

Hawaii Pacific Architecture

The Journal of the Hawaii State Council • AIA • August 1994



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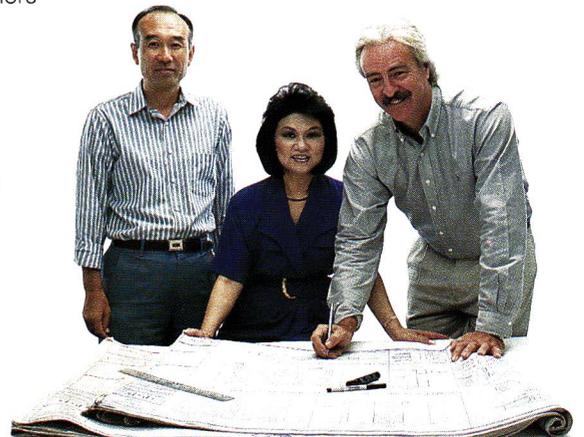
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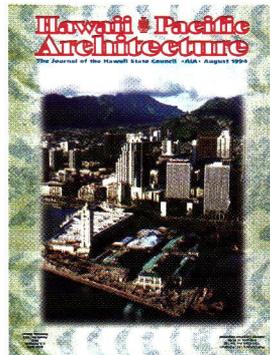
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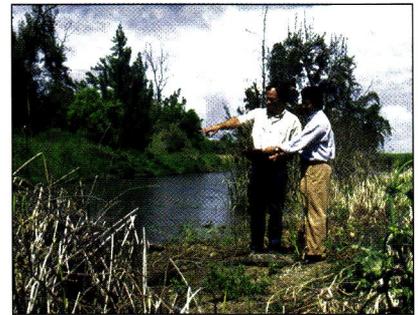
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Postmaster: Send change of addresses to Hawaii
Pacific Architecture (ISSN 0919-83111), 1034
Kilani Ave., Wahiawa, Hawaii 96786.



Gary Hofheimer Photo



9 Projects Around the Globe



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IN THIS ISSUE ...

International architecture is the focus of this premier issue of *Hawaii Pacific Architecture*. The cover depicts the breathtaking sight welcoming travelers entering Oahu's airspace, with ocean and the Aloha tower on the foreground, the built environment in the middle and the natural environment in the background. Some of Hawaii's architectural firms are aggressively and successfully exporting architecture around the globe.

To successfully compete for overseas projects requires a thorough understanding of the needs of the targeted region, the culture and business practices. Some of the architects involved in international projects and the dean of the University of Hawaii's School of Architecture provide insights into doing business abroad.

The Hawaiian Tapa used as a graphic element for this issue of *Hawaii Pacific Architecture* is one of thousands of tapa fabrics which are on display in photograph and slide form at the Bishop Museum.

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Hawaii Pacific Architecture is the
monthly journal of the AIA Hawaii
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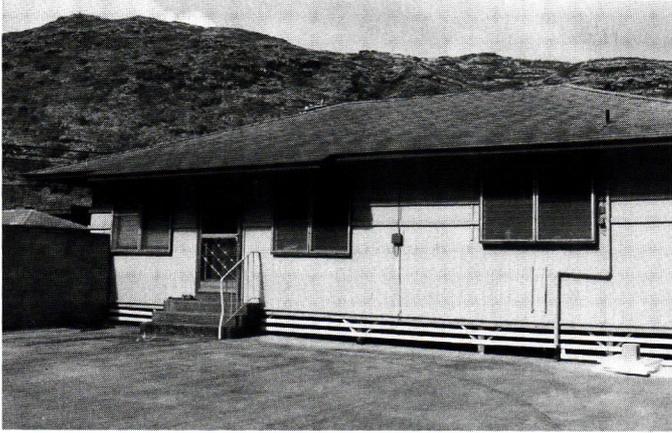
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Local firms export services

Projects Around the Globe

by Glenn Mason, AIA



The Aqua Hills Condotel, Saipan, Northern Mariana Islands, sketched by Kajioka Okada Yamachi Architects, Inc., is currently in design development.

Many firms in Hawaii provide architectural services around the world. For every project done in Hawaii by a firm not based in Hawaii, there are many more projects done by local architectural firms for foreign clients in India, Africa, the Far East, South America or the South Pacific.

In fact, Wimberly Allison Tong & Goo (WAT&G) is currently doing work in 34 different countries. In a related article appearing in this issue, Raymond Yeh, FAIA, points out the opportunities and some of the business practices to adopt when working in the Asia-Pacific Region. The professionals from five firms in Hawaii who were interviewed for this article represented offices employing from six to more than 200 employees scattered at various office locations. As different as the offices appeared, the observations made by interviewees about their international work were remarkably similar.

Construction of the Penang Adventist Hospital in Malaysia, designed by Architects Hawaii, Ltd., is expected to start this month.

Commitment

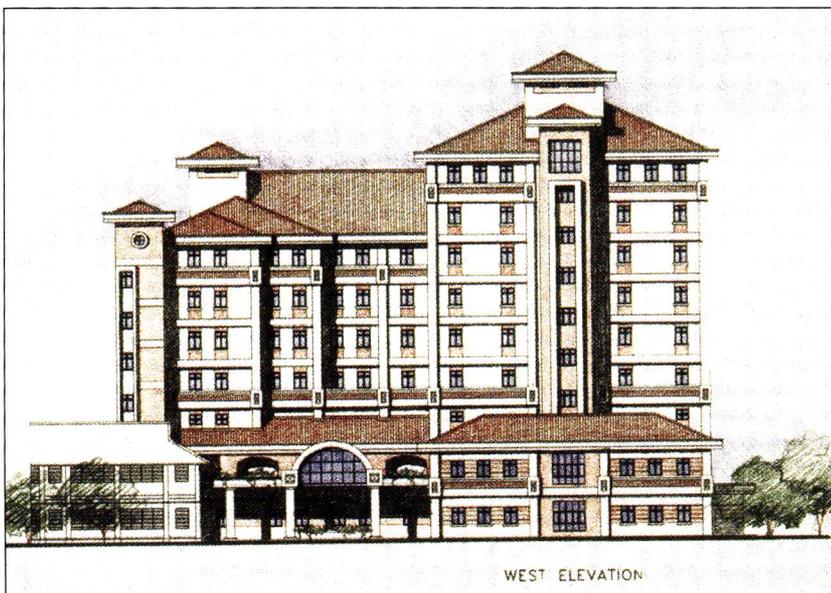
Invariably, each participant in the international architecture field takes the long view of work in the region. The grand daddy of Hawaii's firms in the international business is probably WAT&G, which has been doing this type of work for more than 40 years, starting with the Hotel Tahiti in the 1950's. Kajioka Okada Yamachi Architects (KOY), with its 10 years of experience overseas, is a relative newcomer. Yet, even that firm had years of experience prior to that working for foreign investors on their projects in Hawaii.

At times that commitment is expressed by opening branch offices in the targeted region. The 200-person WAT&G firm is spread over three offices—California, Hawaii and London—and has sales representatives in Singapore. Their four-year old London office, currently with a staff of 40, is operated with many foreign nationals. Most firms eschew the branch office concept because of high cost of maintaining those offices and other problems. Architects Hawaii, which currently has 15 active projects in countries across the Pacific and Asia, closed their Hong Kong office two years ago in favor of pursuing projects through the intricate variety of contacts they have built up and through their frequent travels to the region.

Relationships

The development and nurturing of relationships is the heart and soul of getting business anywhere, but it is perhaps even more important in the foreign markets in which these firms operate.

Robert Fox, AIA, claims he doesn't market anymore. He believes that the



relationship network he has built through 20 years of developing his credibility brings him almost all the work his six-person firm does in the foreign arena. At 50 percent of his gross billings, his proportion of work from foreign sources is higher than most other firms engaged in that type of work.

Most firms, especially larger ones, consciously market their services overseas. Melvyn Choy, AIA, of Media Five responded to initial attempts to meet with the two principals who bear the brunt of developing their foreign work, Michael J. Leineweber, AIA, and Tom Colusa, AIA, with the response: "You'll have to wait until they get back; they are where they are supposed to be."

George S. Berean, AIA, of WAT&G, attributes at least a portion of their recent increased success in obtaining more foreign work to aggressive marketing of their firm.

Most agree, a firm has to be "personified," the client needs to identify with a human being in that firm. Most architects who have developed these relationships are people born in the United States who have spent a lot of time in the region, either during their school years, while they worked for other firms doing overseas work, or while on military duty. One of KOY's chief contacts with Japan, however, is Japan-born Henry Inui, currently a senior associate with that firm. Inui is an architect who, prior to joining KOY, had served as a liaison for many years between U.S. construction and design firms and the Shimizu Company of Japan.

Adaptability

Every foreign country has its own laws and standards of practice. These laws and standards are different from the ones used in Hawaii and the United States. This is probably the single most difficult hurdle to clear when practicing in foreign countries. Adaptability is the key to survival in foreign work. The firm that doesn't pay attention to local customs will create awkward relationships which can doom any project. The firm which doesn't pay attention to such things as foreign exchange rates can end up working for nothing, or worse. As Fox stated, "Stay up on the politics and economies of the region, and get used to traveling with one suitcase, so you are always prepared to go anywhere,

anytime."

Adaptability can also mean recognizing what a U.S. firm seeking work has to offer a country, and even that can change over time. As the sophistication of architects of those countries increases, as in Japan, it becomes harder for American firms to compete, and efforts to obtain work need to become more focused.

Fox said he is almost always engaged for conceptual design and planning services, although his firm has at times done design development services, just short of construction documents. It is fairly rare when even the largest firms carry the drawings and specifications to final completion and offer on site field representation. More often, work done beyond the design development stage is handled by a local architectural member of the team, in cooperation with the selected construction company.

There are many reasons for this method of producing the architecture. First, American firms are often recognized as being more creative than their Asian counterparts, so the early, form-creating parts of the design process are where American firms are the strongest and have the most to offer. This is coupled with the fact that design professionals in the Asia-Pacific region are typically paid substantially less than their American counterparts.

Michael T. Okada, AIA, of KOY, estimated American design professionals are paid three to four times as much as architects in Malaysia or Singapore. Those same architects also know the local codes and construction systems better than the American firms.

The Seri Azah Langkai Resort, Malaysia is one of several projects currently being designed by Wimberly Allison Tong & Goo



It is simply more economical to work with firms from the country to do the bulk of the drawings and construction review.

The lack of involvement in the construction document, and later, portions of the process also results from the very different role that the construction firms play in many other countries. It is not unusual for almost all detailing, for example, to be done by the construction company's designers and many other aspects of the design/construction process are similarly absorbed by the contractors, which have their own design staffs. This is just another example of why it is not "business as usual" abroad.

Type of work

This is a question of the individual/firm's expertise and needs of the local region.

All firms acknowledge that the hospitality and leisure market is the strong suit of local firms. As Leineweber pointed out, "Hawaii invented the leisure resort. We are the laboratory" for many leisure resort concepts. WAT&G was perhaps the earliest Hawaii firm to market this expertise worldwide and it remains their strength today. They, like most of the firms interviewed, started in foreign markets with leisure resorts as their strong suit.

It would be a mistake, however, to think there are no other opportunities in these regions, particularly for firms with diversified portfolios. Architects Hawaii, for example, is currently doing a lot of medical work, particularly planning. Media Five markets itself as a multi-disciplinary design firm but has often done projects which focus on only one of those disciplines; where their interior design department was the lead, or they did graphic design as a major task. And, since relationships are so important, once a Hawaii firm has done good work for a client, that client will sometimes use the firm for other, unrelated work.

Government: help or hindrance?

No one views either the state or federal government as being of much help. One architect statement that "government gets in the way" summarizes the attitudes of most involved in doing work for overseas clients. More than one mentioned the great lengths to which other governments go to help their design professionals find work in other countries. As Berean, WAT&G's vice president

and managing principal pointed out, "We have laws and incentives to export goods, but no equivalent incentives to export services." He mentioned that, when competing against Canadian or Australian firms, there is a competitive disadvantage because they receive tax incentives from their governments. They don't have to declare their income overseas, while local firms do. Berean experienced, while in the WAT&G London office, the British government's use of fronting money for consortiums trying to get foreign projects.

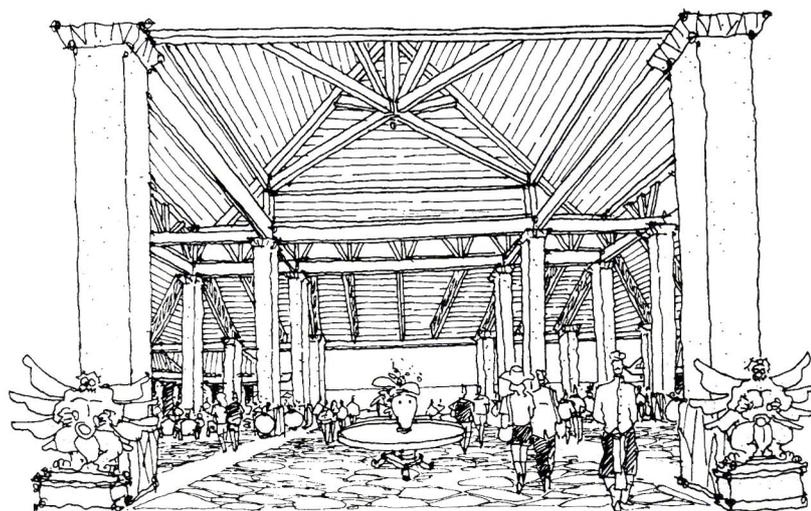
Berean also mentioned that Hawaii state government used to have a mini international trade center which could provide leads to businesses. Since the state's austerity program began, efforts in this arena have been drastically cut.

Where is the future work?

All over the world seems to be the answer. With all the talk of the potential Chinese market, most firms are circumspect about the near term increasing significantly. The hottest "new" areas seem to be India, Malaysia and Indonesia, with the Philippines being mentioned by some as a great potential new market. Most of the traditional markets like Japan, Singapore and Hong Kong are holding steady, albeit at a lower level than the mad house days of the late 1980s. Hawaii architectural firms have worked on every continent of the globe, however, and it is likely that almost any country with a relatively stable political and economic situation would need the leisure and hospitality expertise found here.

♦♦Glenn Mason, AIA, is principal, Spencer Mason Architects, Inc., and guest editor for this issue of *Hawaii Pacific Architecture*.

Media Five is designing Desa Mulia - The Beach Hotel, Bali Indonesia. The project is in work and has just cleared conceptual stages.



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A sustainable community approach

Wetlands Wastewater Treatment

by Jeffrey Overton, AICP



The Lihi Lani site plan shows the proposed wetland area.

A wetland environment, such as Ukoa Pond, Kawailoa, near Haleiwa, would be created to treat wastewater at Lihi Lani.

Wastewater treatment isn't a subject everybody considers on a daily basis, even though we all are in the wastewater generation business. When we do think about where "it" goes, we often are reminded of past images of treatment plant failures as well as spills into Hawaii coastal waters.

So, when North Shore landowner Obayashi Hawaii Corporation first introduced plans for building homes in the highland above Sunset Beach in 1988, it's not hard to guess what issue local residents raised as their first concern. Fortunately, initial anxiety about

wastewater management problems has been turned into a model approach for addressing sewage treatment and disposal in rural Hawaiian settings.

Lihi Lani is a low density residential and agricultural community being proposed by Obayashi for their 1100-plus acres in Pupukea. Plans include 315 one-acre country lots, similar to the existing Pupukea subdivision, and 130 affordable homes. The projected timetable calls for construction to begin in 1996, pending receipt of necessary state and county approvals.

Presently, the North Shore is not served by municipal sewers and treatment facilities.



Instead, private homes and businesses rely on individual cesspools and septic systems for waste treatment and disposal. The reliability of these individual systems has been variable, especially in more crowded areas near the beach. This has raised general concern about issues of public health and water quality.

Obayashi has accepted a major challenge in *Lihi Lani's* project planning by finding an acceptable manner to treat and dispose of wastewater. For over six years, the project managers, Quon/Yamagishi Partnership, and the planning and environmental consultants, Group 70 International, have participated in a vigorous community-based planning process. The local people's involvement has caused the original plans to shift from a golf course luxury housing emphasis to a country-style large lot housing and agricultural master plan. The current plan is felt to be more compatible with the rural open space character of the North Shore.

A group of environmentally conscious North Shore residents introduced Obayashi to the concept of using a reliable natural process of man-made ponds and wetlands to safely treat the project's wastewater. Obayashi, in turn, enlisted the expertise of Dr. Robert Gearheart of Arcata, California, along with the Honolulu based Engineering Concepts Inc., to help plan *Lihi Lani's* wetlands treatment system.

Unlike typical mechanical facilities, this natural treatment process has few mechanical components which are a common cause of plant operations failure. It does require a large storage capacity, however, to permit natural breakdown of wastewater over several weeks. Such systems are designed to hold wastewater for more than 30 days during peak rainfall periods—without discharging. Pond and wetlands systems pose the least potential for sewage overflows during storm conditions.

The new wetlands wastewater facility constitutes a treatment method involving several components. *Lihi Lani's* facility would encompass 24 acres of former grazing pasture for two large stabilization ponds, a series of constructed wetlands, filters, disinfection and an office-laboratory building. When completed, the system is expected to produce treated effluent that will have the state Department of Health's highest rating. The wetlands would also create a new aquatic habitat area in the

highlands.

One drawback of this natural treatment system is the large land area requirement—nearly 10 acres per every 300 homes served. That's more than double the land required for typical mechanical treatment facilities. In Hawaii's rural areas, however, there is still an abundance of relatively level agricultural lands, as is the case at this Pupukea site.

The treatment system proposed for *Lihi Lani* is called a "water reclamation facility" because the treated effluent would be reused to irrigate on-site agricultural lands for pasture, nursery and forestry purposes. Reuse of reclaimed water represents an ecologically appropriate disposal technique that adds another level of treatment in the irrigated soils. Plants utilize nutrients and a portion of the water while the remainder is recycled to the underlying groundwater aquifer. Water reuse in agricultural irrigation also conserves our potable water resources.

Wetlands treatment and water reuse follows a sustainable community approach to planning for rural Hawaii's future wastewater management needs. Group 70 is proposing the use of wetlands treatment/water reuse programs in planning for other mixed-use rural communities in the state.

♦ Jeffrey Overton, AICP, is chief environmental planner, Group 70 International Inc.

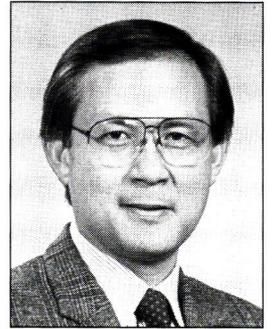
Jeffrey Overton, left, and Craig Yamagichi, project coordinator for Obayashi Hawaii, are pictured studying North Shore Wetland areas.



Opening a world of opportunities

Asia Pacific Region

by Raymond Yeh, FAIA



Raymond Yeh

UH solicits entries

One of the major events that will mark the School of Architecture's long-awaited move into its new facilities at the University of Hawaii next spring will be the Kenneth F. Brown Asia Pacific Culture and Architecture Design Awards Program, sponsored by the University of Hawaii at Manoa, School of Architecture, in cooperation with the Architects Regional Council Asia (ARCASIA).

The awards program is named in honor of Kenneth F. Brown, FAIA, the distinguished Honolulu architect and businessman whose achievements in professional, governmental and community service have been instrumental in the development of Hawaii. He has received numerous awards for his extensive community efforts, including "Humanitarian of the Year" in 1986, "Living Treasure" in 1988 and "Kamaaina of the Year" in 1992.

The purpose of this design awards program is to identify and recognize outstanding examples of contemporary architecture and to promote the development of sensitive and

The national slump in the U.S. building industry over the last few years, as painfully evident in Hawaii, has created the appearance that there are too many architects and too few projects. At the same time, there exists a significant shortage of well-trained and experienced architects in many Asian countries.

In May, an official delegation of Thai architects and educators, which included the deans of three schools of architecture and the president of the Association of Siamese Architects, visited the UH School of Architecture. Their mission was to increase the number of architectural graduates entering the Thai work force. Currently in Thailand, the ratio of architects to the general population stands at 1:15,000, whereas the ratio in the United States is about 1:2000, and Hawaii's ratio is closer to 1:1000.

The trip was sponsored by Thailand's Ministry of University Affairs, which allocated \$42 million for this "Architectural Education Mission." The UH School of Architecture is one of several schools in the U.S. and Canada which is being considered to assist Thailand in the education and training of future architects needed to meet the critical national need over a relatively short time frame.

Given the global economic shift, the Asia Pacific region will have the world's largest economy early in the 21st century. Add that to the fact

that we are now in an age of increased regional collaboration, where countries are shedding some of the nationalistic self-interest that was evident in the past.

The subsequent development boom in places such as China, Thailand and Vietnam, combined with the current shortage of architects in those and other countries, presents opportunities for American architects, including future architectural graduates in Hawaii.

While many American architects want to export their expertise to Asia, the success of U.S. firms doing work in the region has been rather limited.

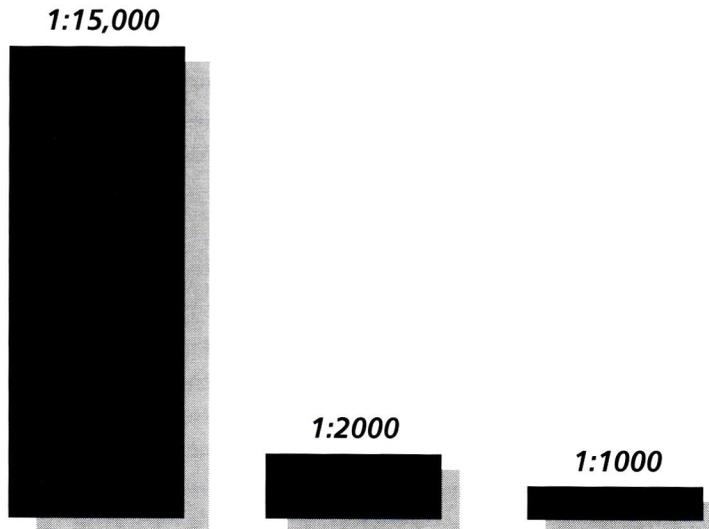
That may be because foreign architects practicing in Asia must alter the way they typically get and perform work. Firms that have been successful in the region are those with a studied understanding of the Asian cultures and the particular business needs and practices that exist.

The issue is not about selling so much as it is about understanding, which is the precursor to doing business in any foreign country.

Unfortunately, for those in a hurry to get their contracts signed, doing business in Asia is all about developing relationships...and relationships take time to forge.

Trade with China, for example, is conducted on a more personal dimension than trade with Western countries. In Asia more than in the U.S., success may be measured by

Ratio of Architects to General Population



having not only the best product or service, but by having relationships with the proper sources.

Architects practicing in Asia need to understand the broad context in which the work will take place, and to appreciate the importance of culture to the practice of business.

Culture includes all of the elements that give a place its unique character: the people, the language, the politics, the economics, the physical environment and the history and contemporary values of the region. An understanding of the culture provides a useful framework for decision-making on an international project.

American architects in Asia have found it important to collaborate with local firms. Working effectively as a cross-cultural team, however, does not mean taking a superior position to local architects. The effort calls for close collaboration between firms that can work together as colleagues and peers.

In earlier times, when Western design was considered a rare commodity, American architects could come in with a "know-it-all" mentality. Americans continue to export technology and design talent to their Asian counterparts; but those who are succeeding are

addressing local needs in a serious way and demonstrating proper humility.

Our effectiveness in contributing to the development of the Asia Pacific region can be enhanced by re-tooling ourselves as specialists and marketing U.S. expertise that is specific to a local need.

Traditionally, American architects, as generalists, have offered a comprehensive service approach; many offices are set up to do all the pieces of a project. In Asia, that all-services approach is not necessarily needed or workable.

Under a different arrangement, the generalists would then be the local architects, with whom a collaborative rather than a competitive relationship could evolve.

The complexities of this project team structure go well beyond the relationship of architects and engineers to include the developers, contractors and material suppliers, in a variation of a design-build arrangement.

To be included, American architects would have to be viewed as effective team players on project team arrangements that currently fall outside of those covered by the General Conditions of the AIA.

Because of the intricacies of doing

humane environments in the Asia Pacific region.

Architectural works will be judged on how well they fit and contribute to the physical, historical, and cultural contexts of their location, reflecting the social, religious, political, economic, technical and aesthetic ideals of particular cultures and locales. The awards program is open to any built architectural work completed between Jan. 1, 1970 and Jan. 1, 1994 and located either on the continent of Asia or in any country which touches the Pacific Ocean.

The architect or architects whose project(s) is selected by the jury will be awarded the Kenneth F. Brown Architecture Design Award, which includes a cash prize of \$25,000.

The distinguished panel of jurors will consist of architects Kenneth F. Brown of Hawaii; Charles Mark Correa of India; Ashley DeVos of Sri Lanka; and Fumihiko Maki of Japan.

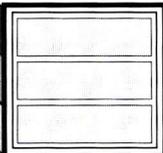
The judging and announcement of winners will take place at the First International Symposium on Asia Pacific Architecture: The East-West Encounter, March 22-24, 1995. Registration deadline for the awards program is Dec. 15; deadline for submitting completed entries is Feb. 15, 1995.

For information, contact the Design Awards Program Chair, School of Architecture, University of Hawaii at Manoa, 1859 East-West Road, Honolulu, HI 96822; or call (808) 956-8311.

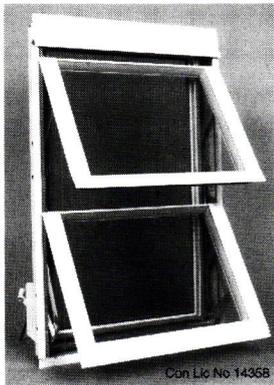
*Leighton Liu, Associate Professor
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- Kauai Rainbow Paint Supply, 4350 Waialo Rd., Eleele, Kauai 96705, (Port Allen), Ph: 335-6412
- Kaunakakai Sales & Service, Kaunakakai, Molokai 96748, Ph: 553-5565
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work in the Asia Pacific region, and because of Hawaii's strategic position between East and West, the University of Hawaii has an opportunity, and in fact a responsibility, to be the hub for research and training in this area. The School of Architecture is developing a focus on Asian-Pacific architecture to meet the architectural challenges of Hawaii and the Pacific region.

This fall, a group of advanced architectural students will be working on a project in Vietnam. Several other programs are also planned to further study the cultural forces that shape architectural design in the Asia Pacific region.

One of these is the First International Symposium on Asia Pacific Architecture: The East-West Encounter, co-sponsored by the UH School of Architecture, the Cultural Studies Division of the East-West Center, the Honolulu Chapter of the American Institute of Architects and the Architects Regional Council Asia.

The symposium will address crosscultural design issues in our region. The program, to be held March 21-24, 1995 on the Manoa campus, is expected to attract delegates from around the world and across academic disciplines. The symposium will offer continuing education credits which enable participating architects to satisfy the new requirement for AIA membership.

In the next century many opportunities will come from the Asia Pacific region. Architects who take the time to learn the nuances of the culture and the subtleties of the business environment, and who make timely adjustments to their practice methods, will stand to benefit from these opportunities.

♦*Raymond Yeh, FAIA, is dean of the School of Architecture, University of Hawaii at Manoa. A licensed architect, Yeh has been involved with a consulting practice in Asia over the last 10 years.*

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Project Profile:

UNIVERSITY OF HAWAII'S SPECIAL EVENTS CENTER



The 200,000-square-foot multi-purpose Special Events Center under construction at the University of Hawaii at Manoa is slated to open this fall. The complex was designed for sporting events, commencements and entertainment functions ranging from rock concerts to theatrical

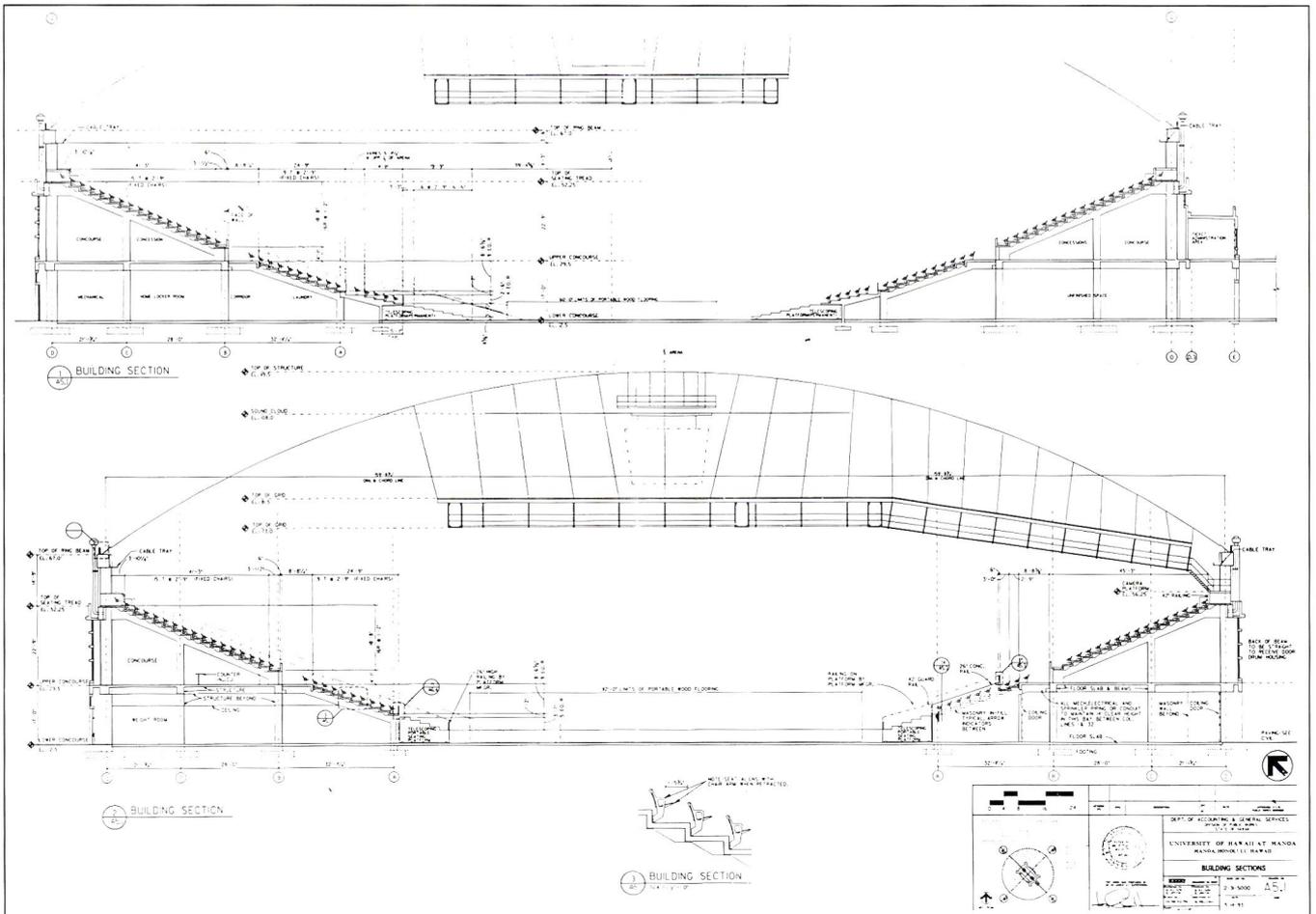
productions.

Architect Daniel G. Chun, AIA, explained that the TEMCOR marine-aluminum alloy dome system selected to cap the arena takes full advantage of metal fabrication and erection techniques. He indicated that primary consideration for selection of an aluminum dome was economy.

Chun indicated that light weight

aluminum exerts less stress on the ring tension beam and foundations. Faster erection time was also a design consideration.

Another advantage, according to Chun, was that the dome subcontractor assumed complete responsibility for the dome system, which came complete with design assistance, structural calculations, shop drawings and field erection.



ENGINEERING

According to Dimitrios Bratakos, president of American Structural Engineers, several dome system options were considered, including concrete and structural steel.

"Aluminum framing was the most economical," said Bratakos. "TEMCOR, the manufacturer, standardized process and details to the point where their dome system is convenient to use."

Bratakos said the subcontractor's unique panel assembly technique on the ground decreased assembly costs and eliminated the need for scaffolding and assembly high off the arena floor.

TEMCOR's Engineer Alfonzo Lopez said the dome structure

and sits atop a 55-foot-high concrete seating bowl. The clear-span dome supports an all aluminum grid and catwalk system that is suspended from the dome roof over the arena floor. The aluminum exterior surface of the dome has a soft mechanical matte finish.

The dome structure consists of triangulated aluminum roof panels.

Theatrical rigging, lighting fixtures and speakers are contained within the grid. Drapery beams which can subdivide the arena seating bowl are also suspended from the dome. The dome roof will support more than 450,000 pounds of suspended loads, including a 38,000 pound scoreboard.



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An historical turning point

Universal Design

by Richard R. Bosch, AIA

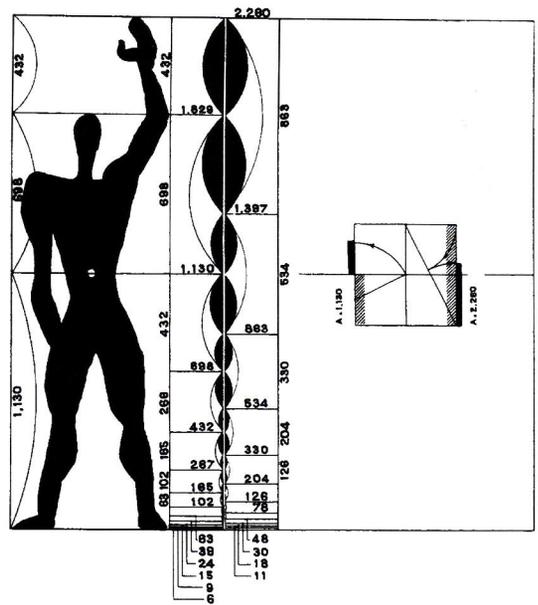
The Commission on Persons with Disabilities has introduced its own version of a “global” theme, the concept of universal design or perhaps better stated, “designing for the universal individual.”

The term *universal design* is reminiscent of Leonardo’s Vitruvian Man or Le Corbusier’s Modulator Man. It is appealing to believe that design professionals are about to assimilate a new design model of a similar symbolic significance which will offer a new interpretation of universal design.

The recent passage of the Americans with Disabilities Act (ADA) requires design professionals to consider two questions in a new way: “Who really is the building or facility user?” and “Can all building/facility users enjoy the same services and amenities to the same extent?”

Historically, design has emphasized the “average” human being—the six-foot tall male. This average has been perceived not as a statistical averaging of the current population, but more as a societal goal for the ideal individual. Even Le Corbusier, in developing the dimensions of the Modulator Man, initially had determined that the average male is 1.75 meters (5 ft. 9 in.), but was persuaded that dimension was “too French,” and that the ideal male should be 6-ft. 0-in. tall, based on the typical hero of the English detective novel.

The problem is that this concept of an average person is based on myth and ignores most of the population. The range of human abilities is too vast to be represented by one physical description. All the same, the perpetuation of the myth of the average human is responsible, in part, for the physical environments that are inaccessible to those with disabilities, and environments that are hostile



Le Corbusier's Modulator Man

to many other people.

Recognizing the need to get away from designing for the average person, the past three decades have seen three levels of response, each building philosophically on the previous.

Barrier-free design

Barrier-free design came into existence during the 50s and 60s and is still the basis for most accessible design. It focuses on the anthropometrics and spatial needs of two major categories of individuals with disabilities—people who use wheelchairs, a distinct minority, and ambulatory persons with disabilities, the majority.

“Wheelchair users are a distinct minority among the population of people with disabilities. But as is the case with people who are disabled but ambulatory, people who use wheelchairs may also experience more than one impairment. In some instances, wheelchair users may actually be less severely disabled than many people who are disabled but ambulatory. For example those with intact arms and sufficient upper body strength may be extremely mobile and capable of independently propelling themselves over great distance.”

“The majority of people with disabilities are ambulatory. Their disability may be related to one or more impairments resulting from temporary illness; accident; degenerative, hereditary or congenital condition; disease; or

damage to the nervous system. The most common impairments are heart and respiratory problems, arthritis, paralysis of various parts of the body due to stroke or disease and the effects of aging. Each impairment or combination of impairments presents the individual with a particular disability or set of disabilities. Each individual, in turn, develops a unique ability to cope and adapt."

In spite of the smaller representation, the wheelchair has been perceived as a "common denominator" for barrier-free accessibility, with the assumption that if a site is accessible for wheelchairs it will also be accessible for others with disabilities. Unfortunately this assumption does not hold true; in fact, sometimes the results are hazardous or unusable.

Percentile distribution

Percentile distribution is a concept that attempts to find solutions that satisfy a target number (usually 95 or 97.5 percent) of individuals. The spacing of airline seats, for instance, is intended to accommodate such a target percentage of the population (or so we are led to believe).

The shortcoming of designing to satisfy a percentile distribution is the inability to bring together disparate characteristics — percentile distribution measures only one trait at a time. The standard 6-ft. 8-in. door is intended to accommodate the target percentage of the population based on height, but does not assure usability by an individual in a wheelchair or someone who is blind or cannot use conventional hardware. The use of lever handles may permit operation by someone who cannot grip, but does not take into account difficulties of maneuvering a wheelchair through a confined area.

Enabler model

By 1978 it was recognized that an alternate image of the design model was required that could consider many factors simultaneously.

"(T)his image must be easy to

conceptualize in terms of building design and must integrate all the relevant disabilities in a simplified way. All relevant disabilities must be easily visualized so that a designer, researcher, or building evaluator can picture, in their [sic] mind, who it is that accessibility is meant to help."

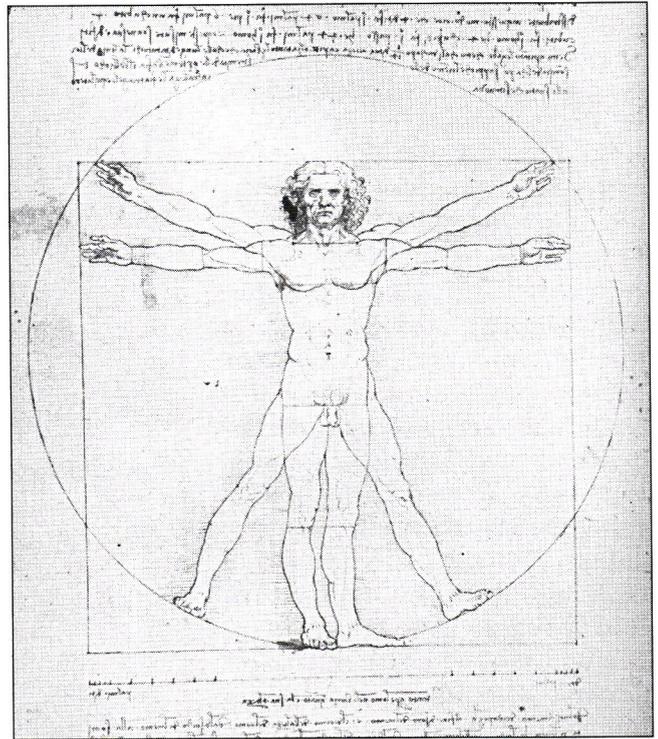
This resulted in a new conceptual image—an ideogram—the "enabler model," which considers 15 disability concerns.

The word "enabler" emphasizes abilities rather than the lack of ability associated with the word "disability."

Most individuals will experience some form of disability at some point in their lives. Since disability is accepted as part of the human condition, the enabler is a more meaningful paradigm than either the "average human being" or the "wheelchair user." The enabler is the basis for the concept of universal design.

Universal design

Unfortunately, universal design is in its infancy as a design field. It is a purely philosophical approach which combines barrier-free design with the more comprehensive view of people based on the enabler model. The term will mean different things to different professionals, yet all of the definitions may be correct. To some, universal design signifies design that addresses all types of disabilities, as reinforced by the enabler model; to others it represents design that tries to address all types of human experiences; and, to others it represents design that goes



Leonardo da Vinci's Vitruvian figure, Accademia, Venice

beyond the built environment and might include product design, industrial design and interiors.

Regardless of the assumption, universal design attempts to increase the designer's awareness of sensory awareness, locomotion, physical function, and intellectual function. It attempts to cover the broadest spectrum with all-encompassing design rather than multiple elements for discrete groups of individuals. Universal design also considers the able-bodied.

The value of the various accessibility standards is acknowledged in universal design, but it also recognizes that compliance with the law may not ensure accessibility or usability for all people.

"Universal design is not yet an established or systematic design methodology with well-defined parameters, technical specifications, or implementation procedures. The development of universal design from a philosophical concept into a concrete, applicable design methodology awaits the interest and attention of design professionals. The attempt to combine the fundamen-

tals of barrier-free design with the enabler paradigm will present one of the greatest challenges ever faced by the design profession.”

Universal design is concerned with design issues in the broadest sense and not solely architectural design. Appropriately the term is used more commonly in the schools that teach industrial and product design. In these areas of specialized design, besides striving for an esthetic that has to be marketable, ergonomics (the study of human function and dimension) is the basis for every design consideration. Ironically, as these designers attempt to respond to a more global market, the results become simpler and more elegant.

Universal design seems to create a dilemma of how all types of people can be accommodated at all times. The success of this design approach, however, will come simply from taking a broad and functional approach, and not presuming a single, mythical design model. With the standards for barrier-free design designers have focused on maneuvering dimensions and mounting heights, universal design represents an opportunity to create an esthetic rooted in functionality and simplicity.

The architectural design process has changed dramatically during this century; the completed design now considers function, structure, site conditions, mechanical systems, soils, climate, orientation, etc., yet the building user has remained fairly constant throughout history. Universal design now challenges the designer to place a similar importance on the question “Who am I designing for?”.

This is the fourth in a series of five articles to help clarify the Americans with Disabilities Act Accessibility Guidelines (ADAAG).

↔ *Richard R. Bosch, AIA, is facility access specialist, Facilities Access Unit, Commission of Persons with Disabilities, state Department of Health.*

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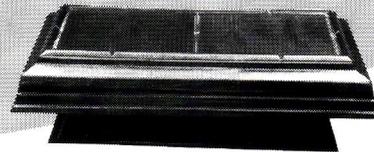


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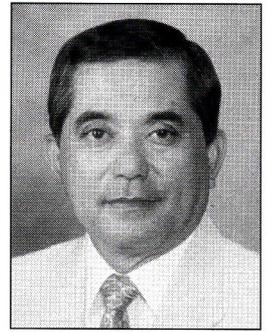
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Building the 'superstructure'

AIA Hawaii State Council

by Stanley S. Gima, AIA
President



Stanley S. Gima

The new name and look of *Hawaii Pacific Architecture* is the result of on-going AIA Hawaii State Council (AIAHSC) activities. Each year, the Council builds on the foundation layer of the previous year. This year, we are ready to address the "superstructure." In preparation, we have to divide the anticipated job into smaller, more manageable portions and assign each portion to separate teams.

This organizational approach can be compared to a construction site, with everyone busy doing work in an area of expertise, but all trades working on the common goal of building a superstructure on the foundation.

Six main work areas should be monitored by AIAHSC:

1. Legislative
2. State Agencies
3. Publications & Public Relations
4. Membership Services
5. Statewide Special Events
6. Staff & Facilities Support

Each area of responsibility provides opportunities for interested members of AIA. This article addresses the main responsibility assigned to AIAHSC in its bylaws—legislative activities.

Legislative work is limited to the state legislature. To be most effective, AIAHSC needs to marshal resources by forming "teams" of AIA members interested in specific subjects related to architectural practice. I am organizing the legislative team into the following interest groups:

- *Professional Registration*: This area involves legislation pertaining to the regulation of licensed professionals, including architects, engineers and other building industry professionals.

- *Procurement of A|E Services*: A controversial subject recently in the public limelight, this is an area of extreme importance to AIA members who design state or county projects. The Council should definitely be involved in discussions involving clarification or revision of this new law.

- *Statute of Limitations & Tort Reform*: Although some progress was made during the last legislature, additional research needs to be done to help AIAHSC present strong arguments against recurring annual efforts by others to break down our legal protection against unwarranted lawsuits.

- *Excise Tax Waiver on A/E Fees*: Hawaii's architects are at a significant disadvantage when competing against non-Hawaii firms which are not burdened by the 4.17 percent state tax.

- *Workmen's Compensation*: Hawaii's firms have difficulty surviving slow economic times, partly because of lenient legislation resulting in high operational costs for architect-employers.

- *New Codes & Revisions*: New state legislation, some mandated by federal legislation, needs to be reviewed by AIAHSC, with timely and expert commentary required, often within days after its introduction into the legislative mill.

Unknown and unexpected legislation is routinely proposed at each new session of the legislature. Therefore, the legislative team is guaranteed lots of work—before, during and after each legislative session. AIA members interested in any of these topics should circle areas of interest and fax the marked up copy of this article, along with names and phone numbers, to 537-1463.

More information about the other work areas of AIAHSC will be discussed in forthcoming issues of *Hawaii Pacific Architecture*.

Taking Shape

by Peggi Marshall Murchison, Publisher

A new face, a new name and a larger circulation. That's how we begin the second half of 1994.

We have made what we feel are some very positive changes to Hawaii's only architectural magazine and we would like to hear from you with your comments—good or bad!

The new name, *Hawaii Pacific Architecture*, more accurately reflects the broadening area that local architects practice in, which includes the entire Pacific Rim.

The new graphic look, starting with kapa (tapa) on the cover, reproduced from the Bishop Museum Collection, keeps us aware of our Pacific Island heritage. On the inside pages, we have updated to a more modern look including a more easily read typeface.

Editorial changes will include a broadened news section, more focus on the changing processes of architecture and the larger problems facing architects and others in the construction industry. We will also be investigating subjects relevant to our readers and trying to enlighten the public's perception of architecture.

These changes started taking shape early this year with the new makeup of the magazine's editorial board. A. Kimbal Thompson, AIA, heads the new group which includes Greg Bayless, AIA, Maui; Jim Freeman, AIA; Fritz Harris Glade, AIA, Hawaii; Henry Grimbald, AIA; Glenn Mason, AIA; Lorrin Matsunaga, AIA; Jeff Nishi, AIA; Sandi Quildon, AIA; and Gordon Tyau, AIA. Each of them has met regularly (on Saturday mornings!) with me, our editor and our art director for long (up to four hours) brainstorming sessions that ranged from choosing our new name to agreeing on the new cover design (try to get architects to agree on design!).

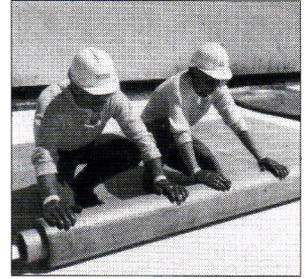
To continue upgrading our editorial content, we need your help. Call any member of the editorial board or me to volunteer for the committee, write an article or provide information on a topic.

We bid a fond aloha to editor Paul Sanders with this issue. Paul is moving on to other areas of writing. He has worked hard on Hawaii Architect and to produce *Hawaii Pacific Architecture*. Au Revoir!



Quiz on Specialty Roofing Products

- Q:** What is the most popular commercial low slope roofing in America?
- A:** EPDM rubber single-ply according to the 1994 annual roofer survey by *Roofing/Siding/Insulation* magazine. Built up is second and modified bitumen is third.
- Q:** Which single-ply company is doing the best overall job including product quality, weatherability, availability, and technical support?
- A:** **Carlisle SynTec Systems** is No.1 according to a report published in *Building Design & Construction* magazine. Carlisle received 3 times as many votes as its nearest competitor.
- Q:** How is Carlisle EPDM membrane faring in Hawaii?
- A:** Very Well. Recent projects include MCAS Commissary (70,000 SF) BYU Aloha center (55,000 SF), Honolulu International Airport-Gates 31 thru 34 (71,000 SF), K-Mart Kahului (110,000 SF), and Coca-Cola Bottling (39,000 SF).
- Q:** Sounds great, How do I go about getting a Carlisle Catalog, samples, or technical design assistance?
- A:** Call MAP and ask for Bill South or Bob Hockaday.

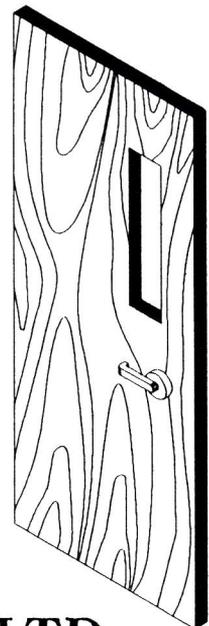


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A major voice for change

Evan D. Cruthers, FAIA

by Paul Sanders



A brief profile

Evan D. Cruthers, FAIA, a resident of Hawaii since 1971, began his career in architecture with a small firm in the Washington state's tri-cities area upon graduation from the University of Idaho with a bachelor in architecture degree.

Cruthers was interested in working in Alaska, but was asked to move to Hawaii instead. He joined Media Five only months after it was founded as a multi-discipline firm in 1972.

Cruthers holds a masters degree in business administration from the University of Hawaii. He was president of the statewide Hawaii Society/AIA in 1987.

A successful organization constantly adjusts its operations to the needs of its membership and those it serves. Evan D. Cruthers, FAIA, president and chief executive of Media Five Ltd., said that in today's fast-moving high tech world, any organization not adhering to this philosophy stands a good chance of "going the way of the dinosaurs."

Cruthers concluded a three-year hitch as director of AIA's Northwest Pacific Region with a stinging assessment of the Institute's operational practices, claiming the AIA, as an organization, has become "top-heavy and ineffective."

In May, Cruthers, who earned a reputation within AIA leadership ranks as a "major voice for change," was awarded the American Institute of Architects Fellowship for his contributions to the advancement of AIA. Some of Cruthers' suggestions have been implemented while other changes are under consideration.

As regional director and director of the Institute, Cruthers observed activities at all organizational levels.

"It was an eye opener," said Cruthers. "It reinforced my conviction that sweeping organizational changes were necessary to make the organization relevant to architects."

With annual income of almost \$50 million, the AIA spends \$30 million at the Institute level and \$20 million at the local level, indicating "top-heaviness," Cruthers said.

Some architects, he said, join solely for the "right" to append the AIA symbol to their names, and the positive image the symbol invokes. This attitude burdens those few members who volunteer their services, Cruthers said, interpreting lack of member participation as an indication of organizational weakness.

What disturbs Cruthers is that of the nation's 100,000 registered architects, only 45,000 are AIA members, excluding associate and affiliate members. "We are batting less than .500," he pointed out. "More than 50,000 eligible architects and other affiliated professionals have chosen not to join the AIA. Their choice may be for economic reasons or may speak to a perceived lack of relevance."

Cruthers indicated that Hawaii is an exception to the national norm—AIA Honolulu and AIA Maui, under the Hawaii State council, have one of the strongest and most active organizations in the country.

Hawaii belongs to an AIA region that extends from Montana to Hawaii and Guam to Alaska. He pointed out that there didn't seem to be any predictable organizational pattern in the whole region or the nation, noting that the organization was a "loose" confederation.

He noted that some of the chapters and sections (subdivisions of chapters) had few members, or held no meetings; therefore "did not experience professional stimulation."

Some members reportedly traveled long distances to meetings.

Exposure to Institute activities is limited, said Cruthers, who favors participation by as "many members as possible." Although 9,000 people attended the May national AIA convention in Los Angeles, Cruthers remarked that "most of them were familiar faces, people who attend conventions year in and year out."

Cruthers pointed out that the annual Grassroots Meetings are very beneficial to attendees; but attendance is limited to chapter officers. Joining national committees seems to provide opportunities for participation, but there are not many action committees to join, he reported.

Disheartening for Cruthers was that members at the local level "did not feel connected to the national AIA." At the Institute level, Cruthers also observed "areas where money spent seemed questionable."

The Institute in Washington D.C. has a staff of 200. "Lines of responsibility were blurred," he noted. "Directors often interfered with staff operations."

Cruthers also questioned the effectiveness of a decision-making body involving 36 representative directors, case representatives, student representatives, public member representatives, president, first vice president, secretary, treasurer and three vice presidents—about "50 people trying to carry on debate on crucial architectural issues."

Cruthers instigated the hiring of a consultant to survey the organization and suggest changes.

"The operational effectiveness of the board has improved," Cruthers remarked. "It was restructured to provide direction/policy without getting in the way of staff."

Last year, the board and AIA President Susan Maxman, FAIA, brought in a business management consultant to "poll membership at all organizational levels." The consultant recommended a smaller board of directors.

"If the national AIA does not change," remarked Cruthers, "we will not attract new architects across the nation. Although these board changes represent a welcomed improvement, more fundamental changes should have been implemented."

"The AIA can become more relevant to architects by encouraging more members to participate in major decision-making gatherings—grassroots and national conventions—where major issues are debated," said Cruthers.

He also favors strengthening state and regional organizations. Cruthers believes that relocating some staff from national headquarters to the regions would help stabilize the organization. "For instance," he explained, "a salaried vice president should be relocated to the Northwest Pacific region and funds provided for staffing at the regional level."

Cruthers also supports reducing the number of regions from 19 to 12.

Another organizational problem impacting decision-making at the Institute level is that AIA national presidents are in office for a year. "By the time a president becomes familiar with the organization, it's time to move on," said Cruthers, who recommends increasing the term limits.

Besides streamlining operations, a re-organization that combines all "semi-independent" levels would also resolve the issue of membership fees paid by members at local and national levels, he pointed out.

Cruthers envisions an AIA organization with components at the local, state, regional and national levels where members would look "primarily to the chapter or local component for services, fellowship and professional development and interaction, but still have the opportunity to participate at the state, regional or national levels."

Cruthers reported that the Institute has endorsed regional staffing and reduction in number of regions; other changes are pending.

Design contributions recognized

Evan Cruthers, FAIA, is the recipient of many design awards, including:

- The Entrepreneurial Success Award for the State of Hawaii by the U.S. Small Business Administration—1992.

- Governor's Energy Award for the USS Arizona Hall from the State of Hawaii—1991.

- Distinguished Service Award from the Hawaii Society/AIA—1987.

- Award of Merit from the Hawaii Society/AIA for his design of Barracks with Dining Facility—1988.

- Award of Merit for Distinguished Architectural Achievement from the AIA and United States Naval Facilities Engineering Command and the Energy Conservation Award for Distinguished Architectural Achievement for the USS Arizona Hall—1984.

- Award of Merit for the USS Arizona Hall from the Hawaii Society/AIA—1984.

- Award of Merit for Straub Satellite Clinic from Hawaii Society/AIA—1984.

- Citation for Meritorious Architecture in High Rises for Tiki Village International Resort from the Royal Australian Institute of Architects, Queensland Chapter—1984.

- Citation for Meritorious Architecture in Interiors for Cavill's Restaurant from Royal Australian Institute of Architects, Queensland Chapter—1984.

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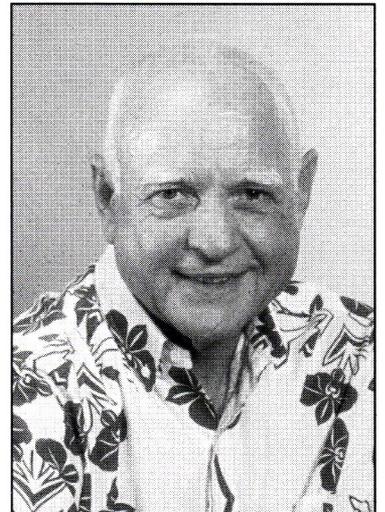
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AIA Honolulu Award winners announced

Four awards of excellence and eight awards of merit were presented at the 1994 AIA Honolulu Design Awards Program banquet on July 20. The semi-formal affair was held at the Hawaii Prince Hotel.

Winners of excellence awards in the office, commercial and institutional category were Franklin Gray and Associates Architects, Inc., for Student Service Center at the University of Hawaii; and Projects International, for their Yajima Service Station entry.

Two entries received excellence awards in the single family residential category—Dinmore & Cisco Architects, Inc., for the McGee Residence; and Ossipoff, Snyder & Rowland Architects, Inc., for additions and alterations to a Makiki Heights Residence.

Awards of merit winners included, in the office, commercial and institutional category, Ferraro Choi &

Associates Ltd., for the Estate of James Campbell Corporate Offices; John Hara Associates, Inc. for Maui Arts and Cultural Center; and Oda/McCarty Architects, for the W. M. Keck Observatory Headquarters.

Winners in the renovations and additions category were Projects International, for Porte Cochere and Entry Court Renovation, Sheraton Waikiki Hotel; and Kajioka Okada Yamachi Architects, for Kailua-Kona Branch, First Hawaiian Bank.

Two award of merit winners in the single family residential category were Virginia Brooks MacDonald, AIA, for Macapleville; and Philip K. White Associates, for Renovation and Addition of a Beach House.

Spencer Mason Architects, Inc. won an award of merit for renovations to the Former Circuit House in the historical/preservation or adaptable reuse category.

According to Paul Pollock, AIA, chairman of the 1994 AIA Design

Awards Committee, winners were selected from a field of 56 entries.

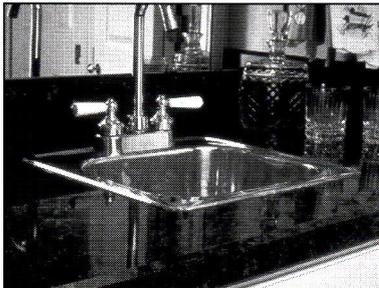
Sheryl B. Seaman, president, AIA Honolulu, made the presentations.

AIA opposed to viaduct

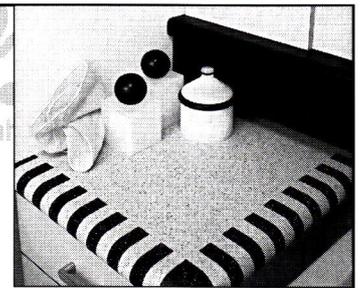
In a recent letter to Rex Johnson, director of the state Department of Transportation (DOT), AIA Honolulu voiced strong opposition to plans for construction of an elevated viaduct to improve traffic flow on Nimitz Highway.

The plans are included in a draft environmental impact statement being prepared by DOT's Highway Division. The DOT proposes extending the existing viaduct segment at the airport to approximately the City Mill location.

Based on recommendations by its Urban Design & Transportation Committee, AIA Honolulu suggested an at-grade landscaped parkway and grade-separated intersection solution that would serve as an entry from the airport



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into the downtown area and Waikiki.

Jim Freeman, AIA, chair of the Urban Design & Transportation Committee said the AIA solution is compatible with the transportation corridor in the Honolulu Waterfront Master Plan and costs less than proposed viaduct alternatives.

The state and consultant, Parsons Brinckerhoff Quade & Douglas Inc., are currently analyzing seven alternatives ranging from a no-build solution to three versions of an elevated viaduct. Publication of the draft statement is expected later this year.

UH School of Architecture Association elects officers

The University of Hawaii School of Architecture Alumni Association elected officers and Board of Directors members at its annual meeting June 29.

The event took place at the Jefferson Hall's Garden Level Conference Room, following dinner and a

program involving an address by UH School Architecture Dean W.H. Raymond Yeh.

Elected to office and installed as officers for 1994-95 were Miles Okimura, AIA, president; Randy Lau, vice president and president-elect; Kristal Lizama, secretary; and Dennis Yamauchi, treasurer.

Elected as members of the Association's board of directors were Warren Hananoki, AIA; John Okita, AIA; Sheryl Seaman, AIA; Brian Takahashi; A. Kimbal Thompson, AIA; and Lanz Yamamoto.

Tyau appointed associate dean

Associate Professor Gordon D.C. Tyau has been appointed Interim Associate Dean replacing Barry John Baker who has returned to his faculty position.

Professor Tyau has been a member of the School of Architecture faculty since 1976 and has previously served as undergraduate and graduate chair.

Tyau currently serves as chair of the Curriculum Committee and advisor to the School of Architecture Alumni Association. He maintains a part-time practice doing mostly residential designs.

Related Activities

Woods of Hawaii displayed

Hawaii architects and interior designers will have a chance to showcase their innovative use of Hawaiian-grown woods at the Hawai'i Forest Industry Association's (HFIA) second annual "Woods of Hawai'i" woodworking show and competition, Sept. 15-23 at Ala Moana Center.

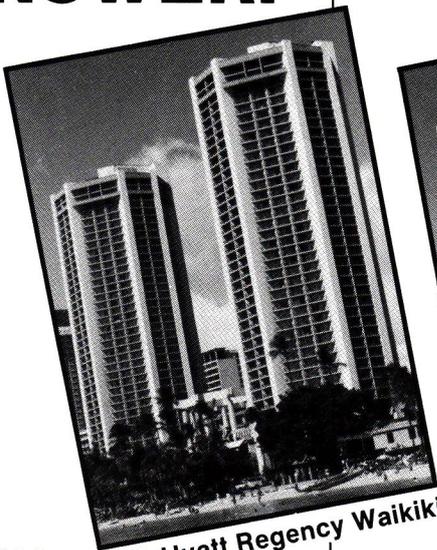
This statewide competition will feature works by Hawaii's top woodworkers. Local architects and interior designers are encouraged to submit photos or actual pieces to demonstrate their use of Hawaiian-grown woods.

For entry forms or information call Alan Wilkinson at 456-1006.

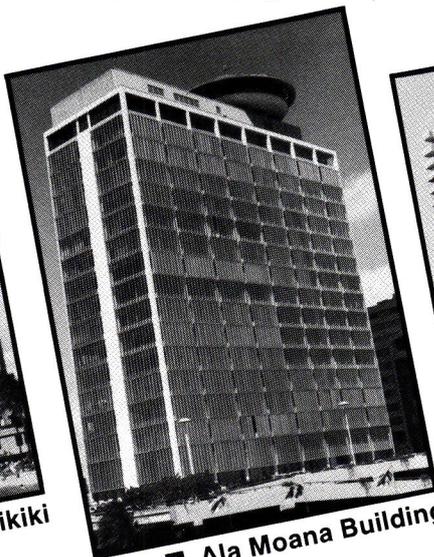
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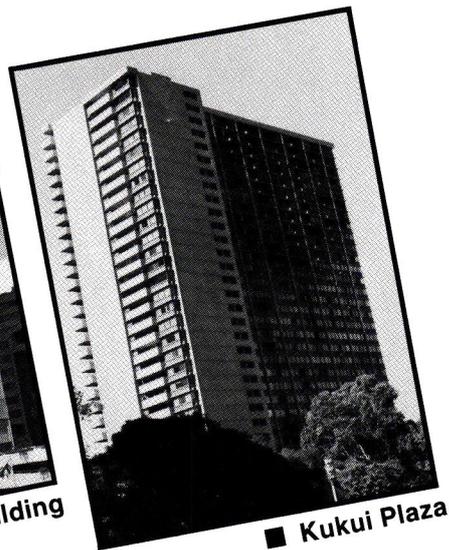
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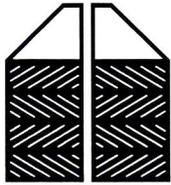
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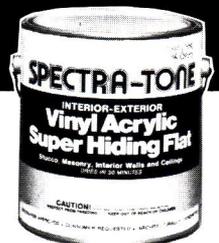
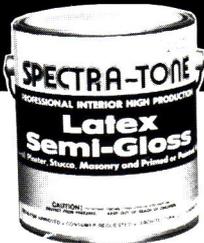
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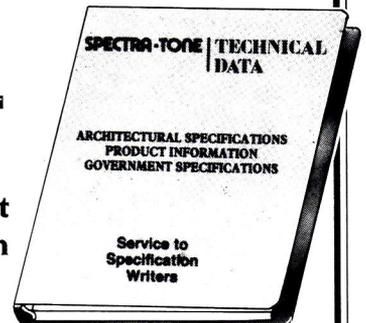
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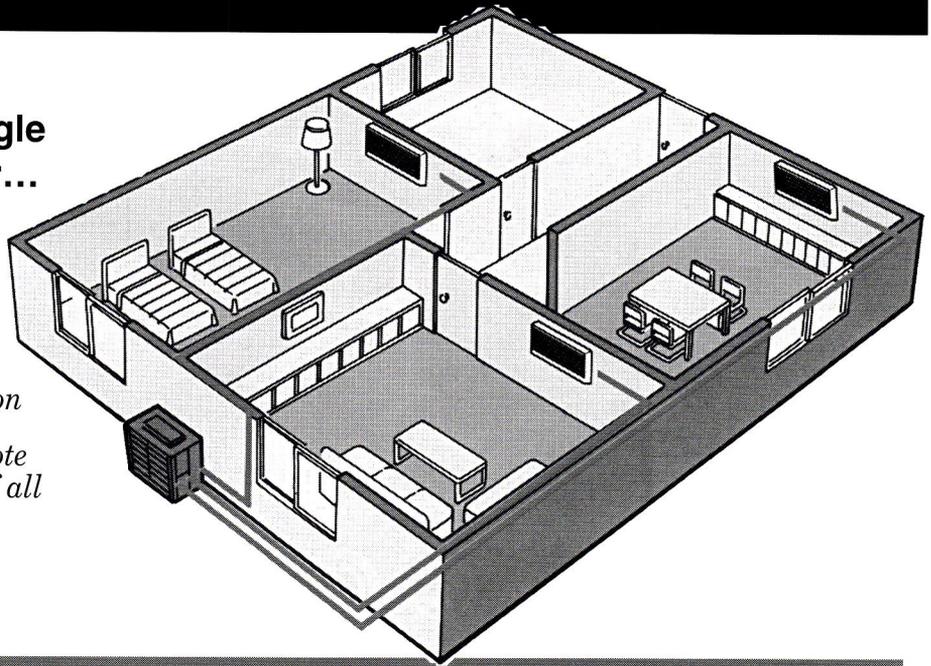


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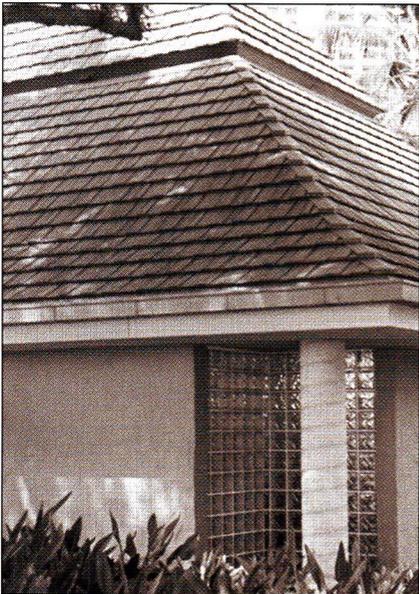
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Addressing issues of the year 2000

Government Restrictions Expected

by Dennis P. Swart



ALCOA aluminum shake panels, designed to be visually identical to wood, were specified on the Hale Koa Hotel pavilions.

Design by Kauhikaua & Chun Architects

Thermo-plastic single-ply roofing was chosen for the Interisland Terminal at the Honolulu Airport due to its superior seam strength and resistance to UV rays.

Design by Interisland Terminal Associates



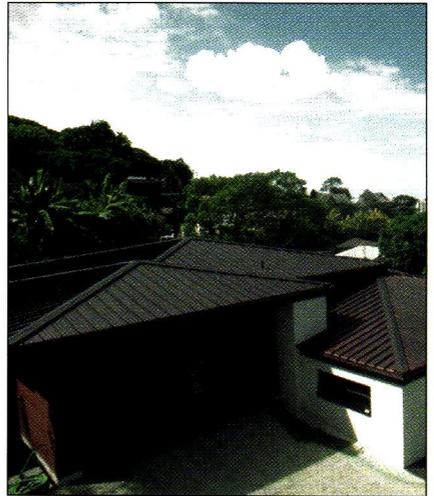
As we approach the year 2000, the roofing industry is wrestling with issues affecting established business practices. The industry is responding to requirements of new technologies and government. Other changes will undoubtedly follow because business practices are likely to change in the future.

Roofing materials used today may no longer be available in the same formulation. This can be expected in view of governmental restrictions. It will happen just like it did when asbestos was removed from most roofing products. Today's effective products will be re-formulated by the industry and re-assessed by the design community to determine their performance characteristics.

What is the focus of governmental restrictions and enforcement? Legislation in Southern California limits to 250 grams per liter the amount of solvent in packaged roofing materials. Volatile organic compounds (VOC) are being restricted to curb environmental pollution. As stricter guidelines take effect,

manufacturers will realize that it's a matter of time before use of solvents is prohibited.

Manufacturers already know that the re-formulation of products involves research and ensuing potential poor



Roll-formed roofing is one of many products offered by Jorgensen Steel.

performance by these new products. Another dilemma manufacturers will face is when certain chemical components used in new products become scarce. Increased demand for these components can outstrip the manufacturers' ability to produce them or increase product costs.

Other governmental restrictions affecting the roofing industry deal with installation, removal and disposal of roofing materials. Occupant safety and health and health hazards to installers are important considerations. Long-term health issues are also under consideration as they affect worker safety.

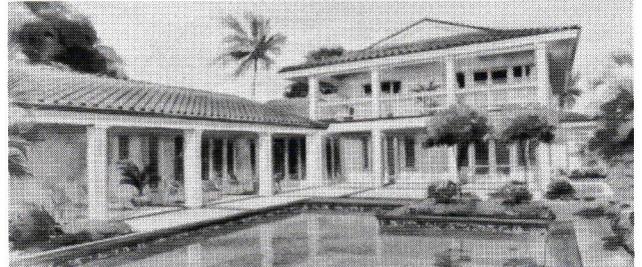
Most people realize the potential dangers associated with burns by hot asphalt; however, few people consider health risks from fumes resulting from heating asphalt, a type 3 carcinogen. Also, most people have driven behind trucks towing smoking kettles without realizing the potential for disaster in case of accident. How often have fires been accidentally ignited during application of asphalt on a roof?

As these issues are considered, the industry can expect new restrictions and changes plus insurance premium increases as the insurance industry weighs potential risks of hot asphalt.

Another dilemma facing the roofing industry is how to dispose of

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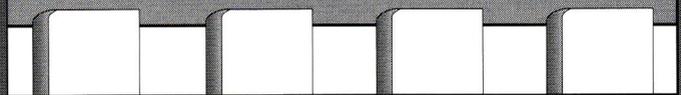


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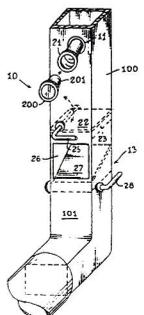
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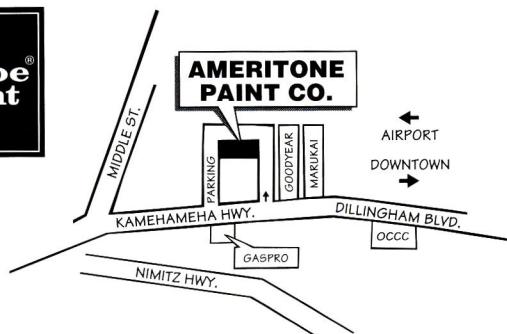
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old roofing materials. Disposed materials may leach into the soil, creating contamination problems. Rubber roof membranes have to be cut into small pieces for disposal, an operation that adds to escalating disposal costs. The larger issue involves disposal in general in landfills nearing capacity.

These challenges can be resolved through compliance. Manufacturers are working on water-based and solvent-free green product technologies. For example, water-based product primers are being developed to meet performance expectations. Single-ply manufacturers who traditionally have used adhesives are either developing new compliant adhesives or have adopted heat-seaming capabilities with membranes.

Water-based asphalt-based roofing products containing no solvents are already available. Standard built up roof can be installed with no kettle or fumes, no volatile organic compounds and without endangering the health of installers. As emerging technologies mature, safer high-performance roofing products that meet design professional expectations will become available.

Solutions for discarding roofing materials also apply to all waste materials. Some materials are being recycled so that they can be reused. Asphalt shingles, for instance, are being added to road surface materials. Hopefully, the recycling and waste management industry will provide expertise in this important area.

Total quality in roofing is another industry goal. Much of the 1993 National Roofing Contractor Association (NRCA) convention program dealt with total quality roofing.

When hurricanes strike, roofing experts examine the extent of damage to determine roofing failure causes or reasons for survival. The data gathered are evaluated and translated into roofing practices, most of which are incorporated into

the NRCA Roofing Manual.

Total quality roofing will be achieved as installers become total-quality oriented, design professionals are provided with information on how to design roofing systems and system installations are properly inspected prior to issuing warranties.

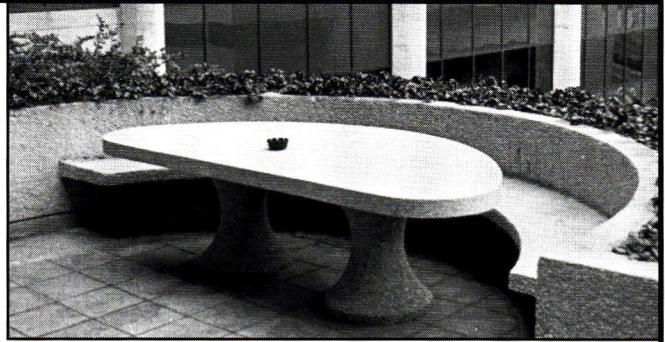
As costs to replace failed roofing systems increase, the effort to do it right the first time makes sense. The mastery of total quality does not come without effort. Design professionals must keep informed and provide specifications that ensure quality roofing.

The roofing industry may have changed, but the need to provide customers with roofs that don't leak remains constant.

Dennis P. Swart represents TREMCO, a BF Goodrich subsidiary in Hawaii and Pacific Basin.

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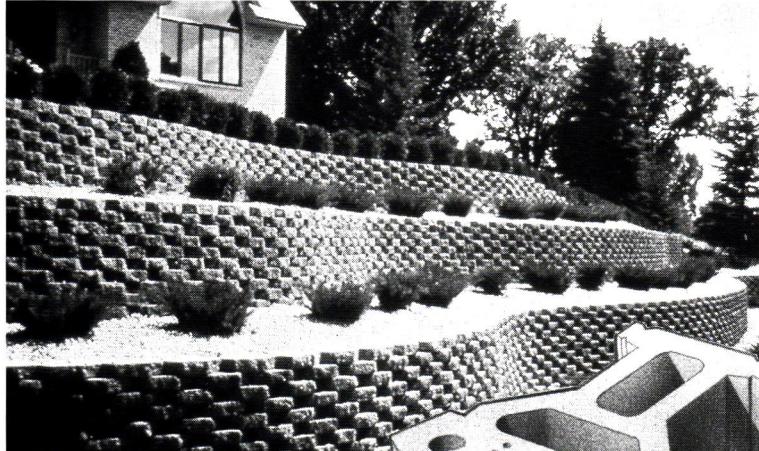
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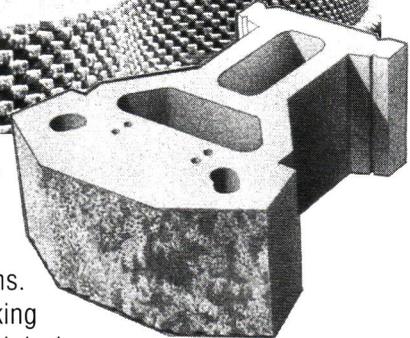
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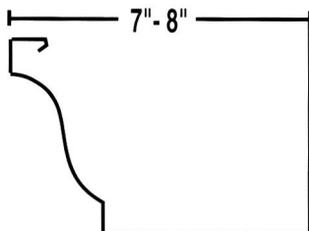


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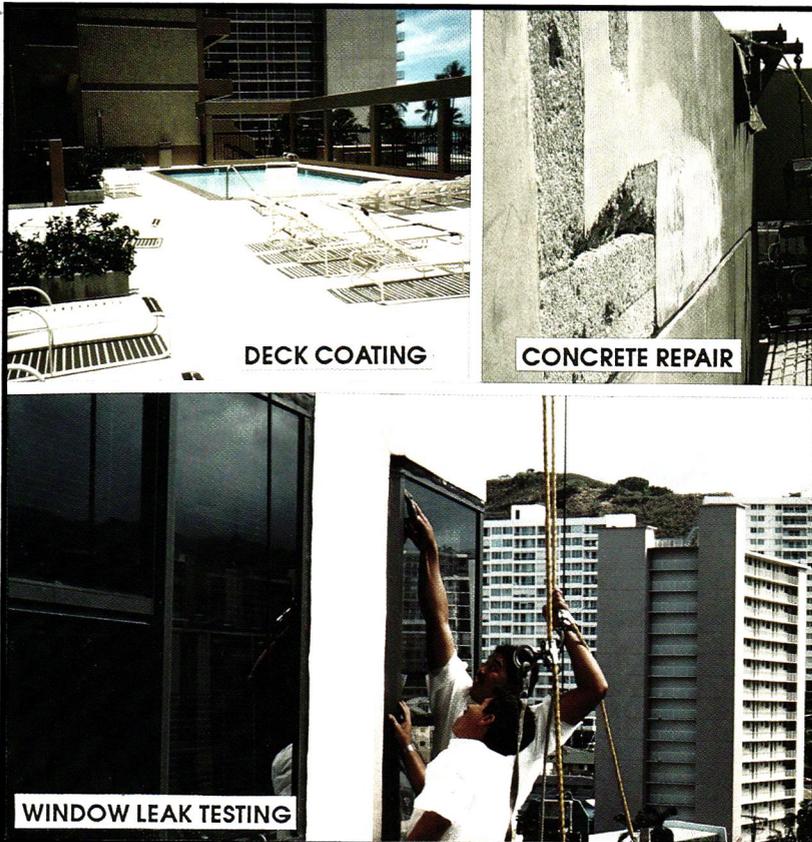


Heading a team of over 40 technicians are left to right:
Alvin Nishikawa, Ken Matusumura, John Kobayashi,
Al Gardner, Steve Kramer, and Jim Hiramatsu

Meet Alvin Nishikawa.



Alvin is Vice President of The American Coating Company. He is in charge of all field and estimating operations. Previously, Alvin was employed with an engineering firm in Chicago and Honolulu where he focused primarily on restoration and water infiltration problems. Alvin holds a M.S. and B.S. in Engineering from Purdue University.



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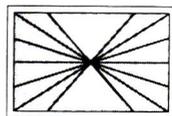
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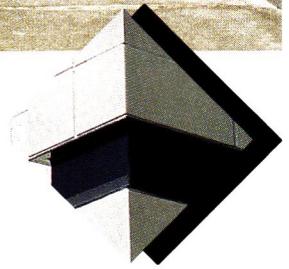
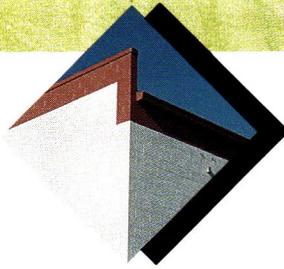
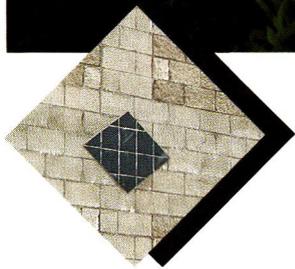


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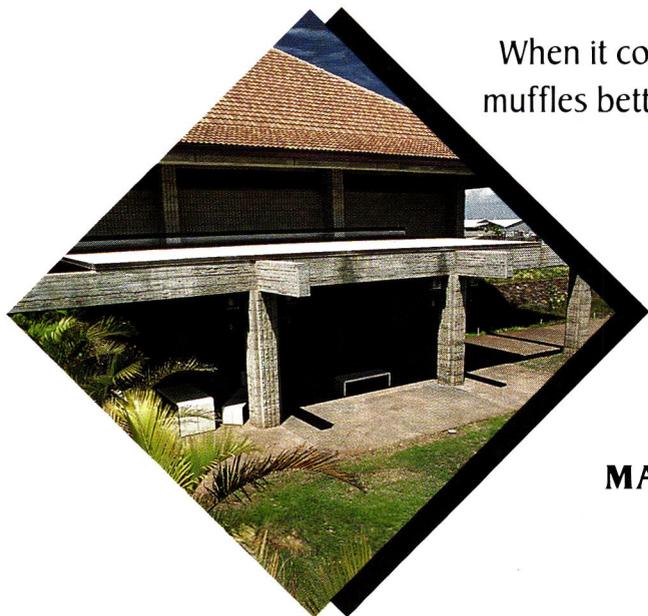
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