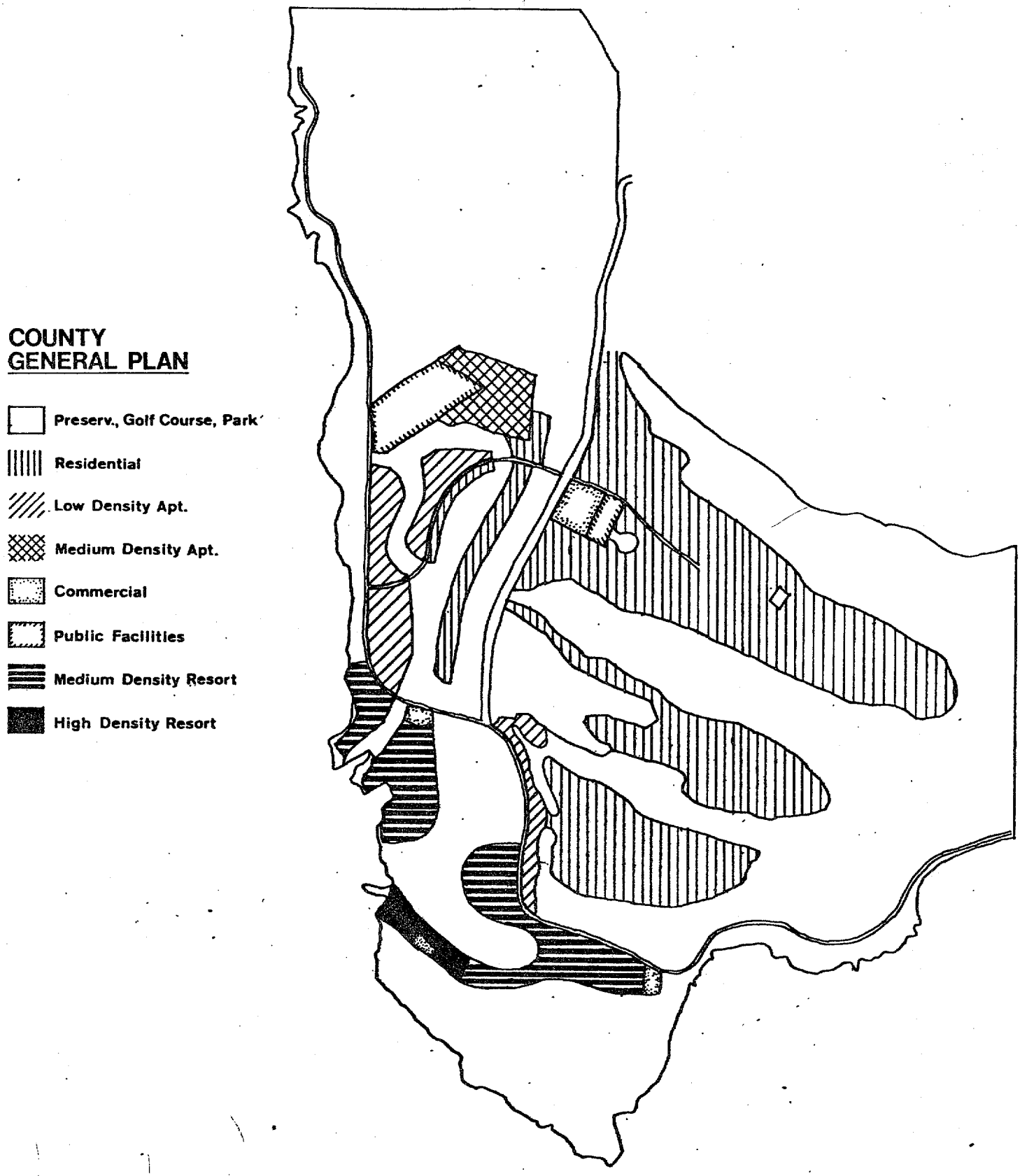
czm project PROTECTION OF SCENIC & AESTHETIC RESOURCES PUSPP 1975



Scenic Coastal Areas



Scenic Coastal Areas



Scenic Coastal Areas

czm project PROTECTION OF SCENIC & AESTHETIC RESOURCES PUSPP 1975

The Existing Land Use Map (page 156) the County General Plan Map (page 158) and the County and State Zoning Map indicate the open space, the type and the density of development (page 157).

It is apparent from the State and County Zoning Map that no criteria for the protection of scenic resources have been utilized in locating the R-6 zoning classification. In fact, the R-6 zoned areas encroaches upon the shoreline and also upon the most perceived or high isovisual sites. Furthermore, the County General Plan Map allows medium and high density resort developments in the most perceived area.

If the proposed methodology were utilized by the County's General Plan Revision Program, the density and the location of State and County zoning would be different from the present one. In fact, the darkest area in the View Planes Map would be the one protected from man-made encroachment as "conservation" or "special design control district."

Facilities and Sites with Scenic Features

Many facilities and sites with scenic features exist in Hawaii. The SCORP report and the Kauai North Shore Plan list as scenic facilities, sites, and structures, the following elements:

- fishpond
- beach
- heiau
- national natural monument
- national memorial cemetery
- public facility
- harbor
- valley
- ridge
- public building
- forest reserve
- watershed
- lake
- campsite
- stables
- garden

- temple
- boat harbor
- ranch
- airfield
- pali coast
- grotto
- reserve (military)
- canyon
- volcano
- golf course
- military camp
- caves
- peninsula
- island
- lookout
- park and recreation area
- botanic garden
- archaeological site
- plantation house
- taro patches
- river bridge
- pier
- museum
- traditional house
- restaurant
- beach house
- church
- school
- vegetation masses
- grazing land
- mountains and peaks
- reef
- hula ground
- palm groove
- trail
- coast

In addition, the following wildlife sites are mentioned:

- fish habitat
- water bird
- lowland bird
- forest bird
- common bird
- endemic insect
- wildlife habitat
- sensitive endemic plant life
- endangered endemic plant life
- conflict zone

This list is not exhaustive, but it is large enough to suggest that almost any site in Hawaii has scenic features. The methodological approach of listing scenic sites is therefore less useful than the one of locating specific scenic sites on maps. More important than the definition of scenic sites is their location on maps.

Policies Relating to Scenic Districts and Sites in Coastal Zones

Island Scenic Districts

The State should formulate and implement a comprehensive Statewide General Plan for the protection of scenic and aesthetic resources which includes the demarcation of scenic districts on all the islands.

The definition of scenic districts should utilize the suggested physiographic divisions and environmental divisions. The procedure for the determination of scenic districts should utilize the technique of overlaying maps, and the classification of scenic districts should be based on the variables and categories proposed in the physiographic and environmental divisions.

Priority ranking of scenic districts should apply the environmental design values and principles described in this report--including the concept of uniqueness, vividness, and variety at the detailed level of the island physiographic and environmental divisions. In addition, the concept of variety among districts should be established island-by-island and not statewide.

Coastal Scenic Districts

The coastal scenic districts should be determined by superimposing scenic districts maps upon the scenic coastal features maps, which include island points and peninsulas, bays, and generalized shoreline.

Scenic Views

All the agencies having jurisdiction over scenic districts should undertake the compilation of a detailed inventory of the scenic sites located within each district and identify for each viewpoint the object of observation and its boundaries, the location of the point of observation and the corresponding visual cone. This information should be recorded on the visual structure maps.

The visual co n e should remain unobstructed and the view of the "naturalscape" elements (waterscape, landscape, skyscape) should remain open.

The choice of the observation points should maximize the view of the naturalscape edges (skyline, waterline, shoreline, landline).

The proposed environmental and site planning principles should be adopted as normal procedure by all the public agencies responsible for the evaluation of plans, and buildings and residential development proposals. These principles should be made available in the form of guidelines to developers.

VI. FACTORS THREATENING OR IMPEDING PROTECTION OF SCENIC AND AESTHETIC RESOURCES

The utilization of values defined in this paper will assist in the identification of factors threatening or impeding protection and/or utilization of scenic and aesthetic resources.

Man-Made Actions

Man-made actions, such as construction of highways, roads, radio antennas, power lines, water storages and drainage works, endanger flora, fauna, and natural processes. Stricter rules and regulations should be established to prohibit such man-made encroachments in conservation districts and in water and forest reserves. In fact, ecological and environmental values are the basis for aesthetic experiences in open and wild areas, and their protection enhances the quality of the scenic resource.

Appreciation of Scenic Resources

The analysis of the way people experience the site allows for the identification of factors which decrease the opportunity for enjoyment and which must be removed to protect scenic resources. These factors vary according to the cultural and the educational level of the community. Ignorance as to the importance of nature and environmental beauty, as well as, the pressure of modern life, prevents the individual from the enjoyment of scenic and aesthetic resources. The ways to counteract these factors are the following:

- to increase the level of people's awareness of scenic beauty through educational programs in natural and ecological sciences and the arts.
- to provide access to open space and remote areas of great scenic beauty and the opportunity for people to experience activities new to them such as hiking, boating, fishing, etc.

Access to Scenic Areas

Very often the obstacle in appreciating scenic resources is simply the lack of access to conservation areas. The shoreline and the mountains are scenic resources; access to these areas should be greatly increased. For example, it should be firmly established that each road toward the ocean should be a right-of-way to the beach and be developed as a mini shoreline park. In the case of privately owned land parcels located along the shore, the landowners should be required to provide public right-of-ways on their property at established intervals. In rural areas, a right-of-way could be established at every half a mile; in urban areas, at every three hundred yards. It should be compulsoty that roads running in the direction of the ocean should be rights-of-way to the shore.

Availability of Facilities

Often, remote scenic areas are inaccessible or do not provide people with a minimum number of facilities to allow outings and extended stays on the site. The implementation of the SCORP report recommendations on outdoor recreation would be advisable in order to solve this problem.

Visual Intrusion of Structures

Visual intrusion of structures and pollutants on the range of vision from a lookout diminishes the full appreciation of the scenic resource; so does the scarcity of lookouts within scenic areas.

The survey method suggested in this paper helps to establish how many lookouts would be needed, where they should be located and, most important, identify those specific places where man-made structures and alterations should not occur. All these criteria are discussed in the chapter on scenic views and vistas.

In general, views of and from the shoreline should not be obstructed. Building setback regulations are necessary to enforce the principle which says that buildings and structures should not intrude on the naturalscape edges (shoreline, skyline, waterline and landline) and that setbacks should be directly proportional to the bulk and height of the building.

Unplanned Urban Form

The protection of scenic and aesthetic resources is only partially accomplished through the identification and protection of scenic and conservation districts. A large portion of the Coastal Zone is urbanized and the majority of towns in Hawaii lie in coastal areas of high scenic quality.

The majority of the population lives in these towns which need remedial actions for environmental protection and innovative approaches to town design.

The most striking characteristic of the urban pattern in the land poor State of Hawaii is the adoption of mainland standards for land utilization and building typology which results in the misuse of the land and in an urban form unsuited for human scale.

Particularly evident is the lack of neighborhood design, since all design efforts are limited to the scale of single buildings. No improvement for the protection of scenic and aesthetic resources in an urban setting can be undertaken unless single building construction is conceived within the framework of neighborhood and city block design. This is particularly true for high density areas such as Honolulu.

The urban design tools which allow the protection of scenic vistas and the conservation of a human scale environment suited to people's aesthetic needs include:

- block design instead of single building design. It requires that the buildings in a given block be planned in a coordinated scheme;

and individual building typologies, such as those seen in Waikiki, should not be allowed.

- Greater variety of building height in high density districts, with variations from three to eight floors, neither less than three floors nor more than eight.
- Floor area/land area ratios for the whole block.
- Neighborhood density and neighborhood open space ratios.
- Neighborhood and block ratios (of built-up areas), accessible areas and visible areas.
- Neighborhood view corridors and block view respect zones.
- Separation of traffic flow (bicycle, pedestrian, cars, public transportation) at the neighborhood scale.
- Mixed land use and integration of activities both at block and neighborhood scale.
- View corridors from densely built areas toward the ocean, the shoreline, and the mountains (Mauka-Makai View corridors).
- Block density to permit mass transit stops at easy walking distance for each household.
- Integration of neighborhood parks with an urban network of green pedestrian and bicycle lanes.

These urban design concepts and solutions lead to an urban form which is different from the one we see in Waikiki, Pearl City, Makiki, and Mililani Town. This alternative urban form is based on human scale, town design, and organization. It provides not only for greater access to and protection of scenic resources, but a decreasing need for private transportation by means of a competitive mass transit. Also, it allows greater energy saving.

Urban Design and Land Use Guidance Mechanisms

The implementation of the above design concepts requires modifications in present building codes, comprehensive zoning codes, and general plan land use classifications and procedures.

The urban design and land guidance mechanism includes:

- mixed zoning, to allow integration of activities;
- verticle zoning, to allow the presence of residential, offices, and commercial business in the same building structure;
- land consolidation, to permit small parcels to be redeveloped and planned as one design unit;
- land readjustment, to provide for phasing of structures and infrastructures in a given neighborhood, and a density bonus for open space;
- development corporations, to facilitate public and private enterprise coordination in urban development and redevelopment;
- transfer of development rights, to facilitate the carrying out of neighborhood design schemes in spite of the landownership constraints;
- view corridor ordinance (mauka-makai view corridors and shoreline view);
- shoreline setbacks;
- design control plans;
- development plans;
- design reviews;
- rights-of-way to the shoreline.

Policies and Programs Regarding Factors Impeding Protection of Scenic and Aesthetic Resources

Conservation Districts

Conservation districts should be established in all the areas where flora, fauna, natural features, natural and environmental processes might be endangered by man-made structures or actions. The shoreline would constitute one of these districts.

Educational Programs for the Appreciation of Scenic Resources

State and County agencies should promote educational programs. This would provide opportunities for the appreciation of aesthetic and scenic

resources through the organization of trips and provisions for temporary stays in remote or non-accessible scenic districts and sites on all islands.

Access to Scenic Areas

In all the land under their jurisdiction, State and County agencies should acquire the right-of-way for all the new and existing roads leading toward the shoreline and toward the mountains.

Access roads to the shoreline should be frequent and built at established intervals: at every mile in rural areas and at every quarter of a mile in urban areas.

Availability of Facilities

All scenic districts and sites should be provided with facilities in designated locations to provide outing and camping opportunities.

Number of Lookouts in Scenic Areas

A sufficient number of lookouts should be provided in each scenic district in connection with trails to ensure full appreciation of the scenic area from different observation points. The total number of lookouts for each district should never be less than four.

Visual Intrusion of Structures

Intrusion on the field of vision of man-made structures from a lookout should be prohibited. Specifically, the structure should not obstruct the view of the naturalscape edges (shoreline, skyline, waterline, and landline) from a lookout. (See Figures A and B, page 170).

View of the Shoreline

View of the shoreline from the sea and/or from the shoreline itself should not be impaired. Shoreline setbacks should be established for this purpose.

Shoreline Setbacks

Shoreline setbacks should ensure the protection of the shoreline as a scenic resource and structures should not be permitted within 100 yards of the shoreline in urban districts.

Determination of Building Heights on the Shoreline

Building height should be proportional to the building setbacks from the shoreline; in this way, small structures are allowed near the shore while tall structures must be built away from the shore. For example: rules and regulations establishing buildings height should require buildings in coastal areas not to be higher than 1/10 of their distance from the shoreline, and never higher than 10 stories. (See Figure A page 171 and Figure A page 172).

Determination of Building Land Area on the Shoreline

Building land area should be proportional to the shoreline setback to ensure that bulky and large volume buildings are located at greater distance from the shoreline than smaller ones. For example, the land area of a building structure should never be greater than 1/6 of the area between the shoreline and the building side facing the shoreline. (See Figure A page 173).

Implementation of Urban Design Principles in Coastal Urban Districts

Urban design principles should be implemented in coastal urban districts to promote block design instead of single parcel and single building design. These principles would promote integrated neighborhood design to include: neighborhood scale view corridors; built-not built-area ratios; open space paved areas ratios; accessible-not accessible-area ratios; visible-not visible-area ratios; flood area-land area ratios; mixed uses and integration of activities; and other urban design concepts proposed in this paper.

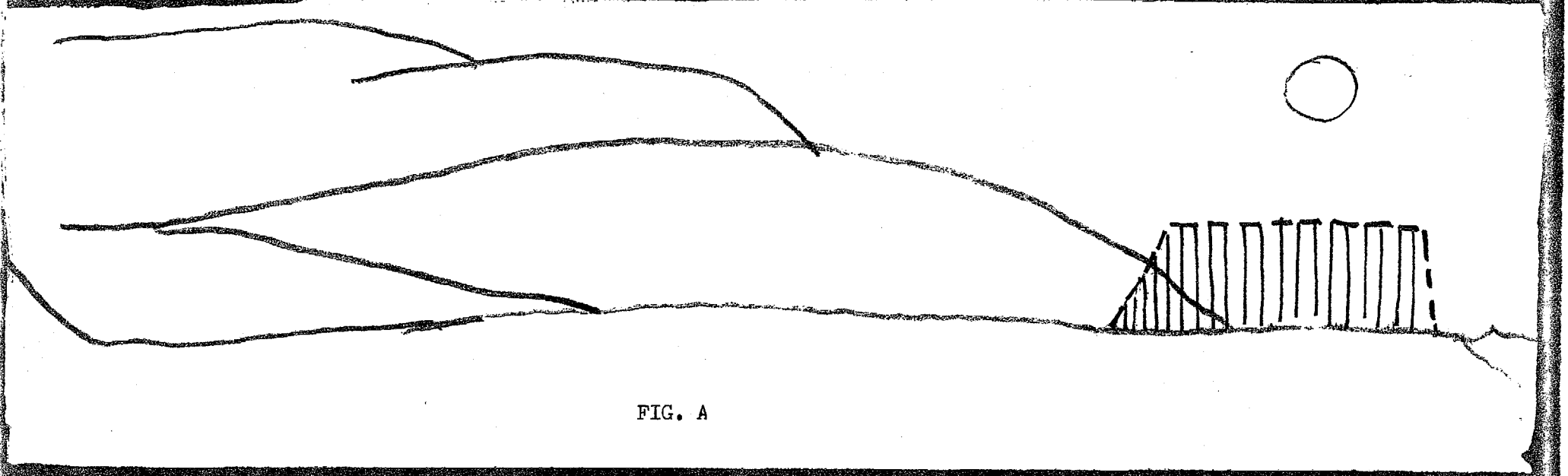


FIG. A

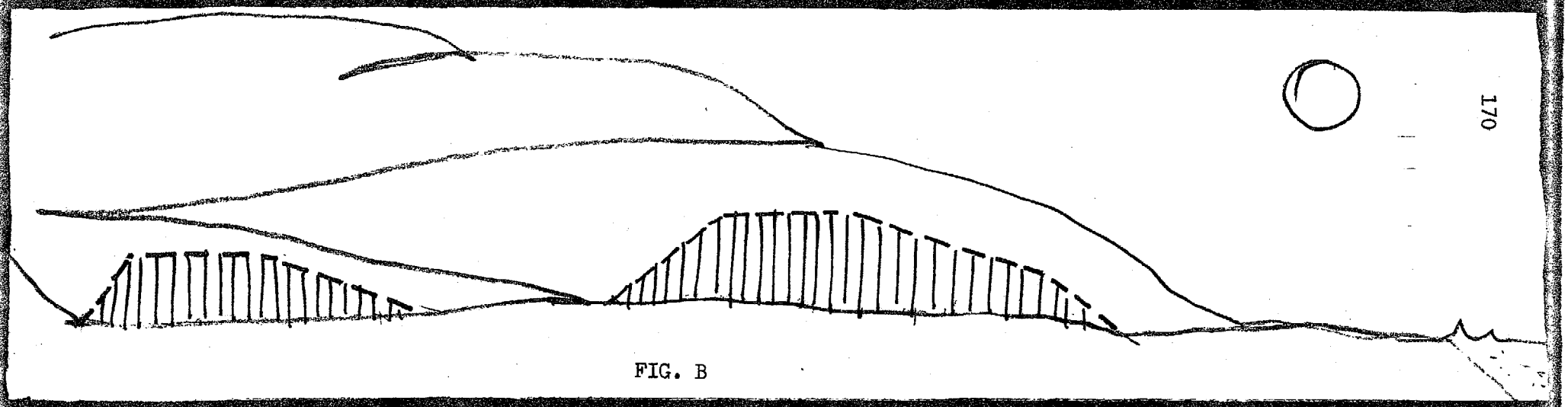


FIG. B

FIG. A WATERFRONT URBAN DEVELOPMENT: BUILDING ENVELOPE

FIG. B INLAND URBAN DEVELOPMENT: BUILDING ENVELOPE DETERMINED BY SITOLOGY APPROACH TO THE STUDY OF LANDSCAPE - BUILDINGS ARE BLEND INTO THE LANDSCAPE .

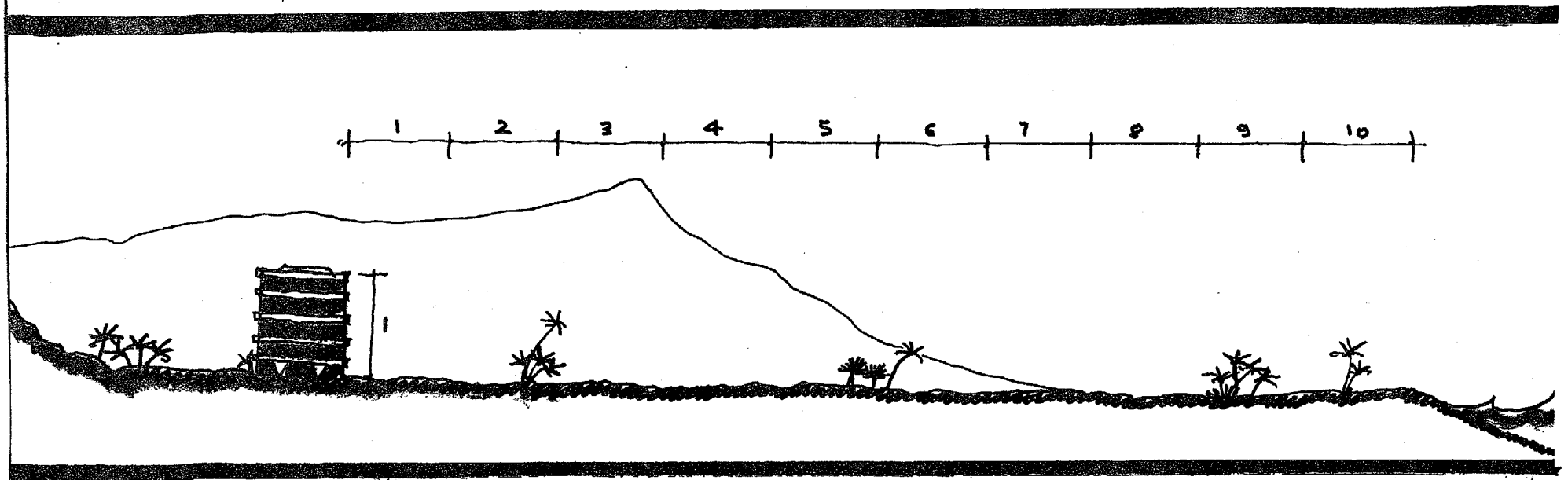


FIG. A: Building height made proportional to the building setback from the shoreline. Building height is one tenth of building distance from the shoreline

CZM-PUSPP 1975

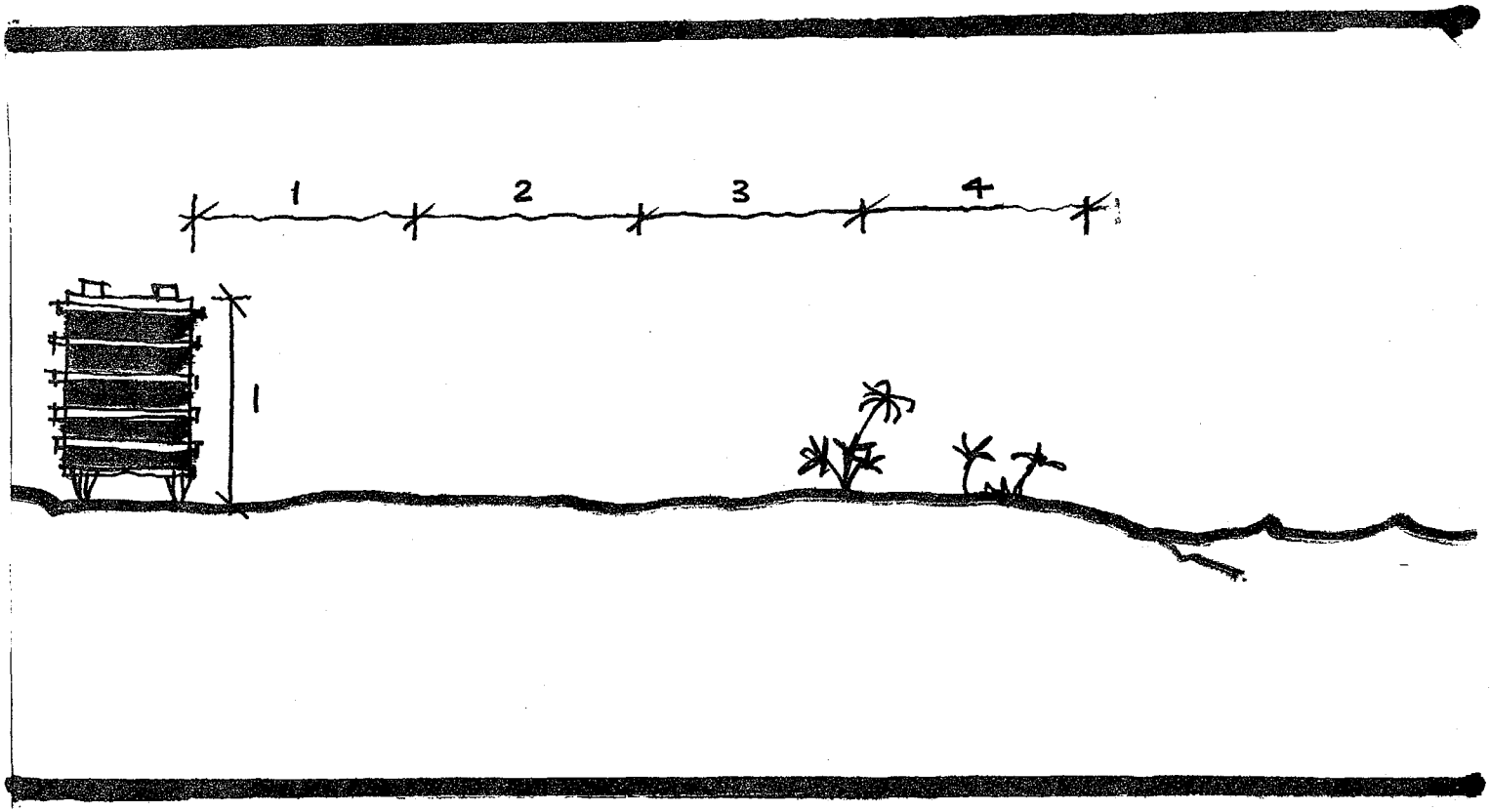


FIG.A : Building height made proportional to the building setback from the shoreline. Building heigh is one forth of building distance from the shoreline.

CZM-PUSPP 1975

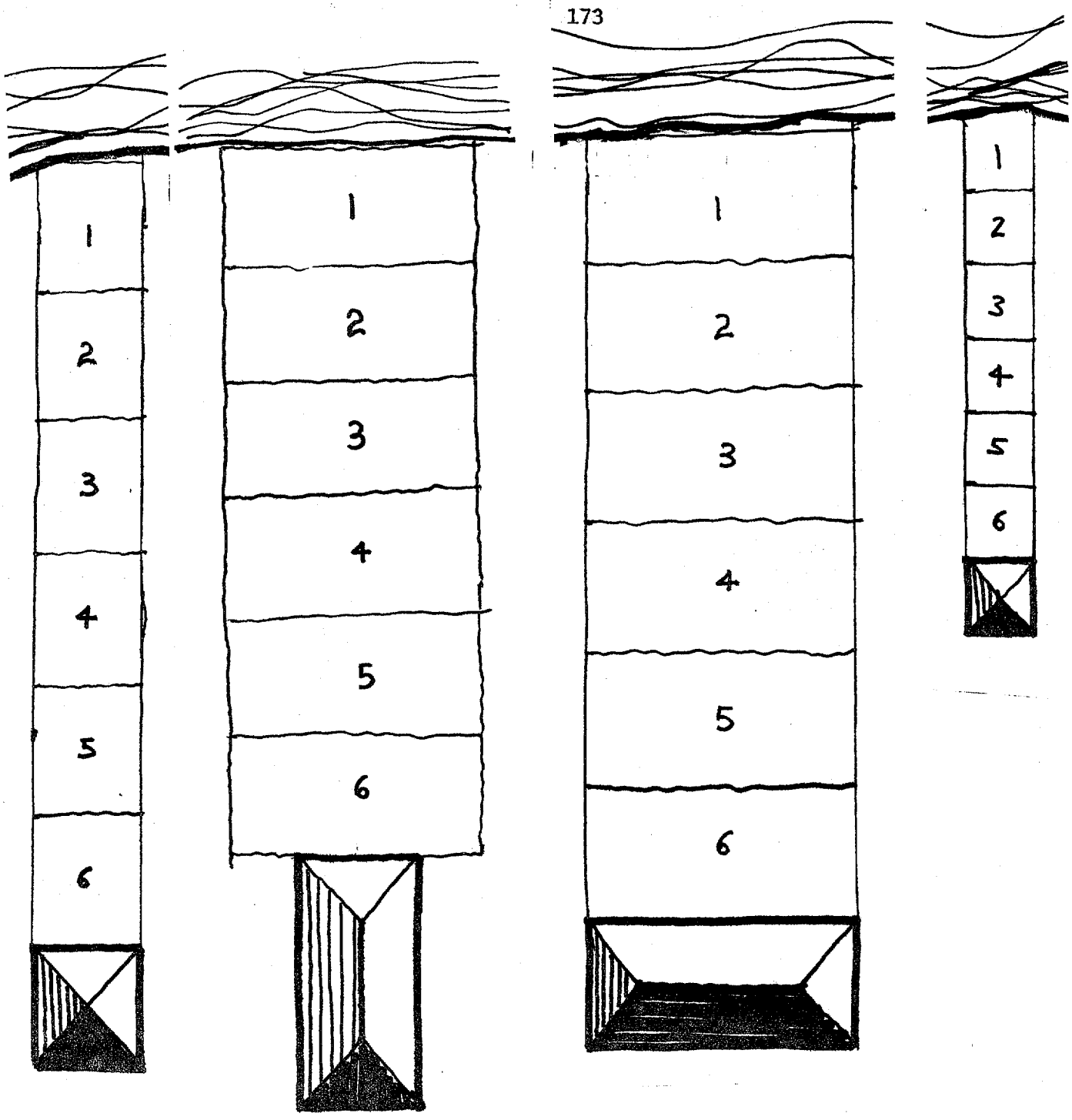


FIG.A: Building land area made proportional to the building setback from the shoreline. Land area of building is one sixth of the area between the shoreline and the building side facing the shoreline.

Urban Design and Land Use Guidance Legislation

Revision of building codes, comprehensive zoning codes and general plans should be undertaken to ensure that they include design principles for block and neighborhood design in coastal areas. Tools and techniques, such as mixed zoning, verticle zoning, land consolidation, land readjustment, development corporations, transfer of development rights, view corridors, shoreline setbacks, development plans, design control plans, design reviews, right-of-ways to the shorelines, would also be included.

View Corridors

A number of County ordinances establish the identification of view corridors to be utilized in the determination of scenic districts and in the identification of the areas from which the view of landmarks, such as Punchbowl and Diamond Head, should be protected.

View corridors of the shoreline should be open from prominent public places, traveled roads, and residential districts. Shoreline views should be unobstructed from the nearest major public road or from 100 yards inland. All roads leading to the shore should have an open space view and access to the shore. The shoreline should be visible at least at intervals of 500 yards to coincide with public roads, accesses and piazzas.

Location of Activities

A new shoreline zoning should screen activities to be located near the shoreline on the basis of their public or private orientation. The most exclusive and private activities to be located away from the shore are apartments, single family homes, private clubs, etc. The most public-oriented activities should be located near the shore. They include parks, public gathering places, restaurants, coffee shops, and market places.

(See Figure A and B page

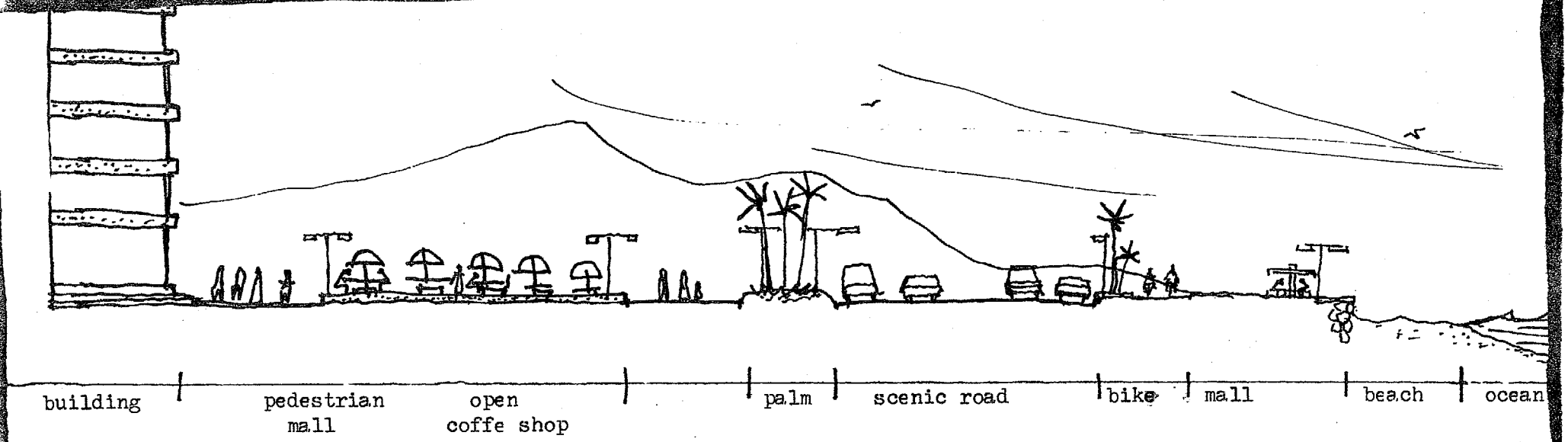


FIG.A: URBAN WATERFRONT

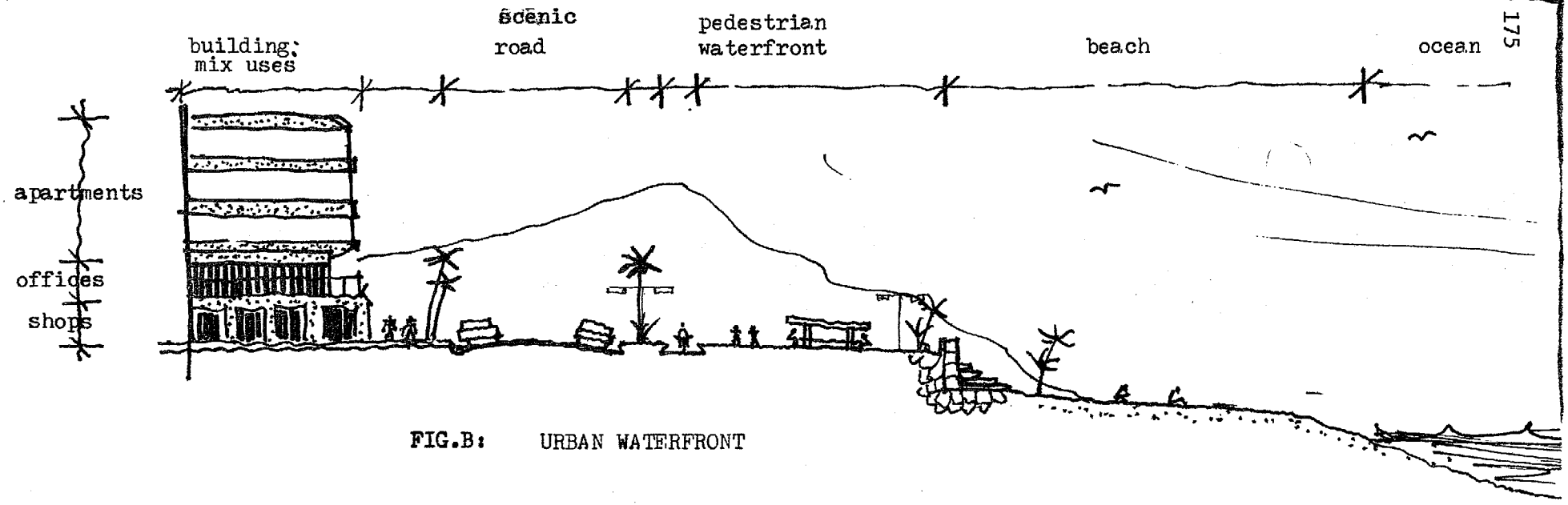
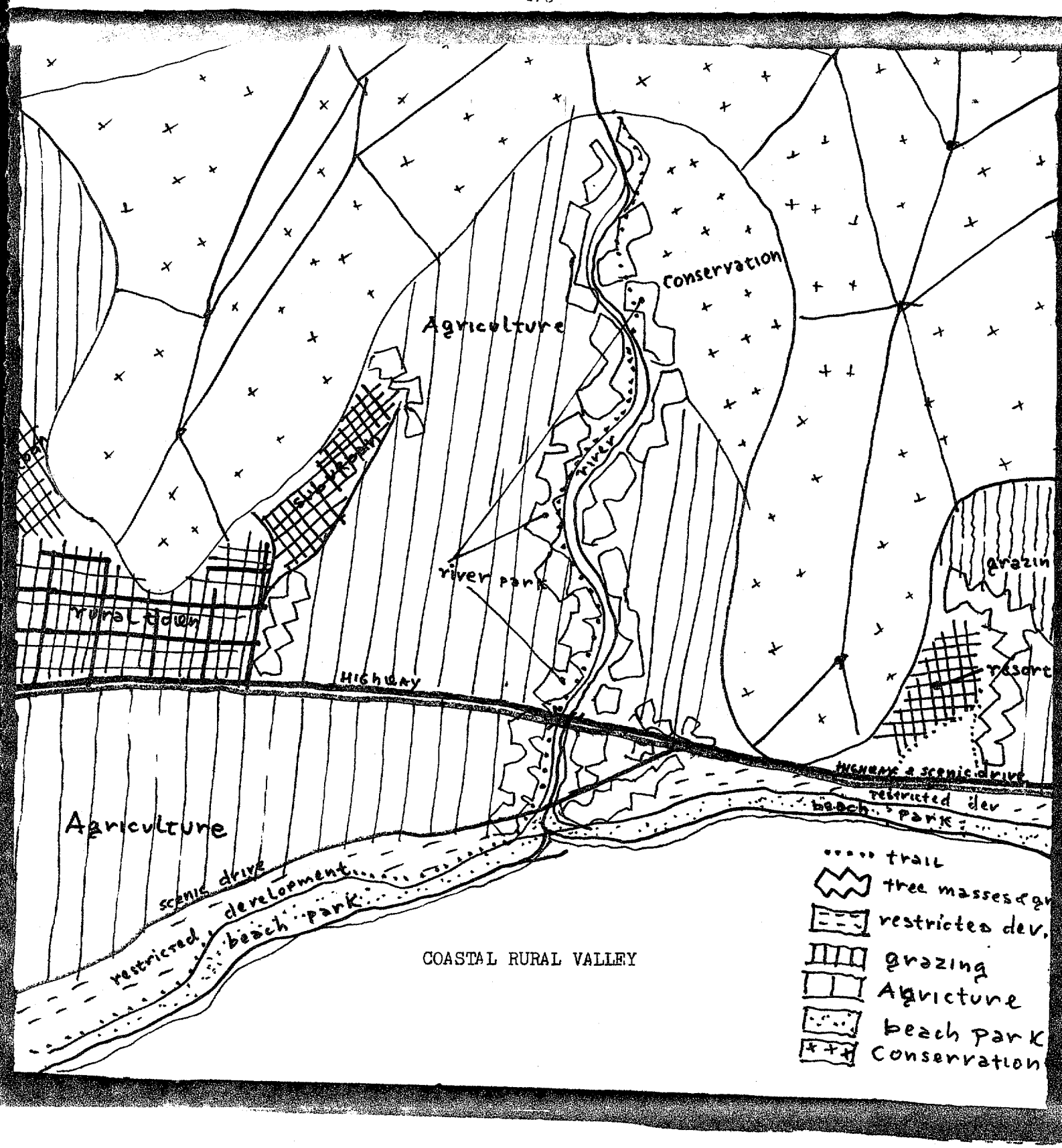


FIG.B: URBAN WATERFRONT



COASTAL RURAL VALLEY

FIG. A

Water-oriented activities, such as harbors, should be designed in a way to provide open ocean views from near-by public lookouts since the view of such activities enhances the experience of the diversity of the shoreline.

Valley streams in coastal, rural areas should be provided with bikeways to be utilized as natural access to the mountains. The shorelines should become linear parks protected by a buffer zone of restricted development between the shore and the scenic road. Agriculture areas should be retained between the inland highway and the shore. Rural towns and isolated resort developments should be allowed only on the mountain side of the highway (see Figure A, page 176). These provisions maintain unobstructured ocean views, low building profiles near the shore and compatibility between agriculture and recreational activities.

VII. INTRODUCTION TO THE APPENDICES

Legislation Relating to the Protection of Scenic and Aesthetic Resources

"Past laws and policies have not been adequate to prevent widespread deterioration of our coastal resources and public access thereto." (H.B. #257) Therefore, in order to protect the coastal zone of Hawaii and to comply with the objectives of the Federal Coastal Zone Management Act of 1972, the State of Hawaii has proposed and enacted legislation to safeguard the scenic, aesthetic and natural resources of its coastal areas. This legislation requires the preparation of long-range conservation and management plans for coastal zone areas consistent with Federal Coastal Zone Management Act requirements. In lieu of this plan or until its completion other legislation provides for a special interim management system for development along the State's shoreline.

The legislative format for the above measures closely parallels Federal CZM guidelines. Such Federal CZM guidelines include provisions for:

1) the identification of boundaries of the Coastal Zone
2) definition of permissable land and water uses within the Coastal Zone that have a significant impact on coastal waters
3) inventory and designation of areas of particular concern
4) broad guidelines of uses
5) a description of the organizational structure to implement the management program (Pub. Law 92-583; Sec. 305).

Within this context Hawaii's Shoreline Protection Legislation varies in specificity.

A. Shoreline Protection Bills

During this legislative session numerous shoreline protection bills

were drafted and introduced, each with varying provisions for the regulation and management of scenic, aesthetic and natural resources. The following section will examine the changes and compromises among these bills. The original shoreline protection bill, H.B. #247, will be the basis for analyzing shoreline protection measures. Special attention will be given to legislative provisions that directly relate to scenic and aesthetic resources and their management.

B. Management Body

As drafted H.B. 247 provides for the creation of both a State and four County Coastal Zone Commissions. These commissions will implement the Coastal Zone Management Program. This same management structure is contained within H.B. #41. H.B. #323 excludes the County Commissions, but retains the State Commission as the sole management body. Within the shoreline bills, H.B. #92 and H.B. #42, the respective County Planning Commissions or other body, as designated by the County Council, shall assume the management responsibility.

C. Boundaries of Coastal Zone

Boundary provisions pertain to two separate and distinct areas. One is the Coastal Zone itself. The other provides for special interim management areas: "protected area", "permit area", and "special management area". Within the legislative bills, the boundaries of each area are defined in terms of their inland and seaward limits. The purpose and intent of the bills determine whether the Coastal Zone or management area boundaries or both are defined.

H.B. 247 and H.B. 323 contain boundary provisions for both the Coastal Zone area and the management areas defined as "protected area" and "permit

area", respectively. Both bills define the Coastal Zone to include land and water extending seaward to the outer limits of the State jurisdiction which is three miles. The inland limits of the Coastal Zone, as defined by H.B. 247, are to be determined by the State Coastal Zone Commission. By contrast, H.B. 323 establishes a specific inland boundary extending five miles landward from the mean high tide line.

Special management area boundaries are the same for both H.B. 247 and H.B. 323. The seaward boundary is to extend to the limit of the state jurisdiction and the inland boundary is to extend one thousand yards landward. However, H.B. 257 establishes contingencies that effect this inland boundary. The State and County Coastal Zone Commissions may grant exclusions within the management area provided such exclusions affect no significant change on density, height or overall nature of uses within a "protected area". Each County Commission is required to adopt a map delineating the precise protected area boundaries and to avoid bisecting a lot or parcel may move the inland boundary fifty yards seaward or inland.

House Bill 92 and Senate Bill 42 do not define the Coastal Zone boundaries. The intent is to establish "special management areas". The boundaries of these areas are to extend inland one hundred yards from the shoreline (or to the wash of the waves as evidenced by vegetation or debris) and also include any area subject to salinity intrusion or tidal influences.

D. Visual Corridors and Scenic Vistas

The precise listing of scenic points, view corridors and scenic resources to be preserved, protected or restored is not included within any of these legislative measures. However, guidelines and mandates included within the measures contain several provisions for the future management

and definition of scenic resources. Possibly the strongest mandates are contained within H.B. 247.

H.B. 247 requires the State Coastal Zone Commission to adopt planning criteria for the examination and definition of the Coastal Zone within 60 days of its first meeting. This criteria provides for the examination of coastal geomorphic characteristics. The geomorphic characteristics are to include visual corridors and scenic vistas. However, neither a method of analysis nor a definition of visual corridors or scenic vistas is described or discussed. Further, H.B. 257 requires the Coastal Zone Commission, with the advice and recommendations of the County commissions, to compile a "comprehensive inventory" of the defined Coastal Zone. This inventory is to be completed within one year of the Commission's first meeting. The inventory is to include scenic characteristics. Moreover, until such time as the Coastal Zone is defined and inventoried any development that would "substantially interfere with or detract from the line of sight toward the sea from the state highway nearest the coast" is to be minimized.

House Bill 323 does not provide for an inventory of scenic characteristics within the Coastal Zone. It does mandate the creation of a Coastal Zone Plan. Included within this plan is an element discussing the preservation and management of scenic resources. It does not define scenic resources nor does it seek to examine the Coastal Zone's geomorphic characteristics. However, it provides a line of sight restrictions on development until the adoption and implementation of a Coastal Zone Plan.

House Bill 92 and Senate Bill 42 contain fewer scenic and view corridor provisions than the above two measures. Both merely provide interim development guidelines that restrict line of sight infractions.

E. Management Considerations

Present territory contained within Hawaii's coastline is under multiple jurisdiction. The military manages and controls large amounts of the land. Public access is limited or non-existent. Both the State and the City and Counties control varying amounts of coastal lands.

This legislative session bills were drafted and introduced that would alter the present situation. House Bills 247 and 323 sought to establish a new management structure based on the State Coastal Zone Commission and four County Commissions. These bills failed to be approved. Later measures, H.B. 92 and S.B. 42, did little to change the present management structure, but delegated the management authority to the County Planning Commissions. This could have been due to the legislative intent and purpose of each measure.

House Bills 247 and 323 both sought to establish a Coastal Zone Plan and a separate management body to implement it. H.B. 92 and S.B. 42 were intended to provide an interim management structure to monitor development.

House Bills 247 and 323 assumed, implicitly or explicitly, that to implement a Coastal Zone Plan a new layer of government was needed to manage it over and above the present structure. Sufficient government bodies both State and County now possess jurisdiction over Hawaii's shoreline and scenic resources: DPED, through the Statewide Comprehensive Outdoor Recreation Plan; L.U.C.; DLNR; and DOT. As they presently exist, these bodies may not possess sufficient powers to manage a Coastal Zone Plan. However, consideration should be given to the analysis and review of their reorganization and integration in implementing a Coastal Zone Plan.

F. Boundary Considerations

As previously discussed boundaries are delineated by seward and inland limits. It is the inland limits that significantly affect scenic resources. All the legislative proposals equate these boundaries with management mechanisms rather than to preservation, protection or restorative purposes.

Within the legislative measures various boundary stipulations have been proposed, eg., 5 miles, 1000 yards, and 100 yards. A more realistic approach might be to accept these limits and equate them to a specific purpose: 1. The 100 yards limit can be completely restricted to development and used only for parks and beaches——thus, safeguarding Hawaii's coastline within the Coastal Zone. 2. The 1000 yards boundary can be established with provisions for designed and closely monitored development. Specific considerations should be given to density, height, view corridors, scenic roads, building envelopes, mix of uses and urban design principles. Where possible agricultural lands within this limit could be preserved. This would increase both open space and visual attractiveness. 3. The five miles shoreline setback could establish a zoning control based on water-oriented activities and inland-oriented activities. A locational decision would be based on the merit and the need for the activity to be located near the ocean with public-oriented activities being located on the shore and private or exclusive activities being located inland.

APPENDIX A

Summary of Proposed State and Enacted County Legislation

A. House Bills

Environmental Shoreline Protection

H.B. 257 establishes a new chapter in the Hawaii Revised Statutes designed to: 1) study Coastal Zone to determine ecological planning principles; 2) propose a comprehesive management plan for Coastal Zone and its natural resources; 3) establish interim controls for development; and 4) create a Hawaii Coastal Zone Conservation Commission and four County Commissions. "Protected area" is defined as 1000 yards, a stipulaton based on National Ocean Survey Maps. Precise boundaries created by County Commission and reviewed by State Commission can be moved 50 yards inland or seaward.

Coastal Zone Conservation

H.B. 323 amends chapter 205 of the Hawaii Revised Statutes by studying the Coastal Zone to determine ecological planning principles to ensure Coastal Zone resources. Mandates the preparation of a long-range, enforceable conservation and management plan for natural resources of the Coastal Zone. Creates a Hawaii Coastal Zone Conservation Commission responsible for the above plan and the administering of an interim permit system for development until such a plan is adopted. "Permit area" is defined as 1000 yards inland from the mean high tide line. "Coastal zone" is defined as land and water area extending inland five miles from high tide line.

Coastal Zone Management

H.B. 92 establishes special interim management controls on development along State's shoreline extending not less than 100 yards inland from the vegetation or debris line. Within 60 days of the effective date of the act the Planning Commission for each county will delineate the boundaries of the management area and administer a permit system until such time as a comprehensive coastal zone management plan is proposed and adopted.

B. Senate Bills

S.B. 42 establishes special interim management of development along the State's shoreline within 100 yards of the beach vegetation line. The interim management would be effective until a comprehensive Coastal Zone Management Plan is adopted. Directs each County to establish a "special management area" and administer a permit system.

C. Ordinances

#4319
Bill #137

Amends Chapter 21 of the Revised Ordinances of Honolulu, 1969, Article 12 by creating Historic, Cultural and Scenic Zoning districts and a management system to monitor development within each H, C, S district. Historic, Cultural and Scenic districts are to be determined through process: department of Land Utilization study and analysis of area, planning commission review and recommendations, and city council and mayoral approval. Proposes a design control system of these levels: Precise Plan Precincts--with detailed site development, conservation and preservation plans, Conceptual Plan Precincts--with an environmental design program, and General Criteria Precedents--with only limited controls above existing zoning. One precinct level will be designated for the regulatory control of each district.

#3947
Bill #64 HCS District No. #1, the Capitol District

This ordinance establishes the Hawaii Capitol District located west of the Central Business District of Honolulu; between the Harbor and Punchbowl. Provides development procedures through planning structures consisting of planning districts, Planning Commission and City Council. Designates specific sites and structures within the district as significant. Provides specific yards, use, height, open space and landscaping regulations to be enforced within Capitol District. Measure passed by City Council over Mayor's veto.

Ord #
Bill #44 Interim Control of Diamond Head

Establishes regulations governing Diamond Head and adjacent areas until such time as studies can be done with Diamond Head designated as a Historic, Cultural and Scenic district. Provides a moratorium on building permits for projects in excess of 40 feet in height. Allows City Council to review and vary ordinance with respect to a specific land parcel. Applicant shall have burden of proving to City Council that development will not impair view planes and profiles of Diamond Head. (Note: Ordinance does not define or elaborate on what constitutes a view plane.)

Ord. #4436
Bill #27 Interim Development Control of Slopes of Punchbowl

Establishes a moratorium on all building permits for repair, renovation of existing structures or buildings, unless approved by City Council, until such time as studies can be done with Punchbowl established as a Historic, Cultural and Scenic district. Boundaries of Punchbowl Interim Development Area are delineated by Interim Development Map.

Comprehensive Zoning Ordinance

County of Kauai

Ord. #164
Sec. 4.02-4.07 Types of Special Treatment Districts:
C) Scenic/Ecologic Resources (ST-R)

Establishes Scenic/Ecologic Special Treatment Districts and creates a permit system and procedures. Requires plans, maps, drawings indicating existing and proposed topography, building, utilities and roadways within Special Treatment districts and adjacent areas where deemed necessary by Planning Director to limits of 200 feet from property line abutting a public thoroughfare or 100 feet from property line abutting privately owned land. Also required are cross sections, elevations and models to illustrate development's three-dimensional realtionship to area; information on development design, including color, form, mass or shape and development's impact on environmental characteristics as wind, noise, shadow, traffic, and visual appearance.

Also, establishes guidelines for Development Plans for Special Treatment District designated Special Planning Areas. Such plans to include: a review of existing physical structures, improvements, ownership, use, and scenic ecolgic and geographic resources; a review of social, economic, cultural, and historic characteristics of area; a program of specific activities, improvements and modifications to meet development goals compatible with General Plan; a physical development plan consisting of recreation, open space, agricultural uses and their applicability and/or feasibility.

Ord. #164
Sec. 4.07 Scenic Corridors and Points

Definition of and indication of scenic corridors shall be included in General Plan and Zoning Maps. (Note: no definite description of scenic corridor is provided in ordinances.) Establishes development control

requirements for scenic corridor to include graphic, pictoral and to indicate proposed use and its visual impact. Planning Director to determine whether proposed development will block, disrupt or change visual accessibility or quality of scenic corridor.

Ord. #164
Sec. 5

Constraint Districts
Sec. 5.051 Shore District (S-SH)

Creates Shore District inlcuding lands: 1) designated by Planning Director as significant with respect to physical, biologic or ecologic interrelationships or 2) 40 feet inland from wash of waves, whichever is greatest. Requires Planning Commission to prepare a Shoreline Special Treatment Zone Plan within 5 years of ordinance approval. Establishes development requirements and a permit system for the Shore District. Development requirements include: 1) studies of existing conditions--the configuration of the shore, the nature of wind and wave action, the physical and biologic characteristics and the rate of Shore District change over time; 2) description of alternatives to proposed development including a no-construction alternative; 3) assessment of development's impact on water quality, marine and aquatic life, and navigation and safety. Restrictions are placed on marinas and harbors. Design and construction standards are established.

APPENDIX B

Power and Responsibilities for Coastal Zone Management, Shoreline Protection and Scenic Resource Protection

A. House Bills

H.B. 257 Creates: Hawaii Coastal Zone Commission

I. Membership

A. One representative from each of the four County Councils selected from among its members.
B. Five members from public appointed by Governor.
   1) Six weeks prior to Governor's appointment, Governor shall solicit nominees through public notice.
   2) Public hearings on all nominees.

II. County Commission of nine members appointed by Mayor from names prepared by County Council

A. In Counties where Council members are elected, one representative shall be chosen from each Council district.
B. In Counties where Council members are elected-at-large, County Commission members may be elected-at-large from slate of at least 18 names.
C. Four weeks before submitting nominees to Mayor, each County Council will solicit nominees through public notice.
D. Mayor will conduct public hearings on all nominees.
   1) Full public disclosure of finances.
   2) Vacancies filled in same manner as original member selection.

III. Commissions; organization and meetings

A. Commissions shall meet no less than once a month. No decision or action whatsoever shall be made without prior public hearing. Majority vote of total membership is necessary to approve any action.
B. All meetings and discussions shall be open to the public.
C. Members of State and County Commissions "shall serve from the date of appointment for the duration of the State Commission and County Commissions," (P. 13, 2-4).

IV. Commission; powers and duties

A. Apply for and accept grants.
B. Contract for professional services.
C. Sue and be sued.
D. Adopt any rule, take any action necessary and reasonable to carry out chapters (H.B. 257).
E. Examine and inspect all books, records, files, etc., of any agency or department for the purpose of the chapter.

V. Staffing: (exempt from civil service)

A. A chairperson from Commission membership
B. Executive director
C. Community relations person
D. Each member of State Commission shall have an administrative assistance of his choice.

VI. Conservation Plan for Legislative Approval

A. Provides detailed and coordinated objectives, standards and maps necessary to regulate land and water uses, a common reference point for State and County and citizens to resolve conflicts.
B. Based on the following objectives: the maintenance, restoration and enhancement of the quality of Coastal Zone, including aesthetic values; continued existence of living organisms; the utilization and preservation of Coastal Zone resources.
C. Contains the following components:
    1. Identification of boundaries of Coastal Zone.
    2. Precise definition of public interest in Coastal Zone.
    3. Ecological planning principles to regulate allowable development.
    4. Policy statements and maps to establish priorities relating to:
        a. location; magnitude and nature of permissable and prohibited uses
        b. including transportation, preservation and management of scenic and other natural resources, public access, recreation, public services and facilities, maximum population diversities, and educational, cultural and scientific uses
    5. Recommendations for governmental policies and powers including:
        a. agencies which would assume permanent responsibility
        b. the authority such agencies would have to administer land and water use regulations
        c. the authority agencies would possess to acquire land through condemnation
        d. authority such agencies would have over other State or County agencies to conform to Coastal Zone Plan.

VII. Planning Procedure:

A. Extent and size of inland Coastal Zone determined by following criteria:
   1. Drainage patterns
   2. Coastal ponds and riverine features as extensions of oceanic watertable.
   3. Coastal geomorphic features; e.g., land deposits, marshes, associated visual corridors and scenic vistas
   4. Coastal areas of historic and cultural significance
   5. Areas of reclamation, restoration, harbor expansion, public access

B. These above recommendations using this criteria shall be indicated within 4 months after first meeting of State Commission.

C. The State Commission shall
   1. Within six months of first meeting, delineate and define the initial boundary of the Coastal Zone (adjustable over time with new information) based on County recommendations.
   2. Compile a comprehensive inventory of the Coastal Zone including (one year after first meeting):
      a. environmental constraint analysis
      b. physical, biological, historical and archaeological characteristics
      c. scenic, soil characteristics, present and projected human uses and ownership
   3. Conduct analysis of existing institutional framework, laws, regulations and procedures relating to ability to plan and implement Coastal Zone.

D. Each County Commission shall
   1. Prepare within two years of State Commission's first meeting its recommendations.
      a. after 18 months, County shall hold public hearings on preliminary recommendations
      b. second public hearings shall be held two weeks prior to County Commissions adoption of recommendations
   2. Recommendation to be submitted to State Commission
      a. within six months the State Commission shall hold public hearings on preliminary Coastal Zone Plan
      b. one month prior to final adoption, public hearings shall be completed

Before December 1, 1978, the State Commission shall adopt a Coastal Zone Plan.

Citizen advisory task forces shall be created by the State and County Commissions to aid in the whole planning process.

VIII. Permit structure

A. State Commission shall prescribe procedures for permit applications.

B. County Commission shall conduct public hearings on proposed development projects at least 21 days.
C. County shall act on application within sixty days after the hearing.
D. Duplication of all pertaining permits from County and State agencies shall be filed with the appropriate County Commission pertaining to development proposals.

H.B. 323 Creates: Hawaii Coastal Zone Commission

I. Membership shall include:

A. Four representatives, one from each County.
B. Five representatives, reelected at large who shall be appointed by the Governor.
C. Members shall serve for the duration of the Commission without pay but reimbursed for expenses.

II. Organization

A. Shall meet no less than once a month.
B. No decision or action whatsoever shall be made without prior public hearing.
C. All meetings shall be open to the public.

The first meeting shall be no later than February 15, 1977, and members shall be appointed no later than December 31, 1976.

III. Commission: powers and duties

A. Accept grants, contributions.
B. Contract for professional services.
C. Sue and be sued.
D. Take any action, adopt any rule necessary and reasonable to carry out act, but not without prior public hearing.
E. Request aid and services from local, state and federal agencies.
F. Elect from among members a chairman and executive director.

IV. Conservation Plan for Legislative Approval

A. Components: maintenance, restoration of Coastal Zone quality, including amendities and aesthetic values.
B. Continued existence of living organisms.
C. Preservation and utilization of living and non-living Coastal Zone resources.
D. Avoidance of irreversible and irretrievable commitments of Coastal Zone resources.
E. Consists of maps, text and policy statements consisting of
   1. definition of public interest
   2. ecological planning principals to regulate allowable development

3. elements to include:
   a. transportation
   b. land-use
   c. conservation and management of scenic and other natural resources
   d. public access for maximum visual and physical use
   e. recreation element
   f. public services and facilities
   g. oceanic mineral and living resources
   h. population densities
   i. educational or scientific
   j. prohibited and approved land and water uses
   k. recommendations for government policies and powers.

V. Planning Procedure

A. The Commission, within six months of first meeting, shall publish objectives, guidelines and criteria for collection of data and studies relating to Costal Zone Plan.
B. Commission shall before December 1, 1978, adopt and submit to the legislature a Coastal Zone Plan.

VI. Permit structure

A. State Commission shall prescribe permit procedures.
B. Commission give written public notice and public hearings of proposed developments no less than 21 days and no more than 90 days after filing of application.
C. Commission act on application after 60 days of ending of public hearings.

H.B. 92 HD1 Creates: Interim controls for development under the "authority" (County Planning Commission or other designated agency)

- Special Management Area (S.M.A.) boundary not less than 100 yards inland.
- County Area Boundaries established by each County within 60 days of effective date of act.
- SMA boundary may be adjusted inland to the nearest property line.

I. Special Management Area Objectives

A. Maintenance, restoration and enhancement of overall quality of Coastal Zone environment; including amenities and aesthetic values.
B. Provide adequate public access to publicly-owned beaches, recreation areas and natural resources.

II. Special Management Area Policies

A. Maintain where needed the undeveloped portion of the SMA for recreation, scenic, educational and scientific uses.
B. Encourage public and private agencies to manage natural resources in a manner to minimize adverse environmental effects and depletion.
C. Protect shoreline from man-made improvements and structures.
D. Carry out program of intergovernment and private-public interaction on SMA planning.
E. Encourage citizen participation throughout the planning process of SMA.

III. Guidelines for development to ensure

A. Adequate access to public of coastal areas by dedication or other means.
B. Adequate and publicly located recreation and wildlife areas are reserved.
C. Provisions for solid and liquid waste treatment and disposition.
D. Minimum adverse effects to water resources and scenic and recreational amenities and minimum danger of floods, landslides, erosion to minimize adverse environmental and ecological effects.
   1. Minimize dredging, filling or altering of a bay, estuary, river mouth, sloud or lagoon.
   2. Any development that would reduce beach size or recreation area.
   3. Any development that would reduce public access.
   4. Any development that would detract from the line of sight toward the sea from the state highway nearest the coast.
   5. Any development that would adversely affect water quality.

IV. Permit Procedure

A. "Authority" in each County shall prescribe rules and procedure for permits.
B. Authority will give 21 days notice. This notice states the nature of the development and establishes the time and place of the public hearing. Public hearing to be held no less than 21 days nor more than 90 days from application date unless waived by applicant.
C. Any hearing if possible shall be held concurrently with EIS hearing.
D. Authority act upon application within 30 days of hearing unless otherwise agreed to by applicant.
E. No County or State department authorized to issue permits for any development within Coastal Zone will do so without prior authority approval.

B. Senate Bills

S.B. 42 SD 2 HD 2 CD 1 Creates: Interim Controls on development under the responsibility of the County Planning Commission in the County Council when the Planning Commission is advising.

- Special management areas (100 yards inland) SMA County area boundaries established by each County after public hearings.

I. Special Management Area Objectives

A. Maintenance, restoration, and enhancement of the overall quality of the Coastal Zone environment including its amenities and aesthetic values.

II. Special Management Area Policy

A. Maintain where needed the undeveloped portion of SMA for recreation, scenic educational and scientific uses.
B. Encourage public and private agencies to manage the natural resources to minimize adverse environmental effects.
C. Protect shorelines from man-made improvements.
D. Carry out intergovernmental and private-public cooperation in SMA planning.
E. Encourage citizen participation.

III. Guidelines for development review to ensure

A. Public access by dedication to coastal areas.
B. Adequate and properly located public recreation areas.
C. Provisions for liquid and solid waste treatment and disposal.
D. Assurance of minimum adverse effect to water resources and scenic and recreational amenities with minimum flood, erosion and landslides danger to minimize:
   1. dredging, filling or altering of a bay, estuary, marsh or river mouth
   2. reduction of beach size
   3. reduce public access
   4. any restriction of the line of sight from the State highway nearest the coast
   5. any development that would adversely affect water quality

IV. Permit Procedure for Development

A. Planning Commission or authority shall adopt, before December 1, 1975, regulations and procedures for application or permits and hearings.
B. Pulbic hearing no less than 21 days and no more than 90 days from application date unless waived by applicant.

C. Public hearing to be held concurrently with EIS hearing when possible.
D. Authority (Planning Commission) shall act upon application within 30 days of hearings unless otherwise agreed to by applicant.
E. No County or State department authorized to issue permits for any department within Coastal Zone with do so without prior authority and approval.

C. Ordinances (Oahu)

#4319
Bill #137

Section 21-1202 Establishment of Historic, Cultural and/or Scenic Districts

I. Action by Director of Land Utilization

A. Prepare written studies analyzing the primary and ancillary characteristics needed to form a HCS district to include:
1. General analysis of existing structures of "significance"; historic, cultural, architectural, condition and part and present uses.
2. Classification of desirable structures and premises for preservation and conversely an inventory of structures with potential adverse effects.
3. Land use analysis of vacant lands as to ownership, use, location and "significance".
4. Justification of proposed district boundary line.
5. Basis for programming, design and construction of capitol improvements.

B. Prepare HCS district ordinances.
C. Participation of affected citizens of area in studies.
D. Consult persons responsible for development, conservation or preservation activities within and adjacent to study area.

II. Action by Planning Commission

A. Shall review proposed ordinances and reports.
B. Make recommendations and forward them to Mayor and City Council.
C. Shall recommend approval in whole or in part, with or without modifications.

III. Action by City Council

A. Create or disprove HCS ordinance

Section 21-1206 Applicability of regulations: In addition to regulations established by ordinance the underlying zoning regulations shall remain applicable. In conflict the more restrictive provision shall apply.

Section 21-1203 Design Control System: Regulatory hierarchy of three levels of precincts.

I. Precise Plan Precincts

A. Development decision based on detailed site development, conservation or preservation plans
B. Design control documents shall include and specify:
1. conservation systems, preservation requirements, natural and man-made landscape, street equipment and building locations, heights, bulk and coverage.
2. open space and circulation elements stipulated and diagramed in relation to location and sue.
3. inventory of architectural character and vocabulary of buildings in area.

II. Conceptual Plan Precincts

A. Development decisons based on environmental design program.
B. Components of environmental design program shall include:
1. statement of objectives and design principles.
2. diagram of area showing activities.
3. diagram of physical form showing character, arrangement, magnitude of man-made and environmental form. Translated into three-dimensional sketches.
4. diagram of general development and outdoor space and a plan that establishes a landscape framework.
5. diagram of circulation patterns including vehicular flow, public transit, public access and service access.

III. General Criteria Precincts

A. Do not require specific plan used to control given aspects of environment.
B. Establish performance and general design criteria.
C. Some controls are height and open space regulations.

Section 21-1205 Procedural Requirements

I. Certificate of appropriateness filed by developer or owner with Department of Land Utilization Director for construction, alteration ore repair within HCS district.

II. Director evaluates project as to its "significance" or "insignificant"

A. Non-significant project is repair, renovation, etc., of structure

so long as it does not change the character or visual appearance of the building (P. 9).

B. Insignificant certificate of appropriateness is issued by Director.

C. Determined significant the following procedures apply:

1. supporting documents: data on building size, appearance and form by sketches; plans, elevations and sections to describe project's architectural character; area site plan indicating location and nature of project shall be submitted. Department of Land Utilization shall prepare a report on all pertinent documents and forward them to the Planning Commission.
2. Planning Commission shall hold a public hearing. After public hearings (30 days) the Commission forwards its recommendations to the City Council.
3. the City Council shall review the Director's report and the Commission's recommendations and shall approve or disapprove the issuance of a certificate of appropriateness in whole or in part, with or without modifications.

No building permit shall be approved without prior City Council action on significant projects.

APPENDIX C

Current Agency Responsibility*

Population location

DPED and DOT could plan population location and transport systems avoiding encroaching within shoreline and Coastal Zone except for scenic roads and water-oriented productive activity location.

Visual resource

DLNR to protect the shoreline. DPED to include environmental design methodology in the State General Plan. DPED establishing Shoreline Setbacks. DOT utilizing environmental and urban design principle in Harbor design, and maintenance.

Protection of water, forest and open space

DLNR (LNR 402) operates a program for this purpose. This program should utilize urban and environmental design guidelines since one of its objective is to enhance aesthetic beauty.

Establish and maintain natural area preserves, wildlife, forest, marine, ecological preserve.

DLNR with Act 139, SLH 70 establishes the Hawaii Natural Areas Reserve System. DTAX exempts from property tax private land surrendered for forestry.

Protection of endangered species, plants and animals

DLNR manages a program for protection of fish and wildlife and necessary habitat. DOA regulates pests and diseases affecting plants and animals and chemicals.

Landscaping

DAGS, DOT, DLNR are involved in landscaping.

(*) The following material is abstracted from: Progress Toward Hawaii's Environmental Goals

Establish, preserve and maintain scenic, historic, cultural, park and recreation areas including shorelines.

DLNR (LNR 801) operates a program for Historical and Archaeological Places, for other Natural Features, such as geological, scenic, botanic features (LNR 803). DLNR (LNR 804) is in charge of the development and maintenance of trails, picnic grounds, lookout points, preparation of trail maps and (LNR 809) is in charge of planning and data collection for state parks, inventory, review, enforcement and salvage of historic and archaeological sites. DPED operates a program for shoreline access acquisition (Act 244, 1974) and controls access to shoreline and mountain areas (Act 244, SLH 1974).

DPED and DAGS advise the City and County of Honolulu in its zoning of the Hawaii Capitol, Scenic, Historic, and Cultural District. DOT is in charge of the preservation of some Hawaiian petroglyph sites.

Protect the shorelines of the State from encroachment of man-made improvements structures and activities.

DPED acts in conformity with the shoreline setback law, Chapter 205, HRS.

Promote open space in view of its natural beauty.

DTAX, according to Ch. 246-34, HRS, provides exemptions from taxation for open space. This section applies only to urban lands; an amendment would be required if it were to be applied to all lands.

Establish visitor destination areas with planning controls.

DPED exerts its control through the Growth Policies Plan, SCR 52, 1974, Urban Design Plans, Act 119, 1973, the Neighbor Island Economic Development Council and the Pacific Islands Development Commission.

Encouragement of transportation systems in harmony with the environment of the state.

DOT has various airport, harbor and highway expansion, modification and maintenance projects. DPED is involved in transportation planning.

Preservation and promotion of mountain-to-ocean vistas.

DAGS through the Central Services repair and maintenance program and through landscaping by the Public Works Division implements this guideline. DAGS can adopt plans for facilities under its jurisdiction similar to the State Capitol Complex Master Plan which promoted a mountain to ocean vista. DTAX (Ch. 246-12.1 and I1.1 HRS) provides for lower property assessment for golf courses. DOT has

standard procedures for presenting public information sessions for airport, harbor and highway master plans. HHL, according to the Hawaiian Home Commission Act of 1920, as amended, provides lands to qualified native Hawaiians for residential, pastural and agricultural uses. The existing Rules and Regulations for PUC (PUC General Order No. 7) have no provision for nor has manpower been provided for determining whether power plant facilities or transmission lines and distribution lines encroach upon or impair the natural environment.

Promotion of culture and arts linkages to the enhancement of the environment.

State and county programs fostering culture and the arts enhance the urban environment. No effort has been made to determine whether these programs have ever been intentionally directed toward enhancement or knowledge of the physical and natural environment.

Encouragement both of formal and informal environmental education for all age groups.

DOE has not allocated resources for environmental education (except in FY 71-73) Lack of funds and absence of a Science Program Specialist are the main deterrents to DOE development and implementation of environmental education programs. DLNR sees need for educational programs for endangered species of indigenous animals protection and for scenic, historic, cultural, park and recreation areas preservation.

Citizens participation promotion

DOT encourages citizens participation in various programs and projects, such as the Oahu Transportation Planning Process and the proposed Waianae Boat Harbor project. DOE, in the Foundation Program Objectives, gives attention, among other issues, to the development of a moral ethic in regard to the natural environment; environmental education will emphasize problem-solving initially of concerns and issues in the student's immediate environment and gradually discussion and action regarding concerns and issues in the State, Nation and World.

B & F	Department of Budget and Finance
CORE	Commission on Operations, Revenues and Expenditures
CPHF	Commission on Population and the Hawaiian Future
DAGS	Department of Accounting and General Services
DLIR	Department of Labor and Industrial Relations
DLNR	Department of Land and Natural Resources
DOA	Department of Agriculture
DOD	Department of Defense
DOE	Department of Education
DOH	Department of Health
DOT	Department of Transportation

DPED	Department of Planning and Economic Development
DSSH	Department of Social Services and Housing
HHL	Department of Hawaiian Home Lands
ITCC	Interdepartmental Transportation Control Commission
LUC	Land Use Commission
PUC	Public Utilities Commission
DTAX	Department of Taxation
UH	University of Hawaii

PPB Program ID numbers are included where possible.

(Source: Progress Toward Hawaii's Environmental Goals

Responsibility for State Environmental Policy Act Guidelines	County and State agencies	B&F	CPHF	DAGS	DLIR	DLNR	DOA	DOD	DOE	DOH	DOT	DPED	DSSH	HHL	ITCC	LUC	PUC	TAX	UH	Counties
A. Population																				
1. Impact		✓	✓							✓	✓	✓	✓					✓	✓	✓
2. Levels			✓																	✓
B. Natural Resources																				
1. Mgt practices		✓				✓				✓	✓	✓		✓			✓		✓	✓
2. Irrigation, waste water		✓				✓				✓	✓	✓		✓					✓	✓
3. Recycling		✓		✓						✓	✓	✓					✓		✓	✓
4. Water, forest, open space		✓				✓					✓	✓					✓	✓	✓	✓
(5) Natural preserves		✓				✓												✓	✓	✓
6. Land use planning		✓				✓	✓					✓		✓		✓		✓	✓	✓
C. Flora & Fauna																				
1. Endangered species		✓		✓		✓	✓				✓								✓	✓
2. Planting		✓		✓		✓					✓								✓	✓
D. Parks, Recreation, Open Space																				
(1) Preservation, maintenance		✓				✓					✓	✓							✓	✓
(2) Shoreline protection		✓									✓	✓				✓			✓	✓
(3) Open space		✓				✓						✓				✓		✓	✓	✓
E. Economic Development																				
1. Industries		✓				✓	✓					✓							✓	✓
2. Agriculture		✓		✓			✓					✓				✓		✓	✓	✓
3. Federal activities																				
4. Industry protect environ.		✓					✓			✓		✓	✓						✓	✓
5. Visitor destination		✓									✓	✓							✓	✓
F. Transportation																				
1. Systems in harmony		✓									✓	✓							✓	✓
2. Motor vehicles		✓								✓	✓	✓		✓	✓				✓	✓
3. Energy, reduce pollution		✓		✓				✓		✓	✓						✓		✓	✓
G. Efficient Use of Energy		✓			✓		✓	✓									✓		✓	✓
H. Community & Housing																				
1. Compatible life styles		✓					✓		✓		✓	✓		✓				✓	✓	✓
2. Communities in harmony		✓							✓		✓	✓	✓	✓					✓	✓
3. Reduce pollution		✓		✓			✓	✓	✓	✓	✓			✓			✓	✓	✓	✓
4. Safe, sanitary homes		✓				✓			✓			✓	✓	✓					✓	✓
(5) Community appearance		✓		✓							✓		✓	✓			✓	✓	✓	✓
I. Education & Culture																				
1. Culture & art		✓							✓										✓	✓
2. Environ. education		✓				✓			✓	✓							✓		✓	✓
J. Citizen Participation																				
(1) Environ. ethic		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
2. Decision process		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

HONOLULU PACIFIC FEDERAL EXECUTIVE BOARD
P O BOX 496
HONOLULU, HAWAII 96809

DEC 20 1974

STATE ENVIRONMENTAL GUIDELINES - ACT 247

FEDERAL AGENCY	Agric - Soil Cons Serv	Air Force Corps of Army Engineers	Housing & Urban Dev	Interior - Geo Survey	Interior - Nat'l Park	Interior - FWL	Navy	Small Business Admin	Trans - FAA	Trans - Coast Guard	Trans - Fed Highway	Environmental Prot Agy	Army - USASCH
A. Population													
1. Impact		M3	M3	M3		M3					M3	F2	M3
2. Levels		M3	M3	M3		M3		M3		M3		F2	M3
B. Land, Water, Mineral, Visual, Air, Other Natural Resources													
1. Mgt Practices All Resources	A1,2 F1	M1 F1	M1			M1	M2,3 A2	M1	F1	M1 A2		F2	E F2	M1
2. Irrigation and Waste Water	F1,2 A1,2	M1 F1	A2		A1 M3				F1		M1 E	F2	E F2	M1
3. Recycling Waste Water and Solid Wastes	F1,2 A1,2	M1	A2		A1 M3			M1	F1		M1 E		P2	M1
4. Watershed & Sources, Forests, Open Space	F1,2 A1,2	M1	M1,2		A1 M3	M1		M1	F1			F2		M1
5. Natural Preserves	F1,2 A1,2	M1 P1	A2		A1	M1	F1 A2	M1		M1		F2	F2	M1
6. Land Use Planning	A2	F1 M1,2	P2	F1 M2		P1	F2 P1,2	M2		A2	M2	F2	E F2	M1,2
C. Flora and Fauna													
1. Endangered Species	A1,2	M1	A2			M1	M2 A1	M1		M1	M1	F2		M1
2. Planting	A1,2	M1				M1	E M2 A2	M1		M1	M1	F2		M1
D. Parks, Recreation and Open Space													
1. Preservation, Maintenance	A1,2 F1,2	M1 F1	M1		F1,2 M3	M1		M1			M1 E	F2		M1
2. Shoreline Protection		M1 F1	F1 M1		F1,2 M3	M1		M1			M1 E		A2	M1
3. Open Space		M1			F1,2 M3	M1		M1			M1	F2		M1
E. Economic Development													
1. Industries in Harmony	A1,2	M2 P1			F2			M2		M2	A2	F2		
2. Agriculture	A1,2	M1					A1		F1					
3. Federal Activities Protect Env	A1,2 M3	M3	M3	M3	M3	M3	M3	M3	M3	M3	M3	F2 M3	A1 E	M3
4. All Industry Protect Env	A1,2	M1		E			M1	F1	E M2	E A2	F2	A1 E		
5. Visitor Destination Areas						M1								
F. Transportation													
1. Transportation in Harmony		M1	M3			M1			E	M1	F1	A2		
2. Degradation by Motor Vehicles		M1						M1			F1	A1 E	M1	
3. Transportation System Energy Conservation, Reduce Pollution		M1 F1	M3					M2		E A1,2	M1 E	F1		M1,2
G. Energy Resources Efficient Use	M1	M1,2				M1,2		M1,2		M1	M1	F		M1,2
H. Community Life and Housing													
1. Compatible Life Styles		M1 F1			F1,2	A1		M1				F2		M1
2. Develop Communities in Harmony		M1 F1			F1,2			M1			M1			M1
3. Reduce Pollution	A1,2	M1			F1,2			M1	F1	E A1	M1	F2		M1
4. Safe, Sanitary & Decent Homes		M1 F1			F1,2			M1	F1		M1			M1
5. Community Appearance	F1,2	M1 F1			F1,2	M1 A1		M1				F2		M1
I. Education and Culture													
1. Culture and Art Linkage	A1,2	M1			F1		P1,2	P1				F2		P2
2. Environmental Education	A1,2 P1	M1 A2					P1,2	P1 A1	A2		P1 A2	F2		A1,2
J. Citizen Participation													
1. Citizens Involvement	P1,2	P1,2	P1	F2			P1,2	P2			P2	F2	P1	P2
2. Citizen in Decision-Making Process	P1,2	F1, F1	P1,2	F2			P1,2	P1,2		P2	P1,2	F2	P2	P1,2

NAGATIVE REPORTS FROM FCC AND IMMIGRATION

F Funding 1. grants & loans 2. fiscal influence on environmental aspects of project

M Management 1. direct 2. advisory 3. monitoring

E Enforcement of statutes or regulations

A Assistance, technical 1. provide services 2. advispry

P Participation 1. joint responsibility for project; ex-officio on board or commission 2. encourage others to participate

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