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HAWAII ARCHITECT

DECEMBER, 1977

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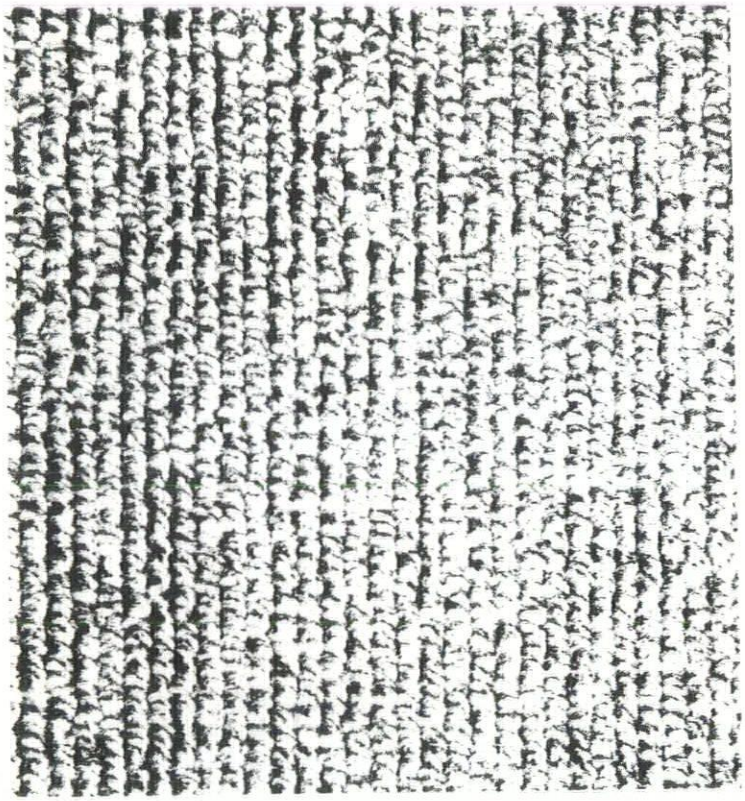

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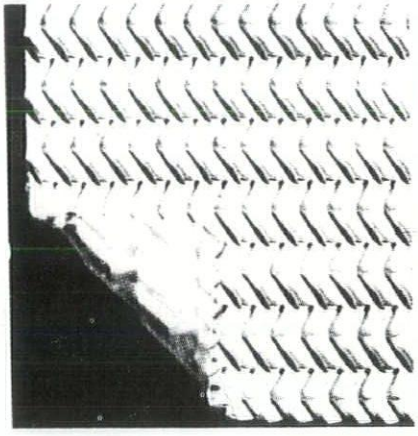

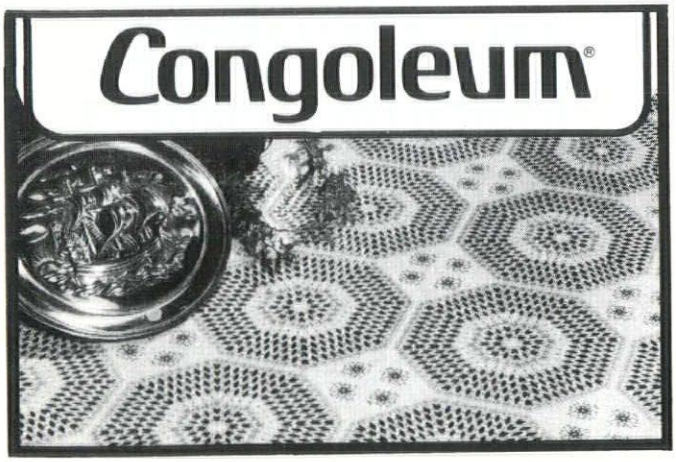

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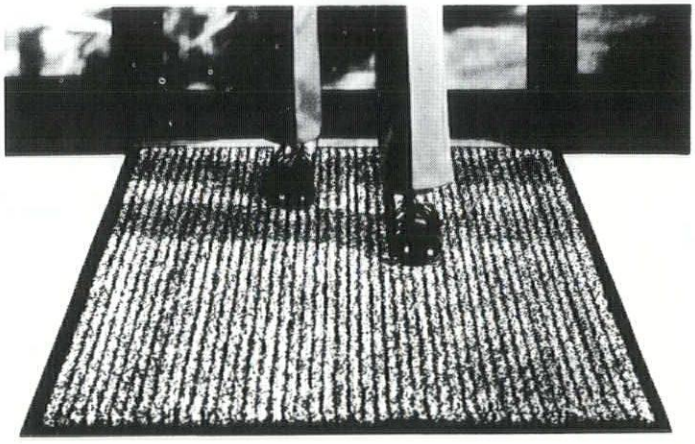

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Hawaii Architect is a monthly journal of the Hawaii Society/American Institute of Architects. Subscriptions are $10 per year. Opinions expressed are those of the editors and writers and do not necessarily reflect those of either the Hawaii Society or the AIA.

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Published by:
Crossroads Press, Inc.
863 Halekauwila Street
P.O. Box 833
Honolulu, Hawaii 96808
(808) 521-0021

Stephen S. Lent, Publisher
William B. Roberts,
Advertising Director

Hawaii Architect (063170)
controlled circulation
postage paid at Honolulu, Hawaii

12/77

Contents

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Designing Honolulu for Mass Transit

by LUCIANO MINERBI, AIP

A great deal of community debate has been addressed to two questions: "Should we have mass transit?" and "Should it be a rail or bus system?" But another pressing question is, "How should we plan and design Honolulu so that mass transit will fit well in the evolving urban structure? In other words we need to clarify the planning and design principles which make an improved transit system the logical solution for the future of Honolulu, avoiding disruption to the physical environment and to the local community.

An answer is needed soon because the preparation of the Development Plan for Central Honolulu is now in progress and our planning approach, it is obvious, must be improved.

For one thing, locally we do not yet have well-articulated and accepted concepts of city design at the block, neighborhood, and district scales. Just look around and try to find examples of adequate area design in recently developed districts; Makiki, Waikiki, Punchbowl, Kapiolani business district, and Salt Lake are all lacking in concern for the design dimension at those community scales.

Why is that so? Those districts are the result of designing single buildings instead of entire areas. This has occurred because of the layout of individual land parcels and a too permissive zoning which allows up to 350-foot building heights in most areas.

We do have suburban Planned Unit Developments, such as Mililani and Hawaii Kai, which apply design principles on an areawide scale. But these examples are inappropriate and inadequate to be replicated in the complexity of the urban core. Urban Planned Unit Developments, such as Marco Polo, with their disregards for density, mass, and scale, can hardly be considered experiences to be repeated again.

It does not take very much imagination to visualize the mushrooming of disordered, unrelated buildings which would occur around mass transit stations given the current development practice. It is not only a question of visual disorder and loss of views and vistas but lack of human scale because of (1) excessive population densities; (2) building too tall: (3) limited pedestrian orientation of ground floor areas; (4) inconvenient access to daily necessities; and (5) inadequate amenities to retain microclimatic conditions for human comfort.

It does not have to be so. There are modern and century-old examples of urban densities which provide clustered development and enough population base to support, in close proximity, services and facilities with moderate building heights, green space, and pedestrian orientation.

Mass transit is a tremendous opportunity to invent such human environments when urban design principles are taken into consideration. Mass transit lessens car dependence. The increased pedestrian flow of resident and commuting population, in transit station areas, makes possible improved pedestrian-oriented services and facilities. The mauka-makai bus routes which feed mass transit would greatly enhance and improve local neighborhood accessibility by covering shorter distances, with more frequent service, than the Ewa-Hawaii Kai route.

There are various urban form concepts and design principles which should be considered for those Central Honolulu areas which will experience some growth in the future:

1—Multipurpose centers where various activities coexist at pedestrian distance, to satisfy commercial, institutional, educational, recreational and residential requirements, could be an alternative to the limited choice of functions of shopping centers such as Ala Moana and Pearlridge. Victor Gruen, a designer of many shopping centers in the past, is now a strong advocate of this idea.

2—At the neighborhood scale, pedestrian traffic can be separated from the vehicular traffic by designing roads and paths perpendicular to one another. This would generate a variety of piazzas—exclusively pedestrian, exclusively vehicular, and mixed vehicular and pedestrian for the interchange of transportation modes. Christopher Alexander proposed this scheme for a Latin American community.

3—The linkage between transit stations and the inner core of an urban district could be structured around a pedestrian system of circulation for commercial and individual pursuits. This is the "stem" idea advanced by Shadrach Woods.

The development plan scheme emerging from these ideas would resemble more the concept of the French town of Toulouse le Mirail than the car-oriented pattern of Honolulu.

But it is with community awareness for design principles at the block, neighborhood, and district scale that development plan schemes will evolve from local environmental characteristics and the needs of area residents. However, such ideas cannot materialize unless innovative legislation is able to better cope with the design constraints existing at the three community scales.

This legislation should include:

Continued on Page 6

Designing Honolulu for Mass Transit

Continued from Page 5

Cities designed for human scale, access to opportunities, pedestrian orientation, mass transit and energy considerations avoid car dependence, low rises, and very tall buildings.

1—At the city block scale:

• Requirements for the designing of mass and bulk of all buildings in the entire block area with specifications for pedestrian, microclimatic and environmental amenities, before construction takes place (Zoning for Housing Quality).

• Assistance to landowners to consolidate their small parcels of land to realize economically viable construction projects where appropriate (Land Assembly).

2—At the neighborhood scale:

• Coordination of private with public development in order to phase housing construction with utilities and facilities. In this manner, adequate land is provided in appropriate locations to serve the entire area (Reserved Land).

• Removal of the obstacles to unified project design because of individual parcel layout by assigning to landowners their appropriate percentage of partnership in an area redevelopment. The replotted land is later reallocated in accordance with the holding of the respective owners prior to the land readjustment (Land Readjustment).

3—At the district scale:

• Allowance for transfer of development rights among landowners in the area by separating a parcel's development value from its physical location (Transfer of Development Rights).

• Recapture of land value increases due to urban growth in order to pay for municipal expenses instead of that value accruing to private landowners located in the path of development as unearned windfall (Land Value Recapture).

• Creation of mixed uses in building structures of core areas to increase their round-the-clock utilization and make feasible for both best and marginal firms to

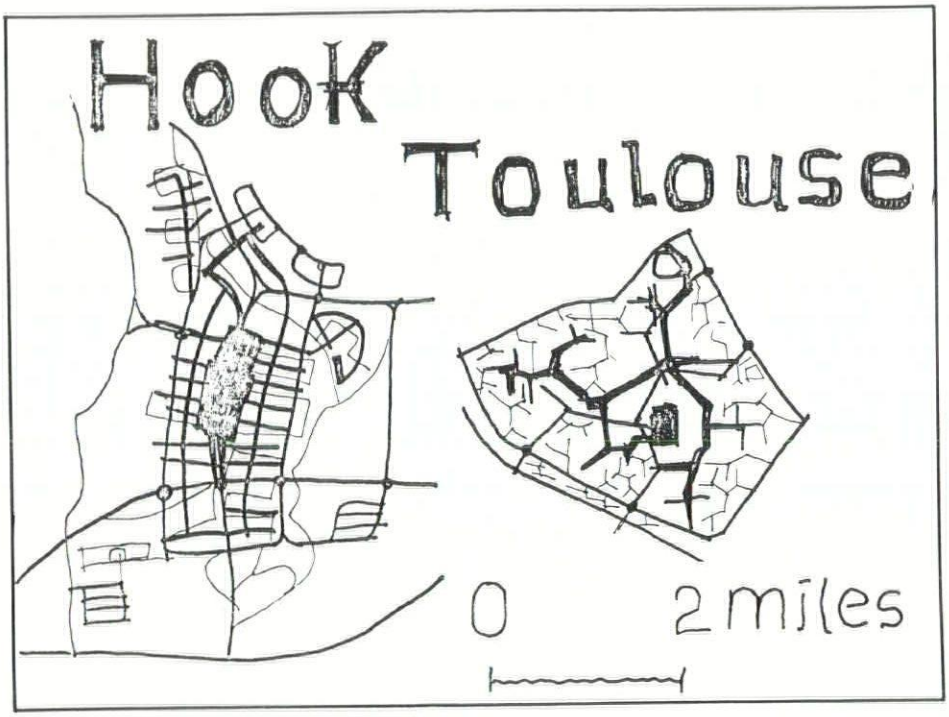


Figure 1: Vehicular and pedestrian networks for a community of 100,000. The Example of Hook and Toulouse.

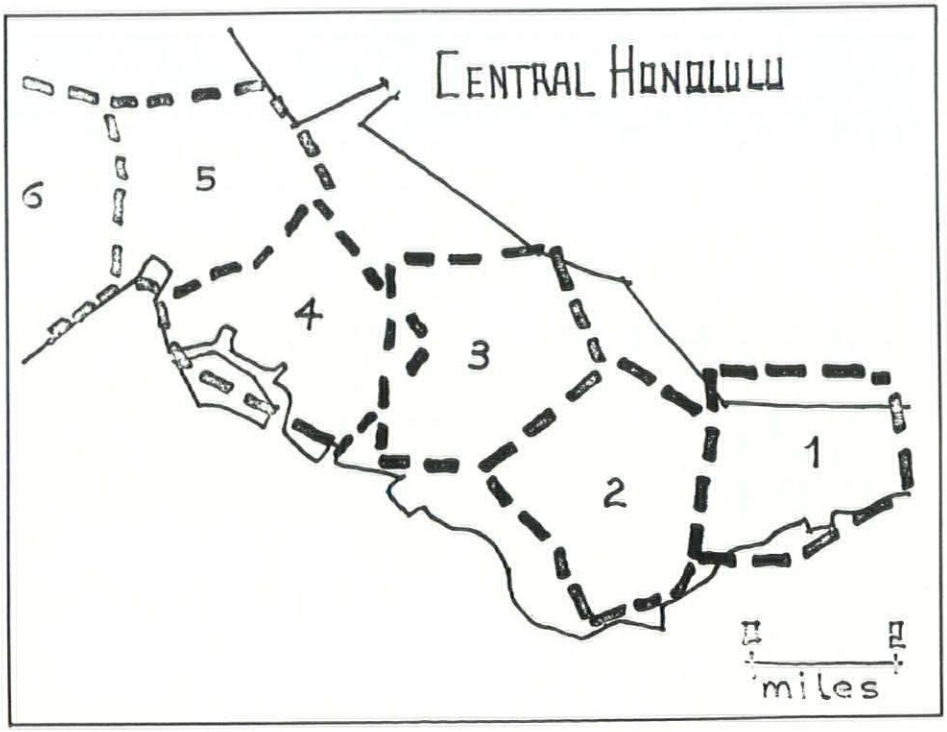


Figure 2: Outline of Toulouse Master Plan (broken line) superimposed several times over central Honolulu (solid line).

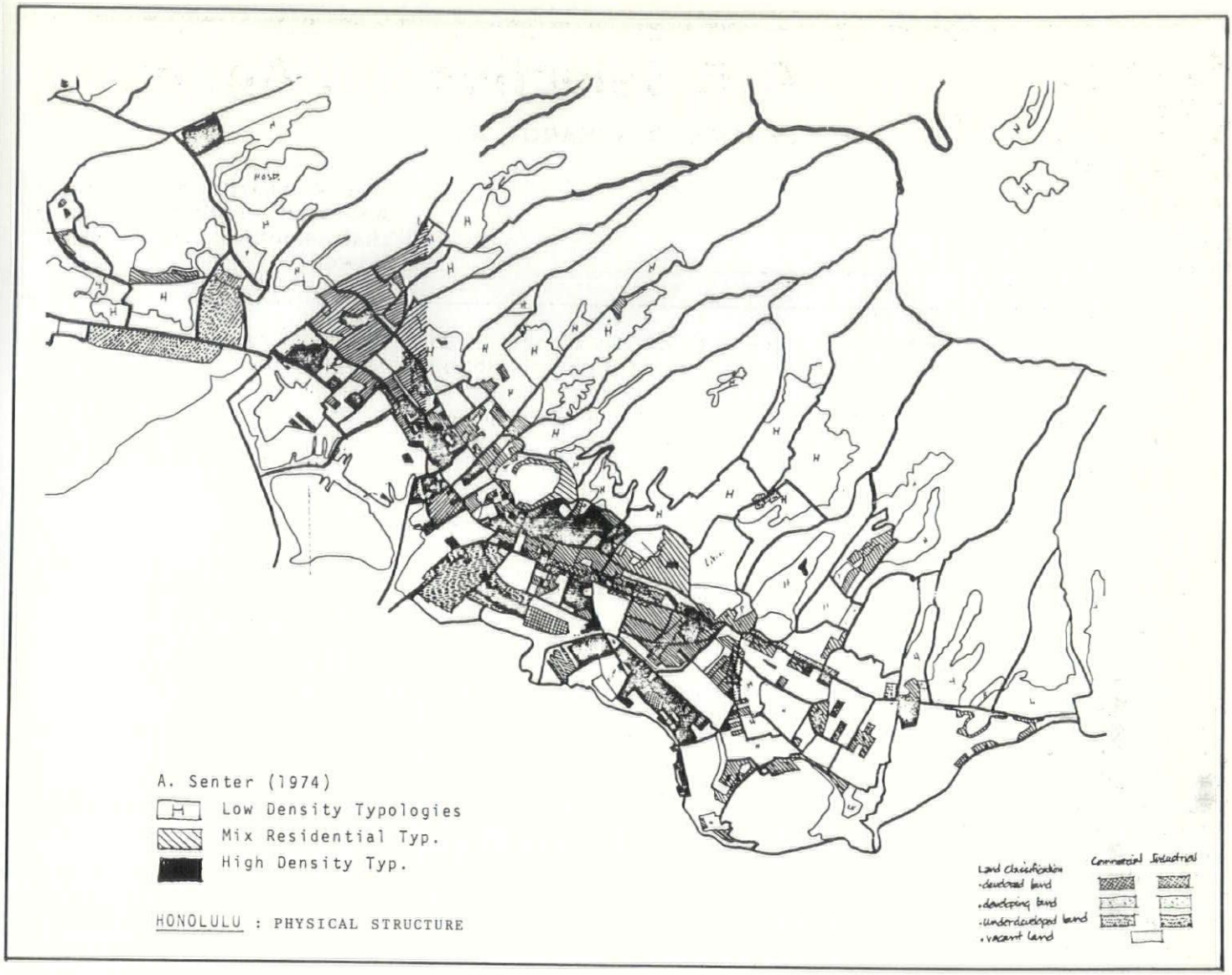


Figure 3: About 350,000 persons reside in Honolulu. Its average density is about 6 persons per acre.

jointly share advantageously located sites with residents, regardless of income brackets (Vertical Zoning).

A city with limited land and fragile amenities, such as Honolulu, should avoid the Los Angeles sprawl and the New York overbuilding by opting—in the long run—for a moderately compact urban form with an average skyline height of six stories and a deviation from this average of plus or minus three stories according to areas.

Such a city would be mass transit and energy efficient with pedestrian access to multifunctional centers. The resulting density would make localized amenities and urban design schemes feasible. This would lessen the competition of various activities for centrally located sites by allowing compatible productive and residential uses to jointly share limited land through vertical zoning.

Two conditions must be met for this scenario to be appealing to people:

- Apartments much better designed for family living as an alternative to the popular but unaffordable single-family house.
- Urban neighborhoods with excellent environmental amenities and with urban facilities and services in close proximity.

In addition people must be willing to share same building structures in a spirit of coexistence and diversity. This entails rethinking some currently held values, but the long range benefit of these ideas to the community might be worth the effort. HA

LEX SCRIPTA
Codes/Law

A-E Selection . . . Again

by JAMES REINHARDT, AIA

Jim Reinhardt, a principal of Anderson/Reinhardt, Ltd., is chairperson of Common Cause/Hawaii.

It's December again. Time for Christmas, New Year's and, before long, the start of a new legislative session. It's also time to turn up the heat under the Architect-Engineer selection pot again.

Actually, the pot has been simmering for some time now. The 1977 session of the Ninth Legislature introduced a trio of promising A-E selection bills. The Kukui Plaza case and the R. M. Towill indictment have focused unusual public and media attention on the issue, and Common Cause/Hawaii added a new ingredient to the stew when it announced it was undertaking an analysis of professional contract awards and campaign contributions.

The three bills introduced in 1977 remain under consideration since the '78 session is the second session of the Ninth Legislature, giving the thrust for a '78 adoption an added head start.

S.B. 1160, introduced by Sen. Robert Taira, calls for:

1—Announcement of a request for proposals in "selected publications" of all architecture, landscape architecture, engineering, surveying, planning, and related professional service contracts where the fee is to exceed $10,000.

2—Selection by the contracting agency head from a list of not less than three firms (to be interviewed if the fee exceeds $25,000), according to an established and published list of criteria.

3—Negotiation of fees is to be conducted with the top ranked firm. If no satisfactory agreement can be reached, negotiations shall be begun with the second ranked. If none of the three negotiations is successful, a new selection sequence is to be conducted.

4—Notification of the three recommended firms is to be made promptly after completion of successful negotiations and an annual summary of projects processed and A-Es selected is to be published.

S.B. 521 introduced by Sen. Jean King is basically similar to S.B. 1160 except that it calls for:

1—Public announcement two times, a minimum of 30 days in advance of the submittal deadline, in a "general circulation newspaper," and that it itemizes the information to be covered (name and description of project, location, scope of services, time and budget requirements and any special features) for all fees over $5,000.

2—The criteria to be used by the agency head in the rating and selection of the firms is spelled out in more detail (demonstrated design and technical competence, specialized experience, capacity to perform work within time allotted, past performance, proximity and familiarity with the project site, and equitable distribution of work among qualified firms).

3—Negotiations—same.

4—Reporting—in addition to the yearly summary, the agency head is to make public the results of the ratings and of the negotiations for each project.

5—In addition, S.B. 521 calls for prohibition of contingency fees, where an A-E seeks a contract as an agent of another firm for a fee.

H.B. 1449 is the same as S.B. 1160, introduced into the House by Rep. Richard Garcia.

In past years, lack of agreement among professional groups has stalled positive action on A-E selection. The familiar response from the legislature "How can you expect us to pass legislation when you—the groups of the design professions—can't agree among yourselves. Get your own houses together. Come in with a mutually acceptable bill and we'll put it into law," has been heard again and again. In the early '70s the agreement was near but dissention in the AIA lead to the break-up of the unit.

This year, prospects for a unified front look better. The Consulting Engineers Council (CEC), the American Society of Landscape Architects (ASLA), the AIA, the Hawaii Society of Professional Engineers (HSPE), the American Institute of Planners (AIP), and the Interprofessional Council for Environment Design (ICED) have endorsed S.B. 1160.

Another of the stumbling blocks to the adoption of good A-E selection laws has been the lack of apparent public interest in the issue. "We know the design groups are interested . . . this is their bread and butter. Who else cares? We've got to focus our attention on matters of general concern, not just solve the in-house problems of a special interest group"—that has been the legislature's attitude.

The entry into the fray by Common Cause/Hawaii (CC/H), the citizens lobby with its 1,250 local members, has changed in that CC/H has taken the position that apart from being bad for the design professions and the quality of professional services, the present system is producing bad government.

CC/H points out that the close ties between campaign contributions and contract awards raise concerns about conflict of interest, ethics, campaign financing, and governmental account-

Continued on Page 22

ENERGY

Energy and the Environment: Hawaii Role

by RICHARD J. MARLAND, Ph.D.
Director Environmental Quality Control State of Hawaii

The subject of energy is more and more a topic of official and professional discussion—and even private conversations. And rightly so.

By including energy as one of your topics at this meeting you are adding needed emphasis to the matter. President Carter has certainly indicated how important he thinks the subject is—he calls it the most important program of his administration. The Congress underscored the need for concerted action by creating a Department of Energy wherein federal leadership can be exerted.

There is no doubt that answers to our energy problems need to be found. I believe that President Carter is right in bringing the entire nation's attention into focus on deriving the answers. It is impossible to overestimate the importance of our nation's energy programs.

As architects and planners of Hawaii's future, you should be vitally concerned with the answers that are found, the policies that are set, the strategies that are followed—indeed the whole shape of things to come in our energy programs. You have a professional stake in designing our living environment. You should have a vital interest in the selection of our energy strategies and the solutions which are selected by our government. For there is a strong relationship between our living environment and the energy programs which we elect to follow.

This strong relationship has been viewed by some—but not by me—as being "inverse." That is, the enhancement of one part occurs at the expense of the other. This view may be based on the historically positive relationship between energy consumption and economic growth.

Some go so far as to say that the environmentalist is the enemy of the energy industry—and others who believe that the energy industry is the enemy of the environment. This characterization of mutual antagonism is pretty well established, and is sometimes used as a basis for explaining unemployment and related economic ills.

We have allowed the debate to become an either/or situation—a dichotomy where the one is "right," "good," "essential," and the other is "wrong," "bad," "unnecessary and wasteful."

Thoughtful persons recognize that bickering of this sort not only interferes with achieving our national goals; it is just plain silly!

The matter is clear. The world **must** have more and more energy available for mankind, and the production and use of this energy **must** be such that it does not overload our environmental systems. We do not have the luxury of deciding which we will sacrifice. We will sacrifice neither, because we do not need to sacrifice either.

Energy whose sources and use are compatible with our environment is called "Environmental Energy."

This dual goal of ample energy and a protected environment through the development of environmental energy is not only possible—we must achieve it. Actually, we do not need any basic scientific breakthroughs to reach it. We do need a quantum jump in departing from tradition, and we need substantial technology adaptation.

There are two aspects to environmental energy:

- Conservation.
- Development of fully renewable, pollution-free sources.

Hawaii is uniquely favored as a place where environmental energy can be demonstrated.

The major purpose of this presentation is to describe some ways in which our nation can resolve this dichotomy and move into the era of environmental energy. I will use Hawaii and its natural resources as a basis for illustrating these possibilities. If we can make it work in Hawaii, maybe others will follow.

Let us look at the several aspects of environmental energy using the two groupings I mentioned: conservation and source development.

Under the general heading of conservation, I would emphasize that conservation practices need be applied only to energy derived from fossil fuels—oil, gas and coal. Thus, those who use renewable source substitutes are practicing the best kind of conservation.

Most of the measures by which we can conserve nonrenewable fuels are well known to such a group, and I will not repeat them, save for general categories. (As I was reviewing the literature on this subject, I found the AIA to be a source of good ideas on such things as energy-efficient buildings.)

The needed conservation can be grouped into a few classes:

1—A shift in human values such that energy conservation is esteemed where presently we associate high prestige with profligacy—that is, the gas-guzzler automobile, the suburban home with its many appliances.

2—Efficiency improvements in our entire array of production, conversion, and use of energy. For example, a recent NSF study for the Council of State Governments shows that the U.S. fails to use 58.3 per cent of the energy it consumes (illustration 1). Transportation and electrical generating processes are the most wasteful of our conversion process. (Transportation is 25.3 per cent efficient and elec-

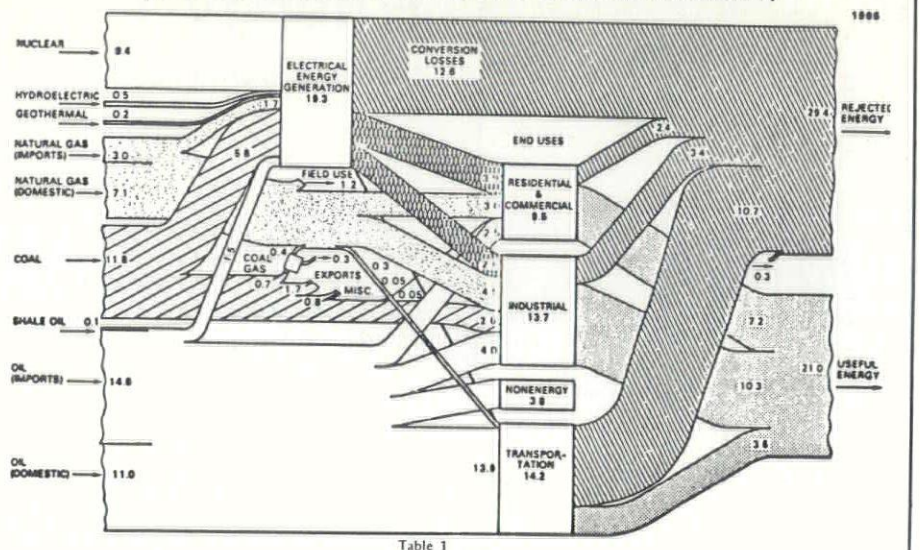


Table 1
U.S. ENERGY FLOWS

Illustration 1

Table 2
A SCHEMATIC RUNDOWN OF ENERGY-CONSERVATION PRACTICES*

Conservation practice	Conservation of: Raw energy resources	End-use energy consumption	capacity Electric generating
1. Reduced population and income	x	x	x
2. Improved conversion efficiency (as in conventional electric generation)	x	o	o
3. Better load balancing	o[a]	o	x
4. Shift in energy end use towards form involving higher conversion efficiency (e.g., from electric to gas heating)	x	o	x
5. Shift in intermediate energy conversion towards a higher-efficiency technology (conceivably from conventional electricity generation to MHD or fuel cell)	x	o	o[b]
6. More efficient end-use energy utilization in satisfying given "need":[c]			
(a) Improved end-use technical efficiency, as in shift from incandescent to fluorescent lighting, lower horsepower automobiles, mass transit, or more efficient household motors	x	x	x[d]
(b) Reduced heat and light needs via improved building design and insulation	x	x	x[e]
(c) Eliminating waste (e.g., turning off unused lights, or raising summer thermostat when home is unoccupied)	x	x	x[e]
7. Shift towards less energy-intensive end-use activities:			
(a) Where purpose of a given activity can be achieved with greatly reduced fuel or power use (e.g., walking instead of riding, electronic communicating instead of traveling)	x	x	[f]
(b) Shift towards consumption of goods and services containing less embodied energy (e.g., more steel, less aluminum, natural instead of synthetic fibers)	x	x	x
(c) Tolerating increased discomfort (e.g., by waste heat utilization or by change in product-output specifications)[g]	x	x	x
8. Shift towards less energy-intensive, but still economic, production practices (e.g., by waste heat utilization, or by change in product-output specifications)[g]	x	x	x

*SOURCE: Joel Darmstadter, Conserving Energy: Prospects and Opportunities in the New York Region (Resources for the Future, John Hopkins University Press, Baltimore, 1975), p. 38.

(a) Slight savings may accrue from not having to use inefficient peaking equipment.
(b) There may not be a saving in kilowattage, but perhaps one of site requirements.
(c) "Need" may have to be defined in physiological or normative terms.
(d) Except if the shift were to electrified mass transit, in which case electricity consumption (even if not energy consumption as a whole) would go up and so, therefore, would electric generating capacity.
(e) The extent of the saving in electric generating capacity depends on whether electric heating and cooling are involved.
(f) Effect is unclear.
(g) Less proliferation of models and increased durability could also produce raw energy savings.

Illustration 2

This is the text of a speech presented at the HS/AIA State Convention held on Molokai, November 19, 1977.

trical generation is 34.7 per cent efficient).

3—Economic incentives which result in consumers paying the full cost of energy including the development costs of new sources. Subsidies, direct or indirect, tend to increase the use of energy since the large user obtains a better rate, and all users fail to perceive the real cost of their energy. Indeed, economic incentives are the best tool to increase the palatability of the previously mentioned conservation practices.

With all the emphasis which President Carter and others have placed on energy conservation, I will not dwell any longer on the subject, save to recommend to your reading that NSF report I cited earlier. (Illustration 2).

Let us move on to the production of environmental energy remembering that the criteria are:

1—Fully renewable.

2—Production techniques do not cause environmental degradation.

3—Burning of the fuel causes a minimum (an acceptable) level of pollution.

There are two aspects to the production process: the fuel and the source. Let us look first at the fuels. (Illustration 3).

CURRENT END USES OF ENERGY IN HAWAII.

TRANSPORTATION	54.9%
AIR TRANSPORT	27.4%
GROUND TRANSPORT	15.6%
WATER TRANSPORT	3.5%
MILITARY TRANSPORT	8.8%
INDUSTRIAL AND COMMERCIAL	14.9%
RESIDENTIAL	13.0%
MILITARY (OTHER THAN TRANSPORT)	9.0%
OTHER	9.2%

Illustration 3

Energy

Continued from Page 11

As can be seen, transportation in Hawaii accounts for about 55 per cent of our fuel usage, mandating a liquid (as opposed to a solid), readily portable fuel.

As shown here, (Illustration 4), Hawaii is not typical of the U.S. in the way our petroleum fuels are divided among end uses. This is important in planning for Hawaii's needs, and also for predicting how environmental energy can be developed for the rest of the U.S.

For instance, the use of solid or nonportable fuels can be used for only about 30 per cent of our needs (electric and industrial).

Finally, (Illustration 5), we see how dependent Hawaii is on petroleum — especially compared to the Mainland.

This same illustration also introduces us to the nature of fuel sources. All these data show us that our environmental fuel must be suitable for use in transportation (air and land, mainly) if we are to replace the current fuels.

What then are the fuels which hold most promise? There are three which have potential: alcohol, methane and hydrogen. Any of these three can replace some or all of the fuels we use for transportation. Alcohol can be used in most auto engines when used at a rate of up to 14 per cent of the total fuel. Use of any of these—without gasoline mixtures can be done by modifying present engines. Examples are now flying the skies and driving our highways.

Any of these three fuels has environmental advantages over the fossil fuels because their use in engines causes substantially less pollution—especially hydrogen. Also, there are production methods to obtain these fuels which are minimally polluting and use renewable resources.

Let us look at these sources—with a quick reference to Hawaii's capability of using them. Note also that we should try to

relate these sources with the nature of fuel we need and to the location of the source with respect to its potential use.

There are four basic sources of environmental energy: solar (direct and indirect), geothermal, hydro, and wave or tidal. Hawaii is not well provided with resources for hydro nor tidal energy. Geothermal sources are one of our richest blessings with proven potential on the Big Island and possible practicality on Oahu.

This source is extremely important as a potential for electrical generation. Researchers from the University of Hawaii who brought in the present well at Puna estimate the Big Island can produce 1,000 megawatts for 100 years.

Geothermal sources are limited to stationary sources close to the well—or to electric transmission or hot water lines—and have little potential to solve our transportation energy needs.

These needs—the liquid or portable fuels—must come from solar sources. And solar sources offer us much more than liquid fuels.

Direct solar heating can provide a substantial conservation measure. Simple arithmetic tells us that by converting just 50 per cent of our residential hot water systems to direct solar could effect a 10 per cent reduction in the electrical and gas consumption in Hawaii.

Added fuel economy could be

Continued on Page 19

CURRENT PETROLEUM USES (HAWAII 1976 FIGURES, U.S. 1975 FIGURES)	HAWAII	MAINLAND U.S.
JET FUEL	36.2%	6.4%
GASOLINE	18.0%	41.0%
RESIDUAL FUEL (ELECTRIC GEN)	24.5%	8.5%
RESIDUAL FUEL (NON-ELECTRIC)	6.1%	6.5%
LPG	4.9%	6.0%
DISTILLATES	10.1%	17.4%
OTHER	0.3%	14.2%

Illustration 4

CONSTRUCTION
materials/methods

Academy of Arts Opens New Wing

The Honolulu Academy of Arts' Clare Boothe Luce Wing, a year in construction, was opened to the public Saturday, December 10, as the culminating event in the museum's 50th anniversary observance. The academy was founded April 8, 1927.

A comprehensive schedule of exhibitions, film showings, and lectures has been arranged from the December 10 date on. A late addition, a sculpture garden containing masterpieces of the medium, including recent acquisitions by Isamu Noguchi and Henry Moore, also was opened on the occasion.

The Luce Wing consists of a large gallery at ground level, the Academy Theater downstairs and administrative offices on the second floor. In the gallery the academy will install its contemporary art collection, the first time this store of works by major artists of our time will be assembled permanently in one place.

In the upper galleries of the main museum the academy will present its 4th biennial Hawaii National Print Exhibition, continuing through January 15. A third exhibition, in the graphic arts galleries, will consist of prints by Marc Chagall and Joan Miro.

As a major inaugural event in the Academy Theater the film "Homage to Chagall, The Colours of Love," was shown for the first time in Hawaii Tuesday and Wednesday, December 13 and 14.

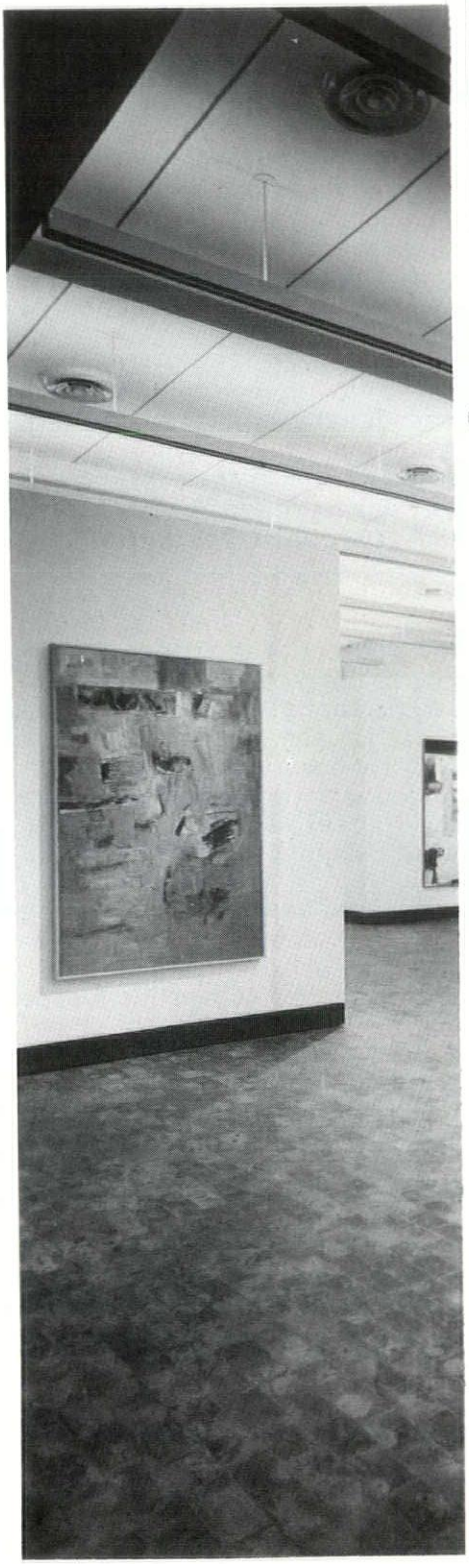
The highly praised film, an exploration of the French master's life and work, was produced only last summer for his 90th birthday.

For the December 10 opening of the theater, a series of art films was shown free to the public continuously from 10 a.m. to 4:30 p.m. These included two Lord Kenneth Clark subjects: "Mystery of Ancient Egypt" and "Carved in Ivory," and other recent films on Toulouse-Lautrec, "Monet in London," and others.

In a light vein, the Academy Theater will offer a family series of comedy movies, "The Big Laugh," with such stars as Charlie Chaplin, Harold Lloyd, and Jack Benny. Dates are Tuesday, Wednesday, and Thursday, December 27, 28, 29, at 10:15 a.m. and 7:30 p.m., admission charged.

The wing was built at a cost of $1.5 million. John Hara Associates, Inc., was the architect and Constructors Hawaii, Inc., the contractor.

A new gallery for primitive arts of the Pacific, the Americas, and Africa, built in the former administrative office space off the Kinau Court of the main museum, will be ready for use early in the New Year.



Mahalo

BALLPOINT

On behalf of the HS/AIA the HAWAII ARCHITECT would like to take this opportunity to express the Societies appreciation for the excellent performance of those responsible for arranging the 1977 State Convention on Molokai; it all went like clockwork, the speakers, moderators and reactors were outstanding; travel and hotel accommodations were flawless (including the added attraction of watching the sunset from Kaunakakai pier). Registration was painless and quick. The whole convention was superb.

Those individuals principally responsible were:

General Chairperson	Carol Sakata
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A full report of the convention will appear in next months issue - ed.

journal of the hawaii society/ american institute of architects

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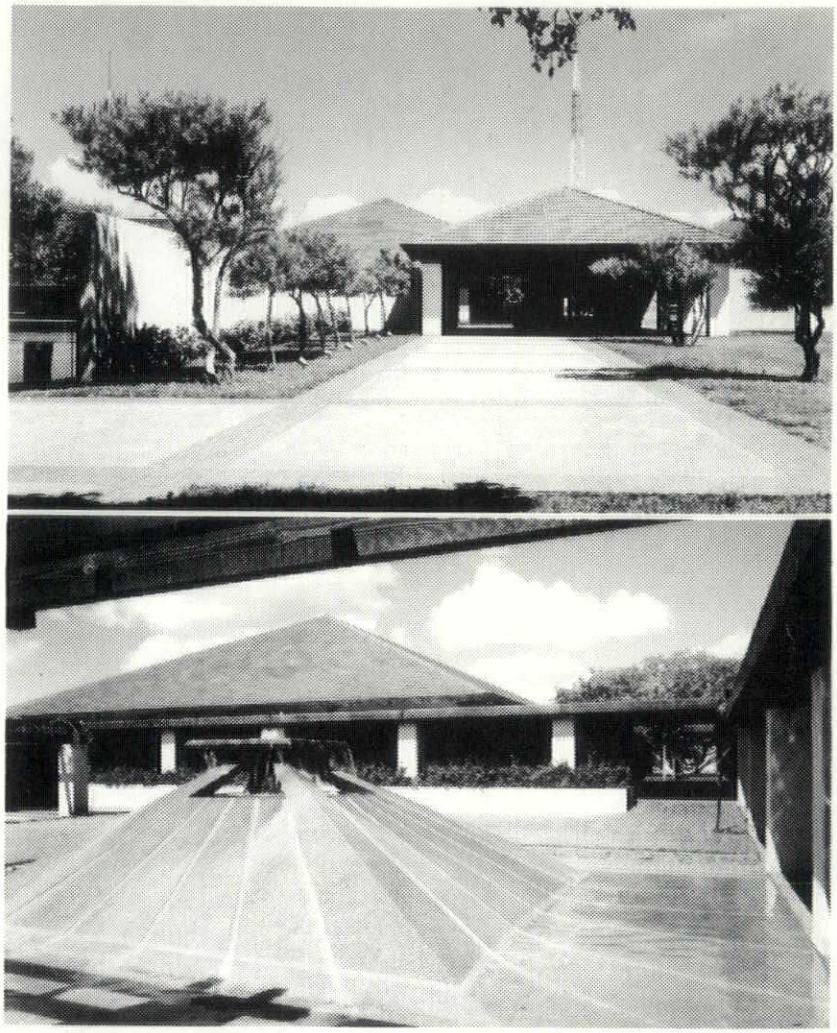
Ceramic Tile & Terrazzo Combine to add charm to Hawaii's McCoy Pavilion

One of the true beauty spots in Hawaii is the Lester McCoy Pavilion in Ala Moana Park. It's a more than million dollar memorial gift to the city from McCoy's widow, who died in 1968. The park itself is a memorial in total to Lester McCoy, who made his fortune in Peoria and at the age of 42 moved to Hawaii where he soon became at $1 a year the first chairman of the Honolulu Parks and Recreation Board in 1931. The Ala Moana Park site at the time was a rubbish dump on a mud flat by the sea.

The McCoy Pavilion today is a jewel set in a park that is Honolulu's pride—a beautiful building beside an open court—where excellent architectural planning has created true beauty plus utility. Ceramic Tile is there—indoors and out—blending with and accentuating its setting. Terrazzo fountain rises above terrazzo courtyard, bubbling in cooling beauty.



TWO VIEWS OF THE PAVILION—Above: Entrance from Park roadway. Below: Fountain in the courtyard. Architect: Charles J. W. Chamberland AIA. Contractor: THOHT Construction, Inc. Advisor to the McCoy Estate Trustees: The Outdoor Circle.

CERAMIC TILE, MARBLE & TERRAZZO BELONG IN HAWAII

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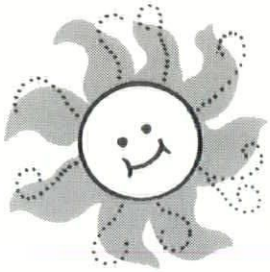

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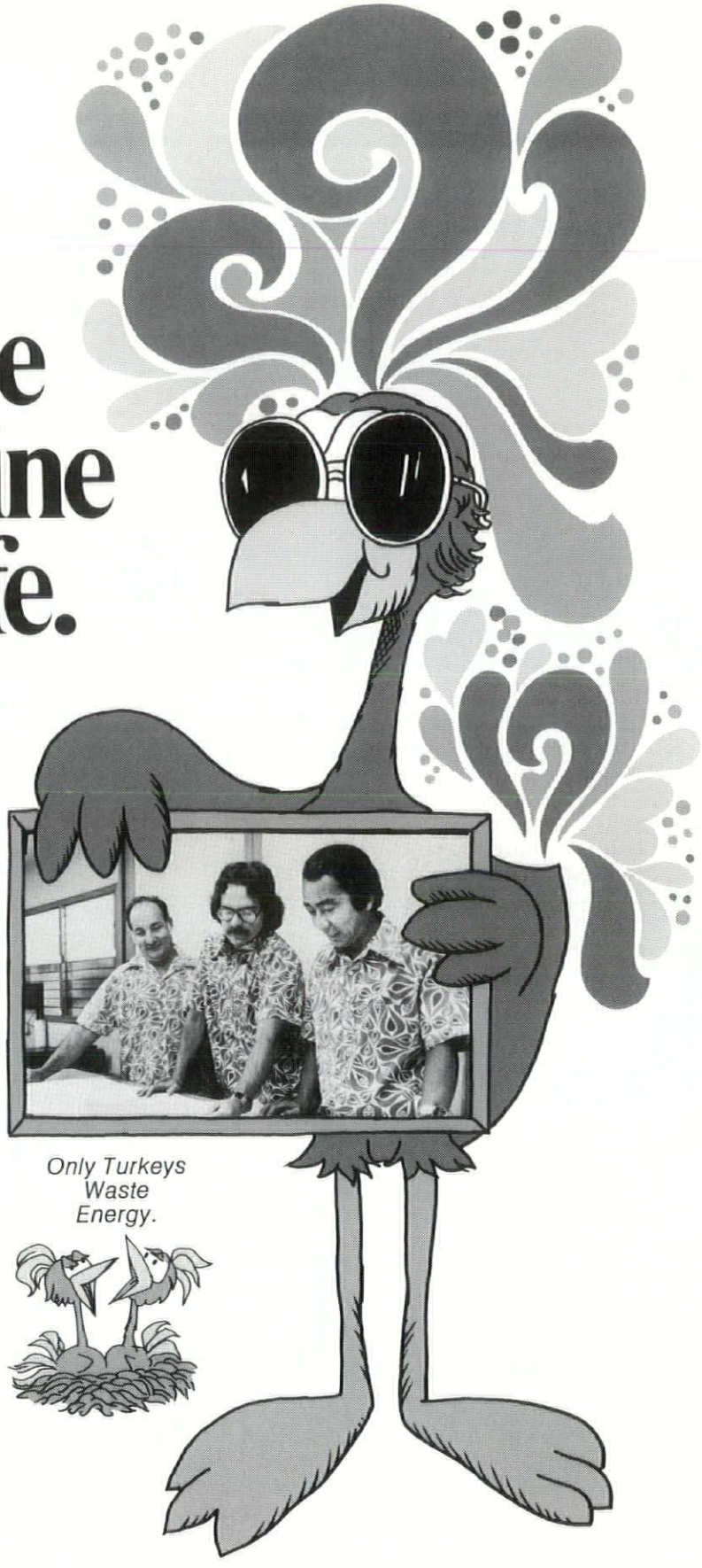

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Energy and the Environment: Hawaii Role

Continued from Page 13

gotten by using this source for commercial hot water, supplementing the fossil fuel sources.

Another energy source classed as derived from the sun is wind energy. No other state is as generously endowed with reliable wind as is Hawaii. That is true, of course of all solar-derived sources. Windmills, like geothermal, are fixed in location and, since we have not developed the technology of storing energy, this source cannot constitute the sole source of any operation. Wind energy, however, should play a part in our total strategy to develop environmental energy.

CURRENT ENERGY GENERATION. (1976 DATA FROM SURVEY DONE BY HENRY ALEXANDER FOR D.P.E.D.)

	HAWAII	MAINLAND U.S.
PETROLEUM	92.0%	47.3%
HYDRO	1.0%	4.0%
WASTE MATTER (BAGASSE)	7.0%	NONE
NUCLEAR	NONE	LESS THAN 5%
NATURAL GAS	NONE	27.4%
COAL	NONE	18.4%

Illustration 5

There are two other solar-derived energy sources which Hawaii most certainly should develop: biomass production and conversion and ocean thermal (called OTEC).

Let us look first at biomass, of which Hawaii is capable of generating significant amounts in six different forms (Illustration 6).

As you can quickly see, biomass can also provide us with many other necessities besides energy—fiber, food, clothing, building materials.

Biomass is useful because green plants are converters of solar energy to hydrocarbons, doing so in a variety of forms, but mainly cellulose. Plants vary as to their efficiency of conversion. Algae are the best at about 5 per cent and sugar cane is high, capturing about 2 per cent of the incident energy in the form of recoverable hydrocarbons.

Municipal refuse is considered as biomass because it is the cellulose portion which is used. In Honolulu, about 70 per cent of our municipal waste has recoverable energy in the form of hydrocarbons. Recent studies have shown that conversion of Honolulu's municipal trash is both technically and economically feasible, and could produce electricity amounting to about 5 per cent of Oahu's electrical needs.

Fuels are derived from biomass in several ways. (Illustration 7). The fuels derived here are: direct combustion, (all) fermentation to alcohol (sugar, corn, trees) pyrolysis to gas (all) and digestion to methane (algae).

We do not now know the practical potential for commercial production of energy from all of these sources, but we do have some educated guesses. At a price of $1.10 to $1.25 per gallon, our sugar industry could provide up to 21 million gallons of alcohol from available molasses. This would displace the energy in about 17 million gallons of gasolines that being about 5.5 per cent of the 300 million gallons per year we consume in Hawaii.

Converting all of Hawaii's current sugar production to alcohol —not just the molasses—could yield an additional 230 million gallons of alcohol, but the cost would approach $2.50 per gallon for this conversion.

Data on production and costs of producing methane from

TYPES OF BIOMASS

SUGARCANE

WOOD

CORN

ALGAE

GRASS

MUNICIPAL REFUSE

Illustration 6

algae should be coming soon from the major research effort at the University of Hawaii.

Suffice to say, the use of biomass in its many forms offers tremendous potential for providing Hawaii with environmental energy. Technical improvements in the processes should be researched to show where economics can be exerted, thus reducing the cost of these fuels. But even with only fractional reduction, these sources are very attractive—especially when their environmental benefits are measured.

The last source of environmental energy I will discuss is perhaps the most exciting—ocean thermal. This little known technology has not been developed on a commercial scale anywhere, but Hawaii has unique conditions which justify a very careful investigation of its use.

For those of you who may not be familiar with the principle of OTEC operations, lets look quickly at how it works. (Illustrations 8 & 9).

This is a massive system in which a refrigerant—ammonia for example—is vaporized in a closed system, using the heat in the warm surface water of the ocean. Expansion of the gas

Continued on Page 20

Energy

Continued from Page 19

turns the turbine, generating electricity. The ammonia is condensed by cooling it with cold water (about 40 degrees F colder) from the deep ocean—perhaps 2,000 feet deep.

Under expected operating conditions such a system would be about 2 to 3 per cent efficient—about three times more efficient than sugar cane—in producing electricity. (Illustration 10). For example a full scale generator would produce 125 mgw from each square mile of ocean. Of this, 98 per cent would be needed to pump the 1.6 million gallons of water per minute to condense the gas, leaving a net productivity of 2.5 mgw per square mile. One unit would effectively ex-

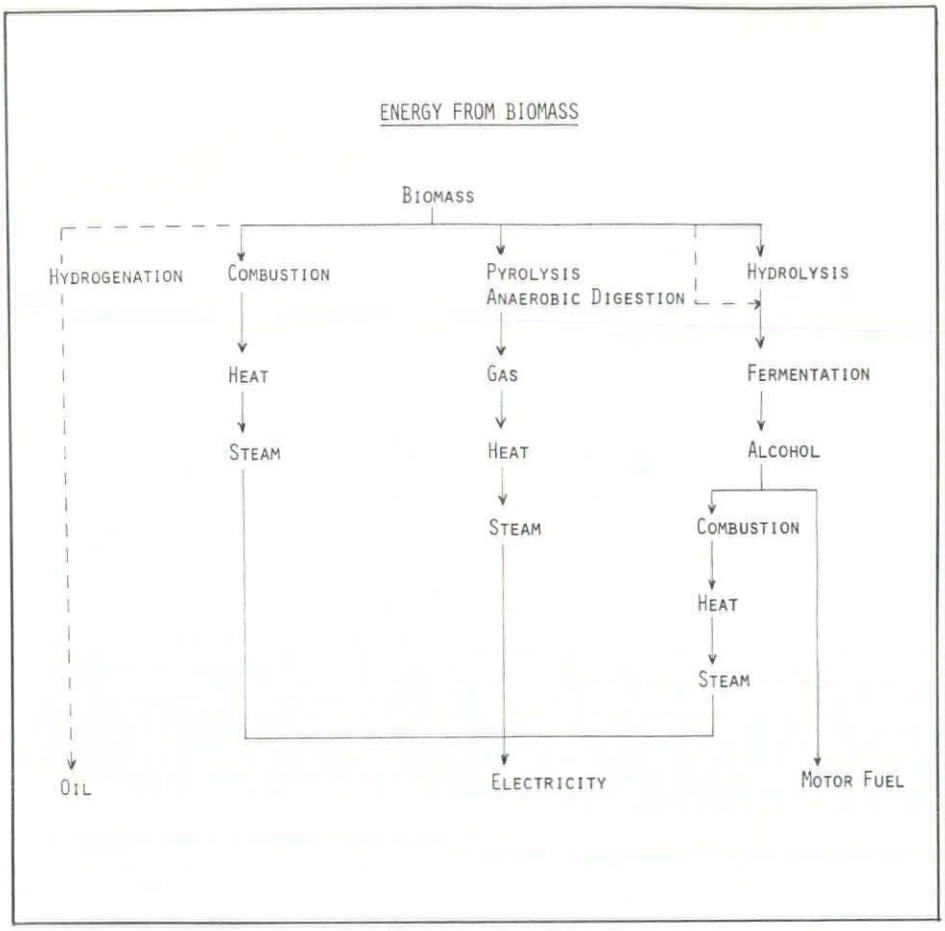


Illustration 7

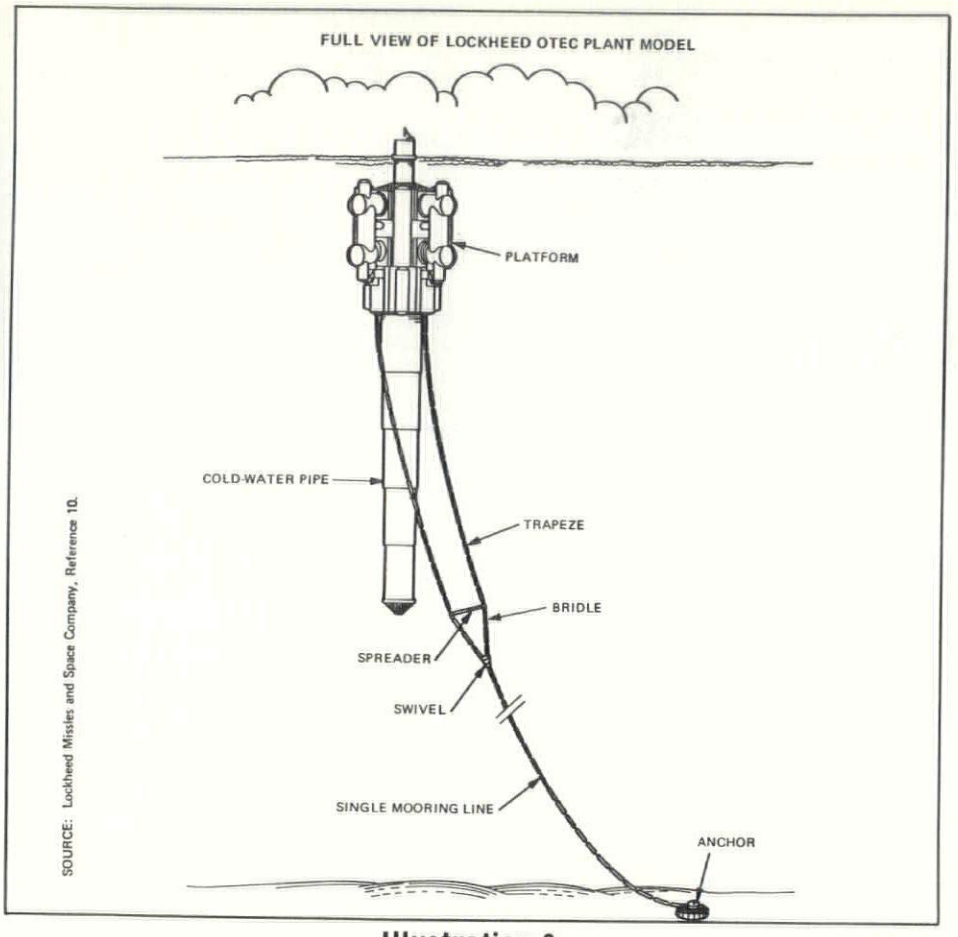


Illustration 8

tract energy from about 3 or 4 square miles.

The efficiency of this system could be radically improved if one were to utilize the waste heat from geothermal generators, or other processes. Increasing the temperature differential from 40 degrees to 60 degrees would provide a 50 per cent increase in the energy output. (It is likely that waste heat necessary to gain such an advantage would not be available in large quantities except from geothermal sources.)

A major advantage of the OTEC system is its environmental compatibility. (Even the up-welling of these large quantities of water is advantageous to sea life.)

A disadvantage of OTEC is that it is designed to produce electricity, and may be located some distance from shore. Our major need is for a transportation fuel—on land or in the air.

But, OTEC is not necessarily confined to the production of electricity. For instance, the

Continued on Page 24

A-E Selection

Continued from Page 8

ability. In addition, the reluctance of the State to release information regarding A-E contracts constitutes violations of public information acts. The public feels "those guys—the professionals and the politicians —are all in it together, lining each other's pockets at our expense."

In these days of the post-Watergate lack of public confidence in government, made worse by the Korean influence-buying revelations and the maritime lobby spending on the recent Cargo Preference Bill, an obvious sore point like the A-E contributions/contracts situation cannot be tolerated.

Common Cause/Hawaii, as part of its effort, is developing a hard data study to present to the members of the legislature prior to convening of the session. Included in it will be a description of Hawaii's procurement system, a compilation and analysis of procedures in other states and by the United States government, proposed model bills from the American Institute of Architects and the American Bar Association (ABA), analyses of S.B. 1160, S.B. 521, and H.B. 1449, and the recommendations of CC/H.

Of particular interest and concern in the anlysis of existing procedures in other states and cities is the issue of competitive bidding. Maryland has had a bid system since 1974 (immediately post-Agnew). The system has been carefully observed by many analysts.

Perhaps the most telling observation came from the bar association in its comprehensive study, "A Model Procurement Code for State and Local Governments—Preliminary Working Paper No. 2". The study says, "Where price is a factor to be

considered prior to selection, it will be exceedingly difficult for the contracting officer to select other than the lowest priced proposal."

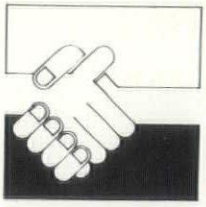
The U.S. Department of Defense has observed, "When price enters the competitive process, it tends to become the dominant consideration . . . . This can only result in the lessening of quality of design . . . . the outcome is poor quality, inefficient layout, costly to maintain."

While competitive price bidding for professional contracts has been discredited where used, and has not been incorporated at all widely, the issue is of concern to the enactment of A-E selection laws because of its potentially devisive effects on the emerging unity among the design professional groups. Opponents of the bills can "divide and conquer" if bidding becomes an issue.

So where does all this leave the efforts to get an A-E selection bill enacted during this session? The public is aware of the issue and aware that it effects how its tax dollars are spent. The media is interested and willing to devote space and coverage to it.

The research has been done on what is the situation and experience elsewhere and on what is the situation here. Some battles have already been won. The State and the City have both released contract lists. The design professions are coming together to stand behind a single bill.

At this time, the prospects look good. With a final surge of effort on the part of the professional groups and some personal contact with your legislators, the battle can be won this time. HA



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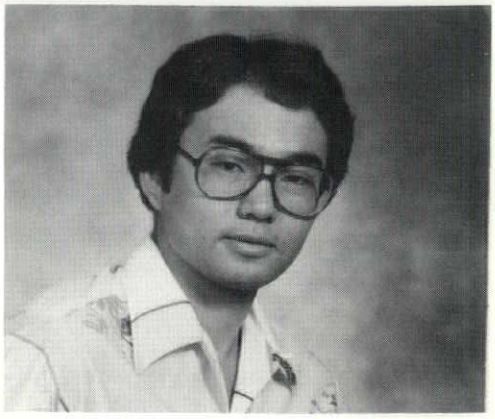

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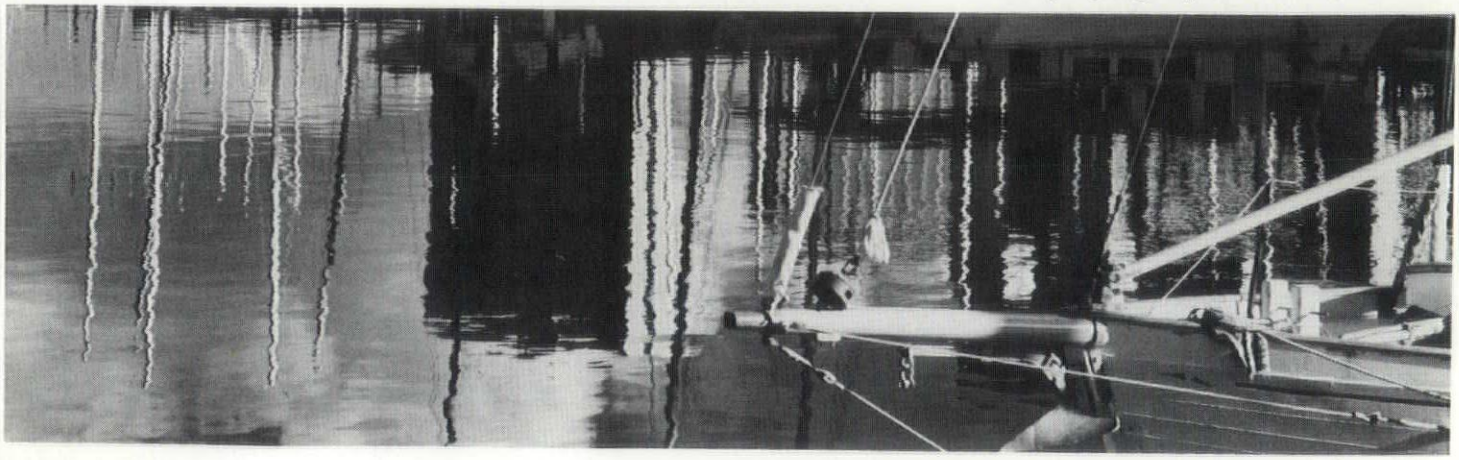

Energy

Continued from Page 21

power could be used right there, on the unit to hydrolyze sea water, obtaining hydrogen. Often called the ideal fuel, hydrogen can be made liquid or even processed into a solid form for portability. Trucks and autos can use it in place of gasoline. The U.S. Air Force is already using hydrogen to power some of its aircraft.

Many enthusiasts believe that hydrogen will be the fuel to replace kerosene in commercial and military aircraft. (Remember Hawaii's 36 per cent of our petroleum going into jet fuel?)

Because Hawaii can operate an OTEC system in 2,000 feet of water at a mile or so distance from shore, and because OTEC can be combined with waste heat from geothermal, and because hydrogen can be produced from such a system—hydrogen being the ultimate in environmental fuels—because of these things, Hawaii and the federal government should examine OTEC very closely. Its theoretical potential is great.

What then does all this mean for Hawaii, and for the U.S. in general? It means several things:

- Sources of environmental energy are abundant, but they need development.
- This is very important: We must learn to utilize several sources simultaneously — extracting 5 per cent here, 10 per cent there—rather then our present reliance of 92 per cent petroleum.
- Environmental energy costs more than we now pay for fossil fuel energy.
- Environmental advantages have not been measured in terms of economic cost, but would tend to reduce the real cost of such energy.
- Many sources of environmental energy are ready to use with only minimal technology adaptation.
- More sophisticated technology such as improving efficiency of conversion, undersea transmission of electricity and improved design of vehicle engines will provide even more benefits.
- Most important, Hawaii can show that abundant energy production and use need not destroy the environment, nor use up our scarce natural resources.

The experts say that realizing these benefits will take 10 to 30 years, and that we had better gear up to use coal in the meantime. I am very concerned that we do not accept this in Hawaii.

On a national scale where coal is plentiful and solar-derived resources are less so, there may be logic to putting off the intensive development of environmental energy. But here in Hawaii it makes no sense at all.

Any person who has studied these issues would agree that the world eventually will depend on environmental energy. We have the chance in Hawaii to show how it can be done. We can be leaders instead of following the Mainland.

As I see it, there are three hurdles to overcome if we are to move as quickly as we should:

- Leadership from both federal and state government.
- The will to succeed must be strong.
- Public awareness must be increased so that the energy industry aids, rather than hinders, the effort.

Our federal policy makers we hope, will recognize these benefits and help Hawaii show the world how well we can live with environmental energy. The rewards will far outstrip the cost especially in the benefits to our environment.

Reactors comments to Richard Marland's talk will be published in the January 1978 Hawaii Architect. HA

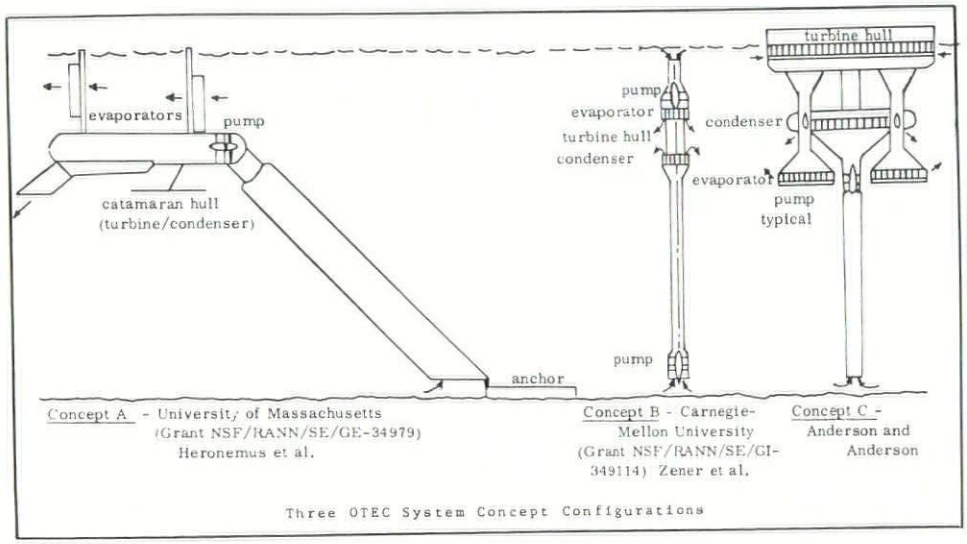

Illustration 9

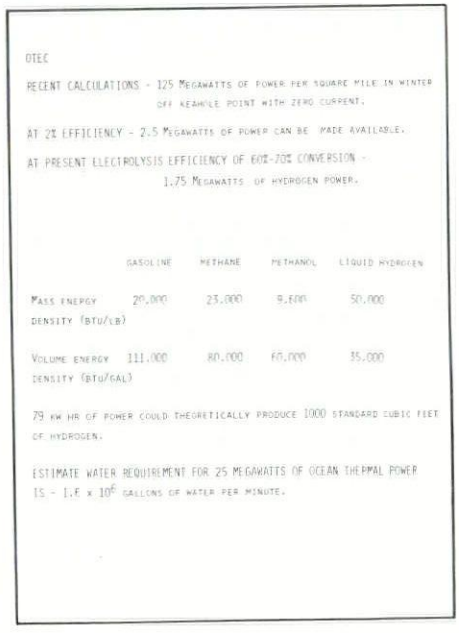
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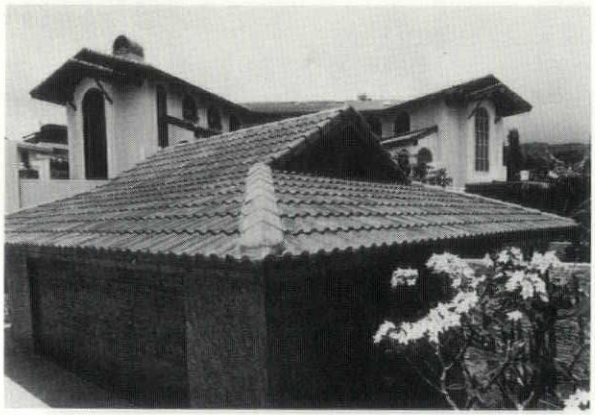
Illustration 10



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Federal Design Policy Urged

A new, six-point approach on the design of federal buildings was urged by the American Institute of Architects.

The AIA proposed creation of a position in the President's office or a Presidential board for design quality in all federal architecture. The proposed approach was developed by a special AIA task force on design quality in federal architecture and approved by the AIA board of directors.

"The benefits of a successful effort will be improved public access and utilization of government buildings, energy savings, and a legacy of design excellence," said John McGinty, president of the AIA.

AIA is in touch with the White House and other Administration officials to work out such a plan.

"The Institute feels deeply that federal construction should exemplify both technological and architectural excellence," McGinty said. "I have written President Carter, asking for his support in meeting this challenge."

Along with the Presidential attention, the five other specific points in the AIA-proposed policy are:

- Procedures for selecting the architect for each government facility should be given more careful attention. Agency regulations on architect/engineer selection should be stronger and public advisory panels' scope on such selections should be broadened.
- More design-oriented, registered architects should be hired in the federal government.
- A design awards program should be set up for all federal architecture.
- Seminars and educational programs should be provided for federal officials charged with architectural selection and implementation of construction programs.
- The federal government should coordinate and simplify the regulations and the bureaucratic paperwork within federal design and construction processes.

"Our buildings—federal and federally subsidized—present an opportunity to speak to America," McGinty said. "They can encourage and reflect new social and technical values now emerging. They can symbolize conservation of energy and other resources of our nation. They can help the government keep in touch with the people."

Each year, the federal government alone directly constructs more than $15 billion worth of facilities. Federally subsidized building far exceeds this level.

To fulfill its big architecture responsibility, the federal government needs a new design emphasis at high governmental decision-making levels. "This emphasis should be establishment of a strong ongoing commitment to good design of the facilities which house our nation's business," McGinty said. HA

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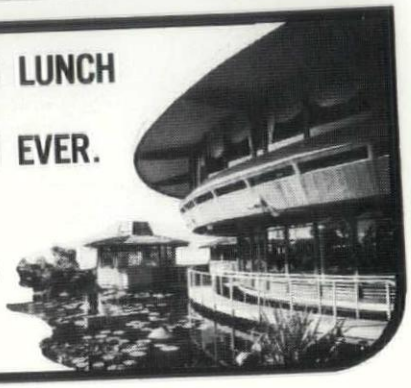

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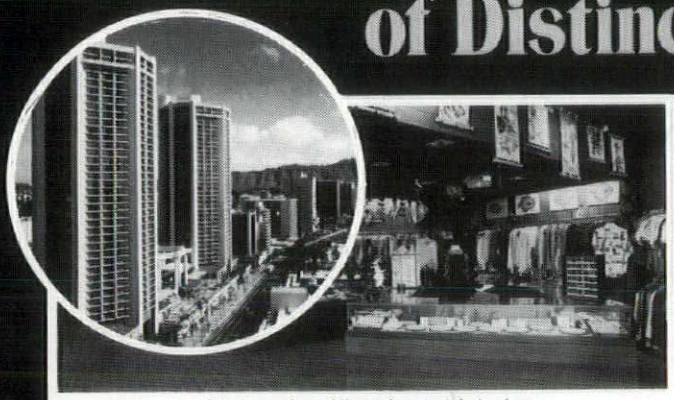
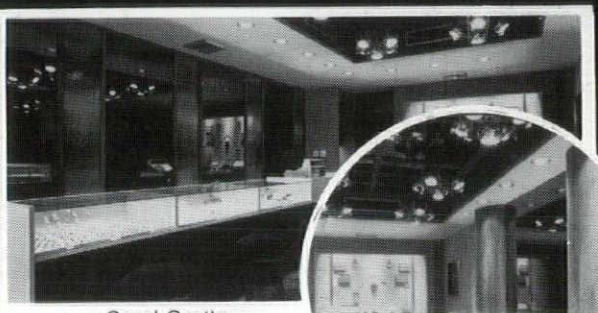
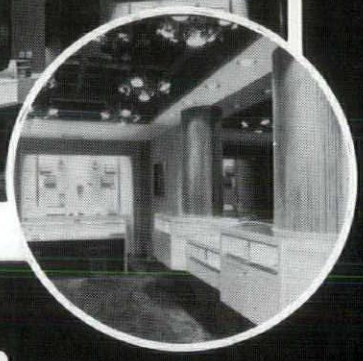


Christopher II's elegant interior

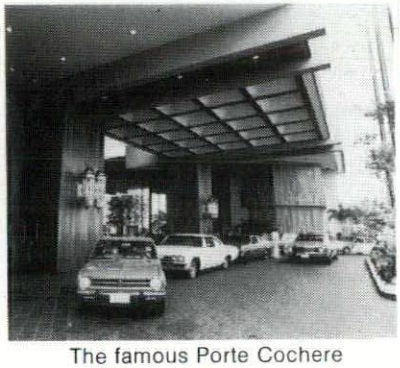


Coral Grotto, a jewel of a store

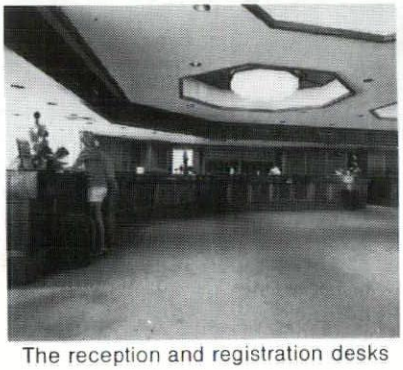


Produced on schedule and within budget by IMUA!

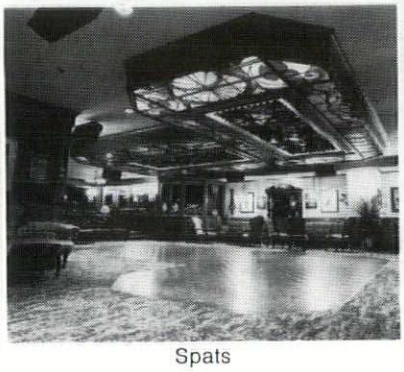
Shown below are several examples of professionally skilled translation of outstanding design into beautiful and highly visible key areas of Hemmeter Center.



The famous Porte Cochere



The reception and registration desks



Spats

Send for the new illustrated folder on operations, personnel, some recent jobs, and staff capabilities.

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